Obstetric Gynecologic Radiology

Program subject to change until 12/16/2019.
Interpretation of Postpartum Imaging: A Challenge in Diagnosis and Management of Enhanced Myometrial Vascularity

All Day Room: OB Community, Learning Center Hardcopy Backboard

Participants
Christopher D. Yeisley, MD, Manhasset, NY (Abstract Co-Author) Nothing to Disclose
Jonathan Penner, MD, Manhasset, NY (Presenter) Nothing to Disclose
Ross B. Ingber, MD, Manhasset, NY (Abstract Co-Author) Nothing to Disclose
Eric J. Gandras, MD, Great Neck, NY (Abstract Co-Author) Nothing to Disclose
Mustafa Al-Roubaie, MD, Manhasset, NY (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1. Review common presentation of enhanced myometrial vascularity (EMV) and differential diagnoses, including arteriovenous malformations (AVMs) and retained products of conception, on multiple imaging modalities.
2. Common pitfalls in interpretation and patient management.
4. Highlight the need for additional research.

TABLE OF CONTENTS/OUTLINE
1. Introduction of enhanced myometrial vascularity and natural history of the disease process
2. Review of imaging findings: - US, CT, MRI, and Angiography
3. Review common differential diagnoses and corresponding treatment algorithms: - Arteriovenous Malformations - Retained products of conception
4. Multimodality case review
5. Review the risks and benefits of uterine artery embolization, specifically in the setting of desired future pregnancy
6. Summary/conclusion

Printed on: 12/22/19
Diagnosis of Abdominopelvic Vascular Rare Pathologies of the Later Pregnancy and the Post-Partum: CT Imaging

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Omar Adib, Lyon, France (Presenter) Nothing to Disclose
Antoine Bouvier, Angers, France (Abstract Co-Author) Nothing to Disclose
Catherine Ridereau-Zins, MD, Angers, France (Abstract Co-Author) Nothing to Disclose
Francine Thouveny, Angers, France (Abstract Co-Author) Nothing to Disclose
Guillaume Legendre, Angers, France (Abstract Co-Author) Nothing to Disclose
Christophe Aube, MD, PhD, Angers, France (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
- To recognize the urgent character and high risk vascular complications of pregnancy and post partum - To request CT-Scan however his irradiation and the administration of contrast medium -

TABLE OF CONTENTS/OUTLINE
- Physiopathology of vascular complications of the later preegnancy and the post-partum - Practice parameters for imaging pregnant with ionizing radiation - Review of CT imaging findings - Conclusion - References

Printed on: 12/22/19
Participants
Wirana Anghthon, MD, Klong Luang, Thailand (Presenter) Nothing to Disclose
Chayanin Anghthon, MD,PhD, Pathum Thani, Thailand (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
angthongw@gmail.com

TEACHING POINTS
1. To illustrate the anatomy of adnexa. 2. To discuss the differential diagnosis of adnexal lesions based on CT and MRI. 3. To review imaging characteristics, pearls and pitfalls of the key concepts in diagnosis of adnexal lesions.

TABLE OF CONTENTS/OUTLINE
1. Anatomical consideration 2. Case-based demonstration of CT and MRI findings of adnexal lesions. a) Acute pelvic pain - Adnexal torsion - Rupture ovarian cyst vs endometriotic cyst b) Chronic pelvic pain or incidental findings - Endometriosis - Typical and atypical manifestation of ovarian teratomas - Teratoma vs immature teratoma - Primary vs secondary ovarian tumors - Serous vs mucinous ovarian tumors - Benign pelvic condition mimicking peritoneal carcinomatosis.

Printed on: 12/22/19
Abnormalities of the Fetal Central Nervous System: Prenatal Ultrasound Diagnosis with Postnatal Correlation

All Day Room: OB Community, Learning Center Digital Education Exhibit

Awards
Identified for RadioGraphics

Participants
Sarah W. Cater, MD, Durham, NC (Presenter) Nothing to Disclose
Brita K. Boyd, MD, Durham, NC (Abstract Co-Author) Consultant, General Electric Company
Sujata V. Ghate, MD, Durham, NC (Abstract Co-Author) Research Grant, Bracco Group Reader, QT Ultrasound Travel support, QT Ultrasound

For information about this presentation, contact:
sarah.cater@duke.edu

TEACHING POINTS

While fetal central nervous system (CNS) abnormalities are uncommon, early and accurate diagnosis on prenatal ultrasound (US) is essential as it allows for improved prenatal counseling and facilitates appropriate referral. Detailed review of the fetal CNS is an important part of prenatal US. Standard views provide an overview of normal intracranial anatomy. Detailed knowledge of normal anatomy and adoption of a logical sonographic approach can improve detection of abnormal findings and lead to a more accurate differential diagnosis. Abnormalities may be classified into 6 main categories: developmental, posterior fossa, ventricular, midline, vascular, and miscellaneous. Correlation with postnatal CT/MR is helpful to confirm and clarify suspected diagnoses.

TABLE OF CONTENTS/OUTLINE


Printed on: 12/22/19
Sex cord stromal tumors (SCST) account for a small but important proportion of ovarian tumors. They present a clinical challenge due to a broad range of image characteristics on presentation ranging from small solid tumors to large multicystic masses. Arising from two embryologically distinct cell lines, SCST can be hormonally active and difficult to locate. Early identification of these lesions is essential due to resultant hormonal imbalance and malignant potential. We explore image characteristics of fibroma, thecoma, fibrothecoma, granulosa cell tumor (GCT) and Sertoli-leydig cell tumors. We break down the diagnostic dilemma by outlining characteristic image findings. We highlight SCST chameleons and how to discern them; e.g. differentiate fibroma from mimics like fibroids using the bridging-vessel sign, or differentiate fibrothecoma or GCT from other tumors that can cause endometrial stripe thickening-endometrioid carcinoma. Utilizing CT, MR and Ultrasound we evaluate the spectrum of SCST in a pictorial analysis.

TABLE OF CONTENTS/OUTLINE

Introduction • Objectives • Pathophysiology and epidemiology of SCST • Fibroma, thecoma, fibrothecoma—presentation, image characteristics, management and follow up • Granulosa and Sertoli-leydig cell tumors—presentation, image characteristics, management and follow up • ACR appropriateness criteria for imaging • Summary • References
Role of MRI in Brachytherapy for Uterine Cervical Cancer: Why, When, and How - 'State-of-the-Art' and Spectrum of Imaging Findings

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Noelia Arevalo, Los Molinos, Spain (Presenter) Nothing to Disclose
Ramiro Mendez, Madrid, Spain (Abstract Co-Author) Nothing to Disclose
Sofia Cordoba Largo, Madrid, Spain (Abstract Co-Author) Nothing to Disclose
Jose Manuel Espejo Dominguez, Madrid, Spain (Abstract Co-Author) Nothing to Disclose
Fatima Matute Teresa, MD, Madrid, Spain (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1. To outline the role of imaging in the locorregional staging of the disease according to the new FIGO classification and the implications for therapy.
2. To describe the current role of brachytherapy in the treatment of cervical cancer.
3. To illustrate the role of multiparametric magnetic resonance imaging (mp-MRI) in the planning of brachytherapy with case examples.
4. To familiarize with the mp-MRI appearance of cervical cancer post-brachytherapy, differentiating usual post-treatment changes from tumoral persistence or tumoral recurrence.
5. To review the possible complications post-brachytherapy of cervical cancer and how mp-MRI can help to prevent these complications.

TABLE OF CONTENTS/OUTLINE

Printed on: 12/22/19
3-Dimensional Ultrasound of the Uterus: From the Mucosa to the Serosa

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Participants
Susan J. Frank, MD, Park Ridge, NJ (Presenter) Nothing to Disclose
Marjorie W. Stein, MD, New Rochelle, NY (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
sfrank@montefiore.org

TEACHING POINTS

1. The coronal view of the uterus is best for evaluating the external fundal contour, essential for the classification of mullerian duct anomalies. 2. Three dimensional ultrasound allows for more complete evaluation of the endometrium, which aids in evaluation of the IUD position. 3. In sonohysterography, 3D US allows simultaneous evaluation of the uterine cavity, endometrial lining, and myometrium. Digital storage of data allows evaluation after catheter removal.

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Printed on: 12/22/19
The Elusive Non-Adnexal Ectopic Pregnancy: Where It’s Hiding and How You Will Find It

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Alyssa K. Kirsch, MD, Pleasant Ridge, MI (Presenter) Nothing to Disclose
Rennard B. Tucker, MD, Royal Oak, MI (Abstract Co-Author) Nothing to Disclose
Richard Bronstein, MD, Royal Oak, MI (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
alyssa.kirsch@beaumont.org

TEACHING POINTS
Review the pathophysiology of and risk factors associated with ectopic and heterotopic pregnancies
Discuss the prevalence of extrauterine pregnancy implantation locations
Discuss key ultrasound findings of uncommon sites of ectopic and heterotopic pregnancies

TABLE OF CONTENTS/OUTLINE
Pathophysiology of ectopic and heterotopic pregnancies
Discuss location and prevalence of extrauterine implantation including interstitial, cornual, ovarian, cervical, and Cesarean section (C-section) scar pregnancies
Discuss key risk factors including prior C-section, history of sexually transmitted infection, in vitro fertilization, or intrauterine device (IUD) placement
Review ultrasound key findings of ectopic and heterotopic pregnancies
Case review of rare ultrasound findings of ectopic and heterotopic pregnancies
Ovarian, C-section scar, and interstitial ectopic pregnancies intra-operatively confirmed
Intrauterine ectopic and cervical heterotopic pregnancies confirmed laparoscopically
Ectopic pregnancies with presence of IUD

Summary

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Teratoma: Various Manifestations and Complications

Awards
Certificate of Merit
Identified for RadioGraphics

Participants
Tsukasa Saida, MD, Tsukuba, Japan (Presenter) Nothing to Disclose
Hiroyuki Ochi, Tsukuba, Japan (Abstract Co-Author) Nothing to Disclose
Toshitaka Ishiguro, Tsukuba, Japan (Abstract Co-Author) Nothing to Disclose
Masafumi Sakai, MD, Tsukuba, Japan (Abstract Co-Author) Nothing to Disclose
Sosai Hoshiai, MD, Tsukuba, Japan (Abstract Co-Author) Nothing to Disclose
Tadashi Hara, Tsukuba, Japan (Abstract Co-Author) Nothing to Disclose
Toyomi Satoh, MD, Tsukuba, Japan (Abstract Co-Author) Nothing to Disclose
Manabu Minami, MD, PhD, Yokohama, Japan (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
saida_sasaki_tsukasa@yahoo.co.jp

TEACHING POINTS

Teratoma is the most common neoplasm of the ovary and usually diagnosed by CT or MRI easily. However, there are a lot of pitfalls with unusual manifestations including mature cystic teratoma without demonstrable fat components, immature teratoma, monodermal teratoma, combination tumors, collision tumors and with various complications including torsion, rupture, malignant transformation, infection, etc. As a result teratoma demonstrates a wide spectrum of imaging features. It is necessary for radiologists to know these various pitfalls of ovarian teratoma for providing adequate diagnosis. Furthermore, teratoma also may develops in other various parts. However, it is rarer than ovarian teratoma and not all radiologists are familiar to these imaging findings. In this educational exhibit we also demonstrate teratoma in various parts other than the ovary with representative imaging. The teaching points of this exhibit are: 1. Pitfalls of teratoma; radiological findings of unusual manifestations and its complications. 2. Teratoma of other various parts with representative imaging findings.

TABLE OF CONTENTS/OUTLINE

A. Common imaging findings of ovarian teratoma. B. Pitfalls of teratoma; unusual manifestations and its complications. C. Teratoma of other various parts with representative imaging findings.

Printed on: 12/22/19
Transperineal 2D and 4D Ultrasound: Suburethral Sling - Peek-a-Boo!

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Mariangeles Gomez, Buenos Aires, Argentina (Presenter) Nothing to Disclose
Silvia E. Gimenez, MS, Buenos Aires, Argentina (Abstract Co-Author) Nothing to Disclose
Maria S. Yacopino, MD, Buenos Aires, Argentina (Abstract Co-Author) Nothing to Disclose
Juan Sardi, Ciudad de Buenos Aires, Argentina (Abstract Co-Author) Nothing to Disclose
Gabriela B. Picco, MD, Capital Federal, Argentina (Abstract Co-Author) Nothing to Disclose
Julia Marucco, Buenos Aires, Argentina (Abstract Co-Author) Nothing to Disclose
Patricia E. Farias, MD, Buenos Aires, Argentina (Abstract Co-Author) Nothing to Disclose
Gustavo Maya, Buenos Aires, Argentina (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1: To transmit how to evaluate a patient with 2D and 4D ultrasound for suburethral sling assessment. 2: To show the utility of transperineal ultrasound in the evaluation of suburethral slings: - To transmit how to evaluate suburethral slings with dynamic ultrasound 2D and 4D - To show the utility of ultrasound in assessing patients before surgical procedure. - To show the utility of ultrasound to determine the position, type and slings integrity, clarifying their mode of action and understanding the causes of surgical failure. - To show the utility of ultrasound in assessing surgical complications.

TABLE OF CONTENTS/OUTLINE

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Methotrexate Chemo Agent in Gynecological and Obstetric Practice: What the Radiologist Needs to Know

Participants
Margarita V. Revzin, MD, New Haven, CT (Presenter) Nothing to Disclose
John S. Pellerito, MD, Manhasset, NY (Abstract Co-Author) Research Grant, General Electric Company
Nariman Nezami, MD, New Haven, CT (Abstract Co-Author) Nothing to Disclose
Douglas S. Katz, MD, Mineola, NY (Abstract Co-Author) Nothing to Disclose
Mariam Moshiri, MD, Bellevue, WA (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
margarita.re vzin@yale.edu

TEACHING POINTS
- Discuss main uses of methotrexate (MTX) chemo agent in gynecological and obstetrical practice
- Recognize the range of imaging appearances of gynecological and pregnancy related conditions post MTX treatment
- Familiarize the radiologists with most common radiological findings associated with complications post MTX treatment

TABLE OF CONTENTS/OUTLINE
- Pathophysiology, Route of administration, and Eligibility Criteria for MTX use
- Main criteria of MTX treatment success and failure
- Gynecologic indications: ectopic pregnancy (tubal, scar, cervical, interstitial)
- Obstetrics indications: invasive placenta, molar pregnancy, choriocarcinoma, abnormal location of gestational sac within the endometrium
- Medical abortion
- Post MTX therapy related complications: Fallopian tube rupture, Infection (endometritis, abscess)
- Failure of treatment with continuous fetal growth post treatment
- Locoregional and distant metastases
- Gastrointestinal side effects (bowel inflammation)

Printed on: 12/22/19
Abdominal Pain in Pregnancy: It’s Not Always Appendicitis!

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Awani Donthireddy, MD, New York, NY (Presenter) Nothing to Disclose
Sara Lewis, MD, New York, NY (Abstract Co-Author) Nothing to Disclose
Amita Kamath, MD,MPH, New York, NY (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
awani.donthireddy@mountsinai.org

TEACHING POINTS
1. Review the imaging algorithm for abdominal pain in pregnancy based on ACR recommendations. 2. Describe the standard abdominal MRI protocol for pregnant patients. 3. Identify the typical appearance of appendicitis in pregnancy on MR imaging along with post-appendectomy complications. 4. Recognize typical and atypical non-appendicitis pathologies in pregnant patients presenting with abdominal pain.

TABLE OF CONTENTS/OUTLINE
1. Presentations of appendicitis
   a. Diagnostic challenges in pregnancy
2. Advantages/Disadvantages of various imaging modalities in pregnancy
3. Imaging Algorithm for abdominal pain in pregnancy
4. Standard abdominal MRI protocol for pregnant patients
   a. Theoretical Risks of MRI for the fetus
   i. Use of gadolinium
   ii. Heating
   iii. Acoustic Noise
5. Imaging findings of appendicitis in pregnancy
6. Risks and complications of appendicitis
7. Post-op complications of appendicitis
8. Typical and unusual cases
   - SBO
   - Crohn's
   - UC
   - Cholelithiasis
   - Cholecystitis
   - Pancreatitis
   - SPEN
   - Cholangiocarcinoma
   - Nephroureterolithiasis
   - Pyelonephritis
   - Xanthogranulomatous pyelonephritis
   - Adrenal hemorrhage
   - Gynecologic
   - Ruptured ovarian cyst
   - Degenerating fibroids
   - Serous cystadenofibroma
   - Serous cystadenoma w/ ovarian torsion
   - Dermoid w/o torsion
   - Dermoid w/ ovarian torsion
   - Lymphoma
9. Summary

Printed on: 12/22/19
Cervical Carcinoma and Updated FIGO Staging: What Should Radiologists Know in 2019?

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Janardhana Ponnatapura, MD, MBBS, Winston Salem, NC (Abstract Co-Author) Nothing to Disclose
Malak Itani, MD, Clayton, MO (Abstract Co-Author) Nothing to Disclose
Ryan O'Malley, MD, Seattle, WA (Abstract Co-Author) Research Grant, General Electric Company
Abdul-rahman Abualruz, MD, Winston Salem, NC (Abstract Co-Author) Nothing to Disclose
Neeraj Lalwani, MD, Winston Salem, NC (Presenter) Nothing to Disclose

For information about this presentation, contact:
nlalwani@wakehealth.edu

TEACHING POINTS
Cervical cancer is the 4th most frequent cancer in women. Over half a million new cases of cervical cancers are diagnosed each year. Modern imaging techniques and novel minimally invasive surgery have significantly impacted the model for management of these cases. The FIGO Gynecologic Oncology Committee has recently revised the staging system to accommodate novel imaging and surgical techniques. Knowledge of updated FIGO system and modifications is essential for the appropriate radiological reporting.

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Printed on: 12/22/19
What to Expect When You’re Inspecting: The Fetal Anatomy Scan

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Valerie Hostetler, MD, Travis AFB, AE (Presenter) Nothing to Disclose

TEACHING POINTS
By viewing this exhibit the learner should be able to: 1. Evaluate all images routinely obtained during a 20 week fetal anatomy scan for adequacy. 2. Identify the expected appearance, size and relationships of the evaluated anatomy.

TABLE OF CONTENTS/OUTLINE
Introduction Placenta, Cerivx, and Umbilical Cord Fetal Biometry Fetal CNS, Face, and Neck Fetal Thorax Fetal Abdomen Fetal Extremities

Printed on: 12/22/19
Uterine Waves: What Does it Mean and Where Can it Take Us?

All Day Room: OB Community, Learning Center Digital Education Exhibit

Awards

Certificate of Merit

Participants
Deborah M. Soares, MD, Rio de Janeiro, Brazil (Abstract Co-Author) Nothing to Disclose
Bernardo S. Oliveira, MD, Rio de Janeiro, Brazil (Presenter) Nothing to Disclose
Heron Werner, MD, Rio de Janeiro, Brazil (Abstract Co-Author) Nothing to Disclose
Leonardo K. Bittencourt, MD, PhD, Rio de Janeiro, Brazil (Abstract Co-Author) Nothing to Disclose
Marco Aurelio P. Oliveira, MD, PhD, Rio de Janeiro, Brazil (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
debymonte@hotmail.com

TEACHING POINTS

The uterus is characterized by inherent movements, known as sustained contractions and uterine peristalsis. They have well-defined roles in the menstrual cycle, in childbirth and especially in fertility. The purpose of this exhibit is: To review the functional movements of the uterus and its variations during the menstrual cycle. To explain the characteristics and functions of uterine peristalsis and sustained contractions in reproduction. To explain the utility of Cine MRI to evaluate the kinematic function of the uterus, allowing assessment of uterine contraction and demonstrating morphological and temporal changes of uterine peristalsis. To discuss some benign conditions such as fibroids, adenomyosis and endometriosis that have been highlighted by interfering with uterine contraction. To illustrate by Cine MR Imaging cases of physiological contractions and uterine dysfunctional movements.

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Printed on: 12/22/19
Ovarian Carcinoma Recurrences at CT and MRI: Not Always that Simple! - A Case-based Review

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Sophie Egels, Paris, France (Presenter) Nothing to Disclose
Yasmina Badachi, MD, Paris, France (Abstract Co-Author) Nothing to Disclose
Salma Ayadi, MD, Villejuif, France (Abstract Co-Author) Nothing to Disclose
Jean-Paul Akakpo, MD, Levallois-Perret, France (Abstract Co-Author) Nothing to Disclose
Olivier Lucidarme, MD, Paris, France (Abstract Co-Author) Speaker, Bracco Group Speaker, F. Hoffmann-La Roche Ltd Speaker, Boehringer Ingelheim GmbH

For information about this presentation, contact:
sophie.egels@aphp.fr

TEACHING POINTS
Since optimal surgical treatment for ovarian cancer involves aggressive surgery, with removal of all grossly visible tumor extended to other abdominal resections when needed, the treatment induces changes of the peritoneum spaces that can make it difficult to identify abdominal recurrences. The aim of this exhibit is to describe the most frequent sites of abdominal recurrences of ovarian malignancies after debulking surgery at both CT and MRI. Where to look for ovarian carcinoma recurrences, how to depict them?

TABLE OF CONTENTS/OUTLINE
- Peritoneal spaces changes induced by the surgery - The most frequent abdominal sites of recurrence, their localisation and imaging aspects at both CT and MRI - Rarer ovarian carcinoma recurrences

Printed on: 12/22/19
Malignant Transformation of Benign Gynecologic Diseases: Wide Spectrum of Clinical and Imaging Manifestations, Pitfalls, and Problem-Solving Advanced MR Techniques

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Mayumi Takeuchi, MD, PhD, Tokushima, Japan (Presenter) Nothing to Disclose
Kenji Matsuzaki, MD, PhD, Tokushima, Japan (Abstract Co-Author) Nothing to Disclose
Masafumi Harada, MD, PhD, Tokushima, Japan (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
mayumi@tokushima-u.ac.jp

TEACHING POINTS
1. Common gynecologic diseases may cause malignant transformation (MT). Because early diagnosis may improve the patient's prognosis, clinical and imaging manifestations of MT should be well recognized. 2. Various imaging manifestations of MT and pitfalls with pathologic correlation are demonstrated, and the feasibility of advanced MR techniques: DWI, reduced FOV-DWI, computed DWI, DCE-MRI, susceptibility-weighted sequences (SWS), MR spectroscopy (MRS) is reviewed for the differential diagnosis and in addressing therapeutic strategy.

TABLE OF CONTENTS/OUTLINE
Endometriosis w/ MT - Endometrioma w/ MT: Carcinomas; Seromucinous borderline tumor-Pitfalls: Clots; Decidualized /Polypoid /Deep pelvic /Extra-ovarian endometriosis-Non-cystic endometriosis w/ MT via adenofibromaTeratoma w/ MT - Carcinomas-Pitfalls: Rokitansky protuberance; Struma ovarii; Immature teratoma; Carcinoid Ovarian epithelial tumors w/ MT - Serous and Mucinous borderline tumors; Carcinomas-Pitfalls: Metastasis-Malignant Brenner tumor-Large cell neuroendocrine carcinomaLeiomyoma w/ MT - LeiomyosarcomaEndometrial hyperplasia /Polyp w/ MT

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Imaging Manifestations of Gynecologic Tumor-related Paraneoplastic Syndromes and Other Disease-Associated Disorders

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Mayumi Takeuchi, MD, PhD, Tokushima, Japan (Presenter) Nothing to Disclose
Kenji Matsuzaki, MD, PhD, Tokushima, Japan (Abstract Co-Author) Nothing to Disclose
Masafumi Harada, MD, PhD, Tokushima, Japan (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
mayumi@tokushima-u.ac.jp

TEACHING POINTS
1. Paraneoplastic syndromes (PNS) are indirect clinical manifestations of tumors induced by tumor-secreted biological substances such as ectopic hormones, cytokines, and growth factors, or by tumor-associated immune reactions. Other gynecologic disease-associated disorders such as hormone hypersecretion from functioning tumors and tumor-like conditions, adhesions related with endometriosis or inflammatory process, and fluid collection due to tumoral secretion or hemorrhage may have characteristic imaging manifestations.
2. It is important for radiologists to be aware of the various imaging manifestations of PNS and other disease-associated disorders, because these syndromes and disorders can be the first clinical presentation of clinically silent diseases, and their timely recognition may enhance the diagnosis and treatment of diseases.

TABLE OF CONTENTS/OUTLINE
Endocrine: Hypercalcemia; Osteomalacia; Carcinoid /New carcinoid synd.; Hyperthyroidism; Hyperestrogenism due to functioning ovarian pathologies
Neurologic: Limbic /Anti-NMDAR encephalitis; Subacute cerebellar degeneration
Dermatologic and rheumatologic: Reiter synd. w/ PID
Hematologic: Autoimmune hemolytic anemia; Trousseau synd.; Tumor-related anemia
Miscellaneous: Meigs /pseudo-Meigs synd.
Adhesive: Endometriosis /PID related
Secondary: Choriocarcinoma synd.; Fitz-Hugh-Curtis synd.

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Is that Normal? What the Radiologist Needs to Know About Contraceptive Devices

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Zara Wadood, MD, Providence, RI (Presenter) Nothing to Disclose
Elizabeth H. Dibble, MD, Barrington, RI (Abstract Co-Author) Nothing to Disclose
Shruthi Ram, MD, Providence, RI (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
zwadood@lifespan.org

TEACHING POINTS
1. Learn the various types of contraceptive devices and indications for imaging. 2. Review appearance of normally positioned contraceptive devices and recognize appearance of abnormally positioned contraceptive devices on various imaging modalities drawing on cases from an emergency department, women's specialty hospital and large outpatient practice. 3. Understand the imaging appearance, incidence and clinical relevance of complications associated with contraceptive devices.

TABLE OF CONTENTS/OUTLINE
I. Contraception Devices
   a. IUDs
   b. Tubal Occlusion Devices
   c. Subdermal implant
II. Intrauterine Devices
   a. Indications for Imaging
   b. Imaging appearance (normal: US including 3D, radiographs, CT, MRI)
      i. USA: copper and hormone-releasing
      ii. IUD's placed outside of the USA
   c. Potential Complications
      i. Displacement: Low-lying IUD
      ii. Fractured arm
      iii. Other forms of displacement with and without embedment
      iv. Expulsion
      v. Unintended Intrauterine Pregnancy
      vi. Ectopic Pregnancy
      vii. Intraabdominal Migration
      viii. Uterine Perforation
III. Tubal Occlusion Devices
   a. Coil system (HSG, US, CT)
      i. Normal
      ii. Malposition
      iii. Perforation
      iv. Fracture and migration
   b. Silicone matrix system
   c. Tubal ligation clips
IV. Subdermal implant
   a. Normal appearance
   b. Vascular migration
V. Summary

Printed on: 12/22/19
If, How, What, When?: The Head and Tail of a Monochorionic Tale!

All Day Room: OB Community, Learning Center Digital Education Exhibit

Awards
Certificate of Merit

Participants
Pooja U. Vyas, MBBS, Mumbai, India (Presenter) Nothing to Disclose
Rajas N. Chaubal, MBBS, MD, Thane, India (Abstract Co-Author) Nothing to Disclose
Nitin G. Chaubal, MD, MBBS, Thane, India (Abstract Co-Author) Nothing to Disclose
Shopnil S. Prasla, MBBS, MD, Mumbai, India (Abstract Co-Author) Nothing to Disclose
Mukund S. Joshi, MD, Mumbai, India (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
pooja.punjani@gmail.com

TEACHING POINTS
1. Determining chorionicity and amnionicity in multifetal pregnancies
2. Detecting early complications in monochorionic pregnancies
3. Treatment options for complicated monochorionic twins and when to intervene

TABLE OF CONTENTS/OUTLINE
1. Understanding the anatomic basis of Monochorionic pregnancies including the anatomy of the placenta and the vascular anastomosis
2. Importance of using transvaginal scans in determining chorionicity and amnionicity in early pregnancy
3. Understanding the complications in monochorionic twins including - Selective IUGR (sIUGR), Twin Anemia- Polycythemia Syndrome (TAPS), Twin Reverse Arterial Perfusion Sequence (TAPS), Twin Twin Transfusion Syndrome (TTTS)
4. Using Ultrasound parameters effectively to detect complications in 1st Trimester including - Growth discordance, Nuchal Translucency (NT), difference in amniotic fluid etc.
5. Discussing ultrasound parameters to detect complications in 2nd Trimester including - Urinary bladder size discordance, Presence of ascites/ effusion/ body edema, Middle cerebral artery (MCA) doppler, Umbilical Artery doppler, Ductus Venosus Doppler
6. Discussing the various treatment options available for these complications including interventional options like laser ablations for anastomotic vessels, Radio Frequency Ablation(RFA), Cord coagulation by bipolar cautery/ laser

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At the Edge of Borderline Ovarian Tumors: Multimodality Imaging Overview

All Day Room: OB Community, Learning Center Digital Education Exhibit

**Participants**
Angelica Patino, MD, Springfield, MA (*Presenter*) Nothing to Disclose
Daniel A. Hynes, MD, Springfield, MA (*Abstract Co-Author*) Nothing to Disclose
Daniel Kowal, MD, Sturbridge, MA (*Abstract Co-Author*) Nothing to Disclose

**TEACHING POINTS**
The goals of this exhibit are: To increase awareness of borderline ovarian epithelial tumors To describe differences between benign, borderline and malignant epithelial ovarian tumors To review pathophysiology and imaging findings across different imaging modalities with pathology proven cases of borderline serous and mucinous ovarian tumors To discuss pitfalls specially involving endometriomas and mucinous ovarian tumors

**TABLE OF CONTENTS/OUTLINE**
Introduction: Population at risk, statistics, management and surveillance
Pathophysiology: Tumoral stepwise progression from benign through borderline to malignant
Pathology proven sample cases of serous and mucinous tumors: US, CT, MRI
Differences with benign and malignant epithelial tumors
Pitfalls: Endometriomas and borderline mucinous ovarian tumors
Summary

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Radiation Exposure in Pregnancy: It's Hot in Here!

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Jean-Ju Sheen, MD, New York, NY (Abstract Co-Author) Nothing to Disclose
Linda B. Haramati, MD, MS, New Rochelle, NY (Presenter) Spouse, Board Member, Kryon Systems Ltd
Eric J. Hall, DPhil, DSc, New York, NY (Abstract Co-Author) Nothing to Disclose
Renee Moadel, MD, Bronx, NY (Abstract Co-Author) Travel support, BTG International Ltd

For information about this presentation, contact:
lharamati@gmail.com

TEACHING POINTS
1. Radiation exposure from medical imaging has increased markedly in recent decades in the US. Collective Effective Dose from medical radiation currently equals background radiation. 2. Reporting of maternal morbidity and adverse pregnancy outcomes are rising in the US, particularly among women of ethnic minorities and advanced maternal age. 3. Radiation doses which have undetectable effects on adults can have disastrous effects on the developing embryo or fetus, depending on the stage of gestation. 4. When faced with symptoms in a pregnant woman that may warrant diagnostic imaging, it is important for physicians to understand the current evidence related to radiation exposure in pregnancy, in order to make informed patient care decisions. 5. Recommend imaging algorithms and their rationale for common clinical scenarios are reviewed.

TABLE OF CONTENTS/OUTLINE
I. Biological effects of radiation exposure: tissue effects and stochastic II. Metrics of radiation exposure: exposure for common exams - radiography, CT and nuclear medicine. Comparison to natural background exposure. III. Fetal radiation effects: atomic bomb survivor data, animal studies, human cohorts IV. Maternal radiation effects: breast and uterus V. Imaging algorithms for pulmonary embolism, appendicitis, urolithiasis, trauma VI. Inadvertent exposure VII. Summary

Printed on: 12/22/19
Endometriosis in Pregnancy: Expecting the Unexpected

Participants
Ryan D. Navarro, MD, San Francisco, CA (Presenter) Nothing to Disclose
Priyanka Jha, MBBS, San Francisco, CA (Abstract Co-Author) Nothing to Disclose
Russell P. Kelley IV, MD, San Francisco, CA (Abstract Co-Author) Nothing to Disclose
Tara A. Morgan, MD, San Francisco, CA (Abstract Co-Author) Nothing to Disclose
Michael A. Ohliger, MD, Burlingame, CA (Abstract Co-Author) Nothing to Disclose
Liina Poder, MD, Mill Valley, CA (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
ryan.navarro@ucsf.edu

TEACHING POINTS
1. Explain the natural history of endometriosis and changes with pregnancy. 2. Discuss classical imaging features of endometriosis with particular focus on endometriomas and deep infiltrative endometriosis on Ultrasound and MRI. 3. Describe association between endometriosis and pregnancy complications. 4. Distinguish imaging features of physiologic decidual reaction from potential neoplastic processes. 5. Understand the role and timing of surgical intervention in pregnancy.

TABLE OF CONTENTS/OUTLINE

Printed on: 12/22/19
The International Federation of Gynecology and Obstetrics (FIGO) Cancer Report 2019: An Imaging Update on Cervical Cancer Staging and Beyond

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Hamid Rajabi, MD, San Antonio, TX (Presenter) Nothing to Disclose
Matthew Milam, San Antonio, TX (Abstract Co-Author) Nothing to Disclose
Sean Daly, San Antonio, TX (Abstract Co-Author) Nothing to Disclose
Philip T. Valente, MD, San Antonio, TX (Abstract Co-Author) Nothing to Disclose
Srinivasa R. Prasad, MD, Houston, TX (Abstract Co-Author) Nothing to Disclose
Christine O. Menias, MD, Chicago, IL (Abstract Co-Author) Nothing to Disclose
Venkata S. Katabathina, MD, San Antonio, TX (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
katabathina@uthscsa.edu

TEACHING POINTS
Familiarize the audience with updates of the 2018 FIGO Cancer Report on gynecologic cancers with a special focus on role of imaging in management of gynecologic cancers. Describe the newly revised cervical cancer staging with emphasize on the role of imaging in diagnosis & treatment Role of imaging in routine management of endometrial cancer. Illustrate the role of imaging in the comprehensive evaluation of gynecologic cancers based on new FIGO 2018 cancer report.

TABLE OF CONTENTS/OUTLINE
Introduction FIGO cancer report 2018 Revised cervical cancer staging with special emphasis on role of imaging in diagnosis & treatment Role of imaging in routine management of endometrial cancer Cancer of the ovary, fallopian tube, and peritoneum: Review of FIGO staging with an update on stage IIIC Gestational trophoblastic disease Vaginal/vulvar cancers Uterine sarcomas Cancers in pregnancy Targeted therapy for gynecologic cancers in era of precision medicine: RadioGenomics & targeted drugs Conclusion Summary: The third edition of the FIGO Cancer Report was released in 2018 to present current update on the state of the art management of gynecological cancers. Staging of cervical cancer is revised, involving use of imaging in the staging. Multimodality imaging in routine management of endometrial cancer is also presented.

Printed on: 12/22/19
Congenital Diaphragmatic Hernia, Ultrasound and MRI: Demystifying the Measurement Methods and Their Prognostic Value

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Sepideh Sefidbakht, MD, Powel, OH (Presenter) Nothing to Disclose
Bijan Bijan, MD, Sacramento, CA (Abstract Co-Author) Nothing to Disclose
Fariba Zarei, MD, Shiraz, Iran (Abstract Co-Author) Nothing to Disclose
Neda Rahimi, Shiraz, Iran (islamic Rep. Of) (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
dr.sefid@gmail.com

TEACHING POINTS
To discuss basic embryology of the diaphragm, to understand the difference between right and left sided congenital diaphragmatic hernia (CDH) To discuss prognostic significance of other organ system anomalies on the prognosis To discuss prognostic significance of hernia sac content To discuss prognostic significance of remaining lung volume To depict various measurements using a case-based approach, and to discuss clinical value of each

TABLE OF CONTENTS/OUTLINE
The diaphragm; basic embryology Congenital Diaphragmatic Hernia, Right sided versus Left sided CDH; Content of the sac and its prognostic value CDH; remaining lung volume and its clinical significance Case-based illustrations; measurement methods in US and MRI and their prognostic significance: LHR (lung-head ratio) observed/expected o/e LHR, total fetal lung volume (TFLV), o/e TFLV percent predicted lung volume (PPLV) LH% (hemiated liver percent) LITR (ratio of volume of herniated liver to total thoracic volume) TFLV/TFBV McGoon index.

Printed on: 12/22/19
Case-based Imaging Review of Uncommon Female Pelvic Pathology

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Elizabeth A. Han, MD, Royal Oak, MI (Presenter) Nothing to Disclose
Monisha Shetty, MD, Royal Oak, MI (Abstract Co-Author) Nothing to Disclose
Belinda Asare, Rochester, MI (Abstract Co-Author) Nothing to Disclose
Syed Zafar H. Jafri, MD, Royal Oak, MI (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
Elizabeth.Miller2@beaumont.org

TEACHING POINTS

The purpose of this exhibit is: • To illustrate uncommon acute pelvic pathology affecting the uterus, endometrium, and vagina • To describe key imaging features associated with each entity • To highlight significant clinical history details suggestive of the specific diagnoses • To review the management implications of these processes

TABLE OF CONTENTS/OUTLINE

Uterine, endometrial, and vaginal pathology: • Hematometra after dilation and curettage (D&C) in a patient with elevated INR • Uterine perforation after D&C • Uterine actinomycosis • Pyometra • Postpartum endometritis • Bladder flap hematoma after caesarean section • Uterine dehiscence after caesarean section • Symptomatic fibroid degeneration • Fibroid rupture • Fibroid torsion • Fibroid prolapse • Fibroid retention after hysterectomy • Ureterovaginal fistula after hysterectomy • Vesicovaginal fistula secondary to a foreign body • Rectovaginal fistula secondary to rectal cancer • Uterovaginal fistula after uterine artery embolization • Uterine necrosis and bowel obstruction after uterine artery embolization • Spontaneous uterine necrosis • Blunt uterine trauma • Perforated intrauterine device

Printed on: 12/22/19
Gynecological Sarcomas: Imaging Features, Differential Diagnosis, and Recurrence Patterns

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Marcela d. Semione, MD, Sao Paulo, Brazil (Presenter) Nothing to Disclose
Marcos V. Lauer Filho, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Lucas R. Torres, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Andrea F. Forest, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Camila R. Houat, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Fabio Lewin, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Maria Helena N. Pedroso, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
Recognize MRI patterns of gynecological sarcomas (GS), focusing on enhancement, borders, T1 and T2 signal and diffusion weighted images. Identify the main differential diagnosis of GS, such as atypical leiomyomas, STUMP and carcinosarcomas.

TABLE OF CONTENTS/OUTLINE
Gynecological sarcomas (GS) are rare and aggressive pelvic tumors, accounting for approximately 1.5-2% of all gynecological malignancies, with a broad differential diagnosis ranging from atypical leiomyomas, STUMP to carcinosarcoma. Leiomyosarcoma (LMS), endometrial stromal sarcoma (ESS) and adenosarcoma (AS) are the most prevalent uterine histological subtypes. LMS usually presents as a massive uterine enlargement with hypointensity on T1 and intermediate-to-high signal intensity on T2, with central hyperintensity indicative of necrosis. ESS are a heterogenous group ranging from relatively indolent lesions (low grade ESS) to lesion with much more aggressive course (ESS undifferentiated). AS is a slow-growing tumor, that most commonly presents as a large well-demarcated polypoid mass arising within the endometrial cavity and protruding through the cervical canal. Enhancement, borders, T1 and T2 signal and diffusion weighted images could offer clues to the diagnosis of GS on MRI, which is also an useful tool for staging, guidance of treatment and follow-up.

Printed on: 12/22/19
An Imaging-based Review of the New 2018 ACR White Paper on Ovarian-Adnexal Reporting Lexicon for Ultrasound with Case-based Examples and Structured Reporting

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Preston D. Danielson, Lebanon, OR (Abstract Co-Author) Nothing to Disclose
Scott Kristenson, Tacoma, WA (Presenter) Nothing to Disclose
Christina S. Fullmer, DO, Joint Base Lewis McChord, WA (Abstract Co-Author) Nothing to Disclose
Matthew Grant, MD, Tacoma, WA (Abstract Co-Author) Nothing to Disclose
David M. Danielson, DO, Dupont, WA (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1. Review the new ACR White Paper on Ovarian-Adnexal Reporting Lexicon for Ultrasound, along with commonly used terms to avoid. 2. Understand the need for shared terminology to improve the quality and clarity of imaging reports. 3. Review risk stratification and management recommendations. 4. Provide case based examples to reinforce this knowledge along with example structured reporting.

TABLE OF CONTENTS/OUTLINE
I. Introduction
   a. Nature of the problem
   b. Goals of the O-RADS committee
   c. Brief history of efforts to standardize adnexal mass lexicon
   d. Brief description of methods used to arrive at terminology
II. Ovarian or adnexal mass terminology and definitions
   a. Basic definitions
   b. Category 1: Major Categories
   c. Category 2: Size
   d. Category 3: Solid or solid-appearing lesions
   e. Category 4: Cystic lesions
   f. Category 5: Vascularity
   g. Category 6: General and extra-ovarian findings
III. Commonly used terms to avoid
IV. Example structure template
V. Risk stratification and management recommendations
VI. Case-based examples
VII. Summary
VIII. References

Printed on: 12/22/19
Pictorial Review of Coexistent Adnexal Masses During Pregnancy: Clinical Significance and Diagnostic Challenge

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Noriko Tanio, MD, Chuo, Japan (Presenter) Nothing to Disclose
Kyoko Shiota, Tokyo, Japan (Abstract Co-Author) Nothing to Disclose
Fumi Nozaki, Tokyo, Japan (Abstract Co-Author) Nothing to Disclose
Kouyu Suzuki, MD, Chuou-ku, Japan (Abstract Co-Author) Nothing to Disclose
Jay Starkey, MD, Portland, OR (Abstract Co-Author) Nothing to Disclose
Yasuyuki Kurihara, MD, Tokyo, Japan (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
noritani@luke.ac.jp

TEACHING POINTS
To learn the benefit of MRI in the evaluation of adnexal masses during pregnancy To demonstrate the MRI imaging findings of adnexal masses, highlighting diagnostic points

TABLE OF CONTENTS/OUTLINE

Printed on: 12/22/19
Ovarian and Adnexal Masses: When to Worry and When Not to Worry - Practical Guide to Enhancing Radiologist Role

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Kheng L. Lim, MD, Bala Cynwyd, PA (Presenter) Nothing to Disclose

For information about this presentation, contact:
Kheng.Lim@pennmedicine.upenn.edu

TEACHING POINTS

In an era where eventual patient outcomes are gaining precedence, radiologists are in a unique position to act as guides to patients by providing accurate diagnosis which then generates appropriate specialist referral. This exhibit presents the many imaging appearances of ovarian and adnexal masses and correlate them to other imaging modalities (ultrasound, MRI, and CT), surgical findings, laboratory, and pathologic diagnosis.

TABLE OF CONTENTS/OUTLINE

This exhibit covers: The clinical presentation of patients with ovarian masses and their course through the healthcare system, surgery (if applicable), and follow up clinical course. Epidemiology of ovarian and adnexal masses and risk stratification. Imaging features of ovarian masses through the lens of ultrasound, MRI, and CT and helpful imaging features that can differentiate benign from malignant masses. Ovarian masses of epithelial, germ cell and sex cord-stromal origins are presented. National society guidelines for managing ovarian masses are reviewed. Pearls and pitfalls in imaging diagnosis of ovarian masses learned from follow up of these cases.

Printed on: 12/22/19
Spectrum of Ovarian Tumors at CT and MRI: A Simplified Classification and Practical Approach

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Pardeep K. Mittal, MD, Augusta, GA (Presenter) Nothing to Disclose
Nikhar Kinger, MD, Atlanta, GA (Abstract Co-Author) Nothing to Disclose
Camila L. Vendrami, MD, Chicago, IL (Abstract Co-Author) Nothing to Disclose
Janet A. Munroe, MD, North Augusta, SC (Abstract Co-Author) Nothing to Disclose
Courtney C. Moreno, MD, Suwanee, GA (Abstract Co-Author) Nothing to Disclose
Frank H. Miller, MD, Chicago, IL (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
pardeep.mittal@gmail.com

TEACHING POINTS
1. Review cystic and solid tumors of the ovary on the basis of tumor origin including differential diagnosis. 2. Describe latest WHO classification of ovarian tumors. 3. Discuss a practical approach to determine key CT and MR imaging features along with clinical information to narrow down the differential diagnosis.

TABLE OF CONTENTS/OUTLINE
Although ovarian tumors have similar clinical and radiologic features, predominant or specific imaging features may be present in some types of ovarian tumors. Familiarity with the clinical and imaging features of various ovarian tumors is important in narrowing the differential classification of ovarian tumors on the basis of tumor of origin Epithelial tumors -serous -mucinous tumors -Endometrioid -clear cell -Brenner tumor Germ cell tumors -Mature and immature teratoma -Dysgerminoma -Endodermal sinus tumor Sex cord-stromal tumors -Fibrothecoma -Granulosa cell -Sertoli-Leydig cell tumors Metastatic tumors. In this exhibit imaging, pathologic, and clinical features of ovarian tumors with emphasis on CT and MR imaging features that indicate a specific diagnosis will be reviewed allowing substantial narrowing of the differential diagnosis.

Printed on: 12/22/19
When the Endometrium Attacks: An MRI Pictorial Review of Endometriosis

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Maria Rebeca Arizaga Ramirez, MD, Mexico City, Mexico (Presenter) Nothing to Disclose
Carlos Casian Ruiz Velasco, MD, Distrito Federal, Mexico (Abstract Co-Author) Nothing to Disclose
Julieta Viridiana Galicia, MD, Mexico City, Mexico (Abstract Co-Author) Nothing to Disclose
Yeni Fernandez de Lara Barrera, MD, Mexico City, Mexico (Abstract Co-Author) Nothing to Disclose
Mary E. Arevalo Molina, MD, Mexico City, Mexico (Abstract Co-Author) Nothing to Disclose
Antonio Jose Cueva Guerrero, MD, Mexico City, Mexico (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
rebecarizaga@gmail.com

TEACHING POINTS
After the exhibit the reader would be able, • To understand the physiopathology of endometriosis • To learn MRI protocol and its limitations • To recognize key imaging findings for endometriosis • To characterize the imaging findings of endometrial implants • To establish a differential diagnosis of endometriosis based on imaging features

TABLE OF CONTENTS/OUTLINE

Printed on: 12/22/19
Coming Out of the Shade: Variable Imaging Appearance of Endometriosis

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Matthew A. Burr, MD, Richmond, VA (Presenter) Nothing to Disclose
Parth N. Shah, MD, Richmond, VA (Abstract Co-Author) Nothing to Disclose
Ryan D. Clayton, MD, Richmond, VA (Abstract Co-Author) Nothing to Disclose
Laura R. Carucci, MD, Midlothian, VA (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
Goals: To review the typical and atypical imaging characteristics of endometriosis To emphasize the variable appearances that endometriosis may have at imaging, which may mimic other disease entities

TABLE OF CONTENTS/OUTLINE
Common location and imaging findings of endometriosis Endometrioma Pelvic endometriosis Uncommon imaging features of endometriosis Atypical location of endometriosis mimicking tumor: Rectal mass Small bowel mass Gastric mass Abdominal wall mass Ovarian mass Peritoneal tumor implants Lymph nodes Throughout pelvis mimicking widespread cancer Endometriosis mimicking infection/PID MR diffusion to distinguish endometriosis from tumor

Printed on: 12/22/19
Prenatal Evaluation of Neural Tube Defects: A Simplified Imaging Algorithm

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Sepideh Sefidbakht, MD, Powel, OH (Presenter) Nothing to Disclose
Nazanin Sadraee, Shiraz, Iran (Islamic Rep. Of) (Abstract Co-Author) Nothing to Disclose
Sara Haseli, Shiraz, Iran (Islamic Rep. Of) (Abstract Co-Author) Nothing to Disclose
Pedram Keshavarz, Shiraz, Iran (Islamic Rep. Of) (Abstract Co-Author) Nothing to Disclose
Parisa Pishpad, Shiraz, Iran (Islamic Rep. Of) (Abstract Co-Author) Nothing to Disclose
Bijan Bijan, MD, Sacramento, CA (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:

dr.sefid@gmail.com

TEACHING POINTS
To recognize signs of open neural tube defects in the 11-13(+6) weeks screening ultrasound To recognize signs of open and closed neural tube defects in midtrimester anatomical survey To describe differences between open and closed neural tube defects in terms of clinical implications, prognosis and parent counseling To understand the conflicting nomenclature of neural tube defects To propose a simple imaging algorithm for diagnosis of neural tube defects. To gain a deeper understanding of various neural tube defects using a case-based approach

TABLE OF CONTENTS/OUTLINE
Basic embryology of the spinal canal and neural groove, implications for patient management The intracranial translucency in the in the 11-13(+6) weeks screening ultrasound, Normal, obliterated and its significance Open versus closed neural tube defects in the midtrimester anatomical survey, imaging and clinical implications Nomenclature of open and closed neural tube defects, overlapping and similar looking A simple imaging algorithm for understanding and diagnosis of neural tube defects Case-based review of neural tube defects using prenatal ultrasound and fetal MRI images

Printed on: 12/22/19
Ten Tips for Successful Interpretation of Transvaginal Ultrasound

All Day Room: OB Community, Learning Center Digital Education Exhibit

Awards
Certificate of Merit

Participants
Belinda G. Collins, MD, PhD, Elizabethtown, PA (Presenter) Nothing to Disclose
Megha Patel, MD, Elizabethtown, PA (Abstract Co-Author) Nothing to Disclose
Kathryn L. McGillen, MD, Hershey, PA (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
bcollins@pennstatehealth.psu.edu

TEACHING POINTS

Transvaginal ultrasound is the primary imaging tool for evaluating gynecologic disorders, which can have varying clinical presentations. The findings on transvaginal ultrasound can be complex and can overlap between disorders, resulting in diagnostic challenges. The purpose of this case-based pictorial review is to present ten tips to facilitate successful interpretation of transvaginal ultrasound with the goal of increasing diagnostic accuracy and improving patient care. Application of the tips will aid the differentiation of the various disorders diagnosed at transvaginal ultrasound.

TABLE OF CONTENTS/OUTLINE

Utilizing an interactive pictorial review and quiz format, ten tips for interpreting transvaginal ultrasound will be presented. Each tip will be illustrated with case-based examples. Both gynecologic and non-gynecologic differential diagnoses will be reviewed. The tips include clinical factors, primary and ancillary differentiating imaging findings, as well as practical technical considerations and problem-solving techniques. Specific example tips include pregnancy status, intra versus extraovarian location, probe push, pattern recognition, color Doppler, probe choice, ancillary findings, patient recall, other considerations, and communication. Summary challenging cases will solidify the information and lead to increased diagnostic accuracy.

Printed on: 12/22/19
Fetal Well-Being in Intrauterine Growth-Restricion: What the Radiologist Needs to Know

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Isabela D. Alves, MD, Sao Paulo, Brazil (Presenter) Nothing to Disclose
Gregory d. Perdizes SR, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Ligia B. Couceiro, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Claudia D. Leite, MD,PhD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Natally Horvat, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Sergio Kobayashi, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
beldsalves@gmail.com

TEACHING POINTS
Through this pictorial essay we will make review about the fetal growth-restriction, in a didactic and illustrative way, we will review the ultrasound techniques and imaging findings to evaluate the fetal well-being in intrauterine growth restriction and what is important to report. The purpose of this exhibition is to: - Review the ultrasound technique to perform the Doppler in obstetrics and fetal biophysical profile. - Describe how to evaluate the fetal well-being. - Recognize the ultrasound findings of fetal growth-restriction and placental insufficiency. - Correlate the ultrasonographic findings with the follow up of fetal growth-restriction.

