

based enhanced liver MRI with DWI in patients with colorectal liver metastases (CRLM) on per-patient basis.

Methods and Materials: A query of our image database was performed between 2014 and 2016, identifying patients with histologically proven colorectal cancer, who were submitted to MRI for suspicion of CRLM. 24 patients were found with CRLM, and 24 patients without liver metastases were found to form the control group. All patients underwent dedicated liver MR protocol among others with DWI and T1-weighted GRE sequences after extracellular Gd. Comparison was performed between the entire dataset (extended protocol) and reduced dataset in which the post-contrast T1 GRE had been removed (reduced protocol). Three abdominal radiologists evaluated both datasets independently of each other, with a minimum time between the reading of 2 weeks. Images were correlated with the reference standard (consisting of histopathology/comparison imaging/follow-up).

Results: The diagnostic performance for the detection of CRLM, on per-patient basis is as follows. Reduced protocol: sensitivity 92% (CI 80.6-100), specificity 100%. Extended protocol: sensitivity 100%, specificity 100%.

Conclusion: DW-MRI is an excellent imaging tool for screening and surveillance of patients at risk of CRLM (sensitivity 92%, specificity 100%) with a short scan time of 10-15 minutes. The combination of DWI with enhanced T1-weighted MRI is the best screening modality for CRLM with 100% sensitivity and 100% specificity, however, with long scan times, 40-45 minutes and with the administration of intravenous contrast agent.

B-0559 11:34

A data mining approach to the SAR values over large MR image repositories

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Purpose: In magnetic resonance imaging, the radiofrequency energy absorption arises as one of the main safety concerns, being mainly related with increased body temperature. Monitoring radiofrequency absorption is achieved by the estimation of specific absorption rate (SAR), whose implementation lies on equipment manufacturers, which in turn are not totally enlightening about its calculus. This work presents an exploratory approach of whole-body SAR values stored in DICOM metadata aiming to find correlation with body weight, body mass index (BMI), gender and pulse sequences for abdominal/pelvic (17.812 series) and head (29.907 series) studies.

Methods and Materials: All studies were acquired in a 3 Tesla scanner with high-performance gradients. Data were extracted using Dicoogle, a DICOM metadata mining tool. Several DICOM tags were analysed (e.g. patient weight, height, gender, sequence name). For each study type, specifically weighted pulse sequences were related with weight, BMI and gender through boxplot diagrams, statistical and effect size analysis.

Results: SAR limits were never exceeded. Generally, SAR values tended to decrease with increasing body weight and BMI values for abdominal/pelvic studies. On the other hand, head studies showed different trends regarding distinct pulse sequences. SAR values tend to be higher in male individuals ($p < 0.05$). As expected, turbo spin echo sequences present the highest SAR values. The values found for echo gradient spoiled sequence (FLASH) were also high.

Conclusion: It is confirmed that SAR estimates are related with the analysed variables. An individual examination of pulse sequences is recommended to observe trends regarding weight, BMI or gender.

B-0560 11:42

Optimisation of the Blade technique in the cervical spine MRI

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Purpose: The Blade technique for MRI imaging of the cervical spine has proven to be a reliable tool for reducing artifacts typically for this anatomic region. The objective of the study is to evaluate the image quality, the contrast and diagnostic acuity between T2 TSE conventional and T2 Blade in the axial and sagittal planes.

Methods and Materials: The sample is composed of 14 patients in the sagittal plane and 12 patients in the axial, being acquired with similar acquisition parameters and evaluated by two neuroradiologist. Statistical evaluations were achieved using the X^2 test.

Results: The neuroradiologist A considered the images of the sagittal Blade excellent in 42.9% of the cases and only 14.3% in the TSE that relates the characterization of bone lesions. The neuroradiologist B considered the sagittal Blade technique excellent in 78.6% of the cases and only 35.7% in the TSE in the representation of herniated disc. In the axial plane, in the representation of bone lesions, the neuroradiologist A, considers the Blade technique excellent in 41.7% of the cases and only 25% in the TSE. The neuroradiologist A, select the Sagittal Blade technique in 42.86% and the TSE in 7.14% of the cases. The neuroradiologist B, in the axial plane prefers the Blade in 41.67% and only 8.33% in the TSE.

Conclusion: The quality of the images belonging to the T2 Blade sequences on the sagittal and axial plans were considered superior to the T2 TSE conventional.

B-0561 11:50

Comparing the detection rate of melanoma metastases on gadolinium-based contrast-enhanced MRI brain scan compared to a non-enhanced scan.

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Purpose: Malignant melanoma is the 3rd most common malignancy to metastasise to the brain. At our institution, patients with high-risk melanoma undergo surveillance with regular MRI brain scans with intravenous gadolinium-based contrast agents (GBCA). Research has recently shown that recurrent administration of GBCA can result in gadolinium deposition within the brain although the effects of this is yet unknown. The purpose of this study was to identify if intