Follow up of Ultrasound Detected Adnexal Masses in the Era of Type 1 and Type 2 Ovarian Cancers: Lessons Learned from Ovarian Cancer Screening Trials Compared to Society of Radiologists in Ultrasound Guideline

All Day Location: OB Community, Learning Center

Participants
Eleanor L. Ormsby, MD, Davis, CA (Presenter) Nothing to Disclose
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TEACHING POINTS
To review current concept of type 1 and type 2 ovarian cancers based on histologic pathogenesis, molecular alterations and clinical progression. Review radiologic and histopathologic images of each subtype epithelial ovarian cancers. Review risk associated with ovarian cysts from large prospective ovarian cancer screening. Review current guideline for follow up of benign and indeterminate masses. Review lessons learned from large prospective ovarian cancer screening trials on indeterminate masses and how morphology index can be incorporated into structured reporting.

TABLE OF CONTENTS/OUTLINE
General Review with Study Data to Support Educational Emphasis: 1. Background on ovarian cancer, statistic, survival rate. 2. Current understanding of different subtype of ovarian cancers (type 1 and type 2). Review of precursors and how each type progress to invasive cancers. 3. Image correlate to review how different morphologies convey risk for ovarian cancer. 4. Review of large prospective ovarian cancer trials with respect ultrasound morphology and they can be utilized for structure reporting with risk categorization. 5. Review data on benefit of ultrasound follow up. 6. Consideration of special cases: Malignant degenerations, is it solid or not?, what to do with Doppler, does size matter?
Prenatal Diagnosis of Placenta Accreta: Spectrum of Ultrasound and MRI Findings with Histopathologic Correlation

All Day Location: OB Community, Learning Center

Participants
Kristin L. Harris, DO, Chicago, IL (Presenter) Nothing to Disclose
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Carey August, Chicago, IL (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS

Placenta accreta represents a spectrum of abnormal placental invasion with increasing prevalence and a significant cause of maternal morbidity and mortality. Accurate prenatal diagnosis is essential for optimal patient management. The purpose of this exhibit is:

1. To review the spectrum of placental implantation abnormalities, including epidemiology, pathophysiology, and risk factors.  
2. To discuss the multimodality imaging approach, including the utility of ultrasound and magnetic resonance imaging in prenatal diagnosis of placental implantation abnormalities.  
3. To illustrate sonographic and MRI findings of placenta accreta through a case-based review, including histopathologic correlation.

TABLE OF CONTENTS/OUTLINE

1. Review of normal placental anatomy with illustrations  
2. Spectrum of placental implantation abnormalities Accreta Increta Percreta  
3. Multimodality imaging approach to prenatal diagnosis Ultrasound Emerging role of MRI  
4. Pictorial review of imaging findings: 5 case-based examples including ultrasound and MRI Placenta accreta (1), increta (3) and percreta (1) Histopathologic correlation
Spectrum of Cystic Placental Lesions: Differential Diagnoses and Management

All Day Location: OB Community, Learning Center

**Participants**
Varun Bhandarkar, MD, Detroit, MI (*Presenter*) Nothing to Disclose  
Zachary S. Delproposto, MD, Detroit, MI (*Abstract Co-Author*) Nothing to Disclose  
Matthew C. Rheinboldt, MD, New Orleans, LA (*Abstract Co-Author*) Nothing to Disclose

**TEACHING POINTS**
The purposes of this presentation are:
1. To review the various cystic lesions of the placenta, primarily identified on ultrasound.
2. To differentiate between benign versus more ominous cystic lesions, which may contribute to intrauterine fetal growth abnormality, fetal anomalies, or abortion.
3. To provide instruction on how to deal with the findings of cystic lesions in terms of follow-up or more urgent attention.

**TABLE OF CONTENTS/OUTLINE**
This presentation is ideal for a poster format, but PowerPoint presentation would also be acceptable.
1. Discuss the epidemiology of placental cystic lesions.
2. Discuss the differential diagnosis for placental cystic or cystic-like lesions, which includes but is not limited to maternal vascular lakes, cytotrophoblastic or decidual cysts (true placental cysts), allantoic duct cysts, circumvallate placenta, vanishing twin, subchorionic hematomas, gestational trophoblastic disease (molar pregnancies), and placental mesenchymal dysplasias.
3. Review the imaging findings of placental cysts. Imaging will be primarily based on ultrasound evaluation, but MRI may be shown when appropriate.
4. Differentiate between benign and concerning lesions and provide a discussion as to what would need to be done after identifying the lesion (i.e. no further follow-up, close follow-up, or urgently notify primary physician).
Case Based Review - MR Imaging of Gynecologic Cancers
All Day Location: OB Community, Learning Center

Participants
Chang Un Lee, MD, Seoul, Korea, Republic Of (Presenter) Nothing to Disclose
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TEACHING POINTS
The major teaching points of this exhibit are: 1. MR imaging is the problem solving tool in the gynecologic cancers. 2. The diffusion and perfusion weighted MR imaging may be already used as promising tool as well conventional MR imaging in gynecologic cancers.

TABLE OF CONTENTS/OUTLINE
Appropriate Evaluation Modalities
Overview of FIGO stage
- Uterine cervix cancer
- Endometrial cancer
- Revised ovarian cancer
(2014) Case Based Review
Ovarian cancer
- Conventional MR imaging
- False positive case of perfusion weighted image
- Diffusion weighted imaging
Ovarian metastasis
- T2 low signal intensity: Krukenberg tumor
- Primary and metastatic multicystic ovarian cancer:
  - multilocularity, divergence
  - Leiomyosarcoma
  - Diffusion and T2 weighted imaging
  - Malignant transformation
  - From uterine leiomyoma
  - From uterine adenomyosis
  - From ovarian mature cystic teratoma
  - From ovarian endometriosis
  - Multilocular cystic lesion in the uterine cervix
  - Adenoma malignum
  - Adenocarcinoma
- Flow chart for differentiation between malignant and benign lesions
Hysterosalpingography: Irreplaceable Study
All Day Location: OB Community, Learning Center

Participants
Melissa Buenrostro, MD, Mexico City, Mexico (Presenter) Nothing to Disclose
Diana Susana Jimenez Paez 1, MD, Mexico, Mexico (Abstract Co-Author) Nothing to Disclose
Kenji Kimura, MD, Mexico City, Mexico (Abstract Co-Author) Nothing to Disclose
Sergio A. Ciales Vera, MD, Mexico, Mexico (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
- Show hysterosalpingography as a useful fluoroscopic procedure to investigate infertility causes, and as a commonly performed examination instead of modern studies (TC-RM-HYSTEROscopic).- In this article, we review the technique, principal indications, contraindications and associated pathology.- We will discuss the advantages of carrying out the hysterosalpingography for the study of uterine pathologies over other studies.- Learn about the morphology of the uterine cavity, the patency of the fallopian tubes and most of their associated pathologies.- The main purpose of this technique nowadays is infertility diagnosis. "Assessment of fallopian tube occlusion"

TABLE OF CONTENTS/OUTLINE
1. Introduction. 2. Technique (Innovations in the technique and equipment used in hysterosalpingography). 3. Indications. 4. Principal pathology, how to diagnose normal hysteroGram, pelvic inflammatory disease, intrauterine adhesions, myomas or polyps, adenomyosis congenital abnormalities and tube occlusion. 5. Conclusions
TEACHING POINTS

1. How to diagnose uterine neoplasms and triage the patient to the appropriate therapy. 2. Recognition of key imaging features that will help the radiologist identify fibroid mimics at triage and at follow-up. 3. Review of FIGO classification and uterine fibroid subtypes. 4. Imaging features associated with treatment efficacy of therapeutic interventions.

TABLE OF CONTENTS/OUTLINE

1. Comprehensive decision tree used at triage to assess further management of uterine neoplasms. 2. Review of common uterine fibroid mimics and incidental uterine neoplasms seen at triage. 3. Review of diagnostic imaging features of uterine fibroid subtypes (hyperccellular, classical, cystic degeneration, red degeneration) and the appropriate interventional therapy for each subtype. 4. Review of FIGO classification of uterine fibroids and which therapies are most amenable to each type. 5. Sample cases of imaging features associated with the treatment efficacy of various interventional therapies (MRgFUS, RF ablation, UAE, myomectomy, hysterectomy). 6. Summary and references
** TEACHING POINTS **

- Review the overview and current classification of endometrial cancer.
- Describe the typical MR imaging appearances of type 1 and type 2 endometrial cancer.
- Recognize the associated diseases such as Lynch syndrome and Cowden disease.
- Identify the common appearance on MR imaging of other mimicking diseases.
- Comprehend the role of DWI for its clinical utility and predicting outcome.

** TABLE OF CONTENTS / OUTLINE **

- Overview of endometrial cancer
- Current classification of endometrial cancer: type 1 and type 2 endometrial cancer
- MR imaging of type 2 endometrial cancer
- Associated diseases with endometrial cancer: Lynch syndrome, Cowden disease
- Endometrial cancer arising from adenomyosis
- Peritumoral enhancement (PTE) mimicking subendometrial enhancement (SEE)
- Other diseases mimicking endometrial cancer: endometrial polyp, adenomyomatous polyp, adenosarcoma, carcinosarcoma, endometrial stromal sarcoma
Fertility Preservation in Women with Gynecological Cancers: Review of Fertility Sparing Techniques and Role of MR Imaging

Awards
Certificate of Merit

Participants
Joanna G. Escalon, MD, New York, NY (Presenter) Nothing to Disclose
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Evis Sala, MD, PhD, New York, NY (Abstract Co-Author) Nothing to Disclose
Yuliya Lakhman, MD, New York, NY (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
Gynecological cancers are often found in reproductive-age women. Early cancer detection and better treatment protocols have made fertility preservation an integral component of the treatment selection and execution. Magnetic resonance imaging (MRI) is central to proper patient selection prior to the fertility-sparing procedures by helping to characterize sonographically indeterminate adnexal masses and to evaluate disease extent in early-stage cervical, endometrial cancers, and gestational trophoblastic tumors (GTD). Radiologists should be familiar with various fertility-sparing approaches, their eligibility criteria, and key findings to be included in the MRI report. This knowledge is essential for radiologists to serve as effective clinical consultants. Teaching points:
1. Review fertility-sparing options available to women with select ovarian tumors, early-stage cervical and endometrial cancers, and GTD.
2. Illustrate the vital role of MRI for proper patient selection.
3. Highlight how radiologists can add value with their imaging reports.

TABLE OF CONTENTS/OUTLINE
1. Ovaries (a. Fertility Sparing Methods and Eligibility Criteria, b. Imaging Pearls)
2. Uterus (a. Fertility Sparing Methods and Eligibility Criteria, b. Imaging Pearls)
3. Cervix (a. Fertility Sparing Methods and Eligibility Criteria, b. Imaging Pearls)

Honored Educators
Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at: https://www.rsna.org/Honored-Educator-Award/

Stephanie Nougaret, MD - 2013 Honored Educator
Evis Sala, MD, PhD - 2013 Honored Educator
Christine O. Menias, MD - 2013 Honored Educator
Christine O. Menias, MD - 2014 Honored Educator
Christine O. Menias, MD - 2015 Honored Educator
Familial Tumors of the Female Genital System; Multi-Modality Imaging with Pathologic Correlation

All Day Location: OB Community, Learning Center

Participants
Yehia M. Elguindy, MD, Toledo, OH (Abstract Co-Author) Nothing to Disclose
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Khaled M. Elsayes, MD, Ann Arbor, MI (Presenter) Nothing to Disclose

TEACHING POINTS
• Describe female genital system tumors with familial predisposition and their epidemiology.
• Illustrate clinical presentations and imaging findings of these tumors.
• Discuss the germ-line mutations in hereditary cancer syndromes associated with cancers of the female genital system.
• Propose highly targeted surveillance strategies for patients with positive family history.

TABLE OF CONTENTS/OUTLINE
- Introduction
- Germ line mutations of hereditary cancer syndromes associated with cancers of the female genital tract.
- Imaging findings of female genital tract cancer that are associated with hereditary syndromes and imaging findings of the associated cancers/lesions.
- Suggested surveillance strategies for patients with positive family history of certain tumors of the female genital tract.

Summary
Several tumors of the female genital tract have been found to have genetic predisposition. In this exhibit we will review the basics of inherited susceptibilities and possible environmental co-factors, discuss surveillance for women who may be at increased hereditary risk for gynecological tumors and demonstrate the imaging findings of these tumors in both the early and late stages.

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Khaled M. Elsayes, MD - 2014 Honored Educator
Christine O. Menias, MD - 2013 Honored Educator
Christine O. Menias, MD - 2014 Honored Educator
Christine O. Menias, MD - 2015 Honored Educator
Cervical cancer is the third most common malignancy in women worldwide, and remains a leading cause of cancer-related death for women in developing countries. Familiarity with the imaging appearances of cervical cancer may assist the radiologist in providing informed counsel on this disease. The purpose of this exhibit is:

1. To provide an overview of the imaging appearance of cervical cancer and its histologic subtypes
2. To review the pathways and patterns of disease spread and its relationship with the 2009 FIGO staging system
3. To describe the treatments of cervical cancer and the role of imaging in management
4. To show entities that can mimic cervical cancer

TABLE OF CONTENTS/OUTLINE

1. Descriptions of the regional and zonal anatomy of the cervix
2. Background of cervical cancer including epidemiology, clinical presentation, and diagnostic workup
3. Multimodal imaging review with ultrasound, CT, PET-CT, and MRI of the imaging characteristics of cervical cancer and imaging findings relevant to staging and/or treatment
4. Differential diagnoses of cervical cancer
MRI of the Clitoris, Labia and Introitus

Awards
Cum Laude

Participants
Monica D. Agarwal, MD, Boston, MA (Presenter) Nothing to Disclose
Elena L. Resnick, MD, Portland, ME (Abstract Co-Author) Nothing to Disclose
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Koenraad J. Mortele, MD, Boston, MA (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
The purpose of this exhibit is: 1. To review normal MRI anatomy of the clitoris, labia and introitus. 2. To describe MRI techniques to optimize evaluation of these structures. 3. To discuss common abnormalities and unusual disorders involving these structures.

TABLE OF CONTENTS/OUTLINE
Normal MRI Anatomy Optimized MRI Techniques Tumors Benign Cellular angiofibroma Aggressive angiomyxoma/angiomyofibroblastoma Nodular fasciitis Vaginal fibroepithelial polyp Non-neoplastic cysts (Bartholin gland cyst, Skene gland cyst, Clitoral epidermal inclusion cyst) Malignant Squamous cell cancer Rectal cancer involving the introitus Anal cancer involving the introitus Metastases involving the clitoris Infectious/Inflammatory Periclitoral abscess Peri-anal fistula involving the labia Infected Bartholin gland cyst Lichen sclerosus Vascular Labial venous varicosities Iatrogenic Silicone injections in the labia Episiotomy Traumatic Major teaching points: 1. Optimized MRI techniques allow for improved visualization of the normal clitoris, labia and introitus and related disorders. 2. Specific MRI features allow differentiation of a vast array of benign and malignant conditions involving the clitoris, labia and introitus.
Adnexal Torsion - Untwisted

All Day Location: OB Community, Learning Center

Participants
Aruna R. Patil, MD, FRCR, Bangalore, India (Presenter) Nothing to Disclose
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Govindarajan J. Mallarajapata, MBBS, MD, Bangalore, India (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1. To understand the pathophysiology, types, the importance of early diagnosis of adnexal torsions2. To get acquainted with the imaging features, complications and mimics of adnexal torsion on ultrasonography, CT and MRI.

TABLE OF CONTENTS/OUTLINE
This presentation discusses the multimodality imaging approach for the diagnosis of adnexal torsion, its complications, limitations and mimics as below.
1. Clinical features, types, pathophysiology and predisposing conditions for torsion
2. Imaging features of torsion on Ultrasonography, Doppler, CT, MRI involving- normal ovary associated with physiologic cysts- ovarian neoplasms - benign and malignant- para ovarian, fimbrial cysts- subserosal fibroid
3. Special cases: - torsion in pregnancy- isolated Fallopian tube torsion
4. Complications: - secondary infection-auto amputation-massive ovarian edema-focal peritonitis
5. Mimics: - ovarian hyper stimulation syndrome- hemorrhagic / endometriotic cysts- pelvic inflammatory disease- degenerated subserosal fibroid- ectopic pregnancy
Magnetic Resonance-Based Treatment Planning for Cervical Cancer Brachytherapy

All Day Location: OB Community, Learning Center

Participants
Kelly Wepking, MD, Milwaukee, WI (Presenter) Nothing to Disclose
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Kristin A. Bradley, MD, Madison, WI (Abstract Co-Author) Author, UpToDate, Inc
Emily F. Dunn, MD, Madison, WI (Abstract Co-Author) Nothing to Disclose
Katherine E. Maturen, MD, Ann Arbor, MI (Abstract Co-Author) Consultant, GlaxoSmithKline plc; Medical Advisory Board, GlaxoSmithKline plc
Jessica B. Robbins, MD, Madison, WI (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS

- Radiation therapy, including external beam followed by intracavitary brachytherapy, is an essential component of definitive treatment of unresectable cervical carcinoma.
- Magnetic Resonance (MR)-based treatment planning yields spectacular tissue contrast allowing for optimal contouring of target structures and sparing of organs at risk.
- Familiarity with the instruments utilized for cervical cancer brachytherapy is necessary to ensure appropriate placement and to recognize complications of instrumentation.
- Appropriate image acquisition includes high spatial resolution and images oblique to the plane of the instruments.
- Progressive disease, bulky residual disease following external beam radiation, and involvement of the bladder, rectum, and/or pelvic sidewall affect brachytherapy planning.
- A multidisciplinary approach is essential for optimal patient management.

TABLE OF CONTENTS/OUTLINE

- Discuss the rationale for MR-based treatment planning in the setting of cervical cancer brachytherapy.
- Review the basic instrumentation of brachytherapy.
- Describe the principles of image acquisition.
- Image-based review of expected instrument positioning and complications following instrument placement.
- Image-based review of the anatomic features and disease characteristics that impact treatment decisions.

Honored Educators

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https://www.rsna.org/Honored-Educator-Award/

Katherine E. Maturen, MD - 2014 Honored Educator
"Ovary-acting:" Imaging of Adnexal Neoplasms and Mimics with Radiopathologic Correlation

All Day Location: OB Community, Learning Center

Participants
Amrita K. Arneja, MD, Hicksville, NY (Presenter) Nothing to Disclose
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Anthony G. Gilet, MD, New York, NY (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
Review anatomy and embryology of adnexal neoplasms. Review imaging characteristics and pathologic correlation of common and rare adnexal neoplasms. Review imaging characteristics and pathologic correlation of conditions mimicking adnexal neoplasms.

TABLE OF CONTENTS/OUTLINE
Anatomy and embryology of the ovary
Review of imaging appearance of adnexal neoplasms and mimics with pathologic correlation
1. Epithelial ovarian tumors: serous cystadenoma, cystadenocarcinoma, mucinous cystadenoma, cystadenocarcinoma, endometrioid tumour, cystadenofibroma, adenofibroma, cystadenocarcinofibroma, clear cell ovarian carcinoma, Brenner tumor, undifferentiated carcinoma, squamous cell carcinoma
2. Germ cell ovarian tumors: teratoma (mature, immature, struma ovarii, carcinoid) dysgerminoma, yolk sac tumor, embryonal carcinoma, choriocarcinoma
4. Mixed tumors: collision tumors, ovarian carcinosarcoma
5. Unique Mimics: ovarian lymphoma, metastases to the ovary, including Krukenburg tumor, tubo-ovarian abscess, endometrioma, ovarian fibroid, peritoneal inclusion cyst, abdominal mesothelioma, ovarian torsion
The Leiomyosarcoma Challenge: The Potential Role of MR Imaging

All Day Location: OB Community, Learning Center

Participants
Danielle O. DeMulder, MD, Washington, DC (Presenter) Nothing to Disclose
Susan M. Ascher, MD, Washington, DC (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS

Leiomyomas (L) are ubiquitous and exert a heavy economic burden in the US. In 2014, the FDA reported the prevalence of unsuspected uterine LMS in women being treated for L was 1/498—markedly increased from previous data. This new prevalence, coupled with rising uterine-sparing treatments for L, underscores the need for improved pre-treatment imaging. This exhibit will focus on imaging challenges of differentiating L from leiomyosarcomas (LMS), what we know, what we don’t know, and potential future research.

