

ECR 2017 – BOOK OF ABSTRACTS



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opacification, there were no notable differences between readers. The interpretation time for all of the 4 reviewers was calculated for each scan. The mean reporting time without opacification dropped from 8.8 minutes to 6.9 minutes when the rectum and vagina were opacified. Moreover, the mean reporting time between the experienced and unexperienced radiologists became almost equivalent.

Conclusion: Our study was intended to evaluate the use of ultrasound gel to opacify the rectum and vagina in diagnosing deep pelvic endometriosis. The results show that this technique is generally accepted by patients, the sensitivity and specificity are extremely high and the differences in reporting between experienced and unexperienced radiologists are almost none.

B-1099 11:50

Uro colon CT in the diagnosis of pelvic deep infiltrating endometriosis

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Purpose: To evaluate the diagnostic accuracy (DA) of the uro-colon-CT (U-CCT) with dose-reduction dedicated protocol in preoperative study of deep infiltrating endometriosis of the anterior and posterior compartments (aDIE and/or pDIE).

Methods and Materials: 73 patients with clinical suspicion of aDIE and/or pDIE were analysed retrospectively, undergone U-CCT between January 2012 and December 2014 before laparoscopic surgery, and imaging data were compared with the surgical and histological reports. We calculated sensitivity, specificity, PPV, NPV of U-CCT and evaluated the utility of this technique to select patients who need a more detailed presurgical planning.

Results: 74 surgical interventions were performed on 73 patients (one patient was exposed to surgery twice due to DIE relapse after two years). In 4/74 surgical interventions U-CCT with dose-reduction dedicated protocol was negative for DIE. The urologists were properly involved when DIE nodules concerning ureters and bladder ($p=0,042$); The colorectal surgeons were more often involved when DIE nodules concerning sigmoid colon, particularly in case of bowel stenosis $>50\%$ ($p=0,031\%$). U-CCT attested better results in the evaluation of DIE nodules involving digestive tract (DA 81%; $p=0,000$) and bladder (DA 87,8%; $p=0,000$).

Conclusion: U-CCT with dose-reduction dedicated protocol proved to be a valid alternative to barium-enema x-ray and urography or in absence of MRI with targeted protocol, to elaborate a detailed presurgical planning in selected patients with DIE; in particular this method is very helpful to individuate DIE nodules involving digestive tract or bladder and to evaluate the correct involvement of the urologist and/or the colorectal surgeon.

10:30 - 12:00

Studio 2017

Oncologic Imaging

SS 1816

Improving imaging of metastatic disease: what's new?

Moderators:

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B-1100 10:30

Radiogenomics: evaluation of CT imaging features of melanoma metastases compared with genomic expression

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Purpose: Imaging features and the distribution of metastases could serve as surrogates predictive of molecular genotype, contributing to the diagnosis, prognosis, and BRAF-dependent treatment response in melanoma. We aimed to identify imaging biomarkers for metastatic melanoma.

Methods and Materials: A database of 142 patients with metastatic melanoma, previously genotyped for BRAF mutation status, was retrospectively reviewed. Patients >18 years with imaging evidence of metastases prior to treatment (including radiation), with no other neoplastic disease, were included. CT and PET-CT were assessed for 182 imaging features, including distribution (10 organs) and characteristics (border, shape, calcifications, central necrosis, vascularity, size) of metastases with blinding to BRAF status. Associations between imaging characteristics and BRAF status were assessed (T-test of proportion, Bayesian analysis).

Results: 30 BRAF-positive (BRAF-POS) and 34 BRAF-negative (BRAF-WT) patients (total 64) met inclusion criteria. There were significant differences between groups in the distribution of 54 imaging features, which were merged into 16 clusters. There was a strong correlation for spread to the adrenals, soft tissue, and lymph nodes for the BRAF-POS genotype (adrenals 10% vs 0%; soft tissues 47% vs 15%, lymph nodes 70% vs 38%, for BRAF-POS and

BRAF-WT, respectively, $p<0.01$), and spread to the liver for the BRAF-WT genotype (26% vs 10% for BRAF-WT and BRAF-POS, respectively, $p<0.01$).

