RSNA 2017 Explore. Invent. Transform.
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McCormick Place, Chicago
Explore Invent Transform

GUS-TUA

Genitourinary Tuesday Poster Discussions

Tuesday, Nov. 28 12:15PM - 12:45PM Room: GU/UR Community, Learning Center

GU

AMA PRA Category 1 Credit ™: .50

FDA Discussions may include off-label uses.

Participants

Antonio C. Westphalen, MD, Mill Valley, CA (*Moderator*) Scientific Advisory Board, 3DBiopsy LLC ; Research Grant, Verily Life Sciences LLC

Sub-Events

GU246-SD-TUA1 Reproducibility of CT Perfusion in Ovarian Cancer: A Substudy of ACRIN 6695/GOG-0262

Station #1

Participants
Ting-Yim Lee, MSc, PhD, London, ON (*Presenter*) License agreement, General Electric Company
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PURPOSE

The primary objective of ACRIN 6695 was to determine whether CT perfusion (CTP) parameters are prognostic of progression-free survival at 6 months in a cohort of patients from the GOG-262 trial. The latter is a phase III trial on advanced stage ovarian cancer comparing standard to dose-dense paclitaxell/carboplatin with 91% of cohort also receiving bevacizumab. The purpose of this substudy was to determine the reproducibility of CTP parameters.

METHOD AND MATERIALS

Seventy-six subjects underwent 3 CTP studies before (T0) and within the third (last) week of first cycle (T1) and first week of second cycle (T2) of treatment in 19 US cancer centers. Each study comprised of dynamic contrast enhanced imaging with a two-phase scanning protocol without breath-hold: 24 images at 2.8 s intervals followed by 8 images at 15 s intervals acquired using 120 kV and 50 mAs each image. Nine out of 76 patients had a repeat CTP study at T1 at 6 different centers. The CTP studies of all these patients except one were performed with the axial shuttle scanning mode on CT scanners from two vendors. There was a 10-15 min of contrast wash-out time between the first and second study. The free-breathing CTP images were mannually registered using ANALYZE (Mayo Clinic, Rochester) to minimize breathing motion before blood flow (F), blood volume (BV) and vessel permeability surface product (PS) maps were generated using CT Perfusion (GE Healthcare).

RESULTS

The coefficients of variation of BF, BV and PS calculated as the whole tumor differences between the two studies as pecentages of the means were: 14.5%, 18.3% and 59.3% respectively.

CONCLUSION

BF measured with CTP had higher reproducibility than either BV or PS. Results from this substudy support the primary finding of ACRIN 6695/GOG 262 that increase in tumor BF from T0 to T2 was associated with reduced patient time to progression and explain why BV and PS were less useful as prognostic markers because of their higher variability.

CLINICAL RELEVANCE/APPLICATION

CT Perfusion derived BF shows promise as an imaging biomarmker of response in ovarian cancer as early as 4-week post treatment and can be reproducibly assessed in a multicenter trial setting.

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/ Susanna I. Lee, MD, PhD - 2013 Honored Educator

GU247-SD-TUA2 Diagnostic Value and Pathological Study of ADC Value in Early Cervical Cancer

Station #2

Participants
Yue Dong, Shen Yang, China (*Presenter*) Nothing to Disclose
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PURPOSE

To analyze the difference of the apparent diffusion coefficient (ADC) value of early cervical cancer in different pathological types, and to explore the clinical application of ADC value in pathological classification of early cervical cancer.

METHOD AND MATERIALS

131 patients were selected who were diagnosed as early cervical cancer by pathology and clinic. There were 100 cases of squamous cell carcinoma(SCC), 17 cases of adenocarcinoma(AC) and 14 cases of adenosquamous carcinoma (ASC). Among 100 cases of SCC, there were 4 cases of poor differentiation, 87 cases of middle differentiation and 7 cases of well differentiation. All patients underwent 3.0T MRI routine scan and DWI examination. The ADC values were measured and analyzed for the characteristics of early cervical cancer with different pathological types and different differentiation.

RESULTS

ADC minimum (ADCmin), ADC mean (ADCmean) and ADC maximum (ADCmax) values of SCC were (619±0.011)×10-3mm2/s, (0.953±0.017)×10-3mm2/s and (1.642±0.032)× 10-3mm2/s; The ADCmin, ADCmean and ADCmax values of AC were (0.798±0.058) ×10-3mm2/s, (1.129±0.055)×10-3mm2/s and (1.643±0.050)×10-3mm2/s; The ADCmin, ADCmean and ADCmax values of ASC were (0.565±0.036)×10-3mm2/s; (0.944±0.063)×10-3mm2/s and (1.636±0.076)×10-3mm2/s. In early cervical cancer, the ADCmin and ADCmean of AC were higher than those of SCC and ASC ($p<0.01$). It was no significant difference in ADCmean and ADCmin value between SCC and ASC. In three pathological types of early cervical cancer, it was no statistical difference of the ADCmax value. It was no statistically significant difference in ADCmean among different pathological differentiation levels of early cervical cancer.

CONCLUSION

ADC values r have a certain diagnostic value in the differentiation of pathological types of early cervical cance, but the value in diagnosing the degrees of differentiation is limited.

CLINICAL RELEVANCE/APPLICATION

The study of ADC values in the early different types of cervical cancer have a certain degree of differentiation,it will help to diagnose different types of eary cervical cancer,and provide the basis for clinical treatment.

GU248-SD-TUA3 Anti-Peristaltic Medication Significantly Decreases Motion Artefacts and Allows Better Delineation of Anatomic Structures in mp-MRT of the Prostate

Station #3

Participants
Tim Ullrich, Duesseldorf, Germany (*Abstract Co-Author*) Nothing to Disclose
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PURPOSE

To prospectively evaluate the effect of hyoscine butylbromide (HBB) on visualization of anatomical details and motion-related artefacts in mp-MRI of the prostate at 3.0 Tesla.

METHOD AND MATERIALS

One hundred and three consecutive patients (65±10y) were included in this prospective trial, powered to demonstrate an improvement of image quality (IQ) after HBB administration, assessed on a 5-point scale by two blinded readers. All patients received high-spatial resolution axial T2-weighted TSE sequences at 3.0T without spasmolytic agent, repeated after application of 40mg HBB and followed by routine mp-MRI. Secondary endpoints were (1) susceptibility to side effects, (2) dependence of spasmolytic effect on patients´ weight, and (3) prostate volume.

RESULTS

In 68% of patients HBB significantly improved the anatomic score (mean: 3.4±0.9 before and 4.4±0.7 after HBB for both readers; p=<0.001). In 67% HBB significantly enhanced the artefact score (mean: 3.2±1 before and 4.2±0.8 after HBB for reader 1 (p= <0.001); 3.2±1 and 4.1±0.8 for reader 2; p=<0.001)). Subgroup analysis revealed no statistically significant difference between patients with different bodyweight or prostate volume. Inter-reader agreement was excellent (k=0.95-0.98).

CONCLUSION

Hyoscine butylbromide significantly improves image quality and reduces motion-related artefacts in mp-MRI of the prostate

Hyoscine butylbromide significantly improves image quality and reduces motion-related artefacts in mp-MRI of the prostate independent of bodyweight or prostate volume. No side effects were reported.

CLINICAL RELEVANCE/APPLICATION

Hyoscine butylbromide significantly improves image quality and reduces motion-related artefacts in mp-MRI of the prostate and therefore facilitates and optimizes prostate cancer detection and diagnostics. Moreover, side effects of hyoscine butylbromide are rare and were not be documented in our study population.

GU249-SD-TUA4 Impact of Magnetic Resonance Imaging (MRI) of the Fetal Brain in the Assessment of Fetal Central Nervous System (CNS) Anomalies

Station #4

Participants
Mariam R. Louis, MD, Cairo, Egypt (*Presenter*) Nothing to Disclose

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PURPOSE

To analyze the impact MRI of the fetal brain and if it adds to the routine antenatal ultrasound study in the second trimester.

METHOD AND MATERIALS

40 fetuses with suspected or diagnosed central nervous system (CNS) anomaly in their routine antenatal ultrasound study at the second trimester done between 18 and 27 weeks . Balanced FFE T2 weighted images of fetal brain done in axial, coronal and sagittal planes, with assessment of brain anatomy and different congenital anomalies.The diagnosis was confirmed by postnatal MRI or CT and autopsy in still born or abortus fetuses.