TABLE OF CONTENTS/OUTLINE

Expect the Unexpected: Extraordinary Manifestations of Endometriosis

All Day Location: OB Community, Learning Center

Participants
Gary A. Dellacerra, DO, New Hyde Park, NY (Presenter) Nothing to Disclose
Barak Friedman, MD, New York, NY (Abstract Co-Author) Nothing to Disclose
John J. Hines JR, MD, New Hyde Park, NY (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
There is commonly a delay in the clinical diagnosis of endometriosis. Varying severities of menstrual pain among women often leads to low suspicion, and furthermore, endometriosis is subsequently over looked as a diagnosis when atypical manifestations arise. Our exhibit will: Discuss epidemiology, clinical presentation and work up, and complications of endometriosis Demonstrate unique cases from our institution which exemplify the diverse and unusual manifestations/complications of endometriosis Provide pearls for the body imager related to when to consider endometriosis based on these diverse cases Discuss differential considerations based on endometrial implant location and imaging appearance

TABLE OF CONTENTS/OUTLINE
Background Pictorial illustration of atypical and diverse manifestations of endometriosis seen at our institution Pearls for the body imager Differential Diagnosis Summary
Fetal Cytomegalovirus Infection of the Brain: Pre and Postnatal Ultrasound and Magnetic Resonance Imaging

All Day Location: OB Community, Learning Center

Participants
Manuel Recio Rodriguez, Pozuelo de Alarcon, Spain (Presenter) Nothing to Disclose
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Vicente Martinez De Vega, MD, Madrid, Spain (Abstract Co-Author) Nothing to Disclose
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Begona Adiego, Alcorcon, Spain (Abstract Co-Author) Nothing to Disclose
Cecilia Garcia Villafane, MD, Madrid, Spain (Abstract Co-Author) Nothing to Disclose
Silvia Badillo, Las Rozas, Spain (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS

-- MR imaging can add information regarding brain anomalies in fetuses with CMV infection, even when US examination results appear to be normal.- Pre and postnatal MR imaging plays an important role in the detection of cortical anomalies.- Lissencephaly and pachygyria are associated with a neurologic outcome worse than that associated with polymicrogyria in patients with congenital CMV infection, and their presence is indicative of early fetal infection.- MR imaging has higher sensitivity than US in the detection of polar temporal lesions and microencephaly.

TABLE OF CONTENTS/OUTLINE

Cytomegalovirus (CMV) is the most common cause of intrauterine infection. Fetal infection results from transmission of the virus across the placenta and is particularly common in women who experience primary infection during pregnancy. CMV is most harmful to the fetus when the mother experiences a primary infection. The purpose of this exhibit is: 1. To review prenatal US and MRI findings characteristic of congenital cytomegalovirus infection, with particular emphasis on their time of appearance, frequency and specificity. 2. To describe postnatal transfontanellar ultrasound examination findings of congenital cytomegalovirus infection. 3. To explain the utility of postnatal MRI particularly in the diagnosis of cortical malformations.
**Multiparametric MR Imaging in Cervical Cancer: Emphasis on Functional Techniques**

All Day Location: OB Community, Learning Center

**Participants**
Andres Lopez Carballeira, MD, Santiago de Compostela, Spain (Presenter) Nothing to Disclose
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Ines Sanchez Paniagua, Santiago de Compostela, Spain (Abstract Co-Author) Nothing to Disclose

**TEACHING POINTS**
To describe both morphological and functional techniques available in cervical cancer. To explain the principles of each technique in an easy way. To discuss the role of the morphological and functional techniques in cervical cancer. To discuss in which specific clinical situations are these techniques useful. To describe diagnostic pearls and potential pitfalls related to the use of these functional techniques for cervical cancer assessment.

**TABLE OF CONTENTS/OUTLINE**
- Role of MRI in cervical cancer.
- Current indications for MRI in the patient with cervical cancer.
- MRI protocol.
- Morphological techniques.
  - T1-weighted imaging.
  - High-resolution T2-weighted imaging.
- Functional techniques.
  - Diffusion-weighted imaging (DWI).
  - Dynamic contrast-enhanced MRI (DCE-MRI).
  - Intrinsic susceptibility-weighted or blood oxygen level-dependent (BOLD) MRI.
  - MR spectroscopy (MRS).
- Role of morphologic imaging in cervical cancer.
- Role of DWI in cervical cancer.
- Role of DCE-MRI in cervical cancer.
- Role of intrinsic susceptibility-weighted BOLD MRI in cervical cancer.
- Role of MRS in cervical cancer.
TEACHING POINTS

The most likely places to find the ectopic pregnancy are in portions of the fallopian tube. Rare sites include: ovarian, cornual, cervical, caesarean scar, intraabdominal, and heterotopic pregnancy. It is important to understand and recognize the different stages of ectopic pregnancy. As the pregnancy evolves, the risk of rupture increases, which could result in massive hemorrhage and hypovolemic shock. Transvaginal US is generally the imaging method of choice for the diagnosis of ectopic pregnancy. CT and mainly MRI are better able to solve cases, and they provide important data to identify the stage of pregnancy, indicating the imminent risk of collapse, while also allowing imaging follow-up after therapy.

TABLE OF CONTENTS/OUTLINE

1- Risk factors for ectopic pregnancy
2- Diagram of the various locations of ectopic pregnancy
3- US, 3D US, MRI and CT findings by location:
   3.1- Fallopian tube (ampulary, isthmic, fimbrial, interstitial)
   3.2- Ovarian
   3.3- Cornual
   3.4- Cervical
   3.5- Caesarian Scar
   3.6- Intraabdominal
   3.7- Heterotopic pregnancy
4- Different stages of ectopic pregnancy
   4.1- first weeks
   4.2- second trimester
   4.3- hemoperitoneum after rupture
   4.4- post methotrexate therapy
   4.5- post surgical therapy
5- Discussion and Conclusions
Awards
Certificate of Merit

Participants
Aman Khurana, MD, San Diego, CA (Presenter) Nothing to Disclose
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Denis Levy, MD, San Diego, CA (Abstract Co-Author) Nothing to Disclose
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TEACHING POINTS
Fetal cardiac screening required by national guidelines (AIUM, ACR, ACOG & SRU) consist of four chamber, right ventricular outflow tract, and left ventricular outflow tract. The three vessel view is also often used in screening. These views are essential for a complete evaluation of fetal heart. We present an exhibit with easy to understand diagrams and simple methodology for a step-wise approach to fetal cardiac screening sonography. The evaluation begins with investigating the situs of the fetus, followed by a four chamber view to evaluate the atria and ventricles including the atrioventricular valves. The right and left ventricle outflow tracts, added in 2013, are essential for assessment of aorta and pulmonary artery. Finally the three vessel view which demonstrates pulmonary artery, aorta and superior vena cava in a single view is important for diagnosis of coarctation of aorta, tetralogy of Fallot and other congenital heart pathologies. With the help of this exhibit, we hope to simplify fetal cardiac screening sonography and help those doing ultrasound screening of pregnancies to make early diagnosis of significant congenital heart disease.

TABLE OF CONTENTS/OCCULTE
A. Introduction
B. Fetal Cardiac Screening views- "How To's"
C. Diagnosing the abnormalities
D. Future direction
Awards
Certificate of Merit

Participants
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TEACHING POINTS
1. To recognize the uptake pattern of FDG in PET-CT and MRI techniques. 2. To know the optimal planning for therapy of uterine cancer and ovarian cancer on PET-CT and MRI. 3. To make knowledge accessible by questions and answers for gynecological imaging.

TABLE OF CONTENTS/OUTLINE
1. Anatomy of uterus, ovary and other intrapelvic organs. 2. Value of PET-CT and MRI in characterizing ovarian cancer a) Additional value of PET-CT for the differential diagnosis of ovarian tumor b) Role of the preoperative diagnosis of ovarian cancer c) Fusion of PET and MRI d) Integrated PET-MR equipment 3. Value of PET-CT for staging and therapeutic response of gynecological cancers (The essential points are highlighted in the discussion of each case.) a) Uterine cervical cancer b) Uterine corpus cancer c) Ovarian cancer and other adnexal malignancies 4. Questions and answers in clinical situation a) Which imaging modality is appropriate for the qualitative diagnosis of ovarian mass? b) Which imaging modality is appropriate for the staging of ovarian cancer? c) Which imaging modality is appropriate for the staging of uterine cervical cancer? d) Which imaging modality is appropriate for the staging of uterine body cancer? e) Is PET appropriate for the diagnosis and follow-up of gynecological tumors?
Squamous Vulvar Carcinoma, Why Imaging? Staging, Follow-up and Practical Considerations

All Day Location: OB Community, Learning Center

FDA Discussions may include off-label uses.

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TEACHING POINTS
The primary aim of the exhibit is to take a fresh look to the anatomy of the female perineal region and to describe the normal appearance in the MRI assessment of vulvar carcinoma. The authors will also discuss the latest FIGO staging system, the new approaches to the management of the vulvar carcinoma and the current role of imaging. Finally, the reader will be able to point out the key findings of the therapeutic response evaluation and become familiar with the post-treatment changes.

TABLE OF CONTENTS/OUTLINE
Multi-Modality Imaging Features of Uncommon Gynecologic Emergencies

All Day Location: OB Community, Learning Center

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TEACHING POINTS

The purpose of this exhibit is as follows: 1.) To illustrate key imaging features that will aid in diagnosing uncommon gynecologic conditions with acute presentations. 2.) To review the clinical and laboratory data that may aid in securing the diagnosis. 3.) To highlight the relevant management implications of these rare entities.

TABLE OF CONTENTS/OUTLINE

Entities to be covered include the following: UTERUS - Uterine perforation after D and C, uterine abscess secondary to actinomycosis, torsed uterine fibroid, prolapsed uterine fibroid, retained uterine fibroid after hysterectomy, uteroenteric fistula after uterine artery embolization, small bowel obstruction after uterine artery embolization, spontaneous uterine necrosis, pyometra, uterine trauma, uterine dehiscence, uterine AVMIUD, perforating bladder, OVARY - ovary ruptured ovarian teratoma, ruptured ovarian endometrioma, ovarian abscess due to diverticulitis, inguinal hernia containing ovary, theca lutein cysts due to gestational trophoblastic disease, ovarian hyperstimulation, PREGNANCY-RELATED - ectopic pregnancy including tubal with active extravasation, bilateral, abdominal, interstitial, c-section scar and ovarian, retained products of conception, fallopian tube, pyosalpinx, tubo-ovarian abscess, Fitz-Hugh Curtis syndrome, tubal cyst with isolated tubal torsion.
Hysterosalpingography...Tubal Occlusion. What Else?

All Day Location: OB Community, Learning Center

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TEACHING POINTS

Hysterosalpingography is an old technique, but still remains the best method to evaluate fallopian tube patency. It is usually performed in the context of infertility or after tubal ligation. The aim of this exhibit is to present the radiologist with attractive hysterosalpingogram images that emphasize normal and pathologic findings, also featuring potential pitfalls.

TABLE OF CONTENTS/OUTLINE

The cases will be presented in a quiz format. Several types of uterine, tubal or peritoneal abnormalities will be presented, and common pitfalls will be addressed. Key differential diagnostic points will be highlighted. The list of cases includes:

- Congenital abnormalities: unicornuate uterus, septate uterus, arcuate uterus
- Contour abnormalities: Venous plexus opacification, adenomiosis, leiomyomas
- Filling defects: Gas bubbles, endometrial polips, synechiae
- Tubal abnormalities: Occlusion, polyps and hydrosalpinx
- Post tubal intervention: Surgical ligation, Essure devices
- Peritoneal abnormalities: Adhesions, loculations
The Mysterious Ovarian Cystic Lesions: A Suggestion for Systematic Diagnostic Approach

All Day Location: OB Community, Learning Center

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TEACHING POINTS
The ovarian cystic lesions with or without accompanying symptoms are commonly encountered in the clinical practice. The purpose of this exhibit is to figure out the approaching method for the diagnosis of frequently encountered ovarian cystic lesions based on imaging (US or CT/MR) categorization and risk stratification

TABLE OF CONTENTS/OUTLINE
We present here the systematic approach for the correct diagnosis of ovarian cystic lesion with relevant cases. Step 1. Determine the origin of the pelvic cystic mass: ovarian vs. non-ovarian. If the lesion is from ovary, then move onto the next step. Step 2. Image-based categorization of ovarian cystic lesions using US and CT/MRI Unilocular cystic lesion/ multilocular cystic lesion/ cystic and solid lesion Step 3. Risk stratification in each category. Conditions to consider: age, lesion size, tumor marker, menopausal status, presence/absence of clinical symptoms, duration of symptoms etc. Step 4. Take into account that ‘endometrioma’ can appear with a thousand faces. Endometrioma can be differential diagnosis in any of the three image-based category. In conclusion, those diagnostic algorithm and strategy would help radiologists solving the enigma of frequently encountered ovarian cystic lesions.
TEACHING POINTS

The classic appearance of a complete molar pregnancy is that of multiple intrauterine cystic sacs filling and expanding the endometrial canal due to proliferation of hydropic chorionic villi. However, the appearance of early molar pregnancy is quite variable, with small hydropic villi below the resolution of ultrasound sometimes manifesting as a solid echogenic mass, or with more subtle findings such as an irregular placenta or angulated but empty gestational sac. Partial molar pregnancies may demonstrate a range of normal or abnormal gestational products and fetal parts, in the context of minimally or markedly abnormal appearances of the chorionic plate and placenta. Complications of molar pregnancy include endogenous ovarian hyperstimulation and invasive trophoblastic disease.

TABLE OF CONTENTS/OUTLINE

Range of sonographic features of: Early and late complete molar pregnancy Early and late partial molar pregnancy Radiologic-pathologic correlation underlying the imaging findings Clinical management of molar pregnancy

Honored Educators

Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at: https://www.rsna.org/Honored-Educator-Award/

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TEACHING POINTS

Purpose: Overview of abdominal and pelvic anatomy with particular reference made to normal variants and benign pathology that can affect surgery. Review the commonest gynecological malignancies - endometrial, ovarian, and cervical - with specific reference to features that the surgeon needs to be aware of for surgical planning. Explore patterns of spread and sites of disease, discussing operability with newer radical surgical techniques. Test the understanding of these key features using real-life examples.

TABLE OF CONTENTS/OUTLINE

Background Normal abdominal and pelvic anatomy. Normal variants and benign pathology that affect surgical approach. Key imaging features that the surgeon needs to be aware of: Endometrial: fibroid disease, uterine size, depth/distance of malignant invasion, nodal disease, pelvic endometriosis. Cervical: volume of malignant disease, parametrial involvement, distance to internal os, nodal disease. Ovarian: disease sites, peritoneal/serosal disease. Interpretation pearls and pitfalls. Distant (thoracic) metastases: implications. Test your skills: real-life cases of normal variant anatomy and a variety of gynecological malignancies with an emphasis on identifying the features that definitively change surgical management.
Skeletal Dysplasias: Don’t Let It Be a Diagnostic Dilemma!

All Day Location: OB Community, Learning Center

Participants
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TEACHING POINTS
Congenital skeletal dysplasias detected in the prenatal period often present the radiologist with a diagnostic dilemma, given the numerous overlapping imaging characteristics of the hundreds of described dysplasias. This exhibit will provide the radiologist with a concise diagnostic approach for the prenatal evaluation of the most common lethal and nonlethal skeletal dysplasias. Various dysplasias will be described and illustrated using prenatal 2D and 3D ultrasound. Correlation with postnatal and postmortem radiographic and photographic will also be provided.

TABLE OF CONTENTS/OUTLINE
A diagnostic approach for the prenatal evaluation of skeletal dysplasias will be proposed, with focus on the prediction of lethal versus nonlethal dysplasias since this determining factor may affect patient management. Further characterization of commonly encountered skeletal dysplasias will be described and illustrated using 2D and 3D imaging. Post-natal and post-mortem imaging and photographic correlation will be provided. The most common dysplasias will be reviewed, include images of the following: Thanatophoric dysplasia, Campomelic dysplasia, Asphyxiating thoracic dysplasia, Chondroectodermal dysplasia, Achondroplasia, Achondrogenesis, Osteogenesis imperfecta, Diastrophic dysplasia, Chondrodysplasia punctata, Short rib dysplasias.
The Gravity of the Situation: Pregnancy Related Vascular Complications

All Day Location: OB Community, Learning Center

Awards
Certificate of Merit
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TEACHING POINTS
To review the pathophysiology and imaging findings of various vascular complications that present in conjunction with pregnancy
To describe pertinent information the radiologist provides which impacts clinical management in the peri-partum and post-partum patient

TABLE OF CONTENTS/OUTLINE
Vascular complications during pregnancy and after delivery
Pre-eclampsia and eclampsia
Pulmonary embolism
Amniotic fluid embolism
Spontaneous coronary artery dissection; Aortic dissection
Aortopathies related to pre-existing conditions
HHT related PA AVM
HELLP
Ovarian Vein Thrombophlebitis
Budd-Chiari
Dural venous sinus thrombosis; venous infarcts
Uterine AVM
Vasa Previa
Radiation considerations in pregnancy
A wide spectrum of vascular complications can arise in the peripartum or post-partum patient. It is important for radiologists to anticipate and be familiar with the imaging of the potential vascular complications in pregnant individuals and pregnancy related conditions to guide appropriate medical or surgical management.

Honored Educators
Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at: https://www.rsna.org/Honored-Educator-Award/

Christine O. Menias, MD - 2013 Honored Educator
Christine O. Menias, MD - 2014 Honored Educator
Christine O. Menias, MD - 2015 Honored Educator
Sanjeev Bhalla, MD - 2014 Honored Educator
Douglas S. Katz, MD - 2013 Honored Educator
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Gestational Trophoblastic Disease: So Much More than a Snowstorm

All Day Location: OB Community, Learning Center

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TEACHING POINTS
1- Ultrasound is the cornerstone of imaging in gestational trophoblastic disease (GTD), CT and MRI have definite role
2- Unusual forms and presentations of GTD do occur and can be diagnostically challenging
3- Review imaging features of unusual presentations and complications of gestational trophoblastic disease

TABLE OF CONTENTS/OUTLINE
I. Clinical aspects of GTD, including genetics, pathology, clinical presentation and up to date management.
II. Imaging features of various forms of GTD on US, CT and MRI
   A. Complete hydatidiform mole
   B. Partial hydatidiform mole
   C. Invasive mole
   D. Choriocarcinoma
   E. Placental-site trophoblastic disease
   F. Epithelioid trophoblastic disease
III. Unusual presentations of GTD
   A. Ectopic molar pregnancy
   B. Coexisting molar and normal pregnancy
IV. Complications of GTD
   A. Gestational trophoblastic neoplasia (GTN): diagnosis, imaging and management
   B. Uterine arteriovenous fistula
   C. Pulmonary arteriovenous fistula

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Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at: https://www.rsna.org/Honored-Educator-Award/

Akram M. Shaaban, MBBCh - 2015 Honored Educator
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Christine O. Menias, MD - 2013 Honored Educator
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**TEACHING POINTS**

Uterine cervical cancer is the third most common cancer in women worldwide. Brachytherapy is an important part of definitive radiation therapy, as it improves overall survival in patients with positive lymph nodes or a locally advanced tumor > 4 cm. Many imaging modalities have emerged for image-based brachytherapy planning. Guidelines have been developed to standardize tumoral contouring in order to improve tumor coverage and decrease dose to critical surrounding organs. Among them, MRI offers superior soft tissue contrast and is a non-irradiating modality, which makes it the method of choice to evaluate local extension, select the patients who would benefit from brachytherapy, plan the treatment and assess the treatment response. The aim of this presentation is to understand the indications, the treatment-planning method, the complications and the post-treatment aspect of MRI-based brachytherapy for cervical cancer at 3 Tesla.