Conclusion: The pattern of metastatic spread in melanoma varies with BRAF genotype. BRAF-positive patients tend to present adrenal, lymph node, and soft tissue metastases; BRAF-negative patients tend to present liver metastases. Future studies assessing prognostic implications of these findings are warranted.

B-1101 10:38

Reduced dose CT for staging in patients with melanoma: evaluation of radiation dose and diagnostic confidence in comparison to standard dose dual-energy CT

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Purpose: To compare reduced dose intermediate tube voltage CT to standard dose dual-energy CT (DECT) for staging in melanoma patients regarding radiation dose, image quality and diagnostic confidence.

Methods and Materials: We retrospectively included 118 melanoma patients (53 females, mean age 60.2 ± 14.5) who underwent whole-body DECT with 100/150 kVp (Tube A/B). Two datasets were reconstructed: 100 kVp (reduced dose, Tube A) and mixed series (standard dose, 80 % Tube A/20 % Tube B). Image quality and diagnostic confidence using a 4-point Likert scale (1=poor, 4=excellent) and presence/absence of tumour were assessed. Target lesions according RECIST1.1 were recorded. SNR values of skeletal muscles of neck, thorax and abdomen were calculated.

Results: Based on fixed combination of both tubes, 100 kVp acquisition instead of mixed DE acquisition renders 27% dose reduction. Diagnostic confidence was rated equal for both datasets (3.29 ± 0.66 vs. 3.30 ± 0.66 , $p=0.317$). For standard dose, we observed better subjective and objective image quality for thorax (3.78 ± 0.44 vs. 3.65 ± 0.5 , $p\leq 0.001$, SNR 6.69 ± 1.02 vs. 6.5 ± 1.34 , $p=0.032$) and better subjective image quality for abdomen (3.81 ± 0.45 vs. 3.41 ± 0.57 , $p\leq 0.001$). There was nearly perfect accordance in size and number of metastases (102 target lesions, mean diameter 33.7 ± 35.1 mm/ 33.3 ± 34.8 mm, $p=0.022$, correlation $r\geq 0.999$, $p\leq 0.001$).

Conclusion: Reduced dose intermediate tube voltage CT provides a comparable diagnostic confidence regarding presence and extent of metastases at 27% dose reduction compared to standard dose DECT for staging of melanoma.

B-1102 10:46

Automated tube potential selection in cancer staging on a third-generation dual-source CT: comparison to second generation dual-source CT

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Purpose: Evaluation of latest generation automated attenuation-based tube potential selection (ATPS) impact on image quality and radiation dose in contrast-enhanced chest-abdomen-pelvis CT examinations for gynaecological cancer staging.

Methods and Materials: This IRB approved single-centre, retrospective study included a total of 100 patients with contrast-enhanced chest-abdomen-pelvis CT for gynaecological cancer staging. All patients were examined with ATPS for adaption of tube voltage to body habitus. 50 patients on a third-generation dual-source CT (DSCT), and another 50 patients on a second-generation DSCT. Predefined image quality setting remained stable between both groups at 120 kV and a current of 210 Reference mAs. Subjective image quality assessment was performed by two blinded readers independently. Attenuation and image noise were measured in several anatomic structures. Signal-to-noise ratio (SNR) was calculated. For the evaluation of radiation exposure, CT dose index ($CTDI_{vol}$) values were compared.

Results: Diagnostic image quality was obtained in all patients. The median $CTDI_{vol}$ (6.1 mGy, range 3.9-22 mGy) was 40% lower when using the algorithm compared with the previous ATCM protocol (median 10.2 mGy·cm, range 5.8-22.8 mGy). A reduction in potential to 90 kV occurred in 19 cases, a reduction to 100 kV in 23 patients and a reduction to 110 kV in 3 patients of our experimental cohort. These patients received significantly lower radiation exposure compared to the former protocol.

Conclusion: Latest generation automated ATPS on third-generation DSCT provides good diagnostic image quality in chest-abdomen-pelvis CT while average radiation dose is reduced by 40% compared to former ATPS protocol on second-generation DSCT.