TABLE OF CONTENTS/OUTLINE
INTRODUCTION - Fetal growth-restriction concept and epidemiology - The role of ultrasound in the evaluation of the fetal growth-restriction ULTRASOUND TECHNIQUE - HOW TO PERFORM? - Normal Doppler in Obstetrics - Fetal biophysical profile FETAL GROWTH AND DEVELOPMENT - HOW TO EVALUATE? - Gestational age dating - Fetal biometry - How to identify a small fetus FETAL GROWTH-RESTRICTION - Etiology and classification - Placental insufficiency - Distinction between early and late onset fetal growth-restriction - Ultrasound findings - Follow up

Printed on: 12/22/19
OB137-ED-X

Not So Epithelial: Review of Imaging and Clinical Features of Less Common, but Not Forgotten, Ovarian Neoplasms

All Day Room: OB Community, Learning Center Digital Education Exhibit

Awards
Certificate of Merit

Participants
Annalice Chang, MD, San Diego, CA (Presenter) Nothing to Disclose
Hailey Choi, MD, San Francisco, CA (Abstract Co-Author) Nothing to Disclose
Loretta M. Strachowski, MD, San Francisco, CA (Abstract Co-Author) Royalties, Reed Elsevier; Speaker, World Class CME
Dorothy J. Shum, MD, San Francisco, CA (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
dorothy.shum@ucsf.edu

TEACHING POINTS
1. While the majority of ovarian neoplasms are of cystic epithelial origin, non-epithelial ovarian tumors account for 30% of ovarian neoplasms and 10% of ovarian malignancies. These often solid masses can cause a diagnostic conundrum due to unfamiliarity. Review the differential of ovarian masses with emphasis on germ cell tumors, sex cord-stromal tumors, metastases, and mimickers.
2. Review imaging features and tumor marker/hormone effects of non-epithelial ovarian masses and how they aid in diagnosis.

TABLE OF CONTENTS/OUTLINE
1. Review of classification: Germ cell tumor, Sex cord-stromal tumor, metastases and mimics
3. Mimics for solid ovarian neoplasms: Myomas, Decidualized endometrioma, Pelvic lymphadenopathy

Summary

Printed on: 12/22/19
TEACHING POINTS

1. MRI is a non-invasive modality capable of dispensing anatomical preoperative details of mullerian structures. 2. MRI guides in assisted reproductive technologies by detailing anatomy of ovaries. 3. MRI plays a vital role in deciding vaginoplasty procedures. 4. MRI has the potential to depict associated renal and vertebral anomalies, thereby help preventing ureteral injuries during laparoscopic vaginoplasty, in ectopically located kidneys. 5. MRI can be used as a preoperative assessment tool and a non-invasive alternative to diagnostic laparoscopy in MRKH syndrome.

TABLE OF CONTENTS/OUTLINE

OB139-ED-X

MRI of Pelvic Infections in the Female Pelvis

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Antonio Luna, MD, PhD, Jaen, Spain (Presenter) Speaker, Koninklijke Philips NV
Esther Sola, MD, Huelva, Spain (Abstract Co-Author) Nothing to Disclose
Lidia Alcala Mata, MD, MD, Jaen, Spain (Abstract Co-Author) Nothing to Disclose
Teodoro M. Noguerol, MD, Jaen, Spain (Abstract Co-Author) Nothing to Disclose
Sandra Baleato Gonzalez, MD, PhD, Santiago de Compostela, Spain (Abstract Co-Author) Nothing to Disclose
Christine O. Menias, MD, Chicago, IL (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
- Review the current indications to perform MRI in cases of female pelvis infection
- Learn how to perform an adequate MRI protocol in this clinical scenario
- Analyze the MR features of actynomicosis, tuberculosis, hydatid cyst, infected endometriosis, PID and their complications

TABLE OF CONTENTS/OUTLINE
1. Introduction
2. MRI protocol
3. When to use MRI?
4. Pelvic infections: Tuberculosis, Actynomicosis, Hydatid cyst, Infected endometriosis
5. Pelvic inflammatory disease: Cervicitis, Endometritis, Salpingitis and tubo-ovarian complex
6. Oophoritis, Pyosalpinx, Hydrosalpinx, Tubo-ovarian abscess
7. Pyometra
8. Complications: Tubal damage, tubo-ovarian abscess rupture, peritonitis, peritoneal adhesions, Fitz-Hugh-Curtis Syndrome, ovarian vein thrombophlebitis, uterine rupture

Printed on: 12/22/19
Your Questions Answered: A Summary of the 2018 FIGO Staging Classification for Cervical Cancer

Awards
Cum Laude
Identified for RadioGraphics

Participants
Miriam Salib, MBBS, London, United Kingdom (Presenter) Nothing to Disclose
Victoria Stewart, London, United Kingdom (Abstract Co-Author) Nothing to Disclose
Siham A. Sudderuddin, MRCP, FRCR, Middlesex, United Kingdom (Abstract Co-Author) Nothing to Disclose
Andrea G. Rockall, FRCR, MRCP, London, United Kingdom (Abstract Co-Author) Speaker and Chairman, Guerbet SA
Nishat Bharwani, FRCR, MBBS, London, United Kingdom (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
miriamsalib@nhs.net

TEACHING POINTS
Cervical cancer is the 4th most common cancer affecting women worldwide. This exhibit will illustrate the recent 2018 update to the FIGO staging classification for cervical cancer, discussing the changes made from the 2009 FIGO system and highlighting the evidence validating these changes. We will outline suggested treatment plans for different levels of staging. This educational exhibit will: Review the epidemiology of cervical cancer; summarise staging of cervical cancer with imaging examples and diagrammatic illustrations; highlight the changes made between the 2009 and 2018 FIGO staging classifications; discuss the diagnostic and prognostic implications of these changes; review potential treatment plans for different stages.

TABLE OF CONTENTS/OUTLINE
Background. Imaging of the stages of cervical cancer with multi-modality (MRI and FDG-PET/CT) examples and diagrammatic illustrations. Take home messages to aid differentiation between stages. Differences between 2009 and 2018 FIGO staging. Summary of evidence that validated these changes. Treatment plans for different stages of cervical cancer. Summary.

Printed on: 12/22/19
Systematic Radiological Approach to Evaluate Female Infertility: A Pictorial Review

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Samra Qureshi, MD, Doha, Qatar (Presenter) Nothing to Disclose
Ashwini Gujrathi, MD, Doha, Qatar (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
squareshi@hamad.qa

TEACHING POINTS

Female infertility is a multifactorial condition and its pelvic causes comprise majority of its aetiologies. Imaging plays a crucial role in accurate diagnosis, further evaluation and subsequent management in such cases. A systematic approach to tackle this issue is vital for the radiologists and hence we present a standardized pictorial multimodality imaging essay. Teaching points: 1. Explain different causes of female infertility and how to approach and assess them with multimodality imaging 2. Learn imaging features of each pathology on different modalities 3. Exhibit case based scenarios to enlighten the radiologists in such cases

TABLE OF CONTENTS/OVERVIEW


Printed on: 12/22/19
Hysterosalpingography (HSG) in the Diagnosis and Management of Fallopian Tube Disease: SIN, Sacrifice and Salvation - Not Simply a Test of Tubal Patency!

All Day Room: OB Community, Learning Center Digital Education Exhibit

Awards
Certificate of Merit

Participants
Anne P. Hemingway, FRCR, MBBS, London, United Kingdom (Presenter) Consultant, Guerbet SA
Elika Kashef, FRCR, London, United Kingdom (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
anne.hemingway@nhs.net

TEACHING POINTS

By viewing this exhibit the learner will appreciate:
1. The importance of meticulous HSG technique to ensure accurate diagnosis
2. The HSG appearance of salpingitis isthmica nodosa (SIN):
   a. understand the aetiology of SIN
   b. recognise the differential diagnoses
   c. appreciate the significance of SIN and its association with ectopic pregnancy
3. The importance of identifying hydrosalpinges and that fallopian tubes exhibiting hydrosalpinges may need to be sacrificed to increase successful embryo implantation in assisted reproduction and maintain ongoing pregnancy
4. The role of the HSG in examining fallopian tubes that have been sacrificed by sterilization techniques to determine the success of sacrifice or to establish possibility of reversal to facilitate natural conception
5. That when fallopian tubes appear occluded the radiologist can salvage tubal patency by selective salpingography and potentially restore fertility

TABLE OF CONTENTS/OUTLINE

Fallopian tube anatomy Pathophysiology of tubal disease HSG technique SIN - Salpingitis Isthmica Nodosa - aetiology, pathology, implications & management Sacrifice- Tubal occlusion for hydrosalpinges to improve fertility Sacrifice- Assessment of efficacy of sterilization Salvation - HSG and fallopian tube recanalization Illustrative cases Discussion References

Printed on: 12/22/19
Endometriosis Without Mysteries: Unravelling Ultrasound Exam Techniques and Imaging Findings Spectrum

All Day Room: OB Community, Learning Center Digital Education Exhibit

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Certificate of Merit

Participants
Alan D. Hummel, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Andre Dubinco, MD, Sao Paulo, Brazil (Presenter) Nothing to Disclose
Louise Bisolo, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Luciana C. Pasquini Raiza, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Paulo Savoini, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Antonio R. Junior, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Miguel J. Neto, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
dubincoandre@gmail.com

TEACHING POINTS

The purpose of this exhibit is: 1. To review the technique of transvaginal ultrasonography for the search for endometriosis by the International Deep Endometriosis Analysis (IDEA) consensus. 2. To discuss imaging findings spectrum of endometriosis on ultrasound. 3. To correlate these findings with MR.

TABLE OF CONTENTS/OUTLINE

1. Transvaginal ultrasonography normal technique
2. Describing protocols (steps) directed to the research of deep endometriosis, using the terms proposed by the IDEA consensus.
3. Findings on Step 1 - Urinary system and uterus and its annexes
4. Findings on Step 2 - Relation of the organs of the pelvis to each other looking for signs of adhesions
5. Findings on Step 3 - Analysis of uterine mobility
6. Findings on Step 4 - search for foci of deep endometriosis in the anterior and posterior pelvic compartments
7. Unusual Sites of Endometriosis

Printed on: 12/22/19
**Imaging Characteristics of Uterine Sarcomas versus Leiomyoma Variants**

All Day Room: OB Community, Learning Center Digital Education Exhibit

**Participants**
Meghan Jardon, MD, Los Angeles, CA (**Presenter**) Nothing to Disclose
Anokh Pahwa, MD, Santa Monica, CA (**Abstract Co-Author**) Nothing to Disclose
Shaden F. Mohammad, MD, Los Angeles, CA (**Abstract Co-Author**) Nothing to Disclose

**TEACHING POINTS**

1. Uterine masses are commonly encountered on ultrasound (US), computed tomography (CT) and magnetic resonance imaging (MRI) when evaluating patients with pelvic pain, abdominal distention and vaginal bleeding.
2. There is significant overlap in appearance of the various uterine masses, particularly leiomyomas, in addition to an overlap in symptoms.
3. Uterine sarcomas, a rare form of mesenchymal tumors of the uterus, account for 3-9% of all uterine tumors but are more aggressive and have a poorer prognosis than the other uterine tumors.
4. Understanding the various subcategories of uterine masses, the characteristic findings and differentiating features across various imaging modalities is essential for the radiologist to help guide further work-up and management.

**TABLE OF CONTENTS/OUTLINE**


Printed on: 12/22/19
The updated FIGO staging system of cervical cancer has added stage IIIC to include patients with pelvic or retroperitoneal metastatic lymphadenopathy. The new system also allows for the imaging and pathologic findings of the pelvis including pelvic and retroperitoneal lymphadenopathy to complement clinical findings and to be used for staging of cervical cancer. MRI can provide the loco-regional assessment of the cervical cancer given its superior soft tissue contrast. For evaluation of the metastatic lymph nodes, MRI relies on the size of the lymph nodes, but results may be inaccurate when the lymph nodes are subcentimeter. PET relies on the functional status of the tissues and can demonstrate FDG-avid subcentimeter metastatic lymph nodes and distant metastases. PET, however, cannot provide anatomic details of the pelvis and loco-regional involvement of the cervical cancer. The integrated PET/MRI system can acquire functional data from PET and detailed anatomic data from MRI in one session providing a one-step approach for staging of the cervical cancer.
Cervical Carcinoma FIGO New Staging: What Changed?

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Gabriela R. Camerin, MD, Sao Paulo, Brazil (Presenter) Nothing to Disclose
Natally Horvat, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Gregory d. Perdizes SR, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Publio C. Viana, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Giovanni G. Cerri, MD,PhD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
gabicamerin@gmail.com

TEACHING POINTS
Understand the current pathological concepts of cervical carcinoma. Describe pelvic anatomy and most significant uterine relationships. Recognize imaging features relevant in cervical cancer staging. Evaluation of protocol to stage cervical cancer. Evaluation of new cervical cancer staging system. Comparison between previous and current systems of staging. Comprehend the indications of different modalities of treatment considering current staging. Know the impact of these changes on treatment.

TABLE OF CONTENTS/OUTLINE
INTRODUCTION Clinical and pathological features of cervical cancer. EPIDEMIOLOGY . ANATOMICAL CONCEPTS Relationship of uterine cervix with other pelvic structures. Main cancer disseminations pathways. DESMISTIFYING NEW STAGING SYSTEM- Substracts that lead to change the staging system (survival statistics), considering tumor size and distinct survival between stage IB1 and IB2. - Survival of stage IIIC1 depends on local tumor factors. COMPARING CURRENT AND PREVIOUS GUIDELINES TO STAGE CERVICAL CANCER - Division of stage IB in three different stages. - Lymph node metastasis designated as stage IIIC (IIIC1: pelvic lymph node and IIIC2: para-aortic). MANAGEMENT OF CERVICAL CANCER Describe different treatments indications considering new staging. INTERACTIVE CASE-BASED DIDACTICS Sample MRI cases to illustrate and solidify new concepts.

Printed on: 12/22/19
Twists, Turns, and Flames on MRI of the Adnexa: Pearls & Pitfalls in Evaluating Adnexal Emergencies
All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Dheeraj Reddy Gopireddy, MD, Tucson, AZ (Presenter) Nothing to Disclose
Usha Jayagurunathan, MBBS, Tucson, AZ (Abstract Co-Author) Nothing to Disclose
Chandana G. Lall, MD, Orange, CA (Abstract Co-Author) Nothing to Disclose
Hina Arif Tiwari, MD, Tucson, AZ (Abstract Co-Author) Nothing to Disclose
Hina Arif, Tucson, AZ (Abstract Co-Author) Nothing to Disclose
Bobby T. Kalb, MD, Tucson, AZ (Abstract Co-Author) Nothing to Disclose
Diego R. Martin, MD, PhD, Tucson, AZ (Abstract Co-Author) Nothing to Disclose
Swati Sharma, MD, Jacksonville, FL (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
dgopireddy10@radiology.arizona.edu

TEACHING POINTS
Understand the typical and atypical imaging features of adnexal emergencies on MRI, also appreciate the complications arising from these emergencies like ovarian ischemia, peritonitis and hemorrhage. Advantages of MRI contrast in depicting pathophysiology, extent and also signs of viability of the ovaries from adnexal torsion.

TABLE OF CONTENTS/OUTLINE
Ultrasound of the pelvis is the most commonly ordered examination from ED for acute adnexal pain in pediatric and reproductive aged women. Although it is a easily performed exam there are some limitations, details of ovarian viability, specific signs of adnexal torsion, hemorrhage and peritonitis are difficult to evaluate with certainty. MRI examination with its superior contrast and anatomical resolution can not only identify the anatomical structure involved but also aid in evaluation of complications. We describe in detail imaging features of common and uncommon adnexal complications and compare the imaging features of sonography versus MRI. Among the typical cases in non pregnant women the following clinical entities will be discussed in detail: ovarian, tubal torsion, ruptured cyst, Tubo ovarian abscess and ovarian abscess. Among the typical cases in pregnant women the following clinical entities will be discussed in detail: tubal, fimbrial and cornual ectopic pregnancies with complications.

Printed on: 12/22/19
Primary Vaginal Neoplasms: The Most Frequent Clinical and Radiological Aspects of Each Subtype

Awards
Identified for RadioGraphics

Participants
Kamila S. Albuquerque, Vila Velha, Brazil (Presenter) Nothing to Disclose
Bruna B. Libanio, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Karina K. Zoghbi, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Carolina P. Abud, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Jose d. Fernandes Sr, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Natalia B. Gomes, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Marcela C. Leite I, MS, Barueri, Brazil (Abstract Co-Author) Nothing to Disclose
Marilia P. Ferreira, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Douglas J. Racy, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Fabio Lewin, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Graziela C. Oliveira, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Tabata X. Silva, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
kamilaseidel@gmail.com

TEACHING POINTS
- Although rare, vaginal neoplasms are possible to be differentiated based on clinical history and imaging methods (magnetic resonance, tomography, and PET-CT).
- Recognize the topography and the most frequent radiological aspects of subtypes of vaginal lesions, such as squamous cell carcinoma, melanoma and lymphoma.
- Compare the functionality of each imaging method for the evaluation of the same lesion.
- Establish the importance of implementing an adequate protocol in the different imaging methods available, with emphasis on magnetic resonance imaging and the use of vaginal gel in the investigation of vaginal lesions.

TABLE OF CONTENTS/OUTLINE
- Concerned with the recognition and understanding of the radiological patterns of the main lesions of the vagina, several images of a series of cases of our institution were selected, including squamous cell carcinoma (representing 80%), adenocarcinoma (15%), melanoma (almost 5%) and lymphoma (0.5-1.5%).
- Basic concepts, based on the clinical and imaging differentiation of the most frequent subtypes of vaginal tumors.

Printed on: 12/22/19
For information about this presentation, contact:
julimarucco@hotmail.com

TEACHING POINTS

• Cervical cancer is one of the leading causes of death from cancer in women, especially in developing countries. • It is estimated that 311,000 women of reproductive age die each year from cervical cancer worldwide, 85% of them in developing and underdeveloped countries • In order to choose the treatment and to obtain an appropriate prognosis, it is crucial to carry out a correct staging • Currently the gold standard imaging tool for cervical cancer staging is contrast enhanced MRI • However, in recent years 3D TVUS with TUI has earned increasing attention given that it is a low-cost, radiation-free imaging tool and widely available. • With an adequate technique we can assess with great detail tumor size and location, degree of vascularization with Color Doppler evaluation, parametrial, vaginal, bladder, ureteral and rectum infiltration

TABLE OF CONTENTS/OUTLINE

• Anatomy • Cervical cancer pathogenesis • 3D TV US and TUI evaluation • US Staging • Comparison between MRI and US staging • Conclusion
Magnetic Resonance Imaging Findings of Vulva: What is the Differential Diagnosis?

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Eito Kozawa, MD, PhD, Moroyama-machi, Japan (Presenter) Nothing to Disclose
Kaiji Inoue, MD, Saitama, Japan (Abstract Co-Author) Nothing to Disclose
Yuki Hara, Iruma-gun, Japan (Abstract Co-Author) Nothing to Disclose
Saki Tsuchihashi, Saitama, Japan (Abstract Co-Author) Nothing to Disclose
Iichirou Osawa, MD, Saitama, Japan (Abstract Co-Author) Nothing to Disclose
Kosei Hasegawa, Hidaka-shi, Japan (Abstract Co-Author) Nothing to Disclose
Masanori Yasuda, Hidaka, Japan (Abstract Co-Author) Nothing to Disclose
Tomoki Ichikawa, MD, PhD, Hidaka, Japan (Abstract Co-Author) Nothing to Disclose
Mamoru Niitsu, MD, Iruma, Japan (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
8kozawa@saitama-med.ac.jp

TEACHING POINTS
- To illustrate cases of the vulvar tumors and to discuss the cause of MR imaging findings.
- To review imaging findings of various mass in the vulva and correlate them to pathologic findings.
- To learn the crucial MR imaging findings for differentiating various masses in the vulva.

TABLE OF CONTENTS/OUTLINE
The cases will be presented in a quiz format. Key differential diagnostic points and pitfalls will be highlighted in the discussion of each case. The list of cases includes:
1. Vulvar Malignant Lesions
   - Squamous Cell Carcinoma
   - Secondary malignant tumors
   - Endometrial Stromal Sarcoma
   - Malignant Melanoma
   - Epithelioid Sarcoma
   - Paget's disease
2. Vulvar benign Lesions
   - Hemangioma
   - Leiomyoma
   - Bartholin Cyst
   - Aggressive Angiomyxoma
   - Endometrial Cyst
It is important to be familiar with variety of imaging appearance of various vulvar tumors to accurate differential diagnosis.

Printed on: 12/22/19
Nice to Know UFE: Tips and Tricks for Evaluating the Pre and Post Uterine Fibroid Embolization Patient

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Neyra Azimov, MD, New York, NY (Presenter) Nothing to Disclose
Nitasha Dhiman, MD, New York, NY (Abstract Co-Author) Nothing to Disclose
Lyndon Luk, MD, New York, NY (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
nea9033@nyp.org

TEACHING POINTS
The purpose of this exhibit is: 1. To review appropriate use and indications for uterine fibroid embolization as a treatment option for symptomatic fibroids and infertility. 2. To evaluate fibroids prior to and after UFE, including typical pre- and post-treatment appearances and complications seen predominantly on MRI. 3. To identify key non-fibroid imaging findings that may contribute to patient symptoms and identify patients who are not optimal UFE candidates.

TABLE OF CONTENTS/OUTLINE

Printed on: 12/22/19
Multimodal Imaging Evaluation of the Normal Endometrium and Its Pathology with a Pictorial Review of the Ultrasound Concepts of the International Endometrial Tumor Analysis (IETA) Consensus

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Angela M. Hormiga Pena, MD, Mexico City, Mexico (Presenter) Nothing to Disclose
Roberth D. Escarria Panesso, MD, Mexico City, Mexico (Abstract Co-Author) Nothing to Disclose
Julieta Viridiana Galicia, MD, Mexico City, Mexico (Abstract Co-Author) Nothing to Disclose
Carmen Rocio Ramirez Carmona, MD, Tecamac, Mexico (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
angelita.maria.hormiga@gmail.com

TEACHING POINTS
1. Recognize the normal or abnormal appearance of the endometrium depending on the clinical setting: age (pre and postmenopausal women), stage in the menstrual cycle, pregnancy, hormonal replacement therapy or tamoxifen therapy. 2. Learn the terms and measurement technique created by the IETA consensus. 3. Understand that a correct measurement of the endometrial thickness can reliably discriminate between women with postmenopausal bleeding who are at low or high risk of endometrial cancer. 4. Evaluate the advantages of the sonohysterography. 5. Perform an image review (US, sonohysterography, MRI and hysteroscopy) of the most common causes of endometrial thickening and other pathological entities.

TABLE OF CONTENTS/OUTLINE
1. Physiology and normal changes of the endometrium according to the menstrual cycle. 2. Normal appearance of the endometrium: - Prepuberal. - Reproductive age. - Postmenopausal women with and without hormone replacement. - Tamoxifen therapy. 3. Terms and definitions used to describe the ultrasonographic findings of the endometrium according to the IETA consensus. 4. Normal endometrial thickness in pre and postmenopausal women. 5. Sonohysterography: Technique, indications, pearls and pitfalls. 6. Common causes of endometrial thickening and other pathological entities. - Summary.

Printed on: 12/22/19
MRI of Thickened Uterine Junctional Zone: Beyond Adenomyosis

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Antonio Luna, MD, PhD, Jaen, Spain (Presenter) Speaker, Koninklijke Philips NV
Lidia Alcala, MD, Jaen, Spain (Abstract Co-Author) Nothing to Disclose
Teodoro M. Noguerol, MD, Jaen, Spain (Abstract Co-Author) Nothing to Disclose
Christine O. Menias, MD, Chicago, IL (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
Review the typical and atypical presentations of adenomyosis Highlight the differential diagnosis of entities with can present as focal or diffuse thickening of uterine junctional zone Learn how MRI can help us to differentiate all these entities

TABLE OF CONTENTS/OUTLINE
1. Introduction
2. MRI protocol
3. MRI appearance of Adenomyosis
4. Differential diagnosis of thickened uterine junctional zone
   Focal adenomyosis
   Adenomyoma
   Uterine contraction
   Leiomyoma/leiomyosarcoma
   Deep infiltrating endometriosis
   Adenomatoid tumor
   Myometrial invasion by endometrial cancer
   Non endometroid carcinoma in adenomyosis
   Invasive gestational trophoblastic disease
   Metastasis to the uterine corpus
5. Conclusions

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Variable Fetal Neoplasms and Mimickers - A to Z

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Taekmin Kim, MD, Seoul, Korea, Republic Of (Presenter) Nothing to Disclose
Jeong Yeon Cho, MD, Seoul, Korea, Republic Of (Abstract Co-Author) Nothing to Disclose
Sang Youn Kim, MD, Seoul, Korea, Republic Of (Abstract Co-Author) Nothing to Disclose
Seung Hyup Kim, MD, Seoul, Korea, Republic Of (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
Variable fetal neoplasms can develop in any organ system. Knowing the presence of fetal neoplasms and suggesting differential diagnosis may alter the prenatal management and enables immediate postnatal treatment.

TABLE OF CONTENTS/OUTLINE
In this exhibit, we presented fetal neoplasms arised from a variety of organs with US findings. The list of cases includes:
- Glioblastoma vs. Intracranial Hematoma
- Intracranial Teratoma vs. Hematoma
- Teratoma vs. Hematoma in the Posterior Fossa
- Subependymal Hamartoma vs. Germinal Matrix Hemorrhage Teratoma vs. Conjoined Twin Cervical Lymphangioma vs. Mimicking Lesions
- Retroperitoneal Lymphangioma vs. Mimicking Lesions
- Mesenteric Cyst vs. Other Abdominal Cystic Lesions
- Hepatocellular Adenoma vs. Abnormal Focal Echo of the Liver
- Abdominal Teratoma (Fetus in Fetu) vs. Meconium Peritonitis
- Mesoblastic Nephroma vs. Autosomal Recessive Polycystic Kidney
- Adrenal Neuroblastoma vs. Mimicking Lesions
- Cystic Sacrococcygeal Teratoma vs. Myelomeningocele
- Solid Sacrococcygeal Teratoma vs. Cloacal Exstrophy

Printed on: 12/22/19
Imaging of Endometriosis-Associated Ovarian Cancer

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Kyeong Ah Kim, MD, Seoul, Korea, Republic Of (Presenter) Nothing to Disclose
Yang Shin Park, MD, Seoul, Korea, Republic Of (Abstract Co-Author) Nothing to Disclose
Jongmee Lee, Seoul, Korea, Republic Of (Abstract Co-Author) Nothing to Disclose
Jae Woong Choi, MD, Seoul, Korea, Republic Of (Abstract Co-Author) Nothing to Disclose
Chang Hee Lee, MD, Seoul, Korea, Republic Of (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS

Endometriosis is a chronic gynecologic disorder, defined as the growth of endometrial tissue located outside the uterine cavity. There are certain types of ovarian epithelial cancers associated with endometriosis, including endometrioid carcinoma, clear cell carcinoma, and seromucinous tumors. Endometriosis-associated ovarian cancers are reported to be found in younger patients than those who have ovarian cancers without endometriosis. In addition, patients with endometriosis-associated ovarian cancers have been reported to have better prognosis than those with ovarian cancers without endometriosis. 1. To recognize the imaging findings of endometriosis. 2. To assess the types of ovarian cancers associated with endometriosis. 3. To evaluate the imaging findings of endometriosis-associated ovarian cancers. 4. To correlate the imaging findings endometriosis-associated ovarian cancers with pathologic findings.