**TABLE OF CONTENTS/OUTLINE**

This presentation will detail the role of the radiologist in patient selection for brachytherapy, based on pre-treatment MRI per-treatment MRI aspects and pitfalls post-treatment evaluation with 3-Tesla MRI.
TEACHING POINTS

To review the epidemiological and clinical aspects of intestinal deeply infiltrative endometriosis
To discuss about the best imaging methods to investigate intestinal lesions
To present the imaging protocols and bowel preparation for ideal results
To demonstrate imaging findings through transvaginal sonography after bowel preparation (TVSBP) and magnetic resonance imaging (MRI)
To correlate imaging with laparoscopic findings

The major teaching points of this exhibit are:
1. Hypoechoic and hypointensity infiltrative nodules on TVSBP and T2-weighted MRI respectively are the most common imaging findings of intestinal endometriosis.
2. TVSBP is the most accurate method to investigate small intestinal lesions.
3. Bowel preparation is crucial for best results.

TABLE OF CONTENTS/OUTLINE

Epidemiology of intestinal deeply infiltrative endometriosis
Clinical presentation according to different sites: ileum, cecum, appendix, descending colon, rectosigmoid colon
Current best imaging methods to investigate intestinal endometriosis: TVSBP and MRI
Imaging protocols and bowel preparation
Imaging findings: TVSBP, MRI
Laparoscopic findings
Pitfalls
Summary
Pelvic Cystic Non Ovarian Masses: How to Determine the Ethiology through MRI, Useful Tools for the Radiologist

All Day Location: OB Community, Learning Center

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**TEACHING POINTS**

Tools to determine if the cystic masses are ovarian and non-ovarian. References points are proposed to be used: 1. Origin organ 2. Peritoneal or non-peritoneal. The purpose of this exhibit is to provide a useful tool for radiologists for the classification of non ovarian masses.

**TABLE OF CONTENTS/OFFLINE**

1- Origin organ: Divide in 5 compartments in the sagittal and coronal planes: CORONAL: above and below the, Levator ani muscle. SAGITAL: Anterior: From the pubian sinfisis to the line across the vesicouterine pouch and the vesicovaginal septum. Medium: From the line across the vesicouterine pouch and vesicovaginal septum to the line across the Douglas pouch and the rectovaginal septum. Signs to define the NON ovarian cyst: Embedded Sing, Beak Sing, Phantom organ Posterior: Between the Douglas pouch and the sacro-coccyx Vascular nervous and fat tissue parcels occupied in the distal part of the recto-sigma, embryologically the presacro space contains the three embrionary tissues. 2- Peritoneal o Extraperitoneal: Extraperitoneal: A) Displace the uterus forward B) Anterior and medial displacement of the ureter and iliac vessels C) Anterior displacement of the rectum. Intraperitoneal: A) Lateral displacement of the iliac vessels, uterus and the bladder. B) Lateral or posterior ureters displace C) Lateral or posterior displacement of the ureters.
Interstitial Ectopics and 'Cornual' Pregnancies: Case Reviews, Imaging, and Outcomes

All Day Location: OB Community, Learning Center

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TEACHING POINTS
Eccentric pregnancies in the cornual region are often a diagnostic challenge for radiologists. Accurate diagnoses and reporting are critical for communication with obstetricians and patient management. Review of terminology and definitions including: interstitial, "cornual", and angular pregnancies Literature review including: incidence, risk factors, clinical presentation, diagnosis, management, and outcomes Ultrasound (US) imaging findings and pearls for the diagnoses of interstitial ectopics, angular pregnancies, and eccentric intrauterine pregnancies, including uteri with Mullerian malformations Adjunct imaging, MRI and 3D US, in indeterminate cases Case reviews to illustrate our approach to diagnosing and problem-solving potential interstitial ectopics

TABLE OF CONTENTS/OUTLINE
I. Introduction - Terminology and definitions: interstitial vs. angular vs. "cornual" pregnanciesII. Literature review of interstitial ectopics and angular pregnanciesIII. US imaging - Uterine cornua versus interstitial tubal location - Myometrial thinning < 5mm - Interstitial line signIV. Adjunct imaging for indeterminate cases - MRI - 3D US V. Case examples from our institution - Interstitial ectopics - Angular pregnancies - Eccentric intrauterine pregnancies - Mullerian malformations - Fibroids
Uterine Fibroids: Common Presentations and Rare Complications

All Day Location: OB Community, Learning Center

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TEACHING POINTS
The purpose of this exhibit is:
• To review the ultrasound, CT and MR appearances of uterine fibroids
• To highlight imaging findings of fibroid symptomatology, including menorrhagia, infertility and pelvic pain
• To introduce case examples of rare fibroid presentations including sarcomatous transformation, intravenous leiomyomatosis and benign metastasizing leiomyoma
• To illustrate complications of imaging-guided fibroid treatment

TABLE OF CONTENTS/OUTLINE
I. Background
   a. Fibroid locations
   b. Classic US, CT and MR features of uncomplicated fibroids
c. Uncommon presentations of common disease
II. Clinical Symptoms
   a. Menorrhagia
      i. Submucosal fibroids
   b. Infertility and Repetitive Pregnancy Loss
      i. Abnormal implantation
      ii. Tubal/cornual occlusion
   c. Pain
      i. Torsion
      ii. Degeneration: red, hyaline, calcific, cystic, myxoid
      iii. Prolapse
   d. Pelvic Pressure
      i. hydronephrosis
      ii. Constipation
      iii. Urinary urgency
III. Rare Complications
   a. Parasitic leiomyoma
   b. Sacromatous transformation (leiomyosarcoma)
   c. Intravenous leiomyomatosis
   d. Diffuse peritoneal leiomyomatosis
   e. Benign metastasizing leiomyoma
IV. Post-Treatment Complications
   a. Uterine artery embolization
   b. High-intensity focused ultrasound
Prevention of Iatrogenic Prematurity in Intrauterine Growth Restriction (IUGR) : Role of Doppler Ultrasonography - The Obvious and Not So Obvious Changes to Look For

All Day Location: OB Community, Learning Center

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TEACHING POINTS

1. To study the various severities of Doppler changes in IUGR versus normal pregnancies.2. To identify the appropriate timing of delivery of IUGR fetuses based on Doppler.

TABLE OF CONTENTS/OUTLINE

Definition of IUGR- Infants with birth weight below 10th centile for gestational age with abnormal uteroplacental or fetoplacental flow as seen on Doppler velocimetry. Pathophysiology of IUGR- Uteroplacental Insufficiency - major cause: pre-eclampsia. Others: Diabetes, anemia, drugs. Doppler technique to detect IUGR in obstetrics - Angle of insonation, location of sampling site in desired vessel. Doppler imaging findings of various vessels- Uterine arteries, Umbilical artery, Middle Cerebral artery, Ductus venosus, Umbilical vein- in Normal pregnancy IUGR pregnancy 5. Newer vessels under research- The Aortic isthmus, venous studies. 6. Usual sequence of doppler changes in IUGR [(Umbilical A +/- Uterine A) ? (MCA :Brain sparing and Reversal of brain sparing) ? (Venous changes)] - Preterminal events to look for. 7. How Doppler helps optimize the delivery timing. 8. How omission of Doppler study, inadequate Doppler study or low resolution of Doppler machine can lead to iatrogenic prematurity.
Fetal Facial Anomalies - Review, Etiology and Diagnosis

Awards
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TEACHING POINTS
1. Facial anomalies can be seen in isolation or as part of chromosomal or syndromic abnormalities. Diagnosis and appropriate evaluation of these anomalies helps in counseling and future management of the pregnancy and the baby postnatally. 2. This exhibit reviews the facial anomalies, reviews the appropriate techniques for diagnosis, etiology of these anomalies and discusses the management options and counseling in each of these anomalies.

TABLE OF CONTENTS/OUTLINE
1. Review the embryology of face development. 2. Review the normal anatomy of the fetal face - nose lips view, profile view and face structures. 3. Review commonly seen facial anomalies like cleft lip, micrognathia, low set ears, sloping forehead, oral teratomas etc 4. Discuss the syndromes or chromosomal anomalies linked to these specific anomalies 5. Discuss management issues related to these anomalies.
Rule-out Ectopic - A Resident’s Guide to Making the Right Call

All Day Location: OB Community, Learning Center

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TEACHING POINTS

Ectopic pregnancy is the overall leading cause of first trimester maternal mortality, and can result in maternal hemorrhage if unrecognized or undiagnosed. "Rule-out" ectopic is a common indication for pelvic ultrasound examinations referred through the Emergency Department. These cases can be challenging, particularly for the radiology trainee, due to the acuity of presentation and treatment implications based on radiographic findings. Knowledge of normal intrauterine pregnancy and abnormal findings, including the various possible locations of ectopic pregnancy and their medical and surgical management, is essential.

TABLE OF CONTENTS/OUTLINE

The exhibit will provide a thorough review of ectopic pregnancy including incidence, risk factors, pathophysiology, and imaging findings in a case-based quiz format. Appropriate management will be reviewed, including medical treatment (systemic or intra-gestational sac methotrexate) and surgical correlation when appropriate. Cases of ectopic locations will include tubal, interstitial (cornual), cervical, heterotopic, and within caesarean section scar.
Multimodality Imaging of Cystic Lesions of Uterus and Cervix

All Day Location: OB Community, Learning Center

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TEACHING POINTS

1. To review the anatomy and normal appearance of uterus and cervix on US and MRI.
2. Analyze the clinical and imaging features of cystic and cystic-like lesions of cervix and uterus.
3. Enhance the role of morphological and functional MRI in this differential diagnosis.

TABLE OF CONTENTS/OUTLINE

1. Introduction
2. Anatomy of cervix and uterus
   3. Normal appearance of uterus and cervix - US - CT - MRI
   4. Cystic lesions of cervix
      4.1 Benign disease - Uterine cervicitis - Endocervical hyperplasia - Nabothian cyst - Tunnel cluster
      4.2 Malignant disease - Necrotic cervical carcinoma - Adenocarcinoma of cervix - Adenoma malignum
   5. Cystic lesions of uterus
      5.1 Benign disease - Cystic adenomiosis - Cystic degeneration of leiomyoma - Endosalpingiosis - Congenital mesonephric or paramesonephric cyst - Abscess - Hematoma
      5.2 Malignant disease - Necrotic adenocarcinoma - Leiomyosarcoma - Other sarcomas - Other tumors
3. Conclusions

Honored Educators

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Christine O. Menias, MD - 2013 Honored Educator
Christine O. Menias, MD - 2014 Honored Educator
Christine O. Menias, MD - 2015 Honored Educator
Akram M. Shaaban, MBBCh - 2015 Honored Educator
MRI of Uncommon Uterine Malignancies: Beyond Endometrial Adenocarcinoma

All Day Location: OB Community, Learning Center

Participants
Antonio Luna, MD, Jaen, Spain (Presenter) Nothing to Disclose
Lidia Alcala, MD, Jaen, Spain (Abstract Co-Author) Nothing to Disclose
Jordi Broncano, MD, Cordoba, Spain (Abstract Co-Author) Nothing to Disclose
Mariano Volpacchio, MD, Buenos Aires, Argentina (Abstract Co-Author) Nothing to Disclose
Akram M. Shaaban, MBCh, Salt Lake City, UT (Abstract Co-Author) Nothing to Disclose
Christine O. Menias, MD, Scottsdale, AZ (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS

1. Review the clinical and imaging features of uterine malignancies other than endometrial carcinoma
2. Enhance the role of morphological and functional MRI in their differential diagnosis

TABLE OF CONTENTS/OUTLINE

1. Introduction
2. MRI protocol
3. Clinical and MRI features of malignancies of the uterus other than endometrial cancer
   3.1 Uterine sarcoma
      3.1.1 Mixed sarcomas - malignant mixed Mullerian tumour - carcinosarcoma of the uterus: 50-70% - mixed uterine leiomyosarcoma and - endometrial stromal sarcoma
      3.1.2 Pure sarcomas - uterine leiomyosarcoma - endometrial stromal sarcoma - fibrosarcoma - rhabdomyosarcoma - liposarcoma - angiosarcoma - leiomyosarcoma
   3.2 Gestational trophoblastic tumours - Choriocarcinoma
   3.3 Uterine lymphoma - Primary - Secondary involvement
   3.4 Secondary direct involvement of the uterus by: - Cervical carcinoma - Vaginal carcinoma - Tubal Carcinoma - Colorectal carcinoma - Bladder carcinoma
   3.5 Hematogenous metastases
4. Conclusions

Honored Educators

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Christine O. Menias, MD - 2013 Honored Educator
Christine O. Menias, MD - 2014 Honored Educator
Christine O. Menias, MD - 2015 Honored Educator
Akram M. Shaaban, MBCh - 2015 Honored Educator
Multimodality Perspective of Acute Uterine Pathologies in the Emergent Setting

All Day Location: OB Community, Learning Center

Participants
Kira Melamud, MD, Boston, MA (Presenter) Nothing to Disclose
Jennifer W. Uyeda, MD, Boston, MA (Abstract Co-Author) Nothing to Disclose
Stephan W. Anderson, MD, Boston, MA (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1. The learner will be familiarized with common and uncommon acute uterine pathologies that may be encountered in an emergency setting in specific patient populations, such as premenopausal and postmenopausal females, and women in peri-partum stage. 2. The reader will review the imaging features of acute uterine pathologies on ultrasound, CT, and MR imaging, and learn about the advantages and disadvantages of each modality in characterizing uterine emergencies.

TABLE OF CONTENTS/OUTLINE
Introduction Description of available imaging modalities for evaluation of suspected uterine emergencies, including US, CT, and MRI. Clinical Examples of Uterine Emergencies would include, but not limited to: First trimester uterine emergencies - including cervical and interstitial ectopic pregnancies on US and MR imaging Post-partum uterine emergencies - including uterine rupture, retained products of conception Post-operative and post-instrumentation emergencies - including uterine abscesses, arteriovenous fistula Malignancy-related uterine emergencies - including pyometra in the setting of malignant cervical stenosis Uterine device-related emergencies - including IUD expulsion, IUD embedment, IUD related uterine perforation, IUD with intrauterine gestation. Uterine leiomyoma related pain/emergencies Pelvic inflammatory disease/endometritis
Value of PET-CT in Gynaecological Malignancy: A Literature and Pictorial Review

All Day Location: OB Community, Learning Center

Participants
Reena Aggarwal, MBBS, BSc, Leicester, United Kingdom (Presenter) Nothing to Disclose
Yvette Griffin, MBCH, Leicestershire, United Kingdom (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS

Conventional cross sectional imaging (CT/MR) has limitations in gynaecological malignancy including detection of nodal metastases and peritoneal disease. PET-CT offers a functional, whole body assessment and can be beneficial when CT/MR is negative or inconclusive. It has a role in staging disease, assessing treatment response, detecting recurrence, prognosis and in optimising radiotherapy planning, with significant impact on patient management. PET-CT can also detect clinically significant, unsuspected non-gynaecological disease. Accuracy of PET-CT can be affected by adjacent rectal and bladder activity. Detection of nodal micrometastases and interpretation of false negative results can also be challenging. If clinical suspicion is high, surgicopathological correlation is most appropriate.

TABLE OF CONTENTS/OUTLINE

Role of cross sectional imaging in the evaluation of gynaecological malignancies including diagnosis, staging, restaging, surveillance and surgical planning. Circumstances in which PET-CT can add value and impact on patient management with review of literature based evidence. Circumstances where PET-CT is unlikely to be of benefit. Use of PET-CT and subsequent clinical impact (or lack of) at our institution with pictorial examples. Limitations and potential pitfalls of PET-CT with pictorial examples.
But It’s not the Appendix: Mimics of Acute Appendicitis in Pregnancy

All Day Location: OB Community, Learning Center

Participants
Alison R. Hart, MD, Providence, RI (Presenter) Nothing to Disclose
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Ana P. Lourenco, MD, Providence, RI (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
Review the physiologic and anatomic changes in pregnancy which make the accurate diagnosis of right sided pain challenging
Review imaging considerations in pregnant patients in regards to minimizing dose Draw on examples from 150 pregnant patients over a 15 year period to illustrate US and MRI findings of common alternative diagnoses that mimic the clinical presentation of acute appendicitis

TABLE OF CONTENTS/OUTLINE
Illustrate the diagnostic dilemma posed by right sided pain in pregnancy a. Inaccuracy of physical exam secondary to anatomic changes b. Nonspecific leukocytosis c. Role of imaging in accurate diagnosis Achieving accurate diagnosis with minimal radiation a. US and MRI as first line modalities b. Low-dose CT reserved for cases where alternative imaging modalities are non-diagnostic
CT Virtual Hysterosalpingography: How “To Do” It

All Day Location: OB Community, Learning Center

Participants
Patricia M. Carrascosa, MD, Buenos Aires, Argentina (Presenter) Research Consultant, General Electric Company
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Mariano Baronio, Buenos Aires, Argentina (Abstract Co-Author) Nothing to Disclose
Jimena B. Carpio, MD, Buenos Aires, Argentina (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1. To review the indications, diagnostic imaging, potential benefits and limitations of performing a CT virtual hysterosalpingography in the infertile patient.

TABLE OF CONTENTS/OUTLINE
Multiparametric MRI of the Uterus: A Primer

All Day Location: OB Community, Learning Center

Participants
Chiedozie A. Mkpolulu, MD, Springfield, MA (Presenter) Nothing to Disclose
Dmitry Rakita, MD, Glastonbury, CT (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1. To review the anatomy of the uterus, including normal zonal anatomy on MRI. 2. To review pelvic MRI protocols utilized in imaging of the uterus and their variations for different applications. 3. To review the clinical features, staging and imaging appearances of benign and malignant uterine neoplasms.

TABLE OF CONTENTS/OUTLINE
Complications of Gynecologic Surgery

All Day Location: OB Community, Learning Center

Awards
Certificate of Merit

Participants
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TEACHING POINTS

To review the imaging manifestations of acute complications of gynecologic surgery. To present complications after surgical treatment that is seen on imaging.

TABLE OF CONTENTS/OUTLINE
Introduction Hysterectomy Vaginal cuff dehiscence Ureteral injury Cesarean section Uterine dehiscence Ureteral injury Colporraphy Perforation Urinary bladder sling Mesh erosion Damage to surrounding structures including ureters, vagina, urinary bladder Fistulae formation Cervical Biopsy Sigmoid colon perforation Summary and conclusion.
Diagnostic and Therapeutic Strategy for Uterine Sarcomas by Advanced MR Techniques

All Day Location: OB Community, Learning Center

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

TEACHING POINTS
1. We demonstrate wide spectrum of clinical and MR manifestations of uterine sarcomas with pathologic correlation, and review the advanced MR techniques in differential diagnosis, tumor staging, and addressing therapeutic strategy according to WHO (2014) and FIGO (2009).
2. In distinguishing sarcomas from benign corpus lesions, demonstration of characteristic morphologic features on MRI, detection of hemorrhagic necrosis by susceptibility-weighted sequences (SWI/SWAN), evaluation of tumor heterogeneity by histogram analysis of ADC values, evaluation of cellular structures and density by DWI and computed DWI, and analysis of tumor metabolites by MR spectroscopy (choline for cellular proliferating activity, mobile lipid droplets for apoptosis/necrosis, creatine for myogenic components) are feasible.