RESULTS

We found different CNS anomalies including :12 cases with supra and infratentorial arachnoid cysts , 6 cases with Dandy-Walker malformation and its variants, 4 cases of holoprosenchephaly and its interhemispheric variant (syntelencephaly) , 3 with cases with hydrocephalus , 6 cases with corpus callosum agenesis , 8 cases with Meckel's Gruber Syndrome and one case of extra-dural lesion which was only diagnosed in MRI as an hematoma. MRI was done in the same week of the ultrasound. Obtained MRI confirmed US diagnosis in 30 cases (75%) , added an extra finding in 6 cases(15%) and changed diagnosis in 4 cases(10%) . The 40 pregnancies resulted in 25 terminations (62.5 %), two intrauterine fetal deaths (IUFD) (5%) two spontaneous abortion (5%) and eleven births (27.5 %).

CONCLUSION

Ultrasound is the gold standard imaging modality for anomaly scan in the second trimester , however fetal MRI of CNS anomalies in the second trimester might be a clinically valuable complement , especially when the ultrasound examination is inconclusive due to maternal obesity , severe oligohydraominos or in complicated cases with unclear diagnosis.

CLINICAL RELEVANCE/APPLICATION

MRI of the fetal brain is a feasible modality that confirms the diagnosis of ultrasound, sometimes adds more information and in other times it completely changes the diagnosis . More over it is not operator dependent and its images are more accepted and understood by neurologists and neuro-surgeons. In addition it provides images with much better tissue contrast thus confirm the US diagnosis and can add or change diagnosis in few cases .

GU250-SD-TUA5 Uterine Malformations Associated with Higher Incidence of Ectopic Ovary

Station #5

Awards
Student Travel Stipend Award

Participants
Yue Wang, MD, Beijing, China (*Presenter*) Nothing to Disclose
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PURPOSE

Ovarian position plays a significant role in the strategy of oocyte retrieval for in vitro fertilization. The aim of the study was to investigate the association between uterine malformations and ectopic ovary.

METHOD AND MATERIALS

Ovarian position was evaluated in 294 individuals with uterine malformations and 53 normal females. Forty-five patients were excluded for prior pelvic surgery and/or large pelvic mass (>5cm). The rest 249 patients were finally included and divided into three subgroups. Group A. Development anomalies (MRKH syndrome and unicornuate uterus), 100 patients. Group B. Fusion anomalies (Bicornuate uterus and Didelphys Uteri), 45 patients. Group C. Degeneration anomalies (Complete and partial septate uterus), 104 patients. Ovary is located in the posterior compartment of the pelvis generally. The evaluaion strategy of ectopic ovary was variable in past publications. In this study, ectopic ovary was established if the ovary was lied out of the pelvic, or located anterolaterally just behind the anterior abdomen wall. Two experience gynecological radiologists rendered consensus diagnosis. Any discrepancies were resolved through discussions.

RESULTS

Resutls: Altogether 498 ovaries in 249 patients with uterine anomalies and 106 ovaries in 53 normal females were evaluated. The incidence of ectopic ovary was highly increased in patients with uterine malformations [20% (49/249), P<0.05], especially in the group of development anomalies [34% (34/100), P<0.001], as compared with normal females (7.5%. 4/53).

CONCLUSION

The study proved that patients with uterine malformation have a higher incidence of ectopic ovary, especially patients with development anomalies.

CLINICAL RELEVANCE/APPLICATION

Patients with uterine malformations have a higher incidence of ectopic ovary. An accurate evaluation of the ovarian location is significant in the strategy of oocyte retrieval approach for in vitro fertilization. Transabdominal approach is preferred than transvaginal routine in cases with ectopic ovary.

GU251-SD-TUA6 Does a Negative Prostate mpMRI Rule-Out Clinically Significant Cancer

Station #6

Participants
Julie Y. An, BS, Copley, OH (*Presenter*) Nothing to Disclose
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Peter Pinto, Bethesda, MD (*Abstract Co-Author*) Nothing to Disclose

PURPOSE

To evaluated the histopathologic results from systematic 12-core biopsy performed in patients with negative prostate multiparametric MRI (mpMRI) to estimate the negative predictive value (NPV) for any and clinically significant cancer detection.

METHOD AND MATERIALS

We queried our IRB approved, retrospective prostate mpMRI registry for men who underwent systematic 12-core biopsy within a year of negative prostate mpMRI between January 2013-February 2017. Clinicopathologic features were analyzed for the entire cohort and stratified by biopsy history. Negative predictive value (NPV) was calculated for detection of any cancer (>=Gleason 6) and clinically significant cancer (>=Gleason 7). Regression analysis was performed to identify outcome predictors.