TABLE OF CONTENTS/OUTLINE

I. Endometriosis (definition, pathogenesis, imaging findings) II. Endometriosis-associated Ovarian Cancer (overview, clinical impact, pathology, imaging findings) 1. Clear Cell Carcinoma 2. Endometrioid Carcinoma 3. Seromucinous Tumor

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Participants
Ashley N. Oladipo, BS, MD, San Francisco, CA (Abstract Co-Author) Nothing to Disclose
Yi Li, MD, Larkspur, CA (Abstract Co-Author) Nothing to Disclose
Shital Gandhi, MD, Burlingame, CA (Abstract Co-Author) Nothing to Disclose
Dorothy J. Shum, MD, San Francisco, CA (Presenter) Nothing to Disclose

For information about this presentation, contact:
dorothy.shum@ucsf.edu

TEACHING POINTS
1. Review the wide range of pathologies associated with fetal ventriculomegaly and distinguishing imaging features on obstetrical ultrasound and fetal MRI. 2. Review commonly encountered intracranial cystic masses and their mimics.

TABLE OF CONTENTS/OUTLINE

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Awards
Identified for RadioGraphics

Participants
Margarita V. Revzin, MD, New Haven, CT (Presenter) Nothing to Disclose
Christine O. Menias, MD, Chicago, IL (Abstract Co-Author) Nothing to Disclose
Douglas S. Katz, MD, Mineola, NY (Abstract Co-Author) Nothing to Disclose
Lori Mankowski Gettle, MD, Madison, WI (Abstract Co-Author) Nothing to Disclose
Mariam Moshiri, MD, Bellevue, WA (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
margarita.revinz@yale.edu

TEACHING POINTS

- Discuss anatomy, anatomical variants, embryology, and physiology of the fallopian tubes (FT)
- Familiarize a radiologist with imaging presentation of various benign/infectious pathologic conditions of the FT, including post-procedural changes
- Review common and uncommon radiological findings of benign and malignant FT pathologies, and the key differentiating features
- Discuss mimics of FT pathology

TABLE OF CONTENTS/OUTLINE

- Anatomy, anatomical variants (tubal absence, paratubal cysts), and embryology and physiology
- FT imaging modalities/techniques, including fluoroscopy, ultrasound, contrast-enhanced US (CEUS), CT, and MRI
- Benign FT pathologies
  - Infectious (acute and chronic PID-related pathology, extension from adjacent organs, TB)
  - Endometriosis (intratubal and paratubal implants, hematosalpinx)
  - Paratubal cysts
  - Isolated tubal torsion
  - Ovarian torsion with twisted tube
  - Tubal ectopic pregnancy and potential complications
- Fertility-related tubal pathology intervention and imaging appearance:
  - Tubal ligation and related devices
  - Tubal pregnancy assessment (fluoroscopy, CEUS, HSG)
- Malignant FT pathologies:
  - Primary carcinomas of the FT
  - Metastatic extension from ovaries and uterus
  - Lymphoma
  - Potential mimics
  - Uterine/broad ligament fibroma
  - Diverticulitis and abscess
  - Multiloculated ovarian neoplasm

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Update on Ovarian Neoplasm: What Radiologists Need to Know on Clinical, Laboratory, and an Algorithmic Imaging Approach to Benign versus Malignant Neoplasms

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Margarita V. Revzin, MD, New Haven, CT (Presenter) Nothing to Disclose
Suraj H. Rambhia, MD, Manhasset, NY (Abstract Co-Author) Nothing to Disclose
John S. Pellerito, MD, Manhasset, NY (Abstract Co-Author) Research Grant, General Electric Company
Arthur C. Fleischer, MD, Nashville, TN (Abstract Co-Author) Nothing to Disclose
Christine O. Menias, MD, Chicago, IL (Abstract Co-Author) Nothing to Disclose
Douglas S. Katz, MD, Mineola, NY (Abstract Co-Author) Nothing to Disclose
Mariam Moshiri, MD, Bellevue, WA (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
margarita.revzin@yale.edu

TEACHING POINTS
• Describe natural history and pathophysiology of ovarian neoplasms • Review pros and cons of different imaging modalities (Ultrasound, CT and MRI) for the diagnosis of ovarian masses with emphasis on new techniques for detection of tumor angiogenesis: dynamic MRI, Diffusion weighted Imaging (DWI) and Contrast Enhanced Ultrasound (CEUS)). • Familiarize a radiologist with differentiating imaging and clinical/laboratory markers that would increase overall accuracy and positive predictive value in the diagnosis of ovarian malignancy with some rad path correlation

TABLE OF CONTENTS/OUTLINE
• Natural history and pathophysiology of benign and malignant ovarian neoplasms • Imaging modalities for diagnosis of ovarian masses: o US/CEUS, CT, MRI - main principles, effectiveness in accuracy of diagnosis and role in cancer staging Dynamic MRI, DWI, and CEUS in the assessment of tumor angiogenesis with review of current literature o Provide flow chart in imaging algorithm • Current available guidelines on approach to characterization of ovarian neoplasms • Revised consensus criteria for characterization of ovarian masses, O-RADs and its implementation into practice o Unilocular cysts o Benign neoplasms: prognostic factors and complications and risk of transformation o Malignant neoplasms: Staging Prognosis Radiological, clinical and laboratory diagnostic markers

Printed on: 12/22/19
Multimodality Imaging Evaluation of Pelvic Inflammatory Disease and Its Related Complications

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Margarita V. Revzin, MD, New Haven, CT (Presenter) Nothing to Disclose
Suraj H. Rambhia, MD, Manhasset, NY (Abstract Co-Author) Nothing to Disclose
Mariam Moshiri, MD, Bellevue, WA (Abstract Co-Author) Nothing to Disclose
John S. Pellerito, MD, Manhasset, NY (Abstract Co-Author) Research Grant, General Electric Company
Christine O. Menias, MD, Chicago, IL (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
margarita.revzin@yale.edu

TEACHING POINTS
o Discuss pathophysiology, common and rare pathogens and clinical spectrum of the pelvic inflammatory disease (PID)
o Review imaging appearance of early and late presentation of PID with emphasis on ultrasound and MRI appearance
o Describe common complications and imaging features of advanced forms of PID on US, CT, and MRI
o Review most common pitfalls in diagnosis

TABLE OF CONTENTS/OUTLINE
o Common and rare pathogens, demographics and risk factors of PID
o Most optimal imaging modalities for diagnosis of PID, including ultrasound (US) and MRI; their technique and usefulness in differentiating PID from other adnexal pathologies
o Range of imaging appearances of PID on US and MRI: early, late and advanced forms
o Imaging appearance of complications of PID: tuboovarian abscess, pyometra, hepatitis, ruptured uterus, thrombophlebitis and venoocclusive disease
o Mimics of PID: ovarian benign and malignant neoplasms, adjacent organ infection, endometriosis, fallopian tube malignancy

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Cervical Cancer Staging: What’s New?

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Pedro Naime B. Araujo I, MD, Rio de Janeiro, Brazil (Presenter) Nothing to Disclose
Andrea d. Aranha, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Debora Z. Recchimuzzi, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Publio C. Viana, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Regis Otaviano Bezerra, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Marcelo A. Queiroz, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Rafael A. Kitamikado, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS

The FIGO Gynecologic Oncology Committee proposed changes to the staging of cancer of the cervix uteri in 2018 to improve the prognostic relevance of its descriptors. Until then, the International Federation of Gynecology and Obstetrics (FIGO) staging was based on clinical examination. In 2018, this has been revised to allow imaging and pathological findings, where available, to assign the stage. The aims of this exhibition are: discuss the changes incorporated into FIGO for the new staging of cervical cancer, in which image begins to have a significant impact on patient management; describe the revised FIGO staging of cervical cancer (2018) and the magnetic resonance (MR) imaging appearances of each stage of the primary tumor; explain the changes in the FIGO (2018) and the repercussions for clinical management and prognosis; recognize potential imaging and interpretative pitfalls.

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Awards
Certificate of Merit

Participants
Luciana C. Belem, MD, Rio de Janeiro, Brazil (Presenter) Nothing to Disclose
Alice Cristina C. Brandao Salomao, MD, Rio de Janeiro, Brazil (Abstract Co-Author) Nothing to Disclose
Claudio P. Crispi, MD, Rio de Janeiro, Brazil (Abstract Co-Author) Nothing to Disclose
Flavia A. Francisco, RT, MD, Rio de Janeiro, Brazil (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
lubelem@gmail.com

TEACHING POINTS
The purpose of this exhibit is: 1. To review the anatomy of the pelvic visceral nerves; 2. To correlate the MR imaging findings with cadaver, robot and laparoscopic anatomy; 3. To explain the utility of MR to the diagnosis of deep infiltrative endometriosis compromising pelvic nerves.

TABLE OF CONTENTS/OUTLINE
Anatomy of pelvic nerves Relationship of DIE and pelvic nerves Review of imaging findings and techniques Sample cases Future directions and summary

Printed on: 12/22/19
TRICKS and TWISTS of the Trade: Time-Resolved MRA for Evaluation of the Female Pelvis

Awards
Certificate of Merit

Participants
Sejal J. Patel, MD, Atlanta, GA (Presenter) Nothing to Disclose
Kelly L. Cox, DO, Jacksonville, FL (Abstract Co-Author) Nothing to Disclose
Ayushi Gupta, MD, Atlanta, GA (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
ayushi.gupta@emory.edu

TEACHING POINTS

MRI of the female pelvis is frequently performed for problem solving and treatment planning, often in younger women with symptoms including chronic pelvic pain, menorrhagia, or bulk symptoms such as urinary incontinence from mass effect. The addition of dynamic MR angiography (MRA) using time-resolved imaging with stochastic trajectories (TWIST) or time-resolved imaging of contrast kinetics (TRICKS) can add valuable information through continuous data collection after contrast administration, adding no extra time to the overall exam. The temporal resolution of time-resolved imaging can assist in identifying vascular pathology including pelvic congestion syndrome and vascular supply for certain entities such as fibroids and adenomyosis.

TABLE OF CONTENTS/OUTLINE

1. Review the physics behind time-resolved MRA
2. Discuss protocol for MRI of the female pelvis
3. Review female pelvis anatomy including vascular supply
4. Understand common gynecologic disorders, their clinical features, and the implication of MRA in their management
   a. Pelvic congestion syndrome and its grading system
   b. Uterine fibroids using the FIGO staging system
   c. Adenomyosis
5. Identify incidental findings on time-resolved imaging due to its larger field-of-view and better temporal resolution
   a. Including benign or malignant tumors and vascular aneurysm or stenosis

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In Utero Brain Curves: Analysis and Staging

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Shilpa Vijayasekar, MBBS, Chennai, India (Presenter) Nothing to Disclose
Amarnath Chellathurai, MD, FRCR, Chennai, India (Abstract Co-Author) Nothing to Disclose
Anand N. Parimalai, MD, Chennai, India (Abstract Co-Author) Nothing to Disclose
Murali K. Logudoss, MBBS, MD, Chennai, India (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
Sulcation is a sequential process and hence evaluation of the developmental stages of sulcal formation using foetal MRI in turn evaluates fetal brain maturation in relation to gestational age especially in second and third trimesters. Foetal MRI also aids in early detection and severity assessment of brain malformations to make the final management decisions.

TABLE OF CONTENTS/OUTLINE
AIM: The timing of the appearance of cerebral sulci in a foetus is so precise that neuropathologists consider it to be a reliable estimate of gestational age and good marker of fetal brain maturation. The aim of this study is to provide a standard of reference to assess normality of fetal sulcation.

MATERIALS & METHODS: Foetal MRI of 74 ultrasonically labelled normal fetuses of GA 22 to 36 wks, done using standard turbo spin echo sequence (HASTE) focussing on Foetal brain. Binding the gestational age 17 sulci were analysed in an orderly manner.

RESULTS: Based on the observation, the gestational age at which each sulci can be and must be identified are tabulated. Six sequential developmental stages of sulcal development is also proposed.

CONCLUSION: The evaluation of fetal brain maturation in relation to gestational age can be done using foetal MRI during the second and third trimesters especially to identify early brain anomalies involving neuronal migration and cortical formation.

Printed on: 12/22/19
Multimodality Appearances, Significance, and Complications of Mullerian Duct Anomalies

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Kaustubh Shiralkar, MD, Houston, TX (Presenter) Nothing to Disclose
Chakradhar R. Thupili, MD, Houston, TX (Abstract Co-Author) Nothing to Disclose
Eduardo J. Matta, MD, Bellaire, TX (Abstract Co-Author) Nothing to Disclose
Daniel Ocazionez, MD, Houston, TX (Abstract Co-Author) Nothing to Disclose
Steven S. Chua, MD, PhD, Houston, TX (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
Kaustubh.G.Shiralkar@uth.tmc.edu

TEACHING POINTS
1. Understanding how embryology leads to Mullerian duct abnormalities (MDA) and potential complications of the various MDA subtypes. Multimodality evaluation including HSG, ultrasound, CT, and MRI facilitate accurate diagnosis and prompt treatment. 2. Differentiation of fusion (didelphys and bicornuate) from reabsorption (septate and arcuate) anomalies is based on the presence of a uterine fundal cleft. 3. Didelphys and bicornuate uterine abnormalities have a fundal cleft greater than 1 cm and can usually be distinguished from each other by the lack of communication in the former and some component of communication of the uterine cavity in the latter. 4. Arcuate and septate uteri generally have a convex fundus or a small fundal cleft less than 1 cm and can be distinguished from the bicornuate and didelphys moities.

TABLE OF CONTENTS/OUTLINE
1. Discuss brief embryology of uterine development and how interruptions during critical stages of development lead to imaging manifestations of MDAs. 2. Highlight salient imaging features that help distinguish these uterine malformations. 3. Utilize multimodality imaging to identify and classify these uterine abnormalities. 4. Discuss concomitant complications and briefly discuss necessary treatment if any that is required. 5. Detail potential diagnostic pitfalls. 6. Interesting cases and conclusion.

Printed on: 12/22/19
Participants
Pedro Panizza, MD, Sao Paulo, Brazil (Presenter) Nothing to Disclose
Brunna Oliveira, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Fernando M. Coelho, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Adriano Basso Dias, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Marcelo d. Gusmao, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Fernanda G. Velloni, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Natalia Horvat, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Roberto Blasbalg, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Giovanni G. Cerri, MD, PhD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Publio C. Viana, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
pedropanizza@gmail.com

TEACHING POINTS
- Differentiate an ovarian mass from any other pelvic lesions
- Assessing the radiology descriptions that provide reliable communication with the referring physician
- Recognize the ovarian mass diagnosis and the main differentials applying a didactic and compartmentalized way
- Perform a structured report which provides all the data necessary for the clinical and surgical therapeutics

TABLE OF CONTENTS/OUTLINE
- Differentiate an ovarian mass from any other pelvic lesions
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- Recognize the ovarian mass diagnosis and the main differentials applying a didactic and compartmentalized way
- Perform a structured report which provides all the data necessary for the clinical and surgical therapeutics

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A User Guide of Susceptibility Weighted Imaging (SWI) for Female Pelvis Lesions Evaluation

Participants
Teodoro M. Noguerol, MD, Jaen, Spain (Presenter) Nothing to Disclose
Lidia Alcala Mata, MD, Jaen, Spain (Abstract Co-Author) Nothing to Disclose
Javier Royuela del Val, Cordoba, Spain (Abstract Co-Author) Nothing to Disclose
Eloisa Navas Campos, MD, Jerez, Spain (Abstract Co-Author) Nothing to Disclose
Antonio Luna, MD, PhD, Jaen, Spain (Abstract Co-Author) Speaker, Koninklijke Philips NV

For information about this presentation, contact:
t.martin.f@htime.org

TEACHING POINTS
1. Review the physical basis of Susceptibility Weighted Imaging (SWI) and technical adjustments for its application in female pelvic studies. 2. Describe the advantages and disadvantages of SWI with regard to other imaging modalities and especially conventional MRI morphological sequences. 3. Review the potential role of SWI for detection of blood and calcium in female pelvic lesions as well for differentiation between both compounds.

TABLE OF CONTENTS/OUTLINE

Printed on: 12/22/19
Morphological and Biometric Analysis of Posterior Fossa Structures by Fetal MRI: Step-by-Step

All Day Room: OB Community, Learning Center Digital Education Exhibit

Awards
Certificate of Merit

Participants
Patricia Oliveira-Szejnfeld, MD, Sao Paulo, Brazil (Presenter) Nothing to Disclose
Renato Ximenes, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Bruna M. Trindade, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Andre Malho, MD, Santo Andre, Brazil (Abstract Co-Author) Nothing to Disclose
Soraya Monteiro, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Karina K. Haratz, MD, MSc, Holon, Israel (Abstract Co-Author) Nothing to Disclose
Fernanda T. Moll, MD, Bethesda, MD (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
patricia.fetal@gmail.com

TEACHING POINTS
Normalization of posterior fossa structures analysis in Fetal MRI Normal morphological and biometric appearance of normal posterior fossa structures between 22 and 38 gestational weeks Diagnosis the main abnormalities of posterior fossa structures in the fetal MRI

TABLE OF CONTENTS/OUTLINE
The analysis of fetal posterior fossa structures is one of the main indications of fetal MRI, due to the frequency of associations of malformations of these structures in cases of alterations of the brain structures, ie, supratentorial structures such as corpus callosum dysgenesis, hydrocephalus, among others, as well as the difficult access of the ultrasound to complete analysis, mainly of the brainstem. The objective of this work is to demonstrate, in a structured and organized way, how to perform a detailed and accurate analysis of posterior fossa structures through Fetal MRI for the appropriate diagnosis. The work is based on the review of the anatomy and embryology of posterior fossa structures, as well as its normal morphological and biometric appearance in Fetal MRI images between 22 and 38 gestational weeks 'step by step', and we will also illustrate the main malformations, and at what stage of development occur and at what gestational age the Fetal MRI diagnosis is possible, being performed for a thorough review of the literature.

Printed on: 12/22/19
FIGO, Fibroids, and You

All Day Room: OB Community, Learning Center Digital Education Exhibit

Participants
Jeremy Middleton, MD, Los Angeles, CA (Presenter) Nothing to Disclose
Maitraya K. Patel, MD, Los Angeles, CA (Abstract Co-Author) Nothing to Disclose
Rinat Masamed, MD, Los Angeles, CA (Abstract Co-Author) Nothing to Disclose
Haatal B. Dave, MD, MS, Marina Del Rey, CA (Abstract Co-Author) Nothing to Disclose
Steven S. Raman, MD, Santa Monica, CA (Abstract Co-Author) Consultant, Johnson & Johnson; Consultant, Bayer AG; Consultant, Merck & Co, Inc; Consultant, Amgen Inc; Consultant, Profound Medical Inc
Simin Bahrami, MD, Manhattan Beach, CA (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
jmiddleton@mednet.ucla.edu

TEACHING POINTS
Fibroids are a significant cause of morbidity in the United States and worldwide. The International Federation of Gynecology and Obstetrics (FIGO) sub-classification of abnormal uterine bleeding provides a concise system for communication of fibroid anatomy, with clinical and management implications. Objectives include: a. Understand the key imaging features of fibroids and FIGO sub-classification of fibroid anatomy b. Review imaging features of classic as well as atypical/degenerative fibroids, common variant presentations, and findings suspicious for malignancy c. Appreciate the utility of ultrasound and MRI modalities in initial work-up, problem-solving, pre-treatment planning, and post-treatment follow-up including expected imaging appearance and review of complications

TABLE OF CONTENTS/OUTLINE
1. Introduction
2. Review of fibroids
3. FIGO classification of fibroids
4. Atypical/degenerative fibroids
5. Common diagnostic pitfalls
6. Imaging features that raise suspicion for malignancy
7. Management options and impact of pre-treatment imaging
8. Post-treatment findings and common complications
9. Summary

Printed on: 12/22/19
Participants
Esther Park, MD, Los Angeles, CA (Presenter) Nothing to Disclose
Megan Sue, MD, Los Angeles, CA (Abstract Co-Author) Nothing to Disclose
Haatali B. Dave, MD, MS, Marina Del Rey, CA (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
eypark@mednet.ucla.edu

TEACHING POINTS
Endometriosis is an inflammatory disease characterized by the presence of endometrial glands and stroma outside of the uterine cavity. While some patients may have minimal symptoms, endometriosis can also be debilitating and cause a wide range of symptoms including chronic pain, dysmenorrhea, dyspareunia, and infertility. In fact, endometriosis has been reported in up to 70 percent of females with pelvic pain, a commonly evaluated symptom by gynecologists. It is therefore important for the radiologist to be knowledgeable of the various imaging manifestations of endometriosis, as well as the clinically relevant imaging findings that can help clinicians determine appropriate management both preoperatively and postoperatively. The purpose of this exhibit is to: Review the pathology and clinical manifestations of endometriosis Familiarize the participant with the various imaging manifestations of endometriosis Outline and discuss pertinent radiologic findings that help guide management, including pre-surgical planning and postoperative reevaluation Discuss imaging findings of potential postoperative complications

TABLE OF CONTENTS/OUTLINE
Pathogenesis and clinical manifestations of endometriosis Imaging manifestations What the gynecologist wants to know - with case examples Postoperative complications

Printed on: 12/22/19
The Enlarged Cisterna Magna: A Practical Imaging Algorithm for Diagnosis of the Most Common Posterior Fossa Abnormalities

All Day Room: NA Digital Education Exhibit

Participants
Sepideh Sefidbakht, MD, Powel, OH (Presenter) Nothing to Disclose
Sina Bagheri, Shiraz, Iran (Islamic Rep. Of) (Abstract Co-Author) Nothing to Disclose
Setareh Hemmati, Shiraz, Iran (Islamic Rep. Of) (Abstract Co-Author) Nothing to Disclose
Pooya Iranpour, MD, Houston, TX (Abstract Co-Author) Nothing to Disclose
Bijan Bijan, MD, Sacramento, CA (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
dr.sefid@gmail.com

TEACHING POINTS
To recognize the normal and abnormal shapes of the posterior fossa in the 11-13(+6) wks screening ultrasound
To identify the proper landmarks for measuring a proper intracranial translucency in the 11-13(+6) wks screening ultrasound
To identify the proper landmarks for measuring the cisterna magna in the 18-22 wks anatomical survey
To recognize the normal and abnormal appearances of the vermis and cerebellum in ultrasound and fetal MRI based on gestational age
To provide a simplified algorithm for diagnosis of most common posterior fossa anomalies for trainees
To discuss various posterior fossa anomalies in a case-based format

TABLE OF CONTENTS/OUTLINE
The posterior fossa in the 11-13(+6) weeks screening ultrasound, the intracranial translucency and its significance
The normal cisterna magna, how not to measure
The vermis, gestational age dependent appearance in fetal MRI
Simplified algorithm for diagnosis of posterior fossa anomalies
The fetal posterior fossa anomalies, a case-based discussion

Printed on: 12/22/19
Ventriculomegaly: A Practical Diagnostic Algorithm

Participants
Sepideh Sefidbakht, MD, Powel, OH (Presenter) Nothing to Disclose
Pooya Iranpour, MD, Houston, TX (Abstract Co-Author) Nothing to Disclose
Sara Haseli, Shiraz, Iran (Islamic Rep. Of) (Abstract Co-Author) Nothing to Disclose
Reza Jalli, Shiraz, Iran (Abstract Co-Author) Nothing to Disclose
Sina Bagheri, Shiraz, Iran (Islamic Rep. Of) (Abstract Co-Author) Nothing to Disclose
Bijan Bijan, MD, Sacramento, CA (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
dr.sefid@gmail.com

TEACHING POINTS
To recognize the normal and abnormal shape of the ventricle in ultrasound and MRI, including specific abnormal shapes with diagnostic implications
To recognize the additional neurosonography and MRI findings which can help identify specific cause for ventriculomegaly.
To understand the contributions of neurosonography and MRI in further evaluation of ventriculomegaly.
To propose a simplified algorithm to approach ventriculomegaly
To discuss the most common causes of ventriculomegaly using a case-based approach.

TABLE OF CONTENTS/OUTLINE
The fetal ventricles, the normal appearance in the first trimester
The fetal ventricles, normal appearance in the second and third trimesters, ultrasound-MRI correlation
Fetal ventriculomegaly, definition and specific shape abnormalities (colpocephaly, pointed occipital horns)
Fetal ventriculomegaly and the cavum septum pellucidum, normal and abnormal appearance
Fetal ventriculomegaly and the posterior fossa, diagnostic implications of posterior fossa findings
Case-based review of fetuses with VMG, including: Chiari II malformation, Callosal agenesis, TORCH diseases, pseudo-TORCH diseases, intracranial hemorrhage, isolated VMG

Printed on: 12/22/19
Obstetrical Imaging Sunday Case of the Day

Sunday, Dec. 1 7:00AM - 11:59PM Room: Case of Day, Learning Center

AMA PRA Category 1 Credit ™: .50

Participants
Mariam Moshiri, MD, Bellevue, WA (Presenter) Nothing to Disclose
Jonathan Revels, DO, Seattle, WA (Abstract Co-Author) Nothing to Disclose
Sherry S. Wang, MBBS, Seattle, WA (Abstract Co-Author) Nothing to Disclose
Paula J. Woodward, MD, Salt Lake City, UT (Abstract Co-Author) Editor, Reed Elsevier
Erez Klein, MD, Haifa, Israel (Abstract Co-Author) Nothing to Disclose
Sherry S. Wang, MBBS, Seattle, WA (Abstract Co-Author) Nothing to Disclose
Sobhi Abadi, MD, Haifa, Israel (Abstract Co-Author) Nothing to Disclose
Marcia C. Javitt, MD, Haifa, Israel (Abstract Co-Author) Nothing to Disclose
Tomas Prior, PhD, MBBS, London, United Kingdom (Abstract Co-Author) Nothing to Disclose
Victoria Jowett, MD, London, United Kingdom (Abstract Co-Author) Nothing to Disclose
Jasmine W. Tay, BMBS, BMedSc, London, United Kingdom (Abstract Co-Author) Nothing to Disclose
Christoph Lees, MD, London, United Kingdom (Abstract Co-Author) Speaker, Samsung Electronics Co, Ltd; Speaker, Canon Medical Systems Corporation; Institutional research support, Samsung Electronics Co, Ltd; Institutional research support, Canon Medical Systems Corporation; Institutional research support, General Electric Company; Institutional research support, F. Hoffmann-La Roche Ltd;
Nishat Bharwani, FRCR,MBS, London, United Kingdom (Abstract Co-Author) Nothing to Disclose
Gitanjali Bajaj, MD, Little Rock, AR (Abstract Co-Author) Nothing to Disclose
Teresita L. Angtuncio, MD, Little Rock, AR (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1) Analyze findings on obstetric imaging studies. 2) Develop differential diagnoses based on the clinical information and imaging findings. 3) Recognize the importance of accurate prenatal diagnosis on pregnancy management.

Printed on: 12/22/19
OB171-ED-SUA1
Size Matters: What Radiologists Need to Know About Fetal Growth
Station #1

Awards
Cum Laude
Identified for RadioGraphics

Participants
Anne M. Kennedy, MD, Salt Lake City, UT (Presenter) Author with royalties, Reed Elsevier
Shannon Son, MD, Salt Lake City, UT (Abstract Co-Author) Nothing to Disclose
Michelle Debbink, MD, Salt Lake City, UT (Abstract Co-Author) Nothing to Disclose
Paula J. Woodward, MD, Salt Lake City, UT (Abstract Co-Author) Editor, Reed Elsevier

For information about this presentation, contact:
anne.kennedy@hsc.utah.edu

TEACHING POINTS
1: Correct pregnancy dating is critical for identification of abnormal fetal growth both growth restriction and overgrowth syndromes.
2: The best time to date a pregnancy is in the first trimester 3: Early onset growth restriction is often due to an intrinsic fetal abnormality such as aneuploidy. 4: Late onset growth restriction is more frequently related to placental insufficiency. 5: Growth abnormalities may occur in one of a twin pair. Twins with discordant growth are at increased risk for poor outcome.

TABLE OF CONTENTS/OUTLINE
Methods to determine gestational age: Clinical: Menstrual dates, ovulation tracking, IVF history, palpation, fundal height measurement. Sonographic: Sac size, crown rump length, routine biometry. Additional sonographic observations: Transverse cerebellar diameter, epiphyseal ossification, foot length, cerebral sulcation. Definition of terms used in description of fetal size and growth: Growth restriction, small for gestational age, large for gestational age, macrosomia. What are the risks associated with abnormal fetal growth? Iatrogenic prematurity, ischemic injury, postnatal hypoglycemia. When is a small fetus in trouble? Umbilical artery and ductus venosus Doppler, fluid volume, NST/BPP. Diagnosis and management of discordant twin growth: Biometry, placental cord insertion, Doppler.

OB172-ED-SUA2
Go with the Flow: Understanding Pathways of Disease Spread in Ovarian Cancer and How to Apply RECIST 1.1
Station #2

Awards
Certificate of Merit

Participants
Shaun A. Wahab, MD, Mason, OH (Presenter) Nothing to Disclose
Tyler G. McCurdy, DO, Cincinnati, OH (Abstract Co-Author) Nothing to Disclose
Michael S. Newberry, MD, Lackland AFB, TX (Abstract Co-Author) Nothing to Disclose
Juliana J. Tobler, MD, Cincinnati, OH (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
Develop a better understanding of the typical patterns of metastatic spread of ovarian cancer with a focus on peritoneal spread of disease. Examine key points specific to ovarian cancer regarding the application of RECIST 1.1

TABLE OF CONTENTS/OUTLINE
Provide a brief overview of ovarian cancer and standard treatments. Discuss the common types of ovarian cancer and illustrate the patterns of metastatic spread, including: peritoneal spread, lymphatic spread, hematologic spread, and direct invasion. Analyze the flow of peritoneal fluid and how it relates to the spread of tumor cells as well as review peritoneal ligaments that may serve as attachment sites for metastatic disease. Examine pearls and pitfalls when applying RECIST 1.1 in the context of ovarian cancer.

Printed on: 12/22/19
Opening Up the Ovary: A Multimodality Approach to Imaging Ovarian Neoplasms with Pathology Correlation

TEACHING POINTS
Ovarian cancer is common, accounting for approximately 4% of all female cancers. As clinical findings can be non-specific, imaging plays an important role in localization, characterization, and staging of suspected malignancies. As it is often treated surgically, knowledge of the histologic appearance can better inform pre-operative imaging studies. At the end of this exhibit, the learner will be able to do the following:

- Elucidate the utility and advantages of different imaging modalities used to assess ovarian neoplasms
- Characterize ovarian neoplasms based on their imaging appearance
- Correlate histologic findings to those seen with radiology

TABLE OF CONTENTS/OUTLINE
Imaging approach to assessing ovarian masses including utility of different modalities (US, CT, MRI, PET-CT)

Surface epithelial-stroma: serous tumors (cystadenoma, borderline, cystadenocarcinoma), mucinous tumors (cystadnoma, borderline tumors, cystadenocarcinoma), endometroid tumors, clear cell, Brenner, Cystadenofibroma Germ cell: Teratoma (mature, immature, struma ovarii, carcinoid), Dysgerminoma, Yolk sac tumor, Embryonal carcinoma, Choriocarcinoma Sex cord-stromal: Fibroma, thecoma, fibrothecoma, Sertoli-leydig cell Miscellaneous: Lymphoma, Metastases, Krukenberg tumor

Key distinguishing imaging features

Summary/Conclusion

O-RADS Made Easy: A Pictorial Review

TEACHING POINTS
Ovarian-Adnexal Imaging-Reporting-Data System (O-RADS) committee was formed under supervision of American College of Radiology in 2015. As per ACR, the long term goals were to minimize vague terminology and inconsistencies among reporting radiologists, to develop a standardized lexicon for classification, risk stratification, follow-up and management of ovarian masses. In October 2018, a white paper was published by the committee describing the standardized lexicon for reporting ovarian and adnexal masses. This exhibit aims to simplify the approach to ovarian lesion using the proposed new standardized terminology.

TABLE OF CONTENTS/OUTLINE
The goals of this exhibit include: to review recently released O-RADS guidelines to standardize descriptions of ovarian/adnexal lesions in step by step fashion, to demonstrate simplified basic descriptors (basic vocabulary), lexicon terms, major categories, and definitions, to provide examples of an O-RADS-based report of common adnexal/ovarian lesions, to highlight the terms that have been commonly used in the past, but must be avoided based on O-RADS guidelines, and to provide case based review of recently published O-RADS ultrasound risk categorization and pre/post menopausal management.
Participants
Eva I. Rubio, MD, Cincinnati, OH (Moderator) Nothing to Disclose
Amy R. Mehollin-Ray, MD, Pearland, TX (Moderator) Nothing to Disclose
Dorothy I. Bulas, MD, Washington, DC (Moderator) Editor with royalties, Wolters Kluwer nv

Sub-Events
RC113-01 Fetal Imaging of Spinal Dysraphisms

Participants
Usha D. Nagaraj, MD, Cincinnati, OH (Presenter) Author with royalties, Reed Elsevier

For information about this presentation, contact:
usha.nagaraj@cchmc.org

LEARNING OBJECTIVES
1) To review the differential diagnosis of spinal dysraphisms identified on fetal imaging. 2) Present examples of some of the most commonly diagnosed fetal spinal dysraphisms.

RC113-02 Pre- and Postnatal MRI Findings in Open Spinal Dysraphism Following Intrauterine Repair via Open versus Fetoscopic Surgical Techniques

Participants
Usha D. Nagaraj, MD, Cincinnati, OH (Presenter) Author with royalties, Reed Elsevier
Karin Bierbrauer, Cincinnati, OH (Abstract Co-Author) Nothing to Disclose
Charles Stevenson, MD, Cincinnati, OH (Abstract Co-Author) Nothing to Disclose
Jose L. Peiro, Barcelona, Spain (Abstract Co-Author) Nothing to Disclose
Foong-Yen Lim, Cincinnati, OH (Abstract Co-Author) Nothing to Disclose
Beth M. Kline-Fath, MD, Cincinnati, OH (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
usha.nagaraj@cchmc.org

PURPOSE
To examine MRI findings of the brain and spine on prenatal and postnatal MRI following prenatal repair of open spinal dysraphism (OSD) by the open and fetoscopic approaches.

METHOD AND MATERIALS
Single center HIPAA compliant and IRB approved retrospective analysis of fetal MRIs with open spinal dysraphism from 1/2011 through 12/2018 that underwent prenatal repair of OSD. Only patients with diagnostic quality postnatal brain and spine MRIs within first 3 months of life were included. Images were reviewed by 2 board certified fellowship-trained pediatric neuroradiologists.

RESULTS
62 patients met inclusion criteria, 47 underwent open repair, 15 underwent fetoscopic repair, average gestational age at initial MRI 22.6 ± 1.4 weeks. 17.7% (11/62) had follow-up fetal MRIs after surgery, 45.5% (5/11) status post open repair and 54.5% (6/11) status post fetoscopic repair. 90.9% (10/11) of these had improved hindbrain herniation status post repair (5/5 open, 5/6 fetoscopic). 54.5% (6/11) had larger lateral ventricular size status post repair (3/5 open, 3/6 fetoscopic), remaining 45.5% (5/11) had stable ventricular size. On postnatal MRI, spinal cord syrinx was seen in 34% (16/47) open repair versus 33.3% (5/15) fetoscopic repair (p=0.96). Degree of postnatal hindbrain herniation by a modified scale (1-4) demonstrated no significant difference in hindbrain herniation between the open (2.6 ± 0.9) versus fetoscopic (2.3 ± 0.7) repair groups (p=0.28). Lateral ventricular size was significantly larger in the open repair (20.9 ± 6.7) versus the fetoscopic repair (16.1 ± 4.9) group (p=0.01).

CONCLUSION
Though lateral ventricular size in the open repair group was larger than the fetoscopic repair group, this can likely be explained by selection criteria used for fetoscopic repair. Other post-operative imaging parameters were not significantly different between the
two groups.

**CLINICAL RELEVANCE/APPLICATION**

By sharing our experience with fetal and postnatal MRI findings in patients with open spinal dysraphisms undergoing both open and fetoscopic intrauterine repair, we hope to improve our understanding of the disease process and establish the groundwork of what can be expected when evaluating MRIs in this patient population.

**RC113-03  Role of Fetal MRI in Diagnosis of Genitourinary Anomalies: Is There an Added Value?**

Sunday, Dec. 1 2:30PM - 2:40PM Room: E353B

Participants
Sepideh Sefidbakht, MD, Powel, OH (Abstract Co-Author) Nothing to Disclose
Bijan Bijan, MD, Sacramento, CA (Presenter) Nothing to Disclose
Hamid Foroutan, Shiraz, Iran (Islamic Rep. Of) (Abstract Co-Author) Nothing to Disclose
Meisam Hoseinyazdi, Shiraz, Iran (Islamic Rep. Of) (Abstract Co-Author) Nothing to Disclose
Pedram Keshavarz, Shiraz, Iran (Islamic Rep. Of) (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
dr.sefid@gmail.com

**PURPOSE**

To retrospectively review fetal MRI's performed over 5 years in our center to establish the added value of MRI in diagnosis of fetal GU anomalies.

**METHOD AND MATERIALS**

IRB approved study. Out of 771 fetal MRI's performed in our center, 65 were done either primarily to evaluate a GU anomaly seen in ultrasound or an anomaly related to the GUT was incidentally detected. Interpretation of MRI's were done by a single radiologist who was not blinded to the ultrasound results. Final diagnosis was established through phone calls and national registry search. Post-delivery images also surgical notes and biopsy results were obtained when available. The added value of MRI was discussed with a pediatric surgeon, pediatric urologist, perinatologist and radiologist.

**RESULTS**

Final diagnoses included bilateral/unilateral renal agenesis(8/4), multicystic dysplastic kidneys(4), urinary tract obstruction(3), duplicate collecting system with obstruction(2), simple renal cyst(3), adrenal cyst(4), posterior urethral valve(5), crossed fused ectopia(1), autosomal recessive/dominant polycystic kidney disease(3/2), glomerulocystic disease(2), bilateral UPJO and isolated mild bilateral pelvocalyctases, normal outcome(25). FMRI was considered to have an impact on diagnosis/counseling/management in 26 (confirming presence/absence of kidneys in severe oligohydramnios (8 & 9), confirming probable normal renal function in hyperintense/hyperechoic fetal kidneys(3), multicystic dysplastic kidney diagnosed as pelvocalyctasis in ultrasound(3), crossed fused ectopia(1), megacystis microcolon(1), & bilateral UPJO(1).

**CONCLUSION**

Fetal MRI had significant additional benefit to ultrasound in congenital genitourinary anomalies which affected either management (27%) or counseling (12%) as a result of more accurate diagnosis.

**CLINICAL RELEVANCE/APPLICATION**

While ultrasound is very sensitive in detecting urinary tract abnormalities in the prenatal period, Fetal MRI can add significant clinically relevant data which can affect management and counseling.

**RC113-04  Comparison of Mediastinal Shift Angles Obtained with Ultrasound and Magnetic Resonance Imaging in Fetuses with Isolated Left Congenital Diaphragmatic Hernia**

Sunday, Dec. 1 2:40PM - 2:50PM Room: E353B

Participants
Chiara Carducci, MD, Rome, Italy (Presenter) Nothing to Disclose
Sara Savelli, MD, Rome, Italy (Abstract Co-Author) Nothing to Disclose
Stefano Bascetta, Rome, Italy (Abstract Co-Author) Nothing to Disclose
Anita Romiti, Rome, Italy (Abstract Co-Author) Nothing to Disclose
Silvia Salvi, Rome, Italy (Abstract Co-Author) Nothing to Disclose
Leonardo Caffo, Rome, Italy (Abstract Co-Author) Nothing to Disclose
Paolo Toma, Rome, Italy (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
sara.savelli@opbg.net

**PURPOSE**

To compare ultrasound (US) and magnetic resonance imaging (MRI) in the assessment of mediastinal shift angles (MSA) in fetuses affected by isolated left congenital diaphragmatic hernia (CDH). To investigate the potential role of MRI-MSA and US-MSA as prognostic factors for postnatal survival in fetuses with left CDH.

**METHOD AND MATERIALS**

This was an observational study of 29 fetuses with prenatally diagnosed isolated left CDH, assessed with both US and MRI examinations between January 2015 and December 2018. The US-MSA measurements performed within two weeks from the MRI assessment were considered for the analysis. The primary outcome was postnatal survival rate.

**RESULTS**
No significant difference between US and MRI MSA values was detected (p=0.419). Among the 29 cases there were 21 alive infants, for an overall postnatal survival rate of 72.41%. After stratification for postnatal survival, the best cut-offs in terms of sensibility and specificity were 42.1° for US-MSA and 39.1° for MRI-MSA since they have demonstrated the highest discriminatory power between survivors and non-survivors. The performance of MRI-MSA in predicting postnatal survival was close to that of US-MSA in terms of sensitivity (62.5% vs. 50.0%), specificity (80.9% vs. 90.5%), positive predictive value (55.6% vs. 66.7%), negative predictive value (85.0% vs. 82.6%) and accuracy (75.9% vs. 79.3%). There was no statistically significant difference between the two modalities (p > 0.05 for all).

CONCLUSION
MRI and US can be used interchangeably for the assessment of MSA in prenatally diagnosed isolated left CDH. Moreover, MSA measured by both US and MRI was confirmed to be correlated with perinatal outcome in terms of survival.

CLINICAL RELEVANCE/APPLICATION
Mediastinal shift angle is a simple, quick and repeatable US and MRI measurement that seems to be a promising diagnostic tool in predicting survival in prenatally diagnosed left CDHs.

RC113-05  Fetal MRI Assessment of Mediastinal Shift Angle (MSA) in Isolated Left Congenital Diaphragmatic Hernia: A New Postnatal Survival Predictive Tool?

Participants
Stefano Bascetta, Rome, Italy (Abstract Co-Author) Nothing to Disclose
Sara Savelli, MD, Rome, Italy (Abstract Co-Author) Nothing to Disclose
Chiara Carducci, MD, Rome, Italy (Presenter) Nothing to Disclose
Milena Viggiano, Rome, Italy (Abstract Co-Author) Nothing to Disclose
Enza Carnevale, MD, Rome, Italy (Abstract Co-Author) Nothing to Disclose
Leonardo Caforio, Rome, Italy (Abstract Co-Author) Nothing to Disclose
Paolo Toma, Roma, Italy (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
sarasavelli@hotmail.it

PURPOSE
To quantify mediastinal shift angle (MSA) in isolated left congenital diaphragmatic hernia (CDH) by fetal MRI and to assess the feasibility of MSA in predicting postnatal survival at discharge.

METHOD AND MATERIALS
A prospective database including fetuses with CDH who underwent fetal MRI from January 2013 to January 2018 was retrospectively reviewed and fetuses from singleton pregnancies with isolated left CDH were selected. Cases were matched for gestational age with controls from singleton fetuses without thoracic, cardiac or mediastinal malformations. For all fetuses MSA was determined twice by two experienced operators (MSA1 and MSA2). Interoperator variability and statistical difference between MSA values in cases and controls were investigated. Total Fetal Lung Volume (TFLV) was also determined in cases and correlation between MSA and TFLV was assessed. Furthermore cases were divided into two groups based on postnatal survival (group 1-survivor, group 2-non survivor) and predictive value of MSA was determined.

RESULTS
From a total of 56 fetuses with prenatal diagnosis of CDH in our database, 34 fetuses with isolated left CDH were included as cases and matched with 42 fetuses as controls. 24 cases survived until discharge (G1) and 10 didn't (G2). An excellent interoperator reliability was obtained in measuring MSA (0.985, interclass correlation coefficient 98%, CI 0.7-1.000) with a statistically significant difference between MSA values in cases and controls. After survival stratification of cases statistical analysis confirmed an inverse correlation between MSA values and survival (p value <0.0001) and a direct correlation between TFLV and survival (p value <0.005), as well as a statistically significant inverse correlation between MSA and TFLV. Area under the ROC curve detected an excellent discriminatory accuracy for MSA in separating survivor and non-survivor (0.931, 95%, CI 0.851-1.000) with the best cutoff at 38.2°.

CONCLUSION
MSA is a promising tool for correlation with postnatal survival in patients with isolated left CDH, alone or in association with TFLV. The possible prognostic role of MSA should be investigated also for early treatments in utero or at birth in future clinical trials.

CLINICAL RELEVANCE/APPLICATION
Mediastinal shift angle can be easily assessed by fetal MRI, it is correlated with pulmonary volume and it could predict survival in left CDH redefining the objectives of future clinical trials.

RC113-06  The Normal Fetal Lung Volume: One Size Does Not Fit All Populations

Participants
Sepideh Sefidbakht, MD, Powel, OH (Abstract Co-Author) Nothing to Disclose
Amin Dehdashtian, MD, Shiraz, Iran (islamic Rep. Of) (Abstract Co-Author) Nothing to Disclose
Fereshteh Bagheri, Shiraz, Iran (islamic Rep. Of) (Abstract Co-Author) Nothing to Disclose
Pedram Keshavarz, Shiraz, Iran (islamic Rep. Of) (Abstract Co-Author) Nothing to Disclose
Bijan Bijan, MD, Sacramento, CA (Presenter) Nothing to Disclose

For information about this presentation, contact:
dr.sefid@gmail.com
PURPOSE
To measure the lung volume using fetal MR images in normal fetuses; in order to establish gestational age-dependent reference data in our population.

METHOD AND MATERIALS
342 fetuses that underwent fetal MRI in our institution during Jan 2016-2017 (gestational age 18-36 weeks). All MRI's were done on a 1.5T Siemens Avanto. 241 fetuses were proven to have normal lung structure and function post-delivery and had technically adequate images for evaluation of the lungs. Fetal lung volumes were measured by manual tracing of consecutive slices on T2 HASTE, or trufisp images in axial planes, whichever was technically acceptable. The volumes were correlated with gestational age. This resulted in a formula calculating the expected fetal lung volume dependent using gestational age.

RESULTS
Normal FLV increased with gestational age. The expected fetal lung volume was derived from the following formula: Fetal lung volume (mL) = 0.002× (GA^2.913), in which GA is the gestational weeks. Our data distribution was closest to Osada et al. rather than Rypens et al and Meyers et al.

CONCLUSION
Fetal lung volumes correlate with gestational age. The exact relationship between lung volumes and gestational age might vary in different populations.

CLINICAL RELEVANCE/APPLICATION
Fetal lung volumes have prognostic significance. In some common anomalies such as congenital diaphragmatic hernia the expected fetal lung volume is used for clinical management and decision-making. Accurate population-specific data is necessary for accurate risk stratification and management in these cases.

RC113-07 The Fetal Airway: In Utero Imaging, Decision Making, and Surgical Planning
Sunday, Dec. 1 3:10PM - 3:30PM Room: E353B

Participants
Mariana L. Meyers, MD, Cleveland, OH (Presenter) Nothing to Disclose

LEARNING OBJECTIVES
1) Understand the normal fetal airway appearance by fetal MRI and ultrasound Identify the main imaging features of fetal neck and chest pathologies affecting the airway. 2) Recognize how fetal MRI aids in the diagnosis of different neck pathologies.

Printed on: 12/22/19
MRI O-RADS (Interactive Session)

Sub-Events

RC129A  Overview and O-RADS 0-1

Participants
Caroline Reinhold, MD, MSc, Montreal, QC (Presenter) Nothing to Disclose

LEARNING OBJECTIVES
1) To introduce MRI O-RADS (Ovarian-Adnexal Reporting and Data Systems) 2) To review the MRI O-RADS governing concepts. 3) To know the main terms for O-RADS MRI scores 0 and 1. 4) To understand the application of O-RADS MRI scores 0 and 1 to adnexal masses and the associated risk of malignancy. 5) To recognize O-RADS MRI score 1 lesions by review of cases.

RC129B  O-RADS 2

Participants
Evan S. Siegelman, MD, Media, PA (Presenter) Advisory Board, Spreemo Health; Consultant, BioClinica, Inc; Consultant, ICON plc; Consultant, inviCRO, LLC

For information about this presentation, contact:
evan.siegelman@uphs.upenn.edu

LEARNING OBJECTIVES
1) Describe the MR terms that characterize adnexal lesions that are almost certainly benign (O-RADS 2). 2) Identify those MR imaging features that would upgrade an adnexal lesion to a higher O-RADS category. 3) Illustrate MR imaging examples of O-RADS 2 lesion such as endometrioma, cystadenoma, mature cystic teratoma, hydrosalpinx and peritoneal inclusion cyst.

RC129C  O-RADS 3

Participants
Isabelle Thomassin-Naggara, MD, Paris, France (Presenter) Researcher, General Electric Company; Research funded, General Electric Company; Researcher, Canon Medical Systems Corporation; Research funded, Canon Medical Systems Corporation; Research funded, Hologic, Inc; Research funded, Siemens AG; Research funded, Guerbet SA

For information about this presentation, contact:
isabelle.thomassin@aphp.fr

LEARNING OBJECTIVES
1) To combine all useful MR features to characterize indeterminate adnexal masses. 2) To describe how to perform DCE MR analysis on solid tissue. 3) To identify how lesions should be classified O-RADS 3. 4) To specify which adnexal lesions will be rated O-RADS 3.

RC129D  O-RADS 4-5

Participants
Andrea G. Rockall, FRCR,MRCP, London, United Kingdom (Presenter) Speaker and Chairman, Guerbet SA

LEARNING OBJECTIVES
1) To know the main terms for O-RADS MR score 4 and 5. 2) To be familiar with the application of O-RADS MR score 4 and 5 to adnexal masses. 3) To recognise O-RADS MR score 4 and 5 lesions by review of cases.

ABSTRACT
The preponderant contribution of MRI in adnexal mass evaluation is its specificity because it provides confident diagnosis of many benign adnexal lesions A standardization of the MR reporting may allow a tailored, patient-centered approach, allowing avoidance of over-extensive surgery and/or fertility preservation where appropriate, whilst ensuring early detection of lesions with high likelihood of malignancy. O-RADS classification is accurate and based on 5 categories related to the risk of malignancy. An adnexal lesion with a solid tissue that enhances according a time intensity curve type 2 or 3 or which is associated with peritoneal implants should be categorized O-RADS 4 or 5. A lesion classified O-RADS 5 has a risk of malignancy higher than 95% and must be referred to a gynecological oncologist.

RC129E  Case Review

Participants
Elizabeth A. Sadowski, MD, Madison, WI (Presenter) Nothing to Disclose
LEARNING OBJECTIVES

1) Understand the basic sequences necessary for characterizing adnexal lesions. 2) Classify adnexal masses using the ACR ORADS MRI system, based on their signal characteristics and enhancement patterns. 3) Assign an ACR ORAD MRI risk score based on the MRI appearance of an adnexal lesion and clinical information.
Obstetrical Imaging Monday Case of the Day

Monday, Dec. 2 7:00AM - 11:59PM Room: Case of Day, Learning Center

AMA PRA Category 1 Credit ™: .50

Participants
Mariam Moshiri, MD, Bellevue, WA (Presenter) Nothing to Disclose
Jonathan Revels, DO, Seattle, WA (Abstract Co-Author) Nothing to Disclose
Sherry S. Wang, MBBS, Seattle, WA (Abstract Co-Author) Nothing to Disclose
Paula J. Woodward, MD, Salt Lake City, UT (Abstract Co-Author) Editor, Reed Elsevier
Erez Klein, MD, Haifa, Israel (Abstract Co-Author) Nothing to Disclose
Sobhi Abadi, MD, Haifa, Israel (Abstract Co-Author) Nothing to Disclose
Marcia C. Javitt, MD, Haifa, Israel (Abstract Co-Author) Nothing to Disclose
Tomas Prior, PhD,MBBS, London, United Kingdom (Abstract Co-Author) Nothing to Disclose
Victoria Jowett, MD, London, United Kingdom (Abstract Co-Author) Nothing to Disclose
Jasmine W. Tay, BMBS,BMedSc, London, United Kingdom (Abstract Co-Author) Nothing to Disclose
Christoph Lees, MD, London, United Kingdom (Abstract Co-Author) Speaker, Samsung Electronics Co, Ltd; Speaker, Canon Medical Systems Corporation; Institutional research support, Samsung Electronics Co, Ltd; Institutional research support, Canon Medical Systems Corporation; Institutional research support, General Electric Company; Institutional research support, F. Hoffmann-La Roche Ltd; ;
Nishat Bharwani, FRCR,MBBS, London, United Kingdom (Abstract Co-Author) Nothing to Disclose
Gitanjali Bajaj, MD, Little Rock, AR (Abstract Co-Author) Nothing to Disclose
Teresita L. Angtuaco, MD, Little Rock, AR (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1) Analyze findings on obstetric imaging studies. 2) Develop differential diagnoses based on the clinical information and imaging findings. 3) Recognize the importance of accurate prenatal diagnosis on pregnancy management.