TABLE OF CONTENTS/OUTLINE
Pathologic classification of uterine sarcomas (WHO 2014)
MR imaging manifestations w/ pathologic correlation
- Mesenchymal tumors: Smooth muscle tumor of uncertain malignant potential, Leiomyosarcoma, Endometrial stromal and related tumors, Miscellaneous mesenchymal tumors
- Mixed epithelial and mesenchymal tumors: Adenosarcoma, Carcinosarcoma
- Lymphoid and myeloid tumors: Lymphoma
MR staging (FIGO 2009)
Advanced MR techniques for the differential diagnosis
Clinical Impact of Reduced Field-Of-View Diffusion-Weighted Imaging in the Female Pelvis

All Day Location: OB Community, Learning Center

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

TEACHING POINTS
1. However conventional DWI can demonstrate malignant tumors as high signal intensity masses, detailed evaluation of tumor extent or internal structure of tumors is occasionally difficult due to its low spatial resolution and distortion. Reduced phase direction FOV technique by using spatially selective phase encoding gradient can offer high quality DWI with improved spatial resolution, without associated phase wrap round artifact, and with less artifacts related to motion and susceptibility common in large FOV.
2. Reduced FOV DWI is feasible in evaluating the extent of various tumors, especially assessing the depth of myometrial invasion by endometrial cancer without the use of contrast enhancement, in evaluating morphologic characteristics, presence of malignant foci, identifying the tumor origin and staging the ovarian tumors.
3. Combination of reduced FOV and computed DWI allows higher b-value images to be obtained with a good SNR and without T2 shine-through effect, and is helpful in differentiating benign and malignant lesions.

TABLE OF CONTENTS/OUTLINE
MR imaging techniques:
- Reduced FOV DWI
- Computed DWI
Clinical applications: Differential diagnosis and staging
- Endometrial tumors
- Cervical tumors
- Ovarian tumors
- Other gynecologic tumors
Technical and diagnostic pitfalls
Malignant Transformation of Pelvic Endometriosis and Adenomyosis: MR Manifestations, Mimickers, and Clues to the Differential Diagnosis

All Day Location: OB Community, Learning Center

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

TEACHING POINTS
1. Malignant transformation (MT) of ectopic endometrium is a rare complication of pelvic endometriosis and adenomyosis affecting relatively young women. Because estrogen may have a role in MT, women of reproductive era with endometriosis should be treated, or followed closely.

2. Definite MR imaging criteria of MT of endometrioma is appearance of contrast-enhanced mural nodules within endometrioma and CE-subtraction imaging is useful for detecting small nodules. Clots or decidualized nodules may show high intensity on T2WI and DWI mimicking MT, and susceptibility-weighted (SW) sequences and computed DWI (cDWI) are feasible for differential diagnosis.

3. For the diagnosis of MT of adenomyosis and solid endometriosis, DWI is useful by demonstrating high intensity malignant areas. cDWI may also helpful in distinguishing benign conditions such as decidualization, edema, or congestion from MT of adenomyosis.

TABLE OF CONTENTS/OUTLINE
Pathogenesis and histologic features of MT
MR imaging manifestations and imaging criteria of MT
- Endometrioma
- Extra-ovarian endometriosis
- Adenomyosis
Problem-solving MR techniques
- CE-subtraction
- DWI and cDWI
- SW sequences
MT mimickers and clues to the differential diagnosis
SONOGRAPHIC FINDINGS AFTER ENDOMETRIAL ABLATION

All Day Location: OB Community, Learning Center

Participants
Katrina F. Lambert, MD, Nashville, TN (Presenter) Nothing to Disclose
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Lucy B. Spalluto, MD, Nashville, TN (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1. Define indications for endometrial ablation
2. Review common complications after endometrial ablation
3. Illustrate sonographic characteristics of the post-endometrial ablation uterus

TABLE OF CONTENTS/OUTLINE
I. Review indications for endometrial ablation
   A. Menorrhagia
   B. Patient perceived menorrhagia
II. Review most common causes of long term complications after endometrial ablation, including:
   A. Inadequate endometrial destruction
   B. Endometrial re-growth
   C. Unsuspected adenomyosis
   D. Persistent or enlarging leiomyomas
   E. Endometrial polyps
III. Illustrate sonographic findings in asymptomatic post-endometrial ablation patients.
   A. Endometrial calcification
   B. Myometrial cysts
IV. Illustrate sonographic findings in symptomatic post-endometrial ablation patients, to include:
   A. Post-ablation tubal sterilization syndrome
   B. Hematometra
   C. Adenomyosis
   D. Pregnancy after endometrial ablation
Usefulness of Pelvic MRI in Female Infertility: A Pictorial Review

All Day Location: OB Community, Learning Center

Participants
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Ana Maria Garcia Morena, Arganda del Rey, Spain (Abstract Co-Author) Nothing to Disclose
Laura Cubillo Olazabal, Arganda Del Rey, Spain (Abstract Co-Author) Nothing to Disclose
Ana Isabel Fernandez Martin, Arganda del Rey, Spain (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
-To show the most frequent causes of congenital and acquired female infertility.
-To set the utility of pelvic MRI in the diagnosis and treatment of women infertility.
-To review selected cases performed in our hospitals.

TABLE OF CONTENTS/OUTLINE
SAMPLE CASES. CONCLUSION.
Imaging in the Workup of Female Infertility

All Day Location: OB Community, Learning Center

Participants
Stephanie N. Histed, MD, Los Angeles, CA (Presenter) Nothing to Disclose
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Cecilia M. Jude, MD, Los Angeles, CA (Abstract Co-Author) Author, UpToDate, Inc
Maitraya K. Patel, MD, Sylmar, CA (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
Infertility is the inability to achieve a successful pregnancy within one year of regular, unprotected intercourse. The causes of female infertility are broad and encompass a range of structural and functional entities. Imaging plays a dynamic role in the work-up of a patient with infertility. Fluency in normal and abnormal radiographic findings, criteria for diagnosis, and diagnostic implications for treatment are essential for the Radiologist.

TABLE OF CONTENTS/OUTLINE
This exhibit will provide a comprehensive review of the spectrum of female infertility with special attention to the role of diagnostic imaging based on the 2015 American College of Radiology’s Appropriateness Criteria and relevant clinical management. Surgical correlation will be provided, when appropriate. Imaging modalities will include fluoroscopy, ultrasound, saline infusion hysterosonography, and MRI. Female infertility related to etiologies of the uterine cavity (adhesions, endometrial polyps, fibroids, Müllerian duct anomalies including agenesis), fallopian tubes (adhesions including salpingitis isthmica nodosa and hydrosalpinx), ovaries (endometriosis) as well as functional hormonal conditions (polycystic ovarian syndrome, pituitary adenoma) will be reviewed.
"CHEETAHs" in the Wild: A Case-based Guide to Complex Adnexal Masses for Residents

All Day Location: OB Community, Learning Center

Participants
Stephanie Channual, MD, Los Angeles, CA (Presenter) Nothing to Disclose
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Cecilia M. Jude, MD, Los Angeles, CA (Abstract Co-Author) Author. UpToDate, Inc
Anokh Pahwa, MD, Los Angeles, CA (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS

Complex adnexal masses are common and often present as a diagnostic dilemma. Many of these complex adnexal masses require timely recognition and treatment. Therefore, it is important to have a good differential diagnostic approach to these lesions. The classic differential for complex adnexal mass is the mnemonic "CHEETAH." This mnemonic may be a helpful memory device for residents, especially for complicated cases. The purpose of this exhibit is to: Review the "CHEETAH" mnemonic (cystadenoma/cystadenocarcinoma, hemorrhagic cyst, endometrioma, ectopic pregnancy, teratoma, abscess, and hemato/hydro/pyosalpinx) and describe the specific appearances of each diagnosis Review the differentiating features of "CHEETAH"

TABLE OF CONTENTS/OUTLINE

A multimodal imaging review with ultrasound, CT, PET-CT, and MRI of the differential diagnoses for complex adnexal masses will be provided using the mnemonic "CHEETAH." The cases will be presented in a quiz format, with pre-test and post-test multiple choice questions. The questions to be answered are: (1) What is the next step in management? and (2) What is the most likely diagnosis?
Mullerian Duct Anomalies. An Imaged Based Demonstration of the 2013 European Society of Human Reproduction and Embryology (ESHRE) / European Society for Gynaecological Endoscopy (ESGE) Consensus Classification

All Day Location: OB Community, Learning Center

Awards
Certificate of Merit

Participants
Ioanna Papadopoulou, MD, London, United Kingdom (Presenter) Nothing to Disclose
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Nishat Bhanwani, MBBS, FRCR, London, United Kingdom (Abstract Co-Author) Nothing to Disclose
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Andrea G. Rockall, MRCP, FRCR, London, United Kingdom (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
The purpose of this exhibit is to:
• Understand the reasons and methods behind the development of the consensus classification.
• Develop familiarity with the '3 category' format of the new classification system.
• Be able to apply the new system to imaging and use it across a broad spectrum of modalities to include;
  - US (including 3D US)
  - Hysterosalpingography
  - MRI
• Understand the key findings to convey to the clinician when describing mullerian duct anomalies.

TABLE OF CONTENTS/OUTLINE
• Review the embryology and frequency of mullerian duct anomalies.
• Describe the theory and methodology behind the development of the new classification system.
• Detailed description of the '3 category' classification with the aid of schematic demonstrations and compare this to American Society for Reproductive Medicine system.
• Demonstration of a wide range of examples of its clinical application pertaining to imaging to include both 2D and 3D US, hysterosalpingography and MRI.
• Use of imaging to highlight key areas that are of clinical importance that could determine treatment options.
• Suggested reporting proforma.
• Quiz cases for individual practice.
• Summary.
Tumor and Tumor-like Lesions of the Ovary: Uncommon MR Imaging Findings and Rare Pathological Entity

All Day Location: OB Community, Learning Center

Participants
Megumi Matsuda, Saitama, Japan (Abstract Co-Author) Nothing to Disclose
Eito Kozawa, MD, PhD, Hidaka, Japan (Presenter) Nothing to Disclose
Kousei Hasegawa, Saitama, Japan (Abstract Co-Author) Nothing to Disclose
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Kaiji Inoue, MD, Saitama, Japan (Abstract Co-Author) Nothing to Disclose
Fumikazu Sakai, MD, PhD, Hidaka, Japan (Abstract Co-Author) Research Consultant, AstraZeneca PLC; Research Consultant, Boehringer Ingelheim GmbH; Speaker, Eisai Co, Ltd; Speaker, Shionogi & Co, Ltd; Research Grant, Bayer AG; Research Grant, Eisai Co, Ltd; ; ;

TEACHING POINTS
To recognize uncommon imaging findings of tumor and tumor-like conditions of the ovary, with emphasis on MR images. To learn key points of MRI findings is useful for accurate diagnosis of the tumor and tumor-like conditions of the ovary.

TABLE OF CONTENTS/OUTLINE
1. Key differential diagnostic points (high signal intensity on T2-weighted images, T2-weighted early, high signal intensity on early phase of contrast enhanced study, cystic areas in the polypoid lesion etc.) for polypoid endometriosis, synchronous mucinous metaplasia and neoplasia of the female genital tract, endometrial stromal sarcoma, endometrioid adenocarcinoma resembling sex-cord tumor, Sertoli-Ledig tumor etc., will be highlighted for each case. 2. Diagnostic points with illustrative cases.
TEACHING POINTS

1-There are currently several prenatal genetic screening methods in use 2-List the current available methods, and describe what they are used for 3-Describe the implication of the results and how they would affect initial prenatal imaging, follow up imaging, and the role of radiologist in patient care

TABLE OF CONTENTS/OUTLINE

1-describe the current prenatal genetic screening methods and their associated ultrasound imaging components. Non-invasive: first trimester screening, second trimester quad screening, 2-step integrated screening, cell free DNA; Invasive: CVS, amniocentesis, cordocentesis2-Describe the implication of the results on prenatal anatomical survey during first and second trimester for singleton and multiple pregnancies3-Describe the implications of the results on prenatal imaging and clinical follow up4-Describe the role of radiologist as a member of high-risk obstetric care

Summary: After reviewing this exhibit, the reader would understand the various prenatal genetic screening processes, and be able to define the radiologist’s role in the team taking care of the patient

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Mariam Moshiri, MD - 2013 Honored Educator
Mariam Moshiri, MD - 2015 Honored Educator
Theodore J. Dubinsky, MD - 2012 Honored Educator
Theodore J. Dubinsky, MD - 2013 Honored Educator
Puneet Bhargava, MD - 2015 Honored Educator
TEACHING POINTS

This exhibit explores the basic principles of fetal ultrasound safety. A review of literature pertaining to effects of different ultrasound techniques on the developing fetus and discussion of scientific evidence will be explored. Past and present guidelines for ultrasound evaluation will be detailed.

TABLE OF CONTENTS/OUTLINE

I. Review of basic ultrasound principles and the potential biological effects of nonionizing radiation
II. Review of the different imaging techniques used in fetal ultrasound
III. Review of ultrasound as a tool to evaluate the pregnant patient
   A. Discussion of the decision making process and ALARA
   B. Discussion of ACR appropriateness criteria
   C. Discussion of emerging imaging techniques
IV. Review of potential biological effects of ultrasound on the developing fetus
   A. Detailed review of scientific studies of the effects of ultrasound on developing fetus
   B. Explanations of deleterious effects of ultrasound on fetal development
V. Review of ultrasound use for non-medical imaging
   A. Review of ethical debate surrounding use of ultrasound for non-medical commercial imaging
   B. Review of professional guideline statements regarding use of ultrasound in non-medical imaging
VI. Multiple choice quiz, answers and explanations reviewing critical educational objectives
Don't be Afraid of the Blood: A Practical Approach to Placental Abnormalities in US and MRI

Participants
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Heron Werner, MD, Rio de Janeiro, Brazil (Abstract Co-Author) Nothing to Disclose
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Taisa D. Gasparetto, MD, PhD, Rio de Janeiro, Brazil (Abstract Co-Author) Nothing to Disclose
Pedro T. Castro, Rio de Janeiro, Brazil (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
Placenta accreta is a general term to different degrees to the abnormal decidual adherence (accreta vera), invasion of the myometrium (increta) or extraterine structures (percreta). It is a severe obstetrical complication and is one of the main causes of obstetrical hemorrhages. The risk factors for accretism are: multiparity, previous cesarian, placenta previa, endometrial scars and manual extraction of the placenta. Ultrasound (US) is the best tool for screening, but the magnetic resonance imaging (MRI) imaging is also used specially when the degree of placenta accreta is a challenge on US. MRI may better delineate the chorionic villi attachment. Radiologists have to be aware of the imaging signals and the pitfalls of placental accretism on US and MRI, to decrease maternal morbidity and mortality.

TABLE OF CONTENTS/OUTLINE
1- Definition and classification
2- US and MRI protocols to placental examination
3- The normal US and MRI appearance of the placenta
4- Placenta accreta, increta and percreta - US and MRI findings and examples
5- Placenta previa - US and MRI findings and examples
6- Pitfalls
7- Management
8- Interventional radiology
9- Discussion and conclusions
Participants
Elena Canales Lachen, Madrid, Spain (Abstract Co-Author) Nothing to Disclose
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Veronica Munoz Carpio, Madrid, Spain (Abstract Co-Author) Nothing to Disclose
Vicente Martinez De Vega, MD, Madrid, Spain (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
Review the most common clinical scenarios
Review the most relevant clinical and treatment elements, so that the radiologist is valuable in making decisions
Knowing the role of different imaging techniques, with emphasis on MRI, adding advanced techniques and combination with PET-CT

TABLE OF CONTENTS/OUTLINE
Diagnostic imaging is critical in the staging of all gynecologic neoplasms and can help ensure that the proper therapy is administered. In this educational exhibit, using a format quiz, we explained in a didactic and reasoned way some clinical cases presented in our multidisciplinary committee gynecology, showing how they have been resolved or evolved, and the questions asked by different specialists (surgeons, oncologists, radiotherapists) to establish a correct patient management and appropriate radiological report.
Current Concepts of Adenomyosis

All Day Location: OB Community, Learning Center

Participants
Roberto Blasbalg, MD, Sao Paulo, Brazil (Presenter) Nothing to Disclose
Carolina C. Rossi, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
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Gustavo Pinto, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Leandro A. Mattos Sr, MD, PhD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS

1. Definition, pathophysiology and classification.
2. Clinical relevance in infertility.
3. Review typical and atypical forms using transvaginal ultrasound and MRI, including cystic adenomyosis and subserous adenomyosis.
4. Discuss some related diseases: deep endometriosis, ovarian endometrial neoplasms.
5. Physiologic modifications during menstrual cycle that mimic adenomyosis.

TABLE OF CONTENTS/OUTLINE

1. Review of definition, pathophysiology and classification of adenomyosis.
2. Discussion of clinical relevance in infertility.
3. Review imaging examples of typical and atypical adenomyosis.
4. Cases that mimic adenomyosis during menstrual cycle.
5. Review associated diseases including deep endometriosis and ovarian neoplasia.
6. Summary and take home message.
Female Reproductive Organs Through the Life Cycle: An MR Imaging Review

All Day Location: OB Community, Learning Center

Participants
Sabrina O. Bernal, MD, Rio de Janeiro, Brazil (Presenter) Nothing to Disclose
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Dafne D. Melquiades, Rio de Janeiro, Brazil (Abstract Co-Author) Nothing to Disclose
Erick S. Hollanda, 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

TEACHING POINTS
1. Recognize the MR imaging features of the female reproductive organs related to hormonal influence from birth through the post-menopausal years.2. Describe the diagnostic clues for benign physiologic changes that mimic pathologic processes on MR images.

TABLE OF CONTENTS/OUTLINE
1. Describe the influence of hormones on the female reproductive organs during the menstrual cycle, pregnancy and puerperium, childhood, puberty and after menopause. 2. Review the normal MR imaging appearance of uterus and ovaries during these physiologic states.3. Illustrate some physiologic changes in normal female reproductive tract that mimic pathologic conditions.
Endometriosis is a very common disease of young women of reproductive age group. It is defined as the presence of functional endometrial tissue outside of the uterus. Endometriosis can occur in a wide variety of locations, ovary being the commonest. Untreated endometriosis can lead to adhesions and can be a cause of infertility. Tenderness guided transvaginal Ultrasound can be extremely useful in making the diagnosis of endometriosis, including deep pelvic endometriosis.

Teaching Points:
1. Understand the imaging spectrum of endometriosis on ultrasound, with some comparative imaging appearance on MRI.
2. Describe the diagnostic pearls for early diagnosis of endometriosis.
3. Discuss the role of tenderness guided transvaginal scanning in the accurate diagnosis.

Table of Contents/Outline
1. Pathophysiology of endometriosis.
2. Locations.
3. Imaging spectrum of ovarian endometriomas and deep pelvic endometriosis.
4. Decidualized endometrioma.
5. Sliding test/ Sliding organ sign.
Accessory Cavitated Uterine Mass: Diagnosis, Differentials and Role of Imaging: A Second Look to Mullerian Anomalies

All Day Location: OB Community, Learning Center

Participants
Nishchint Jain, MBBS, Noida, India (Presenter) Nothing to Disclose
Ritu Verma, MBBS, MD, New Delhi, India (Abstract Co-Author) Nothing to Disclose
Umesh C. Garga, MBBS, MD, New Delhi, India (Abstract Co-Author) Nothing to Disclose
Sachin K. Jain, MD, Noida, India (Abstract Co-Author) Nothing to Disclose
Mohit Gera, MBBS, Patiala, India (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS

1) To learn the diagnostic imaging features of accessory cavitated uterine mass. 2) To understand the role of various imaging modalities in differentiating ACUM from other mullerian anomalies.
I Found a Fat-containing Lesion in the Pelvis: Differential Diagnosis of Fatty Lesions in the Female Pelvis and Their Prognostic Significance

All Day Location: OB Community, Learning Center

Participants
Amer Alaref, MD, Montreal, QC (Presenter) Nothing to Disclose
Yoshiko Ueno, MD, Kobe, Japan (Abstract Co-Author) Nothing to Disclose
Vipul Bist, Montreal, QC (Abstract Co-Author) Nothing to Disclose
Morooj Al Subhi, MD, Montreal, QC (Abstract Co-Author) Nothing to Disclose
Amr S. Elnayal, MD, Cairo, Egypt (Abstract Co-Author) Nothing to Disclose
Caroline Reinhold, MD, MSc, Montreal, QC (Abstract Co-Author) Consultant, GlaxoSmithKline plc

TEACHING POINTS
To understand how to identify intra-lesional fat with US, CT and different MR imaging sequences. To differentiate extra-peritoneal from intra-peritoneal masses using anatomic landmarks. To review the pathology and prognostic significance of different types of fat-containing lesions in the female pelvis, occurring both in the peritoneal cavity and in the extra-peritoneal space. To describe the main clinical and radiological signs of the various fat-containing lesions in the pelvis. Demonstration of fat within a lesion is an important clue for narrowing the differential diagnosis. The widespread use of modern imaging modalities makes identification of fat easier.

TABLE OF CONTENTS/OUTLINE
Criteria for identification of fat (both macroscopic and microscopic) within a lesion will be detailed using cross-sectional imaging. Imaging findings, differential diagnosis, prognosis and management will be presented for fatty lesions of the pelvis. Intra-peritoneal lesions: Uterus: Lipomatous tumours Ovary: Dermoid, struma ovarii, ovarian carcinoid, immature teratoma, lipoleiomyoma Peritoneal space: Epiploic appendagitis, pelvic lipomatosis, omental infarction Extra-peritoneal lesions Presacral teratoma Extraadrenal myelolipoma Fatty lymph nodes Intra- and extraperitoneal lesions Lipoma Liposarcoma

Honored Educators
Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at: https://www.rsna.org/Honored-Educator-Award/

Caroline Reinhold, MD, MSc - 2013 Honored Educator
Caroline Reinhold, MD, MSc - 2014 Honored Educator
Multiparametric MR Imaging in Recurrent Gynecological Cancer

All Day Location: OB Community, Learning Center

Participants
Mercedes Arias, Vigo, Spain (Presenter) Nothing to Disclose
Alfonso Iglesias, MD, PhD, Vigo, Spain (Abstract Co-Author) Nothing to Disclose
Beatriz B. Nieto, MD, Vigo, Spain (Abstract Co-Author) Nothing to Disclose
Angel Nieto, Vigo, Spain (Abstract Co-Author) Nothing to Disclose
Marta Herreros, MD, Vigo, Spain (Abstract Co-Author) Nothing to Disclose
Jorge Manas, MD, Vigo, Spain (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
To describe the multiparametric MR technique in the evaluation of the pelvis in follow-up of treated patients with gynecological cancer. To assess the diagnostic value of multiparametric MRI in diagnosis and therapy planning of recurrent gynecological cancer

TABLE OF CONTENTS/OUTLINE
Technique of multiparametric MRI: Conventional MRI, Diffusion-weighted imaging (DWI), Dynamic contrast enhanced-magnetic resonance imaging (DCE-MRI) Indications of multiparametric MRI in treated gynecological cancer Sample cases compared with other imaging modalities including PET-CT Differential diagnosis Future directions Summary
Torsion of Normal Adnexa: Characteristic MR Imaging Findings Correlated with Laparoscopic Findings

All Day Location: OB Community, Learning Center

Participants
Nobuyuki Kawai, MD, Gifu, Japan (Abstract Co-Author) Nothing to Disclose
Satoshi Goshima, MD, PhD, Gifu, Japan (Abstract Co-Author) Nothing to Disclose
Haruo Watanabe, MD, Gifu, Japan (Abstract Co-Author) Nothing to Disclose
Hiroshi Kawada, MD, Gifu, Japan (Abstract Co-Author) Nothing to Disclose
Yoshifumi Noda, MD, Gifu, Japan (Abstract Co-Author) Nothing to Disclose
Hiromi Ono, MD, Gifu, Japan (Abstract Co-Author) Nothing to Disclose
Mitsuyo Teramachi, Gifu, Japan (Presenter) Nothing to Disclose
Masayuki Kanematsu, MD, Gifu, Japan (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1. Torsion of normal adnexa typically occurs in young patients. Because delay in the diagnosis of adnexal torsion results in the loss of ovarian function, urgent surgical intervention is necessary to prevent ovarian infarction and necrosis. 2. MR imaging is recommended for the diagnosis of torsion of normal adnexa followed by ultrasound especially in the young or pregnant patients without radiation exposure. Radiologists should be aware of characteristic MR imaging findings associated with torsion of normal adnexa.
Hysterosalpingography in Evaluating Infertility and for Documenting Tubal Occlusion Following Sterility Procedures

All Day Location: OB Community, Learning Center

Participants
Michael D. Redwine, MD, Houston, TX (Presenter) Nothing to Disclose
Varaha Tammisetti, MD, Houston, TX (Abstract Co-Author) Nothing to Disclose
Verghese George, MBBS, Houston, TX (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
HSG's can reliably demonstrate tubal patency in evaluating infertility. HSG’s can document tubal occlusion following sterility procedures. Many uterine anomalies can be demonstrated very well with HSG’s although HSG’s are not the primary method of evaluating those anomalies.

TABLE OF CONTENTS/OUTLINE
1. Reasons for ordering HSG’s.
2. Normal Anatomy
3. Evaluating the uterus and tubes following sterility procedures, both successful and unsuccessful
4. Evaluating sterility
5. Examples of Mullerian anomalies seen with HSG’s
6. Examples of intravasation
Participants
Karen Y. Oh, MD, Portland, OR (Presenter) Nothing to Disclose
Roya Sohaey, MD, Portland, OR (Abstract Co-Author) Nothing to Disclose
Ryan Moore, MD, Portland, OR (Abstract Co-Author) Nothing to Disclose
Thomas Gibson, MD, Portland, OR (Abstract Co-Author) Nothing to Disclose
Neda Jafarian, MD, New York, NY (Abstract Co-Author) Nothing to Disclose
Kyle Jensen, MD, Portland, OR (Abstract Co-Author) Nothing to Disclose
McKenna Belzer, MD, Portland, OR (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1) The five submitted Obstetrical Imaging cases will offer challenging ultrasound and MR images to practice visual interpretation skills, promote medical knowledge review and enhance the ability to summarize important findings to achieve a diagnosis.
Multiple Gestations: First Trimester Ultrasound Findings

TEACHING POINTS
1. Review embryology of multiple gestations. 2. Illustrate 1st trimester sonographic findings in multiple gestations. 3. Discuss importance of assigning appropriate amnionicity/chorionicity.

TABLE OF CONTENTS/OUTLINE

Go with the Flow: Fetal GU Anomalies with Pathologic, Post Natal, and Clinical Correlation

TEACHING POINTS
Congenital GU anomalies can result in oligohydramnios and other abnormalities, and can severely affect fetal development. We will review fetal GU anomalies with representative prenatal sonography and fetal MRI with pathologic correlation, and briefly review associated anomalies, syndromes, and conditions, and discuss perinatal and post-natal management. We will develop a systematic approach to diagnosis of fetal GU anomalies using ultrasound, and formulate an algorithmic clinical approach to prenatal management of these anomalies. We will earn about available new management techniques and procedures.

TABLE OF CONTENTS/OUTLINE
Briefly review normal developmental/fetal GU anatomy. Classification fetal GU anomalies: Renal, ureteric, bladder, genitai Imaging appearance of conditions such as: renal agenesis, renal ectopia, obstructive uropathy (UPJ, UVJ, megaureter, urethral), renal cystic disease (PCDK, MCDK, cystic renal dysplasia), bladder extrophy, adrenal masses, and the genital tract, with an emphasis on pre-natal and post-natal sonography, and pre-natal and post-natal MR for problem solving. Review the new consensus statement on renal pelves dilation terminology. Algorithmic approach to prenatal diagnosis as well as postnatal imaging and management. Review of intrauterine complications and treatment and prognosis of various GU anomalies.
Participants

Sub-Events

**OB108-ED-SUB1**

Review of Gynecologic Malignancies: An Update on the Pathophysiology, Multimodality Imaging Findings, and Radiologists' Roles in Management

Station #1

Participants
Nasim R. Khadem, MD, Los Angeles, CA (Presenter) Nothing to Disclose
Suzanne L. Palmer, MD, San Gabriel, CA (Abstract Co-Author) Nothing to Disclose
Daphne K. Walker, MD, Los Angeles, CA (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
To review gynecologic (gyn) cancers, which are commonly encountered in clinical practice
To review current updates in pathophysiology and treatments
To review multimodality (MM) imaging findings and staging with select path correlation
To discuss additional roles of the radiologist, including re-staging, surveillance, and recognizing treatment-related changes, which will help the radiologist communicate with the gyn-oncologic surgeon and facilitate patient management
To recognize atypical appearances of gyn cancers and their mimics on MM imaging to reduce interpretation errors and improve patient outcomes

TABLE OF CONTENTS/OUTLINE
Introduction
- Ovarian CA
- Pathophysiology
- MM imaging
- Radiologist's roles

Ovarian CA Mimics

Endometrial CA
- Pathophysiology
- MM imaging
- Radiologist's roles
- Special considerations in pregnant patients
- Atypical 'Don't Miss' cases from our institution
- Krukenberg tumor
- Choriocarcinoma
- Endometrial stromal cell sarcoma

Fallopian tube CA
- Summary

**OB143-ED-SUB2**

The Postpartum Uterus: A Multimodality Review

Station #2

Participants
David M. Valenzuela, MD, San Francisco, CA (Presenter) Nothing to Disclose
Spencer C. Behr, MD, Burlingame, CA (Abstract Co-Author) Research Grant, General Electric Company; Consultant, General Electric Company
Liina Poder, MD, San Francisco, CA (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1. Describe the variable imaging appearance of the normal post-partum uterus on ultrasound, CT, and MRI.
2. Review the imaging appearance of the most common complications of the post-partum uterus using a multimodality approach.

TABLE OF CONTENTS/OUTLINE
Normal Uterine Appearance
- Ultrasound
- CT
- MR

Hemorrhage
- Uterine Atony
- Incomplete Delivery of the Placenta
- Retained Products of Conception
- Incomplete Involution of the Placental Site
- Arteriovenous Malformations
- Infection
- Endometritis
- Abscess
- Pelvic Septic Thrombophlebitis

Neoplasm
- Gestational Trophoblastic Disease
- Differentiating Hemorrhage, RPOC, and Gestational Trophoblastic Disease
- 5.
- Post C-section Imaging
- Early Complications
- Endometritis
- Wound infection
- Uterine Dehiscence
- Ureter Injury

Late Complications
- Endometriosis at Scar Site
- C-section Ectopic Placenta
- Accreta
RC110A  Uterus and Endometrium

Participants
Ruth B. Goldstein, MD, San Francisco, CA (Presenter) Nothing to Disclose

LEARNING OBJECTIVES
1) Be able to state the acceptable standards for endometrial assessment in women with abnormal vaginal bleeding. 2) Be able to recognize a uterine abnormality in a postmenopausal woman that warrants further evaluation including tissue sampling or MRI. 3) Be able to recognize and diagnose adenomyosis.

Active Handout: Ruth Beth Goldstein

RC110B  Ovarian Masses

Participants
Phyllis Glanc, MD, Toronto, ON (Presenter) Nothing to Disclose

LEARNING OBJECTIVES
1) Evaluate critical ultrasound features of adnexal masses that permit stratification into benign, indeterminate or suspicious for malignancy. 2) Incorporate the role of guidelines, consensus statements, risk prediction algorithms and serum biomarkers. 3) Consider the role of alternate imaging modalities such as MRI, CT, PET-CT. 4) Utilize appropriate management strategies.

ABSTRACT
There remains a gap between the state of the knowledge and translation into practice for the diagnosis and management of adnexal masses. Pelvic ultrasound remains the primary imaging modality in the greater majority of cases. Most ovarian masses can be correctly classified on the basis of their ultrasound characteristics, nonetheless many masses that are ‘almost certainly benign’ or even ‘indeterminate’ come to prompt surgical exploration, which is not always appropriate or without its potential risks. This session will explore further these characteristic findings but also will evaluate the role of serial ultrasound, additional modalities such as MR or CT, serum biomarkers, strategies such as IOTA simple rules and optimization of referral patterns.

Active Handout: Phyllis Glanc

RC110C  Endometriosis

Participants
Luciana P. Chamie, MD, PhD, Sao Paulo, Brazil (Presenter) Nothing to Disclose

LEARNING OBJECTIVES
1) Define clinical and epidemiological aspects of endometriosis. 2) Define the importance of imaging mapping for endometriosis before clinical counseling. 3) Apply the most appropriate technique to investigate endometriosis. 4) Define the bowel preparation required for the transvaginal ultrasound to investigate endometriosis. 5) Apply the imaging algorithm to map deeply infiltrative endometriosis. 6) Assess the ultrasonographic findings of deeply infiltrative endometriosis in the most common sites such as bladder, vesicouterine pouch, retrocervical space, vagina, ureters, appendix and rectosigmoid colon. 7) Assess the ultrasonographic findings of ovarian endometriomas and differentiate them from functional cysts.

ABSTRACT
Endometriosis is a very common gynecological disease affecting millions of women in their reproductive life, often causing pelvic pain and infertility. Clinical history and physical examination may suggest endometriosis, but imaging mapping is necessary to identify the disease and mandatory for clinical counseling and surgical planning. Transvaginal ultrasound after bowel preparation is the best imaging modality as the first-line technique to evaluate patients suspected of endometriosis. The bowel preparation is relatively simple and include the day before and the day of the examination. This method is highly accurate to identify intestinal endometriosis and to determine which layers of the bowel wall are affected. In addition, it provides better assessment of small peritoneal lesions of the retrocervical space, vagina and bladder. Pelvic adhesions can also be evaluated during the exam.

URL
http://chamie.com.br/download

Active Handout: Luciana Pardini Chamie
Participants

Daniela Prayer, MD, Vienna, Austria (Moderator) Nothing to Disclose
Amy R. Mehollin-Ray, MD, Houston, TX, (armeholl@texaschildrens.org) (Moderator) Nothing to Disclose

Sub-Events

**RC113-01  Fetal MRI of Genitourinary Tract Abnormalities**

Sunday, Nov. 29 2:00PM - 2:20PM Location: S102AB

Participants

Ann M. Johnson, MD, Philadelphia, PA, (johnsona@email.chop.edu) (Presenter) Nothing to Disclose

**LEARNING OBJECTIVES**

1) Learn basic fetal MRI techniques and relevent embryology. 2) Understand what fetal MRI can add in evaluation of genitourinary (GU) abnormalities. 3) Become familiar with patterns of fetal GU abnormalities with an emphasis on complex lesions affecting multiple organ systems, such as cloacal malformation spectrum and exstrophy. 4) The purpose of the course is to understand the potential role of fetal MRI in the evaluation of fetal genitourinary tract abnormalities. There will be an emphasis on complex lesions affecting multiple organ systems, such as cloacal malformation spectrum and exstrophy.

**RC113-02  Novel Nanoparticle Gd Contrast Agent Does Not Penetrate the Placental Barrier**

Sunday, Nov. 29 2:20PM - 2:30PM Location: S102AB

Participants

Anil N. Shetty, PhD, Houston, TX (Presenter) Nothing to Disclose
Ketan B. Ghaghada, PhD, Houston, TX (Abstract Co-Author) Nothing to Disclose
Robia Pautler, PhD, Houston, TX (Abstract Co-Author) Nothing to Disclose
Wesley Lee, MD, Houston, TX (Abstract Co-Author) Research support, General Electric Company Research support, Koninklijke Philips NV Research support, Siemens AG Research support, Samsung Electronics Co Ltd
Hajjun Gao, PhD, Houston, TX (Abstract Co-Author) Nothing to Disclose
Chandra Yallampalli, DVM, PhD, Houston, TX (Abstract Co-Author) Nothing to Disclose
David Rendon, PhD, Houston, TX (Abstract Co-Author) Nothing to Disclose
Ananth Annapragna, PhD, Houston, TX (Abstract Co-Author) Stockholder, Marval Pharma Ltd Stockholder, Alzeca Biosciences LLC Stockholder, Sensulin LLC Stockholder, Abbott Laboratories Stockholder, Johnson & Johnson

**PURPOSE**

Gd contrast agent usage in placental imaging is generally contraindicated, for concerns related to fetal contrast agent exposure. We therefore developed a novel liposomal Gd nanoparticle contrast agent for T1-MRI, retaining the Gd on the maternal side, thus shielding the fetus from potential toxicities. In this study, we tested this agent in placental imaging in a mouse model, and measured its transplacental permeability.

**METHOD AND MATERIALS**

Female C57Bl/6 mice, pregnant at gestational age E16.5±1 days, were imaged by T1-MRI on a 9.4T small animal MRI (Bruker Instruments) using a conventional contrast agent (Multihance, a meglumine salt of Gd-BOPTA chelate) (13 mice) and using the novel nanoparticle Gd agent (9 mice). DCE-MRI was conducted using consecutive 3D-SPGRE sequences at a constant flip angle of 16°, TE/TR=1.93ms/6ms, FOV = 3x3x2.5cm, matrix = 128x128x16. Each image was converted to a T1 map, and the contrast agent concentration on a pixel-by-pixel basis, estimated from the known relaxivity. After imaging, the mice were sacrificed and the Gd content of the placenta and fetus measured using ICP-AES.

**RESULTS**

Image and data shown below are representative of each cohort. The placentae are rather small (2mmx3mm) but are still clearly defined, and obviously not invasive into the uterine wall. Signal intensities in the placental and fetal ROI's, indicative of Gd concentration in each compartment, clearly show that the conventional Gd chelate agent penetrates the placental barrier and enters the fetus. The nanoparticle agent however, does not do so, indicated by zero signal in the fetal compartment throughout the duration of this experiment. The ICP-AES study confirmed the imaging study results, with no detectable Gd in the fetal compartment. A separate study in human placentae using an ex vivo perfused placenta preparation, also confirmed these results.

**CONCLUSION**

The nanoparticle contrast agent does not penetrate the placental barrier in a mouse model. The data are consistent with separate tests on a perfused human placenta model.

**CLINICAL RELEVANCE/APPLICATION**

The incidence of placenta accreta has increased 8-fold in the last 30 years, and improved methods for placental imaging are sorely needed. Nanoparticle Gd contrast agents described in this work could be useful for placental imaging, while maintaining fetal safety.
**PURPOSE**

Postnatal neurodevelopmental outcome of fetuses with hindbrain malformations is dependent on normal growth and development of the cerebellar vermis. This comparative in vivo and post mortem fetal MRI study aims to quantitatively assess the relative dimensions of respective vermian lobules between 18 to 32 gestational weeks (GW) in normal and pathological conditions.