RESULTS

Overall, 114 men met the inclusion criteria. Median age in this cohort was 61 (IQR 57-67) years, median PSA was 5.5 (IQR 3.6-8.7) ng/ml, 4.4% of the patients had a positive digital rectal exam. NPV of mpMRI for any cancer and clinically significant cancer was 0.77 and 0.96, respectively. NPV for significant cancer in biopsy naïve (n=20), prior negative biopsy (n=53), and prior positive biopsies (n=41) cohorts was 1.0, 1.0, and 0.90, respectively. Demographic and clinical parameters including age, ethnicity, PSA, prostate volume, PSA density, prior negative biopsy, positive DRE displayed no relationships to the detection of PCa.

CONCLUSION

Negative mpMRI has excellent NPV and useful for ruling out intermediate and high-risk prostate cancer. There was a lower incidence of prostate cancer biopsy naïve patients and patient with previous negative biopsy. Forgoing repeat biopsy on active surveillance patients with negative mpMRI could prevent unnecessary biopsy on these patients. Although imaging currently cannot replace diagnostic biopsy, it may a be useful tool to include in active surveillance and help stratify risk and need for biopsy in patients with elevated PSA.

CLINICAL RELEVANCE/APPLICATION

mpMRI demonstrated high NPV and is useful for ruling out clinically significant prostate cancer. Patients with negative prostate mpMRI may not need to undergo prostate biopsy, especially if they have had a previously negative biopsy or are on active surveillance.

UR170-ED-TUA8 Therapeutic Ultrasound Ablation of the Prostate: A Review of Available Devices and Evidence

Station #8

Participants
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David Penson I, MD, Nashville, TN (*Abstract Co-Author*) Nothing to Disclose
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TEACHING POINTS

Treatments such as prostatectomy and brachytherapy for localized prostate cancer can leave many men with complications affecting urinary, bowel, and sexual function. Therapeutic ultrasound ablation (TUA) of the prostate has the potential to avoid these complications. Two devices, which use high-intensity focused ultrasound under US guidance for TUA of prostate tissue, are FDA approved. Clinical trials for devices that use MRI guidance for TUA of the prostate are ongoing. Our goal is to educate

radiologists about available devices for prostate TUA and to discuss the current evidence & controversies of prostate TUA treatment. In contrast to the limited role in US-guided whole-gland TUA, a radiologist's responsibility in MR whole gland and MR-US fusion-guided focal ablations may include pre-treatment planning, monitoring & deciding if re-treatment is needed, and interpreting the post TUA appearance of the prostate.

TABLE OF CONTENTS/OUTLINE

Discussion of the principles of TUA Description of the technical & patient specifications for available commercial devices Comparison and contrast of different approaches: Transurethral vs. transrectal, MR- vs. US-guided, whole gland vs. focal ablation Evaluation of the current evidence for TUA including efficacy, complications, and controversies surrounding FDA approval. Analysis of imaging after TUA

UR212-ED-TUA9 The Many Faces of Urinary Bladder Disorders

Station #9

Participants
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Carlos Nicolau, MD, Barcelona, Spain (*Abstract Co-Author*) Nothing to Disclose
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Carmen Sebastia Cerqueda, MD, Barcelona, Spain (*Abstract Co-Author*) Nothing to Disclose
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TEACHING POINTS

? To explain the usefulness of different imaging modalities in the diagnosis of urinary bladder diseases, including contrast-enhanced US, MDCT and MRI. ? To propose a diagnostic approach of urinary bladder tumor-like lesions. ? To review a varied group of disorders that can appear as focal bladder masses or bladder wall thickening, with pathologic correlation.

TABLE OF CONTENTS/OUTLINE

1. Introduction a. Anatomy of the bladder b. Focal bladder mass: not always urothelial carcinoma 2. Imaging modalities and diagnostic approach a. US and contrast-enhanced US b. MDCT c. MRI 3. Differential diagnosis of urinary bladder lesions a. Focal bladder mass b. Bladder wall thickening 4. Case-based review a. Infectious: schistosomiasis, tuberculosis, emphysematous cystitis, encrusted cystitis. b. Inflammatory: Crohn disease, diverticulitis, apendicitis, amyloidosis. c. Benign tumors: leiomyoma, paraganglioma, lipoma, fibroma, papilloma. d. Malignant tumors: squamous cell carcinoma, adenocarcinoma, neuroendocrine carcinoma, metastases. e. Idiopathic: inflammatory pseudotumor, endometriosis. f. Iatrogenic: radiation cystitis, post-biopsy and post-cystostomy edema. g. Other: blood clots. 5. Summary