Printed on: 12/22/19
OBE-MOA

Obstetrics/Gynecology Monday Poster Discussions
Monday, Dec. 2 12:15PM - 12:45PM Room: OB Community, Learning Center

Sub-Events

OB175-ED-MOA1
Adenomyosis in Pregnancy: Diagnostic Pearls and Pitfalls
Station #1

Awards
Certificate of Merit
Identified for RadioGraphics

Participants
Chelsea Pyle, MD, Portland, OR (Abstract Co-Author) Nothing to Disclose
Kyle K. Jensen, MD, Portland, OR (Presenter) Nothing to Disclose
Bryan R. Foster, MD, Portland, OR (Abstract Co-Author) Consultant, BotImage Inc
Erika J. Schneble, DO, Portland, OR (Abstract Co-Author) Nothing to Disclose
Roya Sohaey, MD, Portland, OR (Abstract Co-Author) Nothing to Disclose
Karen Y. Oh, MD, Portland, OR (Abstract Co-Author) Research Consultant, FUJIFILM Holdings Corporation

TEACHING POINTS
1. Adenomyosis has a varied appearance in pregnancy
2. Adenomyosis can mimic other uterine pathology, including ectopic pregnancy
3. Accurately recognizing adenomyosis in pregnancy can affect patient management

TABLE OF CONTENTS/OUTLINE
1. Pathogenesis of adenomyosis
2. Brief imaging review of adenomyosis in the nongravid uterus - US and MRI
3. Presentation of varying appearances of adenomyosis during pregnancy - diffuse, focal, cystic
4. Discussion of adenomyosis as a mimic of fibroids, ectopic pregnancy, infiltrative 'masses,' placental abnormalities
5. Pregnancy outcomes and management in the setting of adenomyosis

OB176-ED-MOA2
7 Tips to Tell It's Twisted: Pearls and Pitfalls in the Diagnosis of Pelvic Adnexal Torsion
Station #2

Awards
Certificate of Merit
Identified for RadioGraphics

Participants
Loretta M. Strachowski, MD, San Francisco, CA (Presenter) Royalties, Reed Elsevier; Speaker, World Class CME
Mindy M. Horow, MD, Philadelphia, PA (Abstract Co-Author) Spouse, Employee, Merck & Co, Inc
Hailey Choi, MD, San Francisco, CA (Abstract Co-Author) Nothing to Disclose
Dorothy J. Shum, MD, San Francisco, CA (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
lori.strachowski@ucsf.edu

TEACHING POINTS
By viewing this exhibit, the learner will be able to:
1. Understand the definition, epidemiology, symptoms of adnexal torsion and clinical implications for timely diagnosis and management.
2. Suspect torsion in the setting of acute pelvic pain (and nausea and vomiting) by appreciating several key imaging findings on US and CT.
3. Identify mimics and pitfalls of ovarian torsion, in particular, the confusing role of Doppler on US.

TABLE OF CONTENTS/OUTLINE
Clinical background and statistics of adnexal torsion:
(A) Definition; (B) Epidemiology; (C) Symptoms; (D) Implication for timely diagnosis and management
Multimodality imaging findings of adnexal torsion:
(A) Ovarian edema: enlarged size, peripheralization of follicles, adjacent free fluid, swollen surrounding ovarian parenchyma;
(B) Target and whirlpool sign;
(C) Abnormal positioning: two ovaries on one side, ovary too high, uterine tilting;
(D) Associated lesions: physiologic, neoplasia;
(E) Doppler US findings;
(F) Enhancement and attenuation/signal characteristics on CT/MR Pivals and mimics:
(A) Hemorrhagic cysts; (B) Solid ovarian neoplasms;
(C) Ovarian stimulation syndrome Hyperreactio luteinallis;
(D) Edema due to adjacent inflammatory process Summary with case examples.

Printed on: 12/22/19
**OB177-ED-MOB1**  
**Evolution of Diagnosis and Management of Adnexal Masses on Ultrasound: Where We Are in 2019**

Station #1

Kalesha Hack, MD, FRCP(C), Toronto, ON (**Presenter**) Nothing to Disclose  
Phyllis Glanc, MD, Toronto, ON (**Abstract Co-Author**) Nothing to Disclose

For information about this presentation, contact:  
kalesha.hack@sunnybrook.ca

**TEACHING POINTS**

Understand important principles of adnexal mass evaluation on ultrasound including lesion characterization by pattern recognition, use of standardized terminology, evaluation of risk of malignancy and appropriate referral to gynecology oncology for suspicious masses. Be familiar with evolving concepts in diagnosis and management of adnexal masses from 2000 to present including IOTA Lexicon and Simple Rule, Society for Radiologists in Ultrasound Consensus, First International Consensus on Adnexal Masses and Ovarian-Adnexal Reporting and Data System (ORADS) Lexicon and Risk Stratification. Introduce ORADS terminology and risk stratification with examples for ultrasound detected adnexal masses.

**TABLE OF CONTENTS/OUTLINE**

OUTLINE - Review importance and challenges of adnexal mass classification and risk stratification - Review prior major work in this field including Society for Radiologists in Ultrasound Consensus Statement, IOTA Lexicon and Simple Rules, First International Consensus Report on Adnexal Masses and Ovarian-Adnexal Reporting and Data System (ORADS) Lexicon and Risk Stratification. Highlight similarities, differences and major contributions of each - Pictorial review applying 2018 ORADS Lexicon and Risk Stratification to spectrum of adnexal masses.

**OB178-ED-MOB2**  
**Adnexal Torsion: A Review of the Radiological Appearances**

Station #2

For information about this presentation, contact:  
muhammad.dawood@nhs.net

**TEACHING POINTS**

- To review the clinical presentation of adnexal torsion, and the common predisposing ovarian tumors  
- To review the typical multimodality imaging features of adnexal torsion  
- To highlight atypical imaging features of adnexal torsion  
- To demonstrate how to differentiate atypical features from possible mimics

**TABLE OF CONTENTS/OUTLINE**

Case-based Review of the Abdomen (Interactive Session)

Monday, Dec. 2 3:30PM - 5:00PM Room: S100AB

GI OB

AMA PRA Category 1 Credits ™: 1.50
ARRT Category A+ Credit: 1.75

Participants
Julie H. Song, MD, Sharon, MA (Director) Nothing to Disclose

Sub-Events

MSCA22A  Women's Imaging

Participants
Christine O. Menias, MD, Chicago, IL (Presenter) Nothing to Disclose

For information about this presentation, contact:
menias.christine@mayo.edu

LEARNING OBJECTIVES
1) Review typical MR imaging of Gynecologic Entities encountered in clinical practice using case-based examples. 2) Highlight Imaging Pearls and Pitfalls that may impact diagnosis and treatment. 3) Discuss potential differential diagnosis and mimics.

MSCA22B  Pitfalls in Post-op Abdomen and Pelvis

Participants
Kumaresan Sandrasegaran, MD, Phoenix, AZ (Presenter) Nothing to Disclose

For information about this presentation, contact:
Sandrasegaran.kumaresan@mayo.edu

LEARNING OBJECTIVES
1) To understand postoperative anatomy after complex gastric and pancreatic surgery. 2) To differentiate between expected postoperative anatomy, postoperative complications and tumor recurrence after abdominal surgery. 3) To learn pitfalls in reporting postoperative CT scans.

ABSTRACT
Reading postoperative CT scans is one of the most challenging tasks in abdominal radiology. The radiologist needs to understand the postoperative anatomy to distinguish what is expected and what would constitute a complication. For patients who had surgery for cancer, it is important not to call expected postoperative findings as cancer recurrence. This presentation delves into pitfalls in postoperative CT and MR for gastric, pancreatic, bowel and oncologic surgery.

MSCA22C  Abdominopelvic Trauma Imaging

Participants
Christina A. LeBedis, MD, Newton, MA (Presenter) Nothing to Disclose

For information about this presentation, contact:
Christina.LeBedis@bmc.org

LEARNING OBJECTIVES
1) Review Imaging of abdominal trauma in a case-based format. 2) Discuss common pitfalls and clinically relevant differential diagnosis in abdominal trauma. 3) Discuss protocol considerations to optimize diagnostic yield in abdominal trauma.

MSCA22D  Abdominopelvic Emergency Imaging

Participants
Douglas S. Katz, MD, Mineola, NY (Presenter) Nothing to Disclose

For information about this presentation, contact:
douglasscottkatzmd@gmail.com

LEARNING OBJECTIVES
1) To review a series of cases of CT of the acute abdomen and pelvis, some of which are challenging. 2) To review the differential diagnosis, if any, for these patients, and to discuss prospective patient management based on the clinical and CT findings. 3) To briefly review the imaging and clinical literature on these entities.
ED011-TU

Obstetrical Imaging Tuesday Case of the Day

Tuesday, Dec. 3 7:00AM - 11:59PM Room: Case of Day, Learning Center

AMA PRA Category 1 Credit ™: .50

Participants
Mariam Moshiri, MD, Bellevue, WA (Presenter) Nothing to Disclose
Jonathan Revels, DO, Seattle, WA (Abstract Co-Author) Nothing to Disclose
Sherry S. Wang, MBBS, Seattle, WA (Abstract Co-Author) Nothing to Disclose
Paula J. Woodward, MD, Salt Lake City, UT (Abstract Co-Author) Editor, Reed Elsevier
Erez Klein, MD, Haifa, Israel (Abstract Co-Author) Nothing to Disclose
Sohbi Abadi, MD, Haifa, Israel (Abstract Co-Author) Nothing to Disclose
Marcia C. Javitt, MD, Haifa, Israel (Abstract Co-Author) Nothing to Disclose
Tomas Prior, PhD,MBBS, London, United Kingdom (Abstract Co-Author) Nothing to Disclose
Victoria Jowett, MD, London, United Kingdom (Abstract Co-Author) Nothing to Disclose
Jasmine W. Tay, BMBS,BMedSc, London, United Kingdom (Abstract Co-Author) Nothing to Disclose
Christoph Lees, MD, London, United Kingdom (Abstract Co-Author) Speaker, Samsung Electronics Co, Ltd; Speaker, Canon Medical Systems Corporation; Institutional research support, Samsung Electronics Co, Ltd; Institutional research support, Canon Medical Systems Corporation; Institutional research support, General Electric Company; Institutional research support, F. Hoffmann-La Roche Ltd; ; ;
Nishat Bharwani, FRCR,MBBS, London, United Kingdom (Abstract Co-Author) Nothing to Disclose
Gitanjali Bajaj, MD, Little Rock, AR (Abstract Co-Author) Nothing to Disclose
Teresita L. Angtuaco, MD, Little Rock, AR (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1) Analyze findings on obstetric imaging studies. 2) Develop differential diagnoses based on the clinical information and imaging findings. 3) Recognize the importance of accurate prenatal diagnosis on pregnancy management.

Printed on: 12/22/19
SPDL30

Houston, We Have a Problem (Case-based Competition)

Tuesday, Dec. 3 7:15AM - 8:15AM Room: E451B

CA GI GU MK NR OB PD PH SQ VA

AMA PRA Category 1 Credit ™: 1.00
ARRT Category A+ Credit: 0

Participants
Adam E. Flanders, MD, Philadelphia, PA (Presenter) Nothing to Disclose
Sandeep P. Deshmukh, MD, Philadelphia, PA (Presenter) Nothing to Disclose
Christopher G. Roth, MD,MS, Philadelphia, PA (Presenter) Nothing to Disclose
Vishal Desai, MD, Philadelphia, PA (Presenter) Nothing to Disclose

For information about this presentation, contact:
adam.flanders@jefferson.edu

Special Information
This interactive session will use RSNA Diagnosis Live™. Please bring your charged mobile wireless device (phone, tablet or laptop) to participate.

LEARNING OBJECTIVES
1) Be introduced to a series of radiology case studies via an interactive team game approach designed to encourage 'active' consumption of educational content. 2) Use their mobile wireless device (tablet, phone, laptop) to electronically respond to various imaging case challenges; participants will be able to monitor their individual and team performance in real time. 3) Receive a personalized self-assessment report via email that will review the case material presented during the session, along with individual and team performance.

Printed on: 12/22/19
TEACHING POINTS

1. Fetal facial masses may be true tumors or anomalies that mimic tumors. Key differentiating features between similar appearing diagnoses will be stressed. 2. 3D ultrasound, multiplanar imaging, and fetal MR can help determine origin of mass, key to making an accurate diagnosis. 3. Fetal MR is best for assessing airway involvement and extent of true masses. Careful delivery planning is important for many of the diagnoses covered in this poster. 4. Prognosis, associations, post-natal pediatric considerations, and treatment will be discussed for specific diagnoses.

TABLE OF CONTENTS/OUTLINE


Awards

Certificate of Merit

Participants
Roya Sohaey, MD, Portland, OR (Presenter) Nothing to Disclose
Karen Y. Oh, MD, Portland, OR (Abstract Co-Author) Research Consultant, FUJIFILM Holdings Corporation
Neel Patel, MD, Portland, OR (Abstract Co-Author) Nothing to Disclose
Emily Edwards, MD, San Francisco, CA (Abstract Co-Author) Nothing to Disclose
Petra Vajtai, MD, Portland, OR (Abstract Co-Author) Nothing to Disclose

OB179-ED-TUA1
Fetal Facial Mass and Mass-like Lesions

Station #1

TEACHING POINTS

Uterine arteriovenous malformation (AVM) and enhanced myometrial vascularity (EMV) share similar diagnostic findings and are commonly mistaken for the same entity, although EMV is usually seen postpartum and AVM is seen after uterine trauma (e.g. Cesarean section, dilatation and curettage). Recent literature suggests that these two entities are different in etiology; and management, from observation to endovascular/surgical intervention, depends on the correct diagnosis. The purpose of this exhibit is: 1. To review an unfamiliar diagnosis: enhanced myometrial vascularity (EMV) 2. To differentiate arteriovenous malformations (AVMs) from EMV, in terms of both etiology and imaging presentation 3. To briefly review management options for AVMs and EMV based on a comprehensive literature review

TABLE OF CONTENTS/OUTLINE

Pathophysiology of AVM and EVM AVM vs EVM: How to Differentiate? Case-Based Review of Clinical and Imaging Findings/Follow-Up - Ultrasound - MRA - CTA - Conventional Angiography Controversy and Future Directions References

Printed on: 12/22/19
Nodules and Thickening of Uterosacral Ligament: An Underdiagnosed Feature of Deep Endometriosis (DE) on Endovaginal Sonography

Station #1

TEACHING POINTS

1. Endometriosis is a benign condition with significant morbidity, including pain and infertility, affecting 6 to 10% of women during the reproductive period. 2. A tailored transvaginal exam to identify deep endometriosis must include the assessment of the torus uterinus (posterior aspect of the cervix, close to the junction of the cervix and uterine body, where the uterosacral ligaments attach, forming a ridge). 3. Plaque like areas of thickening can be seen extending along the uterosacral ligaments. The finding is subtle but definitive for DE. Multiple illustrations and images will be displayed in the exhibit to enable learning with pattern recognition.

TABLE OF CONTENTS/OUTLINE

1. Introduction and Historical perspective of DE 2. Illustrative discussion of anatomy of the region with corresponding sonographic images. 3. Technique of endovaginal exam tailored to detect DE. 4. Brief synopsis of areas where DE can occur and representative images. 5. Pictorial review of cases with findings of uterosacral disease with MRI correlation. 6. A discussion of potential pitfalls. 7. Conclusions.

Mastering Complex Müllerian Duct Anomalies

Station #2

TEACHING POINTS

1. Understand the embryologic development of the female reproductive tract. 2. Develop a universal framework for describing complex Müllerian duct anomalies (MDA). 3. Recognize complex MDA in a variety of imaging contexts. 4. Understand treatment options in patients with complex MDA.

TABLE OF CONTENTS/OUTLINE

A. Pathogenesis of anomalies of the female reproductive tract a. Impairment in development, fusion, or septal reabsorption of Müllerian ducts b. Clinical presentation includes amenorrhea, infertility, pain, sub- and infertility, poor obstetric outcomes B. Review imaging diagnosis of MDA a. Incidental detection on routine imaging (ultrasound) or workup of female infertility (hysterosalpingogram, hysterosonogram) b. Minimize errors in US diagnosis, next steps in evaluation c. Confirmation of suspected MDA, role of pelvic MRI and coronal 3D US C. Describe a systematic framework to describe complex MDA a. Overlap of traditional categories b. Universal context to describe MDA for successful communication with referring physicians D. Imaging appearance of anatomic variants and pathology commonly coexistent with MDA E. Surgical management a. Indications for treatment: symptom relief, improved fertility, reduction in maternal morbidity/mortality b. Specific features of MDA that are important to describe to referring surgeon
Obstetrical Imaging Wednesday Case of the Day

Participants
Mariam Moshiri, MD, Bellevue, WA (Presenter) Nothing to Disclose
Jonathan Revels, DO, Seattle, WA (Abstract Co-Author) Nothing to Disclose
Sherry S. Wang, MBBS, Seattle, WA (Abstract Co-Author) Nothing to Disclose
Paula J. Woodward, MD, Salt Lake City, UT (Abstract Co-Author) Editor, Reed Elsevier
Erez Klein, MD, Haifa, Israel (Abstract Co-Author) Nothing to Disclose
Sobhi Abadi, MD, Haifa, Israel (Abstract Co-Author) Nothing to Disclose
Marcia C. Javitt, MD, Haifa, Israel (Abstract Co-Author) Nothing to Disclose
Tomas Prior, PhD,MBBS, London, United Kingdom (Abstract Co-Author) Nothing to Disclose
Victoria Jowett, MD, London, United Kingdom (Abstract Co-Author) Nothing to Disclose
Jasmine W. Tay, BMBS,BMedSc, London, United Kingdom (Abstract Co-Author) Nothing to Disclose
Christoph Lees, MD, London, United Kingdom (Abstract Co-Author) Speaker, Samsung Electronics Co, Ltd; Speaker, Canon Medical Systems Corporation; Institutional research support, Samsung Electronics Co, Ltd; Institutional research support, Canon Medical Systems Corporation; Institutional research support, General Electric Company; Institutional research support, F. Hoffmann-La Roche Ltd; ; ;
Nishat Bharwani, FRCR,MBBS, London, United Kingdom (Abstract Co-Author) Nothing to Disclose
Gitanjali Bajaj, MD, Little Rock, AR (Abstract Co-Author) Nothing to Disclose
Teresita L. Angtuaco, MD, Little Rock, AR (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1) Analyze findings on obstetric imaging studies. 2) Develop differential diagnoses based on the clinical information and imaging findings. 3) Recognize the importance of accurate prenatal diagnosis on pregnancy management.

Printed on: 12/22/19
LEARNING OBJECTIVES

1) Describe the typical appearances of a tubal ectopic pregnancy. 2) List findings that suggest an interstitial ectopic pregnancy. 3) Differentiate a spontaneous abortion in progress from a cervical ectopic pregnancy. 4) Recommend the appropriate follow up for early pregnancies of unknown location (PUL) identified on transvaginal sonography. 5) Differentiate with certainty a failed pregnancy from a pregnancy suspicious for but not diagnostic of failed pregnancy based on the sonographer finding. 6) Diagnose ectopic pregnancy and identify its location. 7) Recognize normal fetal anatomy in the first trimester and differentiate the normal fetus from an abnormal fetus. 8) Predict the sex of the developing fetus during the first trimester and understand the importance of sex determination in some conditions. 9) Recognize 'must know' major anomalies evident in first trimester. 10) Understand the role of first trimester sex designation. 11) Evaluate first trimester assessment of multiple pregnancies.

Sub-Events

RC510A  Ectopic Pregnancy

Participants
Mindy M. Hororow, MD, Philadelphia, PA (Presenter) Spouse, Employee, Merck & Co, Inc

For information about this presentation, contact:
horrowm@einstein.edu

LEARNING OBJECTIVES

1) Describe the typical appearances of a tubal ectopic pregnancy. 2) List findings that suggest an interstitial ectopic pregnancy. 3) Differentiate a spontaneous abortion in progress from a cervical ectopic pregnancy.

RC510B  Abnormal Early Intrauterine Pregnancies

Participants
Carol B. Benson, MD, Boston, MA (Presenter) Nothing to Disclose

For information about this presentation, contact:
cbenson@bwh.harvard.edu

LEARNING OBJECTIVES

1) Recommend the appropriate follow up for early pregnancies of unknown location (PUL) identified on transvaginal sonography. 2) Differentiate with certainty a failed pregnancy from a pregnancy suspicious for but not diagnostic of failed pregnancy based on the sonographer finding. 3) Diagnose ectopic pregnancy and identify its location. 4) Recognize normal fetal anatomy in the first trimester and differentiate the normal fetus from an abnormal fetus. 5) Predict the sex of the developing fetus during the first trimester and understand the importance of sex determination in some conditions.

ABSTRACT

During this session, findings in early pregnancy on transvaginal ultrasound will be discussed including pregnancies of unknown location (PUL), intrauterine pregnancies of uncertain viability (IPUV), and ectopic pregnancy. Criteria for definitive diagnosis of failed pregnancy will be reviewed, as will sonographic findings suspicious for but not diagnostic of failed pregnancy. Diagnosis of ectopic pregnancy will be discussed, including sonographic findings and determination of the location of the ectopic pregnancy. In addition, sonographic evaluation of the fetus during the first trimester will be presented with attention to the early diagnosis of some fetal malformation and the importance of sex determination for some conditions.

Active Handout: Carol Beer Benson


RC510C  First Trimester Anomalies, Sex, and Other Things

Participants
Kalesha Hack, MD, FRCPC, Toronto, ON (Presenter) Nothing to Disclose

For information about this presentation, contact:
kalesha.hack@sunnybrook.ca

LEARNING OBJECTIVES

1) Recognize 'must know' major anomalies evident in first trimester. 2) Understand the role of first trimester sex designation. 3) Evaluate first trimester assessment of multiple pregnancies.
ABSTRACT
This refresher course will review the major anomalies which must be recognized in the later half of first trimester. We will also discuss the role of assessment of external genitalia in first trimester and what key features should be documented in the assessment in twin gestation.

Printed on: 12/22/19
OB183-ED-WEA1  
Imaging for Fetal Interventions: Criteria, Considerations, and Complications  
Station #1  

Awards  
Certificate of Merit  
Identified for RadioGraphics  

Participants  
Priyanka Jha, MBBS, San Francisco, CA (Presenter) Nothing to Disclose  
Vickie A. Feldstein, MD, San Francisco, CA (Abstract Co-Author) Nothing to Disclose  
Margaretta V. Revzin, MD, New Haven, CT (Abstract Co-Author) Nothing to Disclose  
Douglas S. Katz, MD, Mineola, NY (Abstract Co-Author) Nothing to Disclose  
Mariam Moshiri, MD, Bellevue, WA (Abstract Co-Author) Nothing to Disclose  

For information about this presentation, contact:  
priyanka.jha@ucsf.edu  

TEACHING POINTS  
1. Recognize imaging findings of fetal abnormalities amenable to in utero procedures and indications for intervention in these conditions.  
2. Identify sonographic inclusion and exclusion criteria for fetal interventions.  
3. Understand the role of ultrasound for pre-procedure assessment, real-time guidance, monitoring during interventions, and evaluation for possible post-procedure complications.  

TABLE OF CONTENTS/OUTLINE  
Imaging features, indications for fetal interventions, criteria for appropriate case selection and potential complications will be demonstrated.  
1. Intra-uterine fetal transfusion  
2. Myelomeningocele repair  
3. Resection of sacrococcygeal teratoma  
4. Thoracentesis & thoraco-amniotic shunt placement  
5. Aortic valvuloplasty  
6. Tracheal balloon occlusion for congenital diaphragmatic herna (CDH)  
7. Resection of large congenital pulmonary artery malformation (CPAM)  
8. Vesicocectomy & vesico-amniotic shunt placement  
9. Fetoscopic laser procedure (ablation of intertwin vascular connections) to treat twin-twin transfusion syndrome (TTTS)  
10. Radiofrequency ablation for twin reversed arterial perfusion (TRAP) sequence  
11. Radiofrequency ablation for selective reduction of anomalous twin in monochorionic diamniotic pair  
12. Ex-utero intrapartum treatment (EXIT) procedure - for delivering fetuses with neck masses and/or high airway obstruction  

OB184-ED-WEA2  
When the 'Floor' Falls: A Basic Guide to Assess to Dynamic Female Pelvic Floor MRI  
Station #2  

Participants  
Oscar A. Sandoval Fernandez, MD, Mexico City, Mexico (Presenter) Nothing to Disclose  
Rocio Ramirez Cardona, MD, Mexico (Abstract Co-Author) Nothing to Disclose  

TEACHING POINTS  
• Pelvic floor dysfunction is a prevalent disorder in older people, especially in women, causing a decrease in the quality of life.  
• The diagnosis based only on the clinical and physical examination is limited and often erroneous and that can lead to erroneous and sometimes unnecessary surgical interventions.  
• MRI allows a more complete and accurate evaluation of the pelvic compartments, in addition to assessing other structures such as muscles and ligaments involved in the function of the pelvic floor.  
• Basic knowledge of the anatomy of the pelvic floor is crucial to correctly interpret pelvic MRI images and to fully understand dysfunction associated with pelvic floor weakness.  
• There are several reference lines used to assess the presence and degree of pelvic floor dysfunction. Appropriate placement of these lines is the first and one of the most crucial steps in interpreting dynamic pelvic floor MRI.  