**METHOD AND MATERIALS**

75 fetuses (18-32 GW, mean 25.7GW) with normal brain development and 20 fetuses with different types of hindbrain malformations were scanned prenatally (1.5T, T2-TSE, voxel size 0.72/0.72/4.4mm - 1.0/1.0/4.4mm) and seven fetuses (16-30GW, mean 21.9GW, 3T, CISS sequence, resolution: 0.33/0.33/0.33mm) scanned within 24 hours postmortem were selected for postprocessing. A T2-weighted midline sagittal slice was identified and 2D vermian segmentation was performed using ITK snap (Figure).

**RESULTS**

The mean proportional size of 7/9 discriminable vermian lobules did not differ between in vivo and post mortem measurements. The relative size of the following lobules increased during gestation (Pearson, r < 0.05): Culmen (r² = 0.460) and Declive/Folium/Tuber (r² = 0.435). The proportions of Lingula (r² = 0.554), Centrum (r² = 0.554), Proportions of Lingula (r² = 0.491) decreased with gestational age. The relative size of the Uvula did not show age specific changes (p = 0.201). Certain types of hindbrain malformations showed common patterns of cerebellar lobular hypoplasia.

**CONCLUSION**

Fetal vermian lobulation can be accurately assessed by MRI between 18 and 32GW in normal and pathological conditions in vivo. Growth of specific vermian lobules is nonuniform during the second and third trimester. Distinct patterns of vermian lobular hypoplasia can be described antenatally.

**CLINICAL RELEVANCE/APPLICATION**

Knowledge about the distinct growth patterns of specific vermian lobules is helpful in the prognostic classification of fetal hindbrain malformations.

**RC113-04 MRI-US Fusion Imaging in Real-Time Virtual Sonography for the Evaluation of Fetal Anomalies: Preliminary Stud**

Sunday, Nov. 29 2:40PM - 2:50PM Location: S102AB

**PURPOSE**

Magnetic resonance imaging (MRI) and ultrasound (US) scanning complement each other in the screening and diagnosis of fetal anomalies. Real-time virtual sonography (RVS) is a new technique that uses magnetic navigation and computer software for the synchronized display of real-time US and multiplanar reconstruction MRI images. The purpose of this study was to evaluate the feasibility and ability of RVS to assess the main pathologies in fetuses with suspected US anomalies.

**METHOD AND MATERIALS**

This study was conducted over a two-month period March-April 2015 in 30 patients referred for a morphological fetal US-based evaluation. Patients underwent Fetal MRI at 1.5 T for fetal anomalies were offered fusion imaging (Hitachi HI Vision Ascendus). The MRI image dataset acquired at the time of the examination was loaded into the fusion system and displayed together with the US image on the same monitor. Both sets of images were then manually synchronized and image were registered using multiple planes MR imaging. The ability of this combined image (RVS imaging) to assess the main anatomical sites and fetal anomalies was evaluated and compared with standard B-Mode US and MRI images previously acquired.

**RESULTS**

In all cases RVS was technically possible, with a 100% match between MR images and US images. Data registration, matching and fusion imaging were performed in less than 15-20 minutes. On a total of 30 fetuses, 20 were for the encephalic district and 10 for the body (8 thoraco- abdominal; 2 heart). In all cases RVS was technically possible, with a 100% match between MR images and US images. In 10 cases of body abnormalities, fusion imaging helped the diagnosis in 20%. In the 10/20 cases of encephalic pathology, fusion imaging improved the diagnosis; in the other 10 cases MRI was superior to US even using the RVS.

**CONCLUSION**

The present work is a preliminary study on the feasibility and practical use of a Fetal MRI-US real-time fusion imaging. Thanks to
informations from both US and MRI, fusion imaging allows better identification of the different fetal pathologies and could improve the performance of ultrasound examination.

**CLINICAL RELEVANCE/APPLICATION**

Fusion imaging is feasible for the assessment of fetal abnormalities. Because it combines information from both US and MRI techniques, fusion imaging allows better identification of the different fetal pathologies.

**RC113-05** Predictive Value of the MRI-based Ratio of Fetal Lung Volume to Fetal Body Volume in Congenital Diaphragmatic Hernia in Comparison to the MR Fetal Lung Volume and the Sonographic Lung-to-Head Ratio

Sunday, Nov. 29 2:50PM - 3:00PM Location: S102AB

Participants
Claudia Hagelstein, MD, Mannheim, Germany (Presenter) Nothing to Disclose
Silke von Mittelstaedt, Mannheim, Germany (Abstract Co-Author) Nothing to Disclose
Meike Weidner, Mannheim, Germany (Abstract Co-Author) Nothing to Disclose
Christel Weiss, Mannheim, Germany (Abstract Co-Author) Nothing to Disclose
Regine Schaffelder, MD, Mannheim, Germany (Abstract Co-Author) Nothing to Disclose
Thomas Schaab, Mannheim, Germany (Abstract Co-Author) Nothing to Disclose
Stefan O. Schoenberg, MD, PhD, Mannheim, Germany (Abstract Co-Author) Institutional research agreement, Siemens AG
Wolfgang Neff, MD, PhD, Alzey, Germany (Abstract Co-Author) Nothing to Disclose

**PURPOSE**

To evaluate prognostic accuracy of the MRI-based ratio of fetal lung volume to fetal body volume (MR-FLV/FBV) in fetuses with congenital diaphragmatic hernia (CDH) and to compare it to established prognostic parameters (the observed-to-expected MR fetal lung volume \([o/e-MR-FLV]\) and the US-based observed-to-expected lung-to-head ratio \([o/e-LHR]\)) with regard to survival, extracorporeal membrane oxygenation (ECMO) requirement and development of a chronic lung disease (CLD).

**METHOD AND MATERIALS**

Fetal MRI was performed in 132 patients with isolated CDH (mean gestational age 32.8±3.8 weeks) to measure FLV and FLV/FBV. Sonographic assessment of the LHR was performed within three days before or after fetal MRI. To obtain parameters that were independent from gestational age, the o/e-MR-FLV and the o/e-LHR were calculated based on normal controls, whereas calculation of the MR-FLV/FBV is independent from normal controls.

**RESULTS**

91% of the neonates survived, 37% needed ECMO therapy and 45% developed a CLD. All prenatal parameters revealed an excellent correlation with patients’ clinical outcome. MR-FLV/FBV, o/e-MR-FLV and o/e-LHR were significantly higher in survivors (p always <0.0001). Patients with ECMO requirement and patients with CDL showed a significantly lower MR-FLV/FBV, o/e-MR-FLV or o/e-LHR (p always <0.0001). Prognostic accuracy regarding survival was quite similar for the three parameters (AUC MR-FLV/FBV : 0.830, AUC o/e-MR-FLV : 0.868, AUC o/e-LHR : 0.845). Regarding ECMO requirement (AUC MR-FLV/FBV : 0.844, AUC o/e-MR-FLV : 0.843, AUC o/e-LHR : 0.736) and development of CLD (AUC MR-FLV/FBV : 0.778, AUC o/e-MR-FLV : 0.795, AUC o/e-LHR : 0.738) the MR-FLV/FBV and o/e-MR-FLV showed a slightly better prognostic accuracy compared to the o/e-LHR.

**CONCLUSION**

In CDH, assessment of pulmonary hypoplasia based on the MR-FLV/FBV, the o/e-MR-FLV or the o/e-LHR is quite similar in predicting survival. Regarding ECMO requirement and development of CLD, the o/e MR-FLV and the MR-FLV/FBV showed a slightly better prognostic accuracy compared to the US-based o/e-LHR. Compared to other prognostic parameters, MR-FLV/FBV has the advantage of being independent from the reference to a normal control group.

**CLINICAL RELEVANCE/APPLICATION**

In CDH, MRI-based MR-FLV/FBV and o/e-MR-FLV as well as US-based o/e-LHR are excellent and almost equivalent parameters to predict survival, ECMO-requirement and development of CLD.

**RC113-06** Correlation between Fetal and Postmortem Magnetic Resonance Imaging and Conventional Autopsy in the Detection of Fetal Abnormalities

Sunday, Nov. 29 3:00PM - 3:10PM Location: S102AB

Participants
Matteo Saldari, MD, PhD, Rome, Italy (Abstract Co-Author) Nothing to Disclose
Silvia Bernardo, MD, Rome, Italy (Presenter) Nothing to Disclose
Carlo Catalano, MD, Rome, Italy (Abstract Co-Author) Nothing to Disclose
Valeria Vinci, MD, Rome, Italy (Abstract Co-Author) Nothing to Disclose
Lucia Manganaro, MD, Rome, Italy (Abstract Co-Author) Nothing to Disclose

**PURPOSE**

To compare Fetal and postmortem MRI and conventional autoptic findings in cases of major pathological abnormalities.

**METHOD AND MATERIALS**

In this prospective study we enrolled 128 fetuses with identified US findings of severe fetal malformations, with local research ethics committee approval. Among these, we performed 94 whole body Fetal MRI on 94 fetuses using a 1.5 T MR scanner and of these, only 89 women underwent termination of pregnancy because of the fetal abnormalities. Of the 89 patients, 80 (90%) consented to postmortem MRI alone; 59 (6%) women consented to both postmortem MRI and conventional autopsy and formed our study group. Following delivery, fetuses were stored in refrigerated compartments prior to MR imaging and autopsy. Also for the post-mortem imaging evaluation we acquired whole body MR imaging using a 1.5 T MR scanner. MR images were reviewed by a team of two radiologists blinded to the autoptic data. Pathologists who performed conventional autopsy were blinded to the MR data; autoptic data were considered the gold standard.
RESULTS

Final autopic diagnoses were: polycystic kidney disease (n=15), diaphragmatic hernia (n=10), lissencephaly (n=4), type-2 Arnold-Chiari malformation (n=6), Dandy-Walker syndrome (n=13), cloacal malformation (n=1), anencephaly (n=1), holoprosencephaly (n=4), rhombencephalosynapsis (n=2), Walker-Warburg syndrome (n=2), schizencephaly (n=1). MRI-autopsy provided additional information in 10/59 (17%) compared to fetal MRI. In 6 cases (10%) conventional autopsy provided superior diagnostic information compared to MRI-autopsy. On the other hand, in 7 cases (12%) the disruption of the anatomy during autopic dissection of the fetal body couldn't allow a correct identification of the pathology.

CONCLUSION

MR autopsy is accepted by nearly all mothers while conventional autopsy is accepted by about two-thirds of mothers, it provides similar information compared to conventional autopsy in case of fetal malformations and it allows the evaluation of the pathology in case of tissue disruption during the autopic evaluation.

CLINICAL RELEVANCE/APPLICATION

Fetal MRI can add significant additional information and may be use to guide conventional autopsy.

RC113-07 Imaging of Ambiguous Genitalia

Participants
Jeanne S. Chow, MD, Boston, MA (Presenter) Nothing to Disclose

LEARNING OBJECTIVES

1) The purpose of this course is to understand the important role of the radiologists in infants with ambiguous genitalia. Imaging techniques as well as important imaging findings will be detailed.

ABSTRACT
TEACHING POINTS

1) The five submitted Obstetrical Imaging cases will offer challenging ultrasound and MR images to practice visual interpretation skills, promote medical knowledge review and enhance the ability to summarize important findings to achieve a diagnosis.
Ovarian Peritoneal Carcinomatosis. Reviewing an Old Illness with New Techniques

Station #1

Participants

OB109-ED-MOA1

Carmen Sebastia Cerqueda, MD, Barcelona, Spain (Presenter) Nothing to Disclose
Blanca Pano Bruñau, MD, Barcelona, Spain (Abstract Co-Author) Nothing to Disclose
Laura Bunesch Villalba, MD, Barcelona, Spain (Abstract Co-Author) Nothing to Disclose
Pilar Paredes, MD, Barcelona, Spain (Abstract Co-Author) Nothing to Disclose
Sergio Martinez, Barcelona, Spain (Abstract Co-Author) Nothing to Disclose
Laura V. Boixader, Barcelona, Spain (Abstract Co-Author) Nothing to Disclose
Carlos Nicolau, MD, Barcelona, Spain (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS

- To review common and uncommon locations and appearances of ovarian peritoneal implants and their differential diagnosis.
- To describe diagnostic advances in ovarian peritoneal carcinomatosis using helical-CT, anatomical and functional MR, PET-CT and PET-MR fusion images.
- To depict new ovarian metastatic tumoral markers and treatments (peritoneal chemotherapy, targeted therapies and new surgical techniques) and which challenges radiological imaging face. Suppose for radiological imaging.

TABLE OF CONTENTS/OUTLINE

Ovarian peritoneal carcinomatosis has been diagnosed using conventional CT for many years. With the arrival of helical CT with multiplanar capability, diffusion functional techniques associated with high resolution anatomical abdominopelvic MR imaging and whole-body PET-CT and PET fused with enhanced CT or whole body MR sequences, the way to image ovarian peritoneal implants have changed. In addition, new markers and new treatments have appeared. All these advances are a challenge for radiologists who must know how peritoneal carcinomatosis is seen with these new techniques and what the oncologist and the onco-gynecologist need to know to better manage these patients with the new treatment options. The aim of this educational exhibit is to review these topics in order to update ovarian carcinoma imaging knowledge.

Placenta - The Forgotten and Mysterious Organ of Pregnancy

OB145-ED-MOA2

Station #2

Participants

Manjiri K. Dighe, MD, Seattle, WA (Presenter) Research Grant, General Electric Company
Mariam Moshiri, MD, Seattle, WA (Abstract Co-Author) Consultant, Reed Elsevier; Author, Reed Elsevier
Corinne L. Fligner, MD, Seattle, WA (Abstract Co-Author) Nothing to Disclose
Shaimaa A. Fadl, MD, Doha, Qatar (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS

1. Placenta is required not only for transport of oxygen from the mother to the fetus but also for transport of nutrients and production of hormones. Abnormalities in the placenta can lead to serious abnormalities in fetal growth and can also prove to be harmful to the mother.
2. Recognizing normal appearance and abnormalities in the placenta is important. This exhibit will review the normal appearance and abnormalities seen in the placenta on ultrasound and MRI.

TABLE OF CONTENTS/OUTLINE

1. Review of the embryology and development of the placenta
2. Review of normal appearance of the placenta with variations in normal anatomy
3. Discussion of various abnormalities of the placenta: including abnormal shape, abnormal size, abnormal location, masses in the placenta etc.
4. Review of management of placental abnormalities including previa and morbidly adherent placenta
5. Discussion of the research aspects of the placental development and its influence on fetal growth including pre-eclampsia and IUGR

Honored Educators

Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at: https://www.rsna.org/Honored-Educator-Award/

Mariam Moshiri, MD - 2013 Honored Educator
Mariam Moshiri, MD - 2015 Honored Educator
Participants

Sub-Events

Assisted Reproduction- How Ready Are We to Expect Complications?

Station #1

Participants

Anuradha Rao, Bangalore, India (Presenter) Nothing to Disclose
Aruna R. Patil, MD, FRCR, Bangalore, India (Abstract Co-Author) Nothing to Disclose
Shrivali Nandikoor, MBBS, Bangalore, India (Abstract Co-Author) Nothing to Disclose
Govindarajan J. Mallarajapatna, MBBS, MD, Bangalore, India (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS

The purpose of this exhibit is to 1. To understand the various complications of assisted reproduction, their pathophysiology, the importance of early diagnosis. 2. To get acquainted with the imaging features of these complications and to differentiate them from their mimics. 3. It is imperative that radiologists and infertility specialists should be familiar with these complications because of potential issues of fetal safety and maternal fatality associated with these.

TABLE OF CONTENTS/OUTLINE

Starting with brief introduction to assisted reproduction/IVF, this exhibit will discuss various complications associated with it as below: 1. Ovarian hyperstimulation syndrome: its incidence, classification, early/late types, clinical features, pathophysiology, imaging features, differentials and brief understanding of management. 2. Ovarian torsion in OHSS: its clinical/imaging features, pathophysiology. 3. Ectopic gestation: incidence, clinical features, various types including tubal, cornual, cervical, ovarian, scar ectopic, abdominal ectopic gestation. 4. Heterotopic gestation: Importance of not neglecting adnexa when intrauterine pregnancy is confirmed, mimics of heterotopic gestation, diagnostic pitfalls. 5. Non gynecological problems like DVT, pulmonary embolism, stroke.

Rare complications due to the procedure, like vaginal/ intraperitoneal hemorrhage, pelvic infection, injury to ureters/ nerves.

Image Guided Gynecological Interventions: Anatomy, Indications, Technique, and Complications

Station #2

Participants

Joanna Kee-Sampson, MD, Morristown, NJ (Abstract Co-Author) Nothing to Disclose
Jonathan Schiavi, MD, Morristown, NJ (Abstract Co-Author) Nothing to Disclose
Joseph C. DeMarco, DO, Valhalla, NY (Presenter) Nothing to Disclose
Sean K. Calhoun, DO, Long Valley, NJ (Abstract Co-Author) Nothing to Disclose
Thaddeus M. Yablonsky, MD, Morristown, NJ (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS

At the conclusion of this presentation, the viewer will be able to: Identify female pelvic anatomy as it pertains to various gynecological interventions. Discuss the key clinical and imaging features of uterine fibroids, uterine abruption, pelvic congestion syndrome and pelvic pseudoaneurysms on ultrasound, CT, MRI and angiography. Discuss the indications, contraindications, technical concepts and complications of various image-guided gynecological interventions. Discuss appropriate follow-up.

TABLE OF CONTENTS/OUTLINE

1. Uterine fibroids: Background Clinical presentation Imaging features with examples (US, CECT, MRI) Indications/contraindications for uterine fibroid embolization Patient selection Technique Complications Follow-up 2. Uterine abruption: Background Clinical presentation Imaging features Indications for embolization Technique Complications Follow-up 3. Fallopian tube re-canalization Indications Imaging features Technique Complications Follow-up 4. Pelvic congestion syndrome: Background Clinical presentation Imaging features Indications for embolization Technique Complications Follow-up 5. Pelvic pseudoaneurysm: Background/etiologies Imaging features Indications for embolization Technique Complications Follow-up
Participants
Karen Y. Oh, MD, Portland, OR (Presenter) Nothing to Disclose
Roya Sohaey, MD, Portland, OR (Abstract Co-Author) Nothing to Disclose
Ryan Moore, MD, Portland, OR (Abstract Co-Author) Nothing to Disclose
Thomas Gibson, MD, Portland, OR (Abstract Co-Author) Nothing to Disclose
McKenna Belzer, MD, Portland, OR (Abstract Co-Author) Nothing to Disclose
Neda Jafarian, MD, New York, NY (Abstract Co-Author) Nothing to Disclose
Kyle Jensen, MD, Portland, OR (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1) The five submitted Obstetrical Imaging cases will offer challenging ultrasound and MR images to practice visual interpretation skills, promote medical knowledge review and enhance the ability to summarize important findings to achieve a diagnosis.
LEARNING OBJECTIVES

1) Diagnose tubal ectopic. 2) Differentiate Cesarean scar implantation from a normal, low-lying pregnancy. 3) Recognize the more unusual sites of ectopic pregnancy (cervical, interstitial, abdominal). 4) Understand the indications for expectant vs. medical vs. surgical management.

ABSTRACT

Ectopic pregnancy can be a life-threatening condition for young, healthy women. The availability of sensitive urine pregnancy tests means that we are seeing patients at a time when it may be very difficult to see any sonographic findings of pregnancy. The session will review and illustrate examples of the recommended descriptive terms 'pregnancy of unknown location', probable ectopic and 'definite ectopic' both of which refer to tubal ectopics. We will also review the appearance of heterotopic pregnancy and non-tubal ectopics including Cesarean scar implantation, interstitial and cervical implantation, and abdominal and ovarian ectopic with demonstration of the role of color Doppler, 3D ultrasound and other imaging modalities. Modern management of ectopic pregnancy has become much less aggressive, in part because the diagnosis is made so much earlier. The indications for the various treatment options will be outlined with illustrative case of local injection as well as intraoperative photos during laparoscopy.

LEARNING OBJECTIVES

1) Know the sonographic criteria for definite miscarriage and probable miscarriage in the early first trimester. 2) Understand that any saclike intrauterine structure (rounded edges, no yolk sac or embryo) in a woman with a positive pregnancy test is highly likely to be a gestational sac. 3) Understand that nonvisualization of an intrauterine gestational sac in a woman with hCG above the ‘discriminatory’ level (2000 mIU/ml) does not exclude the possibility of a normal pregnancy.

ABSTRACT

This lecture will cover the diagnosis of early first trimester miscarriage in two settings: (i) ultrasound demonstrates no intrauterine gestational sac (‘pregnancy of unknown location’); (ii) ultrasound demonstrates an intrauterine gestational sac but no embryo or heartbeat. In the first of these settings, the role of the quantitative hCG level will be discussed, including whether a single measurement can be used to rule out a normal intrauterine pregnancy. In the second setting, the currently accepted criteria for definite miscarriage and for probable miscarriage will be presented. The lecture will also address findings that indicate a high likelihood of impending pregnancy failure when an embryo with heartbeat is seen on ultrasound.

LEARNING OBJECTIVES

1) Recognize the importance of evaluating the developing fetal head during the late first trimester for early detection of large neural tube defects. 2) Incorporate measurement of the nuchal translucency into their assessment of the fetuses of gestational age 11-14 weeks. 3) Recognize sonographic abnormalities of the ventral wall to distinguish normal physiologic bowel herniation from defects including omphalocele and gastroschisis.

ABSTRACT
This lecture will discuss the sonographic appearance of fetal anatomy in the latter part of the third trimester in order to help participants recognize abnormalities of the fetus at this early gestational age. While many anomalies cannot be detected until later in pregnancy, the discussion will focus on those anomalies that can be detected in the first trimester. Specific topics covered will be central nervous system anomalies, including anencephaly, encephalocele and holoprosencephaly, ventral wall defects including omphalocele and gastroschisis, bladder outlet obstruction, and skeletal anomalies including skeletal dysplasias. Detection of anomalies early in gestation, before the second trimester, permits time to assess the fetus for other anomalies, syndromes, and aneuploidy.
Complications Following Cesarean Section: What Radiologist Should Know on Imaging?

**TEACHING POINTS**
1. Review the spectrum of immediate and delayed complications following Cesarean section.
2. Illustrate imaging features in multiple modalities of immediate complications such as simple fluid collection, hematoma, abscess and uterine rupture; and delayed complications such as scar ectopic pregnancy and endometriosis.
3. Discuss the currently available image guided treatment options and outcome of individual complications.

**TABLE OF CONTENTS/OUTLINE**
1. Normal findings in post Cesarean imaging.  
2. A brief summary of the various complications arising from Cesarean delivery, relative frequency and timeline.  
3. Cases illustrating common and uncommon cases of post-cesarean complications including simple fluid collection, hematoma, abscess, uterine rupture, scar ectopic pregnancy and scar endometriosis.  
4. Image guided treatment options and an overview of outcome.

**Anatomic Radiological Evaluation of the Supporting Structures of the Pelvic Floor in Women - Risk Assessment of the Pelvic Organ Prolapse (POP)**

**TEACHING POINTS**
Pelvic floor (PF) fragility is associated with aging, and the pelvic organ prolapse (POP) increases with aging. 

To explain the relationship with the POP and QOL in aged women: cystocele, uterine prolapse, rectocele 

To understand the clinical presentation of PF aging that causes the POP, and the factors that it occurs in. 

To recognize the human anatomy and imaging anatomy. 

To explain the comparison of MRI with anatomic structures affecting PF aging.

**TABLE OF CONTENTS/OUTLINE**
1) Aging characteristic of the PF 
2) Anatomy of the PF and its supporting systems 
3) Anatomic structures involved in the PF aging: muscles, ligaments, fasciae 
4) Pelvic organs affected by PF aging: bladder, uterus, rectum 
5) MRI interpretation 
6) Anatomic radiological correlation of the PF structures 
7) Anatomic structures affecting PF aging 
8) Comparison of the young and aged 
9) Summary 

It is necessary to know the physiological changes of the PF aging that causes POP. It is important to understand MRI based anatomy for evaluating the PF aging factors. With aging, PF configuration changes, possibly due to weakness of the supporting systems. The muscles became thinner and elongated, and the intrapelvic fat descend. The levator ani muscle is one of the key factors. MRI could contribute to evaluate of the PF aging, and grasp the POP risk factors.
**Obstetrics/Gynecology Tuesday Poster Discussions**

**Tuesday, Dec. 1 12:45PM - 1:15PM Location: OB Community, Learning Center**

AMAPRA Category I Credit™: .50

**FDA** Discussions may include off-label uses.

**OB124-ED-TUB**

**Magnetic Resonance Imaging of Fetal Ventriculomegaly**

Station #1

Participants

Ying Zhu, MD, Beijing, China (Presenter) Nothing to Disclose

Xiaoying Wang, MD, Beijing, China (Abstract Co-Author) Nothing to Disclose

**TEACHING POINTS**

To explain evaluation of fetal ventricle by fetal MRI.

To review MRI findings of various etiologies of ventriculomegaly.

To emphasize additional findings that MRI can provide, compared with sonography.

**TABLE OF CONTENTS/OUTLINE**

1. Evaluation of fetal ventriculomegaly on fetal MRI.
2. Various etiologies of ventriculomegaly.
3. Review MRI findings: aqueductal stenosis, congenital malformation (Agenesis of the corpus callosum, Dandy-Walker malformation, Arnold-Chiari II malformation), choroid plexus cyst, and acquired brain lesions.
4. Additional findings on MRI: neuronal migration disorders, abnormal sulcus and gyri, heterotopias, and intraparenchymal haemorrhage.
5. Follow-up

**OB001-EB-TUB**

**Female Genital Tract Malformations-Changing the Way We Report According to The 2013 European Society of Human Reproduction and Embryology (ESHR) and European Society of Gynaecological Endoscopy (ESGE) Updated Classification System**

Hardcopy Backboard

Participants

Konstantia Diana Stavrou, MBBS, BSc, London, United Kingdom (Presenter) Nothing to Disclose

Olwen A. Westerland, MBBS, London, United Kingdom (Abstract Co-Author) Nothing to Disclose

Audrey Jacques, MBBS, FRCR, London, United Kingdom (Abstract Co-Author) Nothing to Disclose

Carmen Sebastia Cerqueda, MD, Barcelona, Spain (Abstract Co-Author) Nothing to Disclose

Sarah Natas, BSc, FRCR, London, United Kingdom (Abstract Co-Author) Nothing to Disclose

Helen Bickerstaff, London, United Kingdom (Abstract Co-Author) Nothing to Disclose

**TEACHING POINTS**

Female genital tract malformations affect approximately 7% of women and may result in impaired fertility, amenorrhoea, dysmenorrhea and pelvic malignancy. Correct classification of female genital tract malformations is essential, to guide appropriate operative management and prevent unnecessary procedures.

Traditional classification systems, based on embryological origin, have limitations of effectiveness and clinical usefulness and do not necessarily allow for structured reporting of cervical and vaginal anomalies. The ESHR/ESGE classification system aims to address these issues. Magnetic resonance imaging (MRI) is a very useful imaging modality for the characterisation of female genital tract malformations. Radiologists should therefore be aware of the new ESHR/ESGE classification system. The new ESHR/ESGE classification system has many advantages, which we will highlight using case examples.

**TABLE OF CONTENTS/OUTLINE**

1. To summarise the new 2013 classification system of female genital tract malformations, devised by the ESHR and ESGE.  
2. Highlight changes, advantages and disadvantages of the ESHR/ESGE classification system with use of imaging examples.  
3. Describe proposed structured reporting for classification of female genital tract anomalies according to the ESHR/ESGE guidelines.  
4. Imaging examples- 2D/ 3D Ultrasound, MRI and CT
Participants
Karen Y. Oh, MD, Portland, OR (Presenter) Nothing to Disclose
Roya Sohaey, MD, Portland, OR (Abstract Co-Author) Nothing to Disclose
Ryan Moore, MD, Portland, OR (Abstract Co-Author) Nothing to Disclose
Thomas Gibson, MD, Portland, OR (Abstract Co-Author) Nothing to Disclose
Neda Jafarian, MD, New York, NY (Abstract Co-Author) Nothing to Disclose
Kyle Jensen, MD, Portland, OR (Abstract Co-Author) Nothing to Disclose
McKenna Belzer, MD, Portland, OR (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1) The five submitted Obstetrical Imaging cases will offer challenging ultrasound and MR images to practice visual interpretation skills, promote medical knowledge review and enhance the ability to summarize important findings to achieve a diagnosis.
LEARNING OBJECTIVES

1) To apply a systematic approach in the evaluation of pediatric diseases. 2) To identify essential imaging features of various pediatric congenital, musculoskeletal, abdominal and neurological diseases using a multimodality approach. 3) To understand and develop best imaging practice for various pediatric diseases.

ABSTRACT

To apply a systematic approach in the evaluation of pediatric diseases To identify essential imaging features of various pediatric congenital, musculoskeletal, abdominal and neurological diseases using a multimodality approach To understand and develop best imaging practice for various pediatric diseases
Second and Third Trimester Obstetrical Ultrasound (An Interactive Session)

Wednesday, Dec. 2 8:30AM - 10:00AM Location: E450B

LEARNING OBJECTIVES

Please bring your charged mobile wireless device (phone, tablet or laptop) to participate.

RC510A 3D Ultrasound in Obstetrics

Participants
Beryl R. Benacerraf, MD, Brookline, MA (Presenter) Nothing to Disclose

LEARNING OBJECTIVES

1) To learn the principles of 3D sonography and the applications for fetal scanning. To evaluate clinical situations where 3D scanning is helpful and where it is not useful beyond the 2D examination. 2) To see examples of fetal malformations scanned in 3D using surface rendering and multiplanar reconstruction. 3) To learn how to use volume scanning to dramatically reduce scan time and improve you scanning efficiency by rescanning stored volumes of complete fetal anatomy.

ABSTRACT

Three-dimensional (3D) ultrasound allows us to acquire a volume and display any plane of section within that volume regardless of the scanning orientation. The ability to display a 3D image of any type or plane has been one of the most powerful recent advances in sonography, particularly in the field of obstetrics and gynecology. In imaging of the fetus, 3D ultrasound is advantageous in demonstrating many types of fetal defects and dysmorphic facial features using surface rendering. The fetal brain is also one of the areas where 3D ultrasound has been most helpful, since the reconstruction of the third non-scanning plane is crucial in demonstrating planes of section not previously visible sonographically. The corpus callosum is an example of one area not readily imaginable in standard imaging planes. The fetal sutures are also easy to image with 3D, which is particularly helpful in fetuses with suspected craniosynostosis. 3D ultrasound is key for imaging fetal skeletal abnormalities, providing additional information on affected fetuses as compared to 2D. Evaluation of the spine using 3D has been helpful to determine the level of spina bifida, thus providing crucial information regarding prognosis. Evaluation of the fetal heart is an intense area of research interest, and the heart can be imaged in real-time 3D (4D) using a method called STIC. This method provides the ability to obtain a full volume of the beating heart to evaluate in detail off line with or without color Doppler and while it is beating. Volume imaging is also key in improving efficiency of the ultrasound department. The entire fetus can be imaged easily by acquiring and archiving a few volumes. This way, the patient can spend far less time in the ultrasound room and the entire scan can be done remotely and virtually using the stored volumes. This techniques reduces operator dependency usually associated with 2D ultrasound.

RC510B Fetal Genitourinary Anomalies

Participants
Roya Sohaey, MD, Portland, OR (Presenter) Nothing to Disclose

LEARNING OBJECTIVES

1) Apply the Urinary Tract Dilation classification system to fetal imaging practice. 2) Develop an anatomic approach for differential diagnosis of urinary tract obstruction. 3) Develop an understanding of which cases would benefit from fetal MR.

ABSTRACT

By the conclusion of this course, the participant will be able to apply the prenatal Urinary Tract Dilation (UTD) classification system for diagnosis and follow-up planning. The learner will develop an anatomic approach towards differential diagnosis for obstructive causes of UTD, renal cystic dysplasia and complex genitourinary anomalies. In addition, a fetal sex-based approach for analysis of complex lower tract anomalies will be discussed. The course will demonstrate how fetal MR is useful as a problem solving tool in certain complex cases. The lecture is didactic and case-based in format.

RC510C Placenta

Participants
Sara M. Durfee, MD, Boston, MA (Presenter) Nothing to Disclose

LEARNING OBJECTIVES

1) Identify the cause of vaginal bleeding in patients with placental abnormalities that include placenta previa and placental abruption. 2) Describe the sonographic features of placenta accreta. 3) Define trophotropism and describe how this process leads to both normal and abnormal placentation.

ABSTRACT

After this presentation, the participant will understand how the normal placenta develops and how factors such as trophotropism lead to placental abnormalities. Specific abnormalities such as placenta previa, placental abruption and placenta accreta will be
addressed in detail. In addition, first trimester abnormalities such as the chorionic bump and subchorionic hematomas will be discussed. The presenter will describe the sonographic appearance of succenturiate lobe, circumvallate placenta and sonolucencies within the placenta and will comment on placental masses.
Fallopian Tube Catheterization (Hands-on)

Wednesday, Dec. 2 8:30AM - 10:00AM Location: E260

GU  OB

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

Participants
Amy S. Thurmond, MD, Portland, OR (Moderator) Nothing to Disclose
Ronald J. Zagoria, MD, San Francisco, CA, (ron.zagoria@ucsf.edu) (Presenter) Nothing to Disclose
Lindsay S. Machan, MD, Vancouver, BC (Presenter) Nothing to Disclose
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

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

ABSTRACT
Fallopian tube catheterization using fluoroscopic guidance is a relatively easy, inexpensive technique within the capabilities of residency trained radiologists. Fallopian tube catheterization can be used to dislodge debris from the tube in women with infertility, or to place FDA-approved tubal occlusion devices in women who do not desire fertility. The fallopian tube is the 1 mm gateway between the egg and the sperm. Noninvasive access to this structure for promoting, and preventing, pregnancy has been sought for over 160 years. This hands-on course allows participants use commercially available catheters and devices in plastic models for fallopian tube catheterization, and to speak directly to world experts about this exciting procedure.
Obstetrics/Gynecology Wednesday Poster Discussions

Wednesday, Dec. 2 12:15PM - 12:45PM Location: OB Community, Learning Center

AMA PRA Category 1 Credit ™:.50

Participants
Twin Pregnancy: A Review

Participants

Sub-Events

Awards

Certificate of Merit

Participants

Youn Kyung Lee, MD, Los Angeles, CA (Presenter) Nothing to Disclose
Nasim R. Khadem, MD, Los Angeles, CA (Abstract Co-Author) Nothing to Disclose
Charlotte L. Conturie, MD, Los Angeles, CA (Abstract Co-Author) Nothing to Disclose
Jody Hemingway, Los Angeles, CA (Abstract Co-Author) Nothing to Disclose
Daphne K. Walker, MD, Los Angeles, CA (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS

Embryology with schematics Incidence and assisted reproductive technology (ART) Update of US diagnoses of chorionicity and amnionicity Radiologist’s role in monitoring twin growth and well-being: biometry, interval growth, percent weight discordance, Doppler evaluation, amniotic fluid assessment Monochorionic twin complications and management, including placental in utero intervention Identification of uncommon twin gestations

TABLE OF CONTENTS/OUTLINE

SSM20

**Biomodeling and 3D Printing for Simulation of Surgical Separation of Conjoint Twins**

Wednesday, Dec. 2 3:00PM - 3:10PM Location: S102AB

Participants
Richard A. Barth, MD, Stanford, CA (Moderator) Nothing to Disclose
Ellen M. Chung, MD, Bethesda, MD (Moderator) Nothing to Disclose

Sub-Events

**SSM20-01** Biomodeling and 3D Printing for Simulation of Surgical Separation of Conjoint Twins

Wednesday, Dec. 2 3:00PM - 3:10PM Location: S102AB

Participants
Rajesh Krishnamurthy, MD, Houston, TX (Presenter) Research support, Koninklijke Philips NV; Research support, Toshiba Corporation
Nicholas Dodd, Houston, TX (Abstract Co-Author) Nothing to Disclose
Darrell Cass, Houston, TX (Abstract Co-Author) Nothing to Disclose
Amrta Murali, Houston, TX (Abstract Co-Author) Nothing to Disclose
Jayanthy Parthasarathy, Dallas, TX (Abstract Co-Author) Employee, VanDuzen, Inc

**PURPOSE**

We describe a unique use of biomodeling and 3D printing in the setting of surgical simulation of thoracoabdominal conjoint twin separation.

**METHOD AND MATERIALS**

Surgical planning on thoraco-omphalo-pyopagus female twins commenced at 7 months for planned separation at 10 months of life. The modeling process was initiated by a volumetric CT using a 320 detector scanner with target mode prospective EKG gating for the cardiovascular structures, and helical ungated acquisition for the chest, abdomen and pelvis. Intravenous contrast was separately administered into both twins, while oral contrast was administered only into 1 twin. Image segmentation yielded individual segments of the skin, skeleton, heart, lungs, airway, GI tract, abdominal vasculature, urinary tract, and gynecologic structures. In preparation for 3D printing, structures to support the models in a vertical position were created. In one operation, polyjet multi-material 3D printing was used to print skeletal structures, base and supports in hard plastic resin, and the organs in rubber like material. The livers were printed as separate pieces of the transparent resin, with the hepatic and portal vessels in white for better visibility. Pegs were designed so the liver could be attached or removed from the assembly. The models were designed such that they could be assembled together or separated during the surgical planning process. Findings on biomodels and 3-D print were compared to findings at surgical separation.

**RESULTS**

The twins underwent surgical separation by a multidisciplinary surgical team. No discrepancy was noted involving the cardiopulmonary, hepatic, intestinal, renal and skeletal anatomy. Preoperative simulation successfully predicted assignment of the pelvic viscera to each twin based on the vasculature. There was one hemorrhagic complication at surgery, unrelated to preoperative anatomical characterization.

**CONCLUSION**

We have demonstrated a unique use of 3D modeling and 3D printing for simulation and planning of conjoint twin separation, with representation of the surgically relevant viscera and vasculature in a single 3D printed model.

**CLINICAL RELEVANCE/APPLICATION**

Describe a novel application of 3D printing for simulating conjoint twin separation, which involves representation of all surgically relevant visceral and vascular anatomy in a single 3D print.

SSM20-02

**Estimates of Diagnostic Reference Levels for Common Pediatric Fluoroscopic Procedures**

Wednesday, Dec. 2 3:10PM - 3:20PM Location: S102AB

Participants
Keith J. Strauss, FAAPM, FACR, Cincinnati, OH (Presenter) Research Consultant, Koninklijke Philips NV; Speakers Bureau, Koninklijke Philips NV
Rami Nachabe, PhD, Best, Netherlands (Abstract Co-Author) Employee, Koninklijke Philips NV
Steven J. Kraus, MD, Cincinnati, OH (Abstract Co-Author) Nothing to Disclose

**PURPOSE**

To survey radiation dose indices of four common general pediatric fluoroscopic procedures at a tertiary care pediatric hospital. These results allow estimates of diagnostic reference levels (DRLs) from dose indices.

**METHOD AND MATERIALS**

Radiation dose structured reports were retrospectively collected for > 2,000 pediatric general fluoroscopic cases. Kermα Area Product (KAP), air Kerma (Kair), fluoroscopy time (FT), thickness of body part irradiated, and patient age were collected for pediatric video swallow (VS), upper GI (UGI), lower GI (LGI) and voiding cystourethrogram (VCUG) studies. Each group of patients for a study was limited to a size variance of only 3 cm with targeted number of cases > 30 per group. 1st, 2nd, 3rd quartiles for
RESULTS

Only data for the Kair for our 585 VCUG cases is presented here. For group sizes of 5-7, 8-10, 11-13, 14-16, 17-19, 20-22, 23-25 cm the number of cases and 3rd percentile estimate of DRL respectively were 16, 99, 229, 133, 67, 29, 14 and 0.26, 0.55, 0.89, 1.46, 3.52, 6.39, 11.28 mGy. For an exponential fit of patient Kair vs thickness \((ae^{-bx})\), \(a = 0.07\) and \(b = 0.2\). In addition to scatter plots of the data with fitted curves for each type of study, a data table is also provided for each study type that lists the 1st, 2nd, and 3rd quartile of AK, KAP, FT, AK/FT, KAP/FT as a function of the patient group thicknesses along with published average age, height, mass, and BMI corresponding to that measured thicknesses. Calculated DAP/AK ratios allow conversion between these two indices if one is known.

CONCLUSION

Estimates of 3rd quartile dose indices of four common pediatric fluoroscopic procedures as a function of patient thickness should assist departments in the development of DRL values using dose indices.

CLINICAL RELEVANCE/APPLICATION

Fluoroscopic DRL values based on a department’s unique patients and imaging equipment foster better management of radiation dose and image quality to improve pediatric patient care.
Digital imaging has greatly improved clinician access to images and timely reports but may have eroded face-to-face communication between clinicians and radiologists, especially in the ICU. Increased radiology workload together with demands for on-site presence of ICU house staff have made it difficult to hold morning radiology rounds. Despite this, benefits of digital imaging have far outweighed the limitations, and the new hurdles require new thinking. This project leverages simple technology to create personalized point of care radiology consultation in the ICU.

**METHOD AND MATERIALS**

Using Lync 13, 20 minute interactive rounds were delivered by a radiologist from a workstation located in the radiology reading room to a clinical team in a 55 bed pediatric ICU. Images were shared from PACS (Philips iSite) to a large screen in a central meeting space in the ICU, with both stations equipped with panoramic web-cams with built-in audio. There were 12 sessions over 1 month, first and last session reserved for testing. Ten micro-didactic lectures were prepared covering top 10 items from the ACP Core Content for Critical Care; each session started with the lecture followed by review of daily inpatient imaging including all modalities and body systems. Assessment tools: Demographics (experience and background); Skills (image-based pre- and post-test); Confidence (self-reporting questionnaire); Format (learning effectiveness, strengths and weaknesses). The study was granted IRB exemption with consent.

**RESULTS**

8 residents participated (4 control/4 intervention). There was a more significant increase in test scores in the intervention group over the controls (p = 0.031). Test time: 12.9 minutes (8-17). Confidence scores increased significantly for modalities and diagnoses, with pre to post-test scores of 55.6% (40.7-59.3) to 57.4% (44.4-77.8) p = 0.031 and 66.7% (47.9-89.6) to 81.1% (62.5-100) p = 0.016 respectively. Format scored 4-5/5, with positive comments about level of interactivity and time allotment. Weaknesses included intermittent video bandwidth loss and limited time to cover the curriculum.

**CONCLUSION**

Virtual conferencing contributes positively to radiology education, has potential for significant impact on patient care in the ICU and is a viable alternative to interdepartmental travel for radiology rounds.

**CLINICAL RELEVANCE/APPLICATION**

Interdisciplinary dialogue is essential in building knowledge and adds value to patient care through radiology consultation.

**SSM20-06 Getting Published in Paediatric Radiology: What Does it Take?**

**Wednesday, Dec. 2 3:50PM - 4:00PM Location: S102AB**

**Participants**

Susan C. Shelmerdine, MBBS, FRCR, London, United Kingdom (Presenter) Nothing to Disclose
Jeremy Lynch I, BMBC, London, United Kingdom (Abstract Co-Author) Nothing to Disclose
Owen Arthurs, MBBC, PhD, Cambridge, United Kingdom (Abstract Co-Author) Nothing to Disclose

**PURPOSE**

Presentation of new research and emerging techniques at scientific conferences allows dissemination of expertise and enables future development within the specialty. Studies that do not result in a subsequent publication limit the impact of the work undertaken. This study establishes the conversion rate and identifies predictive factors for journal publication of oral scientific presentations within paediatric radiology.

**METHOD AND MATERIALS**

Oral presentations from the European Society of Paediatric Radiology, International Society of Pediatric Radiology and Society of Pediatric Radiology conference between 2010 and 2012 were identified from published conference proceedings. A literature search was performed to ascertain whether publication in a MEDLINE indexed journal was achieved by April 2015. Logistic regression was performed using R, version 3.1.3 to identify predictive factors.

**RESULTS**

300 out of 715 (41%) oral presentation abstracts were subsequently published, most commonly in the journals: Pediatric Radiology (74, 25%), AJR (34, 11%) and Radiology (22, 7%). The majority of presentations (169, 56%) were published within 24 months of the conference date (1 – 59 months). Countries with the highest abstract to publication conversion rates were USA (169, 56%), Canada (18, 6%), France (16, 9%) and United Kingdom (15, 5%). Factors that were predictive of publication included sample size (p = 0.007), publication within the subspecialty subject areas of radiation protection (p = 0.02), neurological imaging (p = 0.03), and functional imaging (p = 0.04). Factors that did not have any effect on subsequent publication included study type, prospective nature of the study or origin of study from an academic or paediatric tertiary centre.

**CONCLUSION**

In this retrospective study of pediatric radiology conference proceedings, fewer than half of all presented oral abstracts result in publication. Studies with a larger sample size and within certain subspecialty areas in paediatric radiology were associated with subsequent publication. Identification of predictive factors in journal publications may help future investigators plan and design successful research projects.

**CLINICAL RELEVANCE/APPLICATION**

Identification of predictive factors in journal publications may help future investigators plan and design successful research projects.
Participants
Karen Y. Oh, MD, Portland, OR (Presenter) Nothing to Disclose
Roya Sohaey, MD, Portland, OR (Abstract Co-Author) Nothing to Disclose
Ryan Moore, MD, Portland, OR (Abstract Co-Author) Nothing to Disclose
Thomas Gibson, MD, Portland, OR (Abstract Co-Author) Nothing to Disclose
Kyle Jensen, MD, Portland, OR (Abstract Co-Author) Nothing to Disclose
McKenna Belzer, MD, Portland, OR (Abstract Co-Author) Nothing to Disclose
Neda Jafarian, MD, New York, NY (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1) The five submitted Obstetrical Imaging cases will offer challenging ultrasound and MR images to practice visual interpretation skills, promote medical knowledge review and enhance the ability to summarize important findings to achieve a diagnosis.
Be Still My Beating Heart: Why Imaging the Fetal Heart Should not Give You Palpitations!

Station #1

Participants

Neel Patel, BA, Salt Lake City, UT (Abstract Co-Author) Nothing to Disclose
Evan Narasimhan, BA, Salt Lake City, UT (Abstract Co-Author) Nothing to Disclose
Anne M. Kennedy, MD, Salt Lake City, UT (Presenter) Nothing to Disclose

TEACHING POINTS

1. Teach a systematic approach to fetal heart evaluation on the standard views obtained during 2nd and 3rd trimester scans allowing the reader to decide if the study is normal or if referral to specialized facility is required. Recognition of congenital heart disease (CHD) starts with recognition of abnormal anatomy. CHD may be isolated or be associated with aneuploidy, other congenital anomalies or syndromes. Prenatal diagnosis of isolated CHD results in better outcome for affected children. 2. Illustrate normal rate and rhythm and show examples of benign abnormal rhythms such as premature atrial contractions as well as the more significant tachyarrhythmias. Sustained fetal arrhythmia can result in hydrops and fetal demise.

TABLE OF CONTENTS/OUTLINE

Fetal ultrasound images will be displayed with chest CT and MRI images for anatomic correlation. Four chamber view: Situs Heart position, axis, size, squeeze Chamber identification/symmetry, septal length, atrioventricular valve offset, foramen ovale flap What's behind the heart? Outflow tracts: Arch views Right ventricular outflow tract Left ventricular outflow tract Three vessel view Rate and rhythm: Making sense of M-mode Examples of abnormal 4-chamber views: Hypoplastic left heart Pulmonary atresia Atrioventricular septal defect
Participants

Sub-Events

**OB139-ED-THB1 Ultrasonographic Imaging of Early Gestation: Diagnostic Criteria of Fetal Demise**

Station #1

Participants
Thomas F. Flood, MD, PhD, Aurora, CO (Presenter) Nothing to Disclose

TEACHING POINTS

Confirming a non-viable first trimester pregnancy can be challenging if not well-versed in the normal and pathological imaging characteristics of an early gestation. This exhibit will present a series of challenging questions/images concerning early gestation in order to help improve the accuracy/understanding of diagnosing a non-viable pregnancy.

TABLE OF CONTENTS/OUTLINE

Learn the imaging characteristics of the major structures comprising an early intra-uterine gestation. Learn the accurate and reproducible timing of the major structures comprising an early intra-uterine gestation. Learn the criteria, including the sensitivity/specificity, for diagnosing a definite non-viable first trimester pregnancy (based on crown-rump length in an embryo without a heartbeat). Learn the criteria for diagnosing a suspicious non-viable first trimester pregnancy (based on crown-rump length in an embryo without a heartbeat). Learn the criteria, including the sensitivity/specificity, for diagnosing a definite non-viable first trimester pregnancy (based on gestational sac size). Learn the criteria for diagnosing a suspicious non-viable first trimester pregnancy (based on gestational sac size). Learn the appropriate follow-up interval and criteria for diagnosing a definite non-viable first trimester pregnancy after an initial evaluation suspicious for a non-viable first trimester pregnancy.
Case-based Review of the Abdomen (An Interactive Session)

Thursday, Dec. 3 1:30PM - 3:00PM Location: S406A

Participants
Douglas S. Katz, MD, Mineola, NY, (dkatz@winthrop.org) (Director) Nothing to Disclose

LEARNING OBJECTIVES
1) To review a series of clinically relevant, abdominal imaging cases, with audience participation. 2) To review important concepts and potential pitfalls of: the liver on sonography; the acute abdomen on US, CT, and MR; liver transplants on multi-modality imaging; genitourinary imaging; and trauma imaging. 3) To provide take home points for the audience based on specific actual case material which was instructional or problematic for the presenters.

ABSTRACT

Sub-Events

MSCA51A Hepatic Tumor Imaging

Participants
Puneet Bhargava, MD, Shoreline, WA (Presenter) Editor, Reed Elsevier

LEARNING OBJECTIVES
1) Review imaging appearances of common hepatic tumors. 2) Review key imaging findings that aid in differential diagnosis.

ABSTRACT

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Puneet Bhargava, MD - 2015 Honored Educator

MSCA51B Abdominal Trauma Imaging

Participants
Savvas Nicolaou, MD, Vancouver, BC (Presenter) Institutional research agreement, Siemens AG

LEARNING OBJECTIVES
1) Review the technique and protocols, with an emphasis on MDCT, for imaging of blunt and penetrating abdominal and pelvic trauma. 2) Demonstrate examples of the spectrum of injuries and the accompanying management associated with abdominal trauma, including hepatic and hepatobiliary (gallbladder) injuries, bowel and mesenteric injuries, and pelvic injuries including bladder and vascular injuries. 3) Demonstrate significance of arterial and portal venous phase imaging in the setting blunt abdominal and pelvic trauma, and the utility of whole body imaging. 4) Review new imaging applications and techniques such as iterative reconstruction and dual-energy CT, which can help better image abdominal and pelvic injuries post-trauma.

ABSTRACT

MSCA51C Acute Abdomen Imaging

Participants
Stephan W. Anderson, MD, Boston, MA (Presenter) Nothing to Disclose

LEARNING OBJECTIVES
1) The participant will be exposed to the current literature related to imaging of acute abdominal pain using CT. 2) The participant will be able to apply an evidence-based approach to CT protocol development in the imaging of acute abdominal pain. 3) The participant will be able to independently evaluate the published literature in this area in a critical fashion and continue to apply recent developments to their own practice.
LEARNING OBJECTIVES

1) The learner will be made aware of the importance of acute kidney injury (AKI) and associated ultrasound findings. 2) Ultrasound criteria of cystic adnexal masses will be reviewed. 3) Testicular and scrotal pathology and the importance of ultrasound will be explained.

ABSTRACT

Ultrasound has taken on new importance in the evaluation of the kidney, female pelvis and the scrotum/testicles. We will explain the ultrasound findings of acute kidney injury (AKI), the evaluation of pelvic masses and the necessary follow-up. Finally, a review of the testicle and ultrasound findings will complete the course.

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Mindy M. Horrow, MD - 2013 Honored Educator
Participants

LEARNING OBJECTIVES

Please bring your charged mobile wireless device (phone, tablet or laptop) to participate.

Sub-Events

RC713A  Fetal Ear and Orbital Anomalies

Participants
Maria A. Calvo-Garcia, MD, Cincinnati, OH (Presenter) Nothing to Disclose

LEARNING OBJECTIVES

1) Identify major fetal external ear and orbital malformations. 2) Apply useful search patterns during US and fetal MRI evaluation of external ear and orbital anomalies.

ABSTRACT

Assessment of the fetal face is an important part of the sonographic structural survey. Craniofacial abnormalities occur as an isolated phenomenon or in the context of syndromes, chromosomal abnormalities or environmental insults. Along the course of this presentation we will review the standard facial anatomic survey with US and the main embryologic steps involved in the development of the face. Subsequently we will discuss major malformations involving the external ear and orbits and their expected association. The presentation will include clinical cases evaluated with US and fetal MRI and their postnatal correlations.

RC713B  Fetal Chest Anomalies

Participants
Teresa Victoria, MD, PhD, Philadelphia, PA, (victoria@email.chop.edu) (Presenter) Nothing to Disclose

LEARNING OBJECTIVES

1) To discuss the most common fetal lung masses. 2) To identify imaging algorithms and patterns that can be helpful in reaching a diagnosis.

ABSTRACT

Accurate diagnosis of fetal lung lesions is crucial for appropriate counseling and management of the abnormalities in hand. During the lecture, the normal appearance of the fetal chest will be briefly done, in order to approach a review of the most common pulmonary lesions encountered during the fetal period. Diagnostic clues that will guide accurate diagnosis will be discussed. Rare lung lesions and their imaging diagnostic approach will also be discussed.

RC713C  Fetal GI Anomalies

Participants
Erika Rubesova, MD, Stanford, CA (Presenter) Researcher, Siemens AG

LEARNING OBJECTIVES

1) After the presentation, the learners should be able to recognize the normal appearance of developing fetal bowel, as well as the most common and uncommon presentations of congenital bowel anomalies on ultrasound and MRI. They will become familiar with the specific information provided by each of the two modalities. The course will present a review of bowel anomalies of the fetus and will be illustrated by representative cases with the objective for the learners to understand the systematic approach of image analysis that can lead to the accurate diagnosis or limited list of differential diagnoses.

ABSTRACT

Diagnosis of fetal bowel anomalies usually presents on ultrasound as bowel dilatation or echogenic bowel. Echogenic bowel is associated with multiple other congenital conditions such as chromosomal anomalies, viral infections or cystic fibrosis. Dilatation of bowel may have various etiologies and systematic review of the findings including bowel wall thickening, number of distended bowel loops or the increased echogenicity of the content may help to localize bowel obstruction and narrow the list of differential diagnosis. Fetal MRI adds precious information to the ultrasound thanks the larger field of view, better tissue contrast but mainly thanks to high T1 signal intensity of meconium. Meconium is formed in the entire bowel and accumulates in the rectum that acts as a reservoir. While meconium is seen in the small bowel and colon in the second trimester, it is mainly seen in the fetal colon after 30 weeks of gestational age. Meconium acts as intraluminal contrast, similar to a barium enema. Systematic review of the distribution of meconium and analysis of the bowel caliber in comparison to normal values for gestational age helps to establish or narrow the list of differential diagnoses of fetal gastrointestinal abnormalities. In this presentation, we will review the advantages and limitations of ultrasound and MRI for diagnosis of fetal anomalies, we will discuss and illustrate, by representative cases, the approach to the most common and some more rare or atypical congenital bowel anomalies on ultrasound and MRI, in order to establish a single or short list of differential diagnoses.
Handout: Erika Rubesova

Participants

Sub-Events

RC808A  Pitfalls in Right Upper Quadrant Ultrasound

Participants
Mindy M. Horrow, MD, Philadelphia, PA, (horrovmm@einstein.edu) (Presenter) Spouse, Director, Merck & Co, Inc

LEARNING OBJECTIVES
1) Describe technical factors that may improve visualization of cholelithiasis including appropriate frequency transducer and identification of gallbladder neck. 2) Identify non biliary causes of gallbladder wall thickening. 3) Recognize causes for non-visualization of a fluid filled gallbladder and how to differentiate the gallbladder from other fluid filled structures in the right upper quadrant. 4) Describe situations in which color Doppler is essential to detect renal causes of right upper quadrant pain.

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Mindy M. Horrow, MD - 2013 Honored Educator

RC808B  Pediatric Abdominal Ultrasound Pitfalls

Participants
Susan D. John, MD, Houston, TX (Presenter) Nothing to Disclose

LEARNING OBJECTIVES
1) Use optimal protocols for performing abdominal US in infants and children. 2) Avoid diagnostic errors in pediatric gastrointestinal US caused by common artifacts and variables in exam performance. 3) Recognize variations in pathology and important secondary findings that are helpful for the diagnosis of acute or emergent conditions in the pediatric abdomen.

ABSTRACT

RC808C  Non-obstetrical Gynecologic Ultrasound Pitfalls

Participants
Ana P. Lourenco, MD, Providence, RI, (alourenco@lifespan.org) (Presenter) Nothing to Disclose

LEARNING OBJECTIVES
1) Recognize commonly encountered gynecological ultrasound pitfalls. 2) Describe strategies to avoid these pitfalls.

ABSTRACT

This session will review common pitfalls encountered in gynecologic ultrasound and highlight strategies for avoiding such pitfalls. Case-based presentations will illustrate the varied presentations of ovarian torsion, non-gynecologic etiologies for acute pelvic pain including ureteral calculi and acute appendicitis, and a variety of uterine, ovarian and adnexal abnormalities. The benefits and limitations of transabdominal and transvaginal imaging, as well as color Doppler, will be highlighted with examples to demonstrate the utility of each technique.

Active Handout:Ana P. Lourenco

RC808D  First Trimester Ultrasound Pitfalls

Participants
Mariam Moshiri, MD, Seattle, WA (Presenter) Consultant, Reed Elsevier; Author, Reed Elsevier

LEARNING OBJECTIVES
1) To review the relatively recent report of the Society of Radiologists in Ultrasound, on new ultrasound criteria for evaluation of first trimester pregnancy. 2) To demonstrate potential pitfalls of sonographic performance and interpretation in the first trimester of pregnancy, and to discuss how to avoid them. 3) To review other relevant, very recent literature on first trimester pregnancy ultrasound performance and interpretation.
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Mariam Moshiri, MD - 2013 Honored Educator
Mariam Moshiri, MD - 2015 Honored Educator