TABLE OF CONTENTS/OUTLINE  
• Introduction  
• Overview of basic anatomy of the female pelvic floor  
• Dynamic magnetic resonance imaging evaluation of the compartments of the pelvic floor.  
• Reference lines and measures in the valuation of pelvic floor dysfunctions.  
• Illustrative cases  

Printed on: 12/22/19
Imaging Findings that Mimic Endometriosis: Tips and Tricks

TEACHING POINTS
- To show findings that mimic endometriosis on cross-sectional imaging methods.
- To discuss tips for recognize these trick imaging findings.
- To highlight the importance of recognizing imaging findings that can simulate endometriosis.

TABLE OF CONTENTS/OUTLINE
Brief review of the main finding of endometriosis on transvaginal US and pelvic MRI. Lesions that simulate endometriosis will be demonstrated with illustrations and cases, as: leiomyomas; urachal remnant; small bowel and appendic neuroendocrine tumors; phleboliths; abdominal or pelvic wall masses (abdominal hematoma; desmoid tumor; suture granuloma; abscess; metastatic implants); rectouterine pouch hematoma; uterosacral ligament thickening due to deviated uterus; inflammatory pelvic disease; surgical fibrosis; sigmoid diverticula; sigmoid and rectal carcinoma; lymph nodes; hemorrhagic cysts after collected oocytes to in fertilization. Tips of this main differential diagnosis of endometriosis will be highlighted. A systematic approach for evaluate these lesions will be proposed.

FIGO Classification System of Leiomyomas in MRI

TEACHING POINTS
- To disseminate the FIGO classification in the radiology environment for better communication with the clinicians.
- To understand the importance of the classification in management decisions.
- To provide the features of leiomyomas in MRI.

TABLE OF CONTENTS/OUTLINE
- Introduction
- Epidemiology
- FIGO classification system
- Types of leiomyomas
- Management
- Conclusion

Printed on: 12/22/19
PURPOSE

Fetal imaging is often perturbed by artifacts affecting the quality of Diffusion Weighted Imaging (DWI), with biased ADC measurements. In this context, the purpose of our study was to investigate the potential of denoising DWI to ameliorate the reliability of ADC values in the study of normal fetal brain maturation.

METHOD AND MATERIALS

36 normal pregnancies underwent fetal MR at 1.5T, using a normal fetal brain protocol including DW-Spin Echo EPI with three b-values (50, 200, 700 s/mm²). Seven ROIs were manually placed in Frontal White Matter (FWM), Occipital WM (OWM), Thalamus (TH), Basal Ganglia (BG), Cerebellum (CH), Pons and Cerebral Spinal Fluid (CSF). Raw data were denoised and DWI were segmented to eliminate CSF. Differences of ADC values occurring in II and III trimester with and without DWI denoising were calculated. Signal-to-Noise Ratio (SNR) was obtained with and without denoising correction. The correlation between ADC in different ROIs and GA was obtained.

RESULTS

SNR considerably increased with denoising correction. Significant differences in ADC mean values of CH, Pons, FWM and TH calculated in II and III trimester were found (p<0.01). ADC values of TH, CH and Pons show a progressive decline in mean diffusivity (p<0.001), depicting a decrease of anisotropy. Positive correlations were found between ADC and GA in FWM ROI (p<0.05). In particular, a bi-quadratic fashion in FWM ROI was found: during the II trimester the ADC increase, with a descending trend during the III trimester.

CONCLUSION

Due to the high amount of imaging artifacts in fetal imaging, denoising DWI is desirable to obtain reliable ADC values and characterize normal fetal brain development. In our sample, no biased ADC parameters showed statistically significant changes in mean values of different fetal brain ROIs: this highlights the physiological heterogeneous microstructural changes occurring during normal fetal brain development, in terms of proliferation, migration and myelination processes.

CLINICAL RELEVANCE/APPLICATION

The study of denoised DW imaging of normal fetal brain is relevant in clinical practice since it allows the measurement of no biased ADC values of physiological brain maturation. The knowledge of normal ADC parameters represent a non-pathological comparison base and a helpful prenatal diagnostic tool to improve the complicated prenatal diagnosis of suspected fetal brain anomalies.
METHODS AND MATERIALS
High resolution (1.5×1.5×1.6 mm3) diffusion weighted imaging data with b values of 1000 s/mm2 were acquired from 61 neonates with ages of 31-42 postmenstrual weeks (PMW). Correction for eddy current distortion, tensor fitting, and deterministic diffusion tractography of SLF were conducted in DTIStudio. Specifically, the fiber tracing was terminated when the fractional anisotropy (FA) value was below 0.15 or the turning angle was greater than 50 degrees. An asymmetry index of FA in SLF was calculated as (Left FA - Right FA) / (Left FA + Right FA). A positive value indicated a leftward asymmetry.

RESULTS
Dramatically morphological changes of SLF from 31 to 42 PMW were observed. In addition, FA values in both left (r=0.794, p<0.001) and right (r=0.758, p<0.001) SLF significantly increased with age, suggesting WM microstructural maturation in SLF. Compared right SLF, left SLF was characterized with lower initial FA values and faster FA increase. Age-related growth trend lines of FA for left and right SLF intersected around 36 PWM. Interestingly, the asymmetry index of FA in SLF significantly increased with age (r=0.330, p<0.01), reflecting a transition toward a leftward structural asymmetry. All neonates were categorized into 3 age groups based on their scan ages to further explore the development of language lateralization. The asymmetry index of FA in SLF from groups aged 34-38 PMW and 38-42 PMW were significantly larger (p<0.05) than that of the youngest group (30-34 PMW) (p<0.05).

CONCLUSION
During the 3rd trimester, we observed age-related increase of leftward asymmetry in the WM microstructural maturation in language associated tract SLF.

CLINICAL RELEVANCE/APPLICATION
Age-related increase of leftward lateralization in language associated tract during 3rd trimester was found. This may serve as an anatomical substrate that enables the following language production.
CONCLUSION
Early midline sulci may be consistently visible in fetal MRI earlier than previously believed. For earlier detection these sulci should be sought not only in the standard orthogonal views, but also in non-orthogonal views.

CLINICAL RELEVANCE/APPLICATION
With more frequent and earlier use of fetal MRI, also with time restrictions imposed by legal abortion dates in many countries, a better understanding of the appearance of the early brain development has become necessary. Without a thorough understanding of the normal appearance, abnormal patterns cannot be recognized accurately.

SSM22-05 In-Utero Diffusion Weighted Imaging with Denoising Correction in the Study of Fetal Brain Microstructure in Isolated Ventriculomegaly

Wednesday, Dec. 4 3:40PM - 3:50PM Room: S103AB

Participants
Amanda Antonelli, MD, Rome, Italy (Presenter) Nothing to Disclose
Lucia Manganaro, MD, Roma, Italy (Abstract Co-Author) Nothing to Disclose
Gia Giovanni Di Trani, Rome, Italy (Abstract Co-Author) Nothing to Disclose
Gada Ercolani, MD, Rome, Italy (Abstract Co-Author) Nothing to Disclose
Roberta Petrillo, MD, Rome, Italy (Abstract Co-Author) Nothing to Disclose
Carlo Catalano, MD, Rome, Italy (Abstract Co-Author) Nothing to Disclose
Silvia Capuani, Rome, Italy (Abstract Co-Author) Nothing to Disclose
Miriam Dolkani, MD, Rome, Italy (Abstract Co-Author) Nothing to Disclose
Veronica Celli, MD, Roma, Italy (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact: amanda.antonelli@uniroma1.it

PURPOSE
To investigate the potential of denoised DW imaging to study fetal brain affected by Ventriculomegaly (VM) and to obtain improved ADC values for the characterization of fetal brain microstructure impairment.

METHOD AND MATERIALS
Fetal MR with Diffusion-weighted imaging (DWI) was performed in 48 fetuses at 1.5 T. The fetal brain MR protocol included a DW-Spin Echo EPI with three b-values (50, 200, 700 s/mm²). Dwi denoise tool and Unring software were used to denoise and correct diffusion imaging. Eight ROIs were manually placed in both normal and VM fetal brains in Centrum Semiovale (CSO), Frontal White Matter (FWM), Occipital WM (OWM), Thalamus (TH), Basal Ganglia (BG) Cerebellum (CH), Pons and Cerebral Spinal Fluid (CSF). In some VM cases, ROIs could not be placed in FWM, BG, TH, OWM, CH due to the severity of VM. ADC values were measured voxel-by-voxel with a MATLAB fitting procedure. Differences in ADC measurements of normal and VM fetal brains and their correlation with Gestational Age (GA) were calculated.

RESULTS
In VM fetuses, ADC measurements were statistically significant different than normal brain, especially in CSO, TH and CSF ROIs (p<0.02), with different ADC values in II and III trimester of normal (p<0.001) and VM fetuses (p<0.05). In VM fetal brains, ADC values in CSO in the III trimester were higher than normal and in TH ROI statistically significant lower ADC values were found in the II trimester. Negative correlation were found between ADC values and GA in CSO, TH, CH and Pons ROIs, both VM and normal brains, showing a progressive decline in diffusivity.

CONCLUSION
The knowledge of reliable ADC values through denoising correction is a helpful tool able to better discriminate microstructural impairment occurring in fetal brain tissue during prenatal life. Our results showed differences in ADC measurement obtained in VM and normal fetal brains, in particular the increasing of ADC values in CSO may reflect the increment of anisotropy occurring in an impaired and non-ordered white matter affected by VM.

CLINICAL RELEVANCE/APPLICATION
In clinical practice, fetal DWI is often complicated by low imaging quality due to fetal motion artifacts. Denoising correction is crucial to allow a proper ADC measurement, providing a correct in vivo characterization of microstructural brain impairment in fetuses affected by VM, being helpful in the prenatal management of those pregnancies.

SSM22-06 Fetal Optic Structures: A Postmortem MRI Study

Wednesday, Dec. 4 3:50PM - 4:00PM Room: S103AB

Participants
Florian Prager, MD, Vienna, Austria (Presenter) Institutional affiliation, Siemens AG; Research Grant, Boehringer Ingelheim GmbH
Daniela Prager, MD, Vienna, Austria (Abstract Co-Author) Nothing to Disclose
Christiane Seitz, Vienna, Austria (Abstract Co-Author) Nothing to Disclose
Peter C. Brugger, MD, PhD, Vienna, Austria (Abstract Co-Author) Nothing to Disclose
Gerlinde Gruber, Vienna, Austria (Abstract Co-Author) Nothing to Disclose

PURPOSE
To establish normal values for fetal MRI of optic structures and to identify pathologies in order to supply basic information for future in vivo studies.

METHOD AND MATERIALS
Fifty-eight cases (16 - 42 gestational weeks), consisting of 33 fetuses with normal development of the optical structures and 25 fetuses with pathologies, were included. The pathological group was composed of: complex malformations (15), premature rupture
of membranes (4), twin-associated problems (3), intrauterine growth restriction (2), and stillbirth (1). Postmortem MRI was obtained within 24 hours of fetal demise using a 3T MR scanner (Siemens Trio) and an eight channel knee coil. Measurements were performed on axial T2-weighted images (TR 300ms, TE 140ms, isovoxel 0.4mm CISS 3D sequence) using Image J software. The following measurements were taken and correlated with gestational age: optic nerves: maximum diameter at retrobulbar and intracranial location; total length; angle between optic nerves; and optic chiasm: minimum transverse diameter.

RESULTS

Total optic nerve length increased from 10.5 mm to 29.4 mm within 26 weeks and correlated significantly with GA (r=0.885, p<0.001). Retrobulbar optic nerve diameter increased from 0.83 to 2.13 mm (right side) and 0.860 to 2.108 mm (left side) within 25 weeks, and correlated significantly with gestational age (right: r=0.852, p<0.001; left: r=0.843, p<0.001). The angle of the optic nerves in front of the optic chiasm became considerably more acute with increasing age (111.49 - 75.04 degrees from 16 to 36 gestation weeks, correlation with gestational age r=-0.741, p<0.001). The course of the optic nerves altered with gestation. In young fetuses, the optic nerves had a U- evolving to a V-shape with higher gestational age. Fetuses in the pathologic group showed significant aberrations in one to three of the above-described parameters.

CONCLUSION

As sizes of fetal optic structures correlate with gestational age, and the shape of the optic chiasm changes from a U- to a V-form from early to late gestation, developmental deviations of the optic nerves and chiasm that may be part of malformative or acquired conditions, can be detected sensitively in postmortem MRI.

CLINICAL RELEVANCE/APPLICATION

Normal values of optic fetal structures obtained in this study allow the sensitive detection of developmental deviations that may be part of malformative or acquired conditions.
ED011-TH

Obstetrical Imaging Thursday Case of the Day

Thursday, Dec. 5 7:00AM - 11:59PM Room: Case of Day, Learning Center

AMA PRA Category 1 Credit ™: .50

Participants
Mariam Moshiri, MD, Bellevue, WA (Presenter) Nothing to Disclose
Jonathan Revels, DO, Seattle, WA (Abstract Co-Author) Nothing to Disclose
Sherry S. Wang, MBBS, Seattle, WA (Abstract Co-Author) Nothing to Disclose
Paula J. Woodward, MD, Salt Lake City, UT (Abstract Co-Author) Editor, Reed Elsevier
Erez Klein, MD, Haifa, Israel (Abstract Co-Author) Nothing to Disclose
Sobhi Abadi, MD, Haifa, Israel (Abstract Co-Author) Nothing to Disclose
Marcia C. Javitt, MD, Haifa, Israel (Abstract Co-Author) Nothing to Disclose
Tomas Prior, PhD,MBBS, London, United Kingdom (Abstract Co-Author) Nothing to Disclose
Victoria Jowett, MD, London, United Kingdom (Abstract Co-Author) Nothing to Disclose
Jasmine W. Tay, BMBS,BMedSc, London, United Kingdom (Abstract Co-Author) Nothing to Disclose
Christoph Lees, MD, London, United Kingdom (Abstract Co-Author) Speaker, Samsung Electronics Co, Ltd; Speaker, Canon Medical Systems Corporation; Institutional research support, Samsung Electronics Co, Ltd; Institutional research support, Canon Medical Systems Corporation; Institutional research support, General Electric Company; Institutional research support, F. Hoffmann-La Roche Ltd; ;
Nishat Bharwani, FRCP,MBBS, London, United Kingdom (Abstract Co-Author) Nothing to Disclose
Gitanjali Bajaj, MD, Little Rock, AR (Abstract Co-Author) Nothing to Disclose
Teresita L. Angtuaco, MD, Little Rock, AR (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1) Analyze findings on obstetric imaging studies. 2) Develop differential diagnoses based on the clinical information and imaging findings. 3) Recognize the importance of accurate prenatal diagnosis on pregnancy management.

Printed on: 12/22/19
Fallopian Tube Catheterization (Hands-on)

Thursday, Dec. 5 8:30AM - 10:00AM Room: E260

AMA PRA Category 1 Credits ™: 1.50
ARRT Category A+ Credit: 1.75

Participants
Amy S. Thurmond, MD, Portland, OR (Presenter) Nothing to Disclose
Ronald J. Zagonia, MD, San Francisco, CA (Presenter) Consultant, ReCor Medical, Inc
A. van Moore JR, MD, Charlotte, NC (Presenter) Nothing to Disclose
Anne C. Roberts, MD, La Jolla, CA (Presenter) Nothing to Disclose
David M. Hovsepian, MD, Stanford, CA (Presenter) Nothing to Disclose
James E. Silberzweig, MD, New York, NY (Presenter) Nothing to Disclose
Lindsay S. Machan, MD, Vancouver, BC (Presenter) Stockholder, Analytics for Life, Inc Stockholder, Calgary Scientific, Inc Stockholder, Harmonic Medical Stockholder, IKOMED Technologies Inc Stockholder, Innovere Medical Inc Stockholder, Confluent Medical Inc
Maureen P. Kohi, MD, San Francisco, CA (Presenter) Advisory Board, Boston Scientific Corporation; Advisory Board, Medtronic plc; Consultant, Medtronic plc; Consultant, Koninklijke Philips NV

For information about this presentation, contact:
lindsay.machan@vch.ca

LEARNING OBJECTIVES
1) Obtain hands-on experience with fallopian tube catheterization using uterine models and commercially available catheters and guidewires. 2) Review the history and evolution of interventions in the fallopian tubes, including tubal recanalization and tubal occlusion. 3) Learn safe techniques for fallopian tube recanalization for promoting fertility. 4) Discuss the outcomes regarding pregnancy rate and complications. 5) Appreciate ways to improve referrals from the fertility specialists and expand your practice. 6) Understand the importance of hysterosalpingography in the evaluation of the infertile couple.

ABSTRACT
More couples and at a younger age are seeking fertility treatment all over the world. Hysterosalpingography which has been done for over a hundred years, is the only imaging technique which depicts the delicate structure of the fallopian tube, the anatomy of which is key for determining optimal fertility treatment. Noninvasive access to this structure for promoting pregnancy has been sought for 170 years. Fluoroscopic Fallopian tube catheterization is currently used predominantly to dislodge debris from the proximal tube in women with infertility. This hands-on course allows participants to understand the anatomy, and to use commercially available catheters and devices in plastic models for fallopian tube catheterization. Fallopian tube catheterization using fluoroscopic guidance is a relatively easy, inexpensive technique within the capabilities of residency trained radiologists. World experts are available to answer your questions and to provide individualized guidance for your practice setting.

Printed on: 12/22/19
To evaluate MR findings described in PAS and identify those significantly associated with PAS severe enough to result in cesarean hysterectomy. Interobserver agreement was also assessed.

METHOD AND MATERIALS

We performed an IRB approved retrospective review of 56 pregnancies, from our 2006-2019 MR database referred for clinically suspected PAS. After randomization, single shot fast spin echo, balanced steady state free precession and T1-weighted sequences were independently evaluated by two reviewers, one expert and one with 4 years MR experience, after review of 10 test training cases. Evaluation of 11 variables was performed, including bladder-serosal interface interruption, bridging vessels, placental texture near the scar, presence of complete or low-lying previa, radiology impression of presence or absence of invasion and degree, bulge characteristics, dark linear bands or lacunae, and cervical varices. To assess readers agreement, simple kappa and prevalence adjusted bias adjusted kappa (PABAK) were used. Univariate logistic regressions were used to assess the association with cesarean hysterectomy.

RESULTS

From the study, 6 of 11 characteristics assessed by the expert were significantly associated (p<0.05) with the outcome of hysterectomy: interrupted bladder-serosal interface (0.007), serosal bridging vessels (0.005), radiologist prediction of invasion degree (0.002) and presence (0.02), inhomogeneous texture near scar (0.003) and low-lying or placenta previa (0.0005). Dark linear band quantification, cervical varices size, lacunae and bulge presence or size were not significant. The reader agreement was fair to moderate according to PABAK. Simple Kappa was constantly underestimated due to unbalance in the dataset.

CONCLUSION

An expert reader was significantly predictive of presence and degree of invasion with MRI in women whose placental invasion was severe enough to result in cesarean hysterectomy. Other significant findings included bridging vessels, bladder serosal interruption, low-lying or complete previa, and inhomogeneous texture near scar. However, in this small series, interobserver agreement was only fair to moderate, suggesting the need for better-defined variables assessed with more MRI cases and larger training datasets.

CLINICAL RELEVANCE/APPLICATION

Several MR findings were associated with PAS severe enough to result in cesarean hysterectomy, but interobserver agreement between radiologists remains less than optimal.
The presence and extent of abnormal fetal intraplacental vasculature seems to be related with PAS invasiveness and adverse outcomes. A retrospective review of placental MRI exams from December 2004 to January 2019 was performed. MRI reports were reviewed for suspicion of abnormal placenta. Criteria suggesting pathology included the presence of dark intraplacental bands, heterogeneous signal intensity, thick nodular contour along the urinary bladder surface, uterine bulging into the bladder, and loss of the myometrial margin with attention paid to parametrial regions. MRI was considered positive even if only one of these criteria were present. Comparison was made with findings at either delivery, operation, and pathology reports.

RESULTS

478 MRI exams were reviewed. 279 exams were negative both on MRI and delivery/pathology. 13 exams interpreted as normal on MRI underwent hysterectomy with pathology demonstrating placenta accreta. 148 exams were interpreted as positive for abnormal placenta and were diagnosed as accreta, increta, or percreta on delivery/pathology. 38 cases interpreted as positive on MRI had normal placental delivery and pathology. MR diagnosis of abnormal placenta had a sensitivity of 92%, specificity of 88%, PPV of 80%, NPV of 96%, and an accuracy of 89%.

CONCLUSION

Placental adhesive spectrum disorder is a significant cause of maternal morbidity and mortality. Detailed imaging provides important information critical for the management of patients with this disorder. Prenatal MRI has a high degree of accuracy for the diagnosis of placenta adhesive spectrum disorder, specifically the myoinvasive forms. MRI provides detailed topographic information and is a critical component in the workup of patients at high risk for this condition.

CLINICAL RELEVANCE/APPLICATION

Advance knowledge of the diagnosis of abnormal placenta allows for pre-delivery operative planning and management. With this information, a multidisciplinary approach to this potentially catastrophic condition can be put into place to prevent significant morbidity and mortality.

SSQ09-03 Abnormal Fetal Placental Vasculature on MRI of Patients at High Risk for Placenta Accreta Spectrum Disorders: Analysis of 130 Cases

Thursday, Dec. 5 10:50AM - 11:00AM Room: E351

Participants

Charis Bourgioti, MD, Athens, Greece (Presenter) Nothing to Disclose
Anastasia Konstantinidou, Athens, Greece (Abstract Co-Author) Nothing to Disclose
Konstantina Zafeiropolou, Athens, Greece (Abstract Co-Author) Nothing to Disclose
Chara Tzavara, Athens, Greece (Abstract Co-Author) Nothing to Disclose
Stavros Fotopoulos, Athens, Greece (Abstract Co-Author) Nothing to Disclose
George Daskalakis, Athens, Greece (Abstract Co-Author) Nothing to Disclose
Maria Evangelia Nikolaidou, Athens, Greece (Abstract Co-Author) Nothing to Disclose
Mariani Theodora, Athens, Greece (Abstract Co-Author) Nothing to Disclose
Lia A. Moulopoulos, MD, Athens, Greece (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
charisbourgioti@gmail.com

PURPOSE

To investigate the association of abnormal intraplacental (fetal) vessels on MRI of patients with placenta accreta spectrum (PAS) disorders with extent of invasiveness and poor clinical outcome.

METHOD AND MATERIALS

Between 3/2016-2/2019, 130 high-risk gravid patients for abnormal placentation were referred for dedicated prenatal MRI (mean age: 34.7 years, mean gestational age: 32.5 weeks); all patients underwent C-section within 6 weeks from MRI. Intraoperative/pathological findings confirmed the presence of PAS in 101/130 patients (percreta: n=58, increta/incrreta: n=43). 48/101 patients with PAS underwent hysterectomy, whereas in 44/101 patients, bladder repair was performed. All MRIs were reviewed by consensus by two expert radiologists after completion of the study for the presence of at least one long (>2cm), intraplacental flow void structure originating from the chorionic plate, crossing the placental parenchyma and reaching the basal plate, with paucity of branching along its course (stripped fetal vessel). Presence of stripped fetal vessels and their caliper were measured. Criteria suggesting pathology included the presence of dark intraplacental bands, heterogeneous signal intensity, thick nodular contour along the urinary bladder surface, uterine bulging into the bladder, and loss of the myometrial margin with attention paid to parametrial regions. MRI was considered positive even if only one of these criteria were present. Comparison was made with findings at either delivery, operation, and pathology reports.

RESULTS

There was a significant association (p<0.001) between presence of stripped fetal vessels with number of prior C-sections, presence of placenta percreta, hysterectomy and bladder repair treatment. Subjects with stripped fetal vessels on MRI, had significantly greater blood loss (1514.2±382.8ml, p<0.001) and increased delivery times (145.2±60.3min, p<0.001). The diameter of stripped fetal vessels was greater in patients with >=2 prior C-sections (5.2±3.6mm, p<0.001), placenta percreta (5.3±3.6mm, p<0.001), major bladder repair (6.4±3.6mm, p<0.001) and caesarian hysterectomy (5.5±3.5mm, p<0.001); additionally, stripped fetal vessel diameter was positively and significantly associated with intraoperative blood loss and duration of delivery.

CONCLUSION

The presence and extent of abnormal fetal intraplacental vasculature seems to be related with PAS invasiveness and adverse outcomes.
The presence and extent of abnormal fetal intraplacental vasculature seems to be related with PAS invasiveness and adverse peripartum events.

**CLINICAL RELEVANCE/APPLICATION**
Accurate prenatal identification of aggressive forms of PAS may optimize treatment planning, improving patients' clinical outcome.

**SSQ09-04** Apparent Diffusion Coefficient Differences in Twins of Monochorionic Diamniotic Pregnancy Complicated by Twin-To-Twin Transfusion Syndrome

Thursday, Dec. 5 11:00AM - 11:10AM Room: E351

Participants
Michael Aertsen, MD, Leuven, Belgium (Presenter) Nothing to Disclose
Isabel Couck, Leuven, Belgium (Abstract Co-Author) Nothing to Disclose
Frederik De Keyzer, Leuven, Belgium (Abstract Co-Author) Nothing to Disclose
Steven Dymarkowski, MD, Leuven, Belgium (Abstract Co-Author) Nothing to Disclose
Liesbeth Lewi, MD, Leuven, Belgium (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
michael.aertsen@uzleuven.be

**PURPOSE**
To evaluate the difference in apparent diffusion coefficient (ADC) of the placental parenchyma between donor and receptor of monochorionic diamniotic (MCDA) pregnancies complicated by twin-to-twin transfusion syndrome (TTTS) and compare those values with a control group of uncomplicated MCDA pairs.

**METHOD AND MATERIALS**
Prospective monocentric cohort study. Magnetic resonance (MR) was performed prior to surgery in TTTS and electively planned around 20 weeks (w) of gestation age (GA) for the uncomplicated MCDA cohort. Regions of interest (ROIs) for ADC calculations were placed at the cord insertion of each twin or as close as possible in velamentous insertion. Another ROI was drawn at the border of the placenta away from the presumed vascular equator. Intrapair ADC differences for the different ROIs (central (c) and peripheral (p), resp.) were compared between donor and recipient (Wilcoxon-signed rank test). GA at time of MR and intratwin ADC differences were compared between TTTS and MCDA twins (Mann-Whitney test).

**RESULTS**
71 pregnancies were included in the analysis. Median GA at the time of MRI was 21 w (range 18-27) in the uncomplicated (N=47) and 21 w (range 18 - 29) in the TTTS cohort (N=24) (p=.9). Intrapair ADC differences for the different placental regions and the difference in mean ADC (=cADC + pADC)/2 of both regions in TTTS are summarized in the table. Between TTTS and MCDA cohorts, central ADC measurements in the donor (168 x10^-5 mm^2/s; 159 - 182 x10^-5 mm^2/s) and smallest twin (179 x10^-5 mm^2/s; 166-197 x10^-5 mm^2/s), respectively, differed significantly (p=.02), whereas no differences were observed between the receptor and larger twin (p=.6). cADC difference between the donor and receptor in TTTS were also larger than those in uncomplicated MCDA pregnancies (p=0.04).

**CONCLUSION**
In TTTS, central ADC measurements are helpful to differentiate receptor and donor insertion compared to peripheral ADC calculations. Furthermore, from an ADC point of view, the receptor seems to exhibit normal values, with the donor behaving significantly different.

**CLINICAL RELEVANCE/APPLICATION**
Diffusion weighted imaging has demonstrated differences in pregnancies with abnormal placental function. We want to analyze the added value of ADC measurements in TTTS twins prior to surgery.

**SSQ09-05** The Value of MRI in Predicting Intraoperative Massive Hemorrhage during Hysteroscopic Treatment of Cesarean Scar Pregnancy

Thursday, Dec. 5 11:10AM - 11:20AM Room: E351

Participants
Piao Zeng, Beijing, China (Presenter) Nothing to Disclose
Yan Zhou, Beijing, China (Abstract Co-Author) Nothing to Disclose
Jianyu Liu, Beijing, China (Abstract Co-Author) Nothing to Disclose

**PURPOSE**
To explore the value of MRI in predicting intraoperative massive hemorrhage during hysteroscopic treatment for cesarean scar pregnancy

**METHOD AND MATERIALS**
A retrospective analysis of 77 first trimester CSP patients who were diagnosed by MRI and confirmed by operation and pathology from January 20 to December 2018. According to the intraoperative blood loss, CSP patients were divided into two groups. The Inclusion criteria of intraoperative massive bleeding group: intraoperative blood loss >=200ml, by hysteroscopic treatment with or without preoperative bilateral uterine artery embolization or medication; The Inclusion criteria of non-massive bleeding group: intraoperative blood loss <200ml, by single hysteroscopic treatment without preoperative bilateral uterine artery embolization or medication. The clinical data and MRI features were compared between the two groups. The multivariate logistic regression analysis was used to analyze the risk factors of CSP intraoperative massive hemorrhage. The ROC curve was used to evaluate the efficacy and optimal threshold

**RESULTS**
Between the intraoperative massive hemorrhage group (11 cases) and non- massive hemorrhage group (66 cases), the gestational
PURPOSE

For information about this presentation, contact:

Farzaneh Ghazaleh
Maryam Mohammad Ali Hossein Masoumeh Hasan Zohreh Nazanin Mahboobeh Behnaz

Participants

SSQ09-07 Differences in Brain Development between Fetuses with Intrauterine Growth Restriction and Normally-Grown Group Assessed by Fetal MRI

Thursday, Dec. 5 11:30AM - 11:40AM Room: E351

Participants
Behnaz Moradi, MD, Tehran, Iran (Islamic Rep. Of) (Abstract Co-Author) Nothing to Disclose
Mahboobeh Shirazi, MD, Tehran, Iran (Islamic Rep. Of) (Abstract Co-Author) Nothing to Disclose
Nazarin Seyed Saadat, MD, Tehran, Iran (Islamic Rep. Of) (Abstract Co-Author) Nothing to Disclose
Zohreh Alibeigi Nezhad, MD, Tehran, Iran (Islamic Rep. Of) (Abstract Co-Author) Nothing to Disclose
Masoumeh Gty, MD, Tehran, Iran (Islamic Rep. Of) (Abstract Co-Author) Nothing to Disclose
Hossein Ghanaiati, MD, Tehran, Iran (Islamic Rep. Of) (Abstract Co-Author) Nothing to Disclose
Mohammad Ali Kazemi, MD, Tehran, Iran (Islamic Rep. Of) (Abstract Co-Author) Nothing to Disclose
Maryam Rahmani, MD, Tehran, Iran (Islamic Rep. Of) (Abstract Co-Author) Nothing to Disclose
Ghazaleh Arabihedarmand, MS, Chicago, CA (Abstract Co-Author) Nothing to Disclose
Farzaneh Fattahi Masrou, MD, Hartford, CT (Presenter) Nothing to Disclose

For information about this presentation, contact:
b.moradi80@gmail.com

PURPOSE

To evaluate the role of shear wave placental elastography (SWE) in pre-clampsia (PE) and to give a cut off value of elasticity that would help in prediction of pre-eclampsia in early second trimester (14-20 weeks of period of gestation).

METHOD AND MATERIALS

A total of 230 patients who presented in obstetric OPD between 14-20 weeks of gestation and were willing to have delivery in our institution were enrolled in the study. After taking detailed obstetric history, gray scale obstetric ultrasound with doppler scan SWE was performed. Mean value of elasticity was taken in every patient; and data were analysed to give the best cut-off value that would determine the diagnosis of PE. Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and diagnostic accuracy for prediction of PE were calculated based on SWE measurements. Statistical analysis was done using Statistical Package for Social Sciences (SPSS) version 21.0. A p value of <0.05 was considered statistically significant.

RESULTS

There was a statically significant difference in the value of elasticity in normal patients and in those who developed PE. The study concluded cut-off value of 2.9667 kPa for prediction of pre-eclampsia, with a sensitivity of 92%, specificity of 91.71%, PPV of 57.5% and NPV of 98.9% in a statistically significant manner with p-value of <0.05.

CONCLUSION

Placental stiffness is higher in patients who develop pre-eclampsia during pregnancy. It can be quantitatively measured by shear wave elastography values for prediction of pre-eclampsia in early second trimester.

CLINICAL RELEVANCE/APPLICATION

Placental elastographic values were statistically significant and higher in the patients developing preeclampsia in later pregnancy. Shear wave elastography can help us to diagnose this life threatening condition in early second trimester before the clinical appearance of preeclampsia, and act to provide early treatment and antenatal care to reduce the devastating maternal as well as fetal outcomes.
To evaluate different features of brain development by Magnetic Resonance Imaging (MRI) in intrauterine growth restricted (IUGR) fetuses compared to normally-grown fetuses.

**METHOD AND MATERIALS**

3T MRI was performed in 42 IUGR and 28 nearly age-matched normally-grown fetuses using T2-weighted half Fourier acquisition single-shot turbo spin echo (HASTE). Cortical thickness was measured in 4 brain regions (insula, frontal, occipital and temporal) and corrected by biparietal diameter/2. Also, whole brain area (WBA) at the level of cavum septum pellucidum and area of 6 brain regions (frontal, temporal, occipital, cerebellum, midbrain and pons) were measured and compared between the two groups. Any cases with brain structural anomaly were excluded. All fetuses were followed until birth.

**RESULTS**

No significant differences were found about maternal characteristic and fetal gestational age between two groups. IUGR fetuses had significantly lower birth weight (2377 g vs 2965 g in control group). Brain signal was normal in all cases. The corrected thickness of cortex was significantly thinner in insula and temporal lobes in IUGR fetuses compared to control group (0.034 vs 0.043 and 0.036 vs 0.047 respectively, P value of < 0.05), but there was no significant different in frontal and occipital lobes. IUGR fetuses have significantly smaller WBA. The assessed corrected area of brain regions was not significantly different between groups except the corrected area of cerebellum which was smaller in normally-grown fetuses (0.147 vs 0.130, P value of < 0.05). During follow up, there was only one still birth in IUGR group.

**CONCLUSION**

IUGR fetuses had a significantly thinner Insular and temporal lobe cortex and smaller WBA. Among different brain regions, cerebellum was less affected by growth restriction.

**CLINICAL RELEVANCE/APPLICATION**

Growth restriction significantly affects brain development and the fetal MRI has a potential value to assess the various aspects of this effect.

**SSQ09-08  Fetal Anterior Abdominal Wall Thickness (FAAWT): A Promising Parameter to Predict Fetal Macrosomia in Pregnancies with Gestational Diabetes**

**METHOD AND MATERIALS**

This is a prospective cohort study conducted in a tertiary care Centre with institutional ethics approval. One hundred singleton pregnancies with gestational diabetes mellitus (GDM) between 36-39 weeks of gestation were included after informed written consent. Exclusion criteria comprised of women with diseases known to affect fetal growth, uncertain gestational age, fetuses with congenital anomalies and intrauterine growth restriction. Standard fetal biometry parameters including biparietal diameter (BPD), head circumference (HC), abdominal circumference (AC), femur length (FL) and estimated fetal weight (EFW) were measured. Fetal anterior abdominal wall thickness (FAAWT) was measured ultrasonographically in AC view. Actual neonatal birth weights were recorded. Birth weight >90th centile (INTERGROWTH-21st charts) was considered as a cut-off for macrosomia. The correlation coefficient of 0.626, p-value 0.009.

**RESULTS**

16 out of 100 neonates were found to be macrosomic (16%). The third trimester mean FAAWT was significantly higher in macrosomic babies (5.36±0.5 mm) as compared to non-macrosomic babies (5.54±0.61 mm) (p-value <0.0001). A FAAWT >6 mm (ROC curve derived) provided sensitivity of 87.5% (95% CI 61.7-98.4), specificity of 75% (95% CI 64.4-83.8), PPV of 40% (95% CI 23.9-57.9) and NPV of 96.9% (95% CI 89.3-99.6) for prediction of macrosomia. While other standard fetal biometric parameters (BPD, HC, AC, FL and EFW) did not correlate well with actual birth weight in neonates with macrosomia in GDM patients, only FAAWT was found to have statistically significant correlation (correlation coefficient of 0.626, p-value 0.009).

**CONCLUSION**

The FAAWT was the only fetal sonographic parameter to have significant correlation with neonatal birth weight in macrosomic neonates of GDM mothers. We found a high sensitivity (87.5%), specificity (75%) and NPV (96.9%) which suggests that FAAWT <6 mm can quite confidently rule out macrosomia in pregnancies with GDM.

**CLINICAL RELEVANCE/APPLICATION**

FAAWT is a promising and easily measurable parameter to rule out fetal macrosomia in late third trimester in pregnancies with GDM, thus, allowing proper obstetric management.

**SSQ09-09  Three-Dimensional Fetal MRI Visualization of Cerebellar White Matter Tracts**

**PARTICIPANTS**

Ashish Bansal, MBBS, New Delhi, India (Presenter) Nothing to Disclose

Brijbhusan Thukral, New Delhi, India (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
ashish_bansal1820@yahoo.com

**PURPOSE**

To evaluate the correlation of fetal anterior abdominal wall thickness and other standard fetal biometric parameters between 36-39 weeks of gestation with neonatal birth weight in pregnancies with gestational diabetes.

**METHOD AND MATERIALS**

This is a prospective cohort study conducted in a tertiary care Centre with institutional ethics approval. One hundred singleton pregnancies with gestational diabetes mellitus (GDM) between 36-39 weeks of gestation were included after informed written consent. Exclusion criteria comprised of women with diseases known to affect fetal growth, uncertain gestational age, fetuses with congenital anomalies and intrauterine growth restriction. Standard fetal biometry parameters including biparietal diameter (BPD), head circumference (HC), abdominal circumference (AC), femur length (FL) and estimated fetal weight (EFW) were measured. Fetal anterior abdominal wall thickness (FAAWT) was measured ultrasonographically in AC view. Actual neonatal birth weights were recorded. Birth weight >90th centile (INTERGROWTH-21st charts) was considered as a cut-off for macrosomia. Statistical analysis was done and 95% confidence level was considered significant for all tests.

**RESULTS**

16 out of 100 neonates were found to be macrosomic (16%). The third trimester mean FAAWT was significantly higher in macrosomic babies (6.36±0.5 mm) as compared to non-macrosomic babies (5.54±0.61 mm) (p-value <0.0001). A FAAWT >6 mm (ROC curve derived) provided sensitivity of 87.5% (95% CI 61.7-98.4), specificity of 75% (95% CI 64.4-83.8), PPV of 40% (95% CI 23.9-57.9) and NPV of 96.9% (95% CI 89.3-99.6) for prediction of macrosomia. While other standard fetal biometric parameters (BPD, HC, AC, FL and EFW) did not correlate well with actual birth weight in neonates with macrosomia in GDM patients, only FAAWT was found to have statistically significant correlation (correlation coefficient of 0.626, p-value 0.009).

**CONCLUSION**

The FAAWT was the only fetal sonographic parameter to have significant correlation with neonatal birth weight in macrosomic neonates of GDM mothers. We found a high sensitivity (87.5%), specificity (75%) and NPV (96.9%) which suggests that FAAWT <6 mm can quite confidently rule out macrosomia in pregnancies with GDM.

**CLINICAL RELEVANCE/APPLICATION**

FAAWT is a promising and easily measurable parameter to rule out fetal macrosomia in late third trimester in pregnancies with GDM, thus, allowing proper obstetric management.

**SSQ09-09  Three-Dimensional Fetal MRI Visualization of Cerebellar White Matter Tracts**

**METHOD AND MATERIALS**

This is a prospective cohort study conducted in a tertiary care Centre with institutional ethics approval. One hundred singleton pregnancies with gestational diabetes mellitus (GDM) between 36-39 weeks of gestation were included after informed written consent. Exclusion criteria comprised of women with diseases known to affect fetal growth, uncertain gestational age, fetuses with congenital anomalies and intrauterine growth restriction. Standard fetal biometry parameters including biparietal diameter (BPD), head circumference (HC), abdominal circumference (AC), femur length (FL) and estimated fetal weight (EFW) were measured. Fetal anterior abdominal wall thickness (FAAWT) was measured ultrasonographically in AC view. Actual neonatal birth weights were recorded. Birth weight >90th centile (INTERGROWTH-21st charts) was considered as a cut-off for macrosomia. Statistical analysis was done and 95% confidence level was considered significant for all tests.

**RESULTS**

16 out of 100 neonates were found to be macrosomic (16%). The third trimester mean FAAWT was significantly higher in macrosomic babies (6.36±0.5 mm) as compared to non-macrosomic babies (5.54±0.61 mm) (p-value <0.0001). A FAAWT >6 mm (ROC curve derived) provided sensitivity of 87.5% (95% CI 61.7-98.4), specificity of 75% (95% CI 64.4-83.8), PPV of 40% (95% CI 23.9-57.9) and NPV of 96.9% (95% CI 89.3-99.6) for prediction of macrosomia. While other standard fetal biometric parameters (BPD, HC, AC, FL and EFW) did not correlate well with actual birth weight in neonates with macrosomia in GDM patients, only FAAWT was found to have statistically significant correlation (correlation coefficient of 0.626, p-value 0.009).

**CONCLUSION**

The FAAWT was the only fetal sonographic parameter to have significant correlation with neonatal birth weight in macrosomic neonates of GDM mothers. We found a high sensitivity (87.5%), specificity (75%) and NPV (96.9%) which suggests that FAAWT <6 mm can quite confidently rule out macrosomia in pregnancies with GDM.

**CLINICAL RELEVANCE/APPLICATION**

FAAWT is a promising and easily measurable parameter to rule out fetal macrosomia in late third trimester in pregnancies with GDM, thus, allowing proper obstetric management.
PURPOSE
Cerebellar white matter connectivity plays a crucial role in affective, cognitive and motor processing. Prenatal diffusion tensor imaging (DTI) can non-invasively visualize major white-matter tracts of the fetal forebrain. We retrospectively assessed the success rate of visualizing the superior, middle and inferior cerebellar peduncle (SCP, MCP and ICP) as well as transverse pontine fibers (TPF) in the third trimester.

METHOD AND MATERIALS
Cases with DTI sequences (b-value of 700 s/mm², 16 gradient encoding directions) covering the cerebellum were retrospectively assessed. Deterministic tractography was performed using the Philips IntelliSpace software based on at least two regions of interest. A visibility score was calculated as the fraction of visible tracts divided by the amount of potentially visible tracts.

RESULTS
14 Fetal MRI were assessed (9 with 1.5T and 5 with 3T MRI) with 38.51±1.00 GW (mean±standard deviation) at 1.5 T and 35.80±1.20 at 3T. There was no significant difference (p=.66) between the scores of 1.5T (0.69±0.27) and 3T (0.74±0.17). SCP could be depicted in 71% of cases, MCP in 71%, ICP in 55% and TPF in 93%.

CONCLUSION
Prenatal tractography of cerebellar white matter tracts is feasible in the third trimester and shows excellent correlation with the respective anatomy. Fetal MR based DTI thus may improve the characterization of infratentorial malformations during the third trimester, when ultrasound is limited by acoustic shadowing at the skull base.

CLINICAL RELEVANCE/APPLICATION
Fetal MR tractography with diffusion tensor imaging can demonstrate cerebellar white matter tracts in the third trimester of pregnancy. This could improve the characterization of infratentorial malformations prenatally.

Printed on: 12/22/19
Diagnosis and Characterization of Female Pelvic Floor Dysfunction: Ultrasound Takes the Challenge

Participants
Maria Pilar Aparisi Gomez, FRANZCR, MBChB, Auckland, New Zealand (Presenter) Nothing to Disclose
Sheryl Watkin, Auckland, New Zealand (Abstract Co-Author) Nothing to Disclose
Jo Kelly, Auckland, New Zealand (Abstract Co-Author) Nothing to Disclose
Helen M. Moore, MBChB, FRANZCR, Auckland, New Zealand (Abstract Co-Author) Nothing to Disclose
Alberto Bazzocchi, MD, Forlimpopoli, Italy (Abstract Co-Author) Nothing to Disclose

For information about this presentation, contact:
pilara@adhb.govt.nz

TEACHING POINTS

Become familiar with the indications and technique for pelvic floor assessment with ultrasound. Recognize the appearances of normal anatomy and functionality of pelvic floor structures and some of the most common pathological findings. Understand the role of ultrasound in the evaluation of postsurgical appearances.

TABLE OF CONTENTS/OUTLINE

The wide availability and development of imaging techniques has provided new horizons for the diagnosis in female urogynecology. MR is a technique with exceptional spatial resolution and high sensitivity for the detection of soft tissue abnormalities, but presents the important limitation of cost and complexity, and is more frequently used as a static method of assessment. Ultrasound is universally available and offers the possibility of real time observation of maneuvers such as Valsalva and pelvic floor contraction, which aid in the visualisation of structures and help to uncover defects. 3D and 4D ultrasound allow axial plane reconstruction, and therefore assessment of the levator hiatus. The transperineal approach is favoured, due to the absence of distortion. Ultrasound presents the great advantage of being a superb tool for identification, evaluation of placement and functional assessment of surgical tapes and meshes, because of their physical properties, significantly superior in its performance to MR.

Printed on: 12/22/19
Obstetrics/Gynecology Thursday Poster Discussions

Thursday, Dec. 5 12:45PM - 1:15PM Room: OB Community, Learning Center

AMA PRA Category 1 Credit ™: .50
Participants
Liina Poder, MD, Mill Valley, CA (Moderator) Nothing to Disclose

For information about this presentation, contact:
liina.poder@ucsf.edu

LEARNING OBJECTIVES
1) Understanding the epidemiology and impact of Placenta Accreta Spectrum (PAS) disorders on maternal fetal health. 2) Understanding the current concepts of pathophysiology of Placenta Accreta Spectrum (PAS) disorders. 3) Understanding the role and impact of imaging in diagnosis and treatment of Placenta Accreta Spectrum (PAS) disorders. 4) Understanding current FIGO guidelines in diagnosis and treatment and most current consensus on Placenta Accreta Spectrum (PAS) disorders.

Sub-Events

SPS3A Impact of PASD in Maternal Fetal Health: The Big Picture
Participants
Dana R. Gossett, MD, San Francisco, CA (Presenter) Consultant, Bayer AG

For information about this presentation, contact:
dana.gossett@ucsf.edu

LEARNING OBJECTIVES
1) Review clinical risk factors, clinical presentation, and morbidity associated with invasive placentation. 2) Present current evidence regarding timing and surgical technique for delivery with invasive placentation. 3) Review team structure and coordination with surgical, obstetric, anesthetic, and radiologic teams for optimal patient outcomes.

SPS3B What We Know of Pathophysiology of PAS Disorder in 2019
Participants
Jonathan Hecht, MD, PhD, Boston, MA (Presenter) Nothing to Disclose

For information about this presentation, contact:
JLHecht@BIDMC.Harvard.edu

LEARNING OBJECTIVES
1) Understanding the current concepts of pathophysiology of Placenta Accreta Spectrum (PAS) disorders. 2) Pathologic correlates of PAS imaging. 3) Potential biomarkers of PAS.

ABSTRACT
Pathophysiology of the placenta accreta spectrum (PAS) will be discussed with reference to defects of trophoblast biology that lead to excessive invasion of the myometrium, the role of abnormal decidualization at the endometrium-myometrial interface in pregnancy, and uterine remodeling in the setting of placenta previa and dehiscence of prior cesarean scar. Potential serum or imaging biomarkers of PAS will be discussed.

SPS3C Current Status and International Consensus on Imaging of PAS Disorders
Participants
Priyanka Jha, MBBS, San Francisco, CA (Presenter) Nothing to Disclose
Charis Bourgioti, MD, Athens, Greece (Presenter) Nothing to Disclose

For information about this presentation, contact:
priyanka.jha@ucsf.edu
charisbourgioti@gmail.com

LEARNING OBJECTIVES
1) Review current updates on US and MR imaging findings of PAS disorders. 2) Develop a checklist of observations for dedicated US evaluation once abnormality is detected. 3) Develop an approach for troubleshooting difficult and equivocal cases.

ABSTRACT
Placenta accreta spectrum disorders may account for a number of important adverse maternal events during the course of delivery; therefore, prenatal diagnosis of the presence and extent of myometrial invasion or placental extrauterine spread is critical for optimal management. Sonography is the frontline imaging modality for the evaluation of abnormal placenta; MRI performs equally well and can be used as a reliable alternative in cases of equivocal sonographic findings or for better topography in case of placental lateral extension. The aim of this presentation is to review current updates on the imaging of PAS disorders and comment on US and MRI indications, in an attempt to familiarize radiologists with the 'hot' topic of abnormal placentation.

**SPSH53D  Current Role and Impact of Interventional Radiology in PAS Disorders**

Participants
Philippe A. Soyer, MD, PhD, Paris, France (Presenter) Nothing to Disclose

**LEARNING OBJECTIVES**

1) To understand the role of interventional radiology in women with postpartum hemorrhage due to placenta accreta spectrum (PAS) disorders. 2) To know the different options provided by interventional radiology in PAS disorders. 3) To understand the advantages and limitations of each approach.

**ABSTRACT**

To date, embolization of pelvic arteries in women with postpartum hemorrhage due to PAS disorder is the treatment option for which highest degrees of evidence are available. However, other options have been tested, including prophylactic catheter placement, balloon occlusion of the internal iliac arteries and abdominal aorta balloon occlusion. This presentation will provide an overview of the currently reported interventional radiology procedures that are used for the treatment of postpartum hemorrhage due to PAS disorders and suggest recommendations based on current evidences.

Printed on: 12/22/19
LEARNING OBJECTIVES

1) Understand how measurements can be used in obstetrical ultrasound. 2) Know which measurements should be used routinely in obstetrical ultrasound. 3) Know how to determine gestational age and estimate fetal weight. 4) To diagnose placenta previa. 5) To diagnose vasa previa. 6) To diagnose morbidly adherent placenta. 6) Identify chorionicity and amnionicity in multiple gestations. 7) Detect complications of monochorionic placentation. 8) Identify those cases that need referral for prenatal intervention.

Sub-Events

**RC710A**  
**OB Measurements**

Participants  
Peter M. Doubilet, MD, PhD, Boston, MA (*Presenter*) Nothing to Disclose

For information about this presentation, contact:  
pdoubleit@gmail.com

**Learning Objectives**

1) Understand how measurements can be used in obstetrical ultrasound. 2) Know which measurements should be used routinely in obstetrical ultrasound. 3) Know how to determine gestational age and estimate fetal weight.

**Active Handout:** Peter Michael Doubilet  

**RC710B**  
**Pregnancy Support Structures: Placenta and Umbilical Cord**

Participants  
Paula J. Woodward, MD, Salt Lake City, UT (*Presenter*) Editor, Reed Elsevier

**Learning Objectives**

1) Distinguish low-lying placenta from placenta previa. 2) Confidently diagnose vasa previa. 3) Recognize findings in placenta accreta spectrum and their clinical implication.

**Abstract**

The placenta and umbilical cord are quite literally the lifeline for the developing fetus. Abnormalities in either can adversely affect the pregnancy and pose a significant risk of morbidity or mortality to either the fetus or mother at the time of delivery.

**RC710C**  
**Multiple Gestations**

Participants  
Anne M. Kennedy, MD, Salt Lake City, UT (*Presenter*) Author with royalties, Reed Elsevier

For information about this presentation, contact:  
anne.kennedy@hsc.utah.edu

**Learning Objectives**

1) Identify chorionicity and amnionicity in multiple gestations. 2) Detect complications of monochorionic placentation. 3) Identify those cases that need referral for prenatal intervention.

**Active Handout:** Anne M. Kennedy  

Printed on: 12/22/19
LEARNING OBJECTIVES

1) To reinforce discriminating between normal and abnormal development. 2) To present pathologies with regard to the supratentorial and infratentorial brain to familiarize the audience with common and rare entities that are relevant to clinical practice. 3) To review a patterned approach and critical thinking skills necessary for correct diagnosis.

ABSTRACT

Cases of central nervous system fetal pathology will be presented. The fetal brain changes dramatically during gestation.

RC713B  Fetal Lung Cases

Participants
Amy R. Mehollin-Ray, MD, Pearland, TX (Presenter) Nothing to Disclose

For information about this presentation, contact:
armeholl@texaschildrens.org

LEARNING OBJECTIVES

Review fetal imaging cases that highlight a variety of pathologies which occur in the fetal chest. Apply an organized approach to evaluating and diagnosing fetal lung malformations. Recognize complications and improve awareness of fetal and postnatal therapies.

RC713C  Fetal GI Cases

Participants
Teresa Victoria, MD, PhD, Philadelphia, PA (Presenter) Nothing to Disclose

Printed on: 12/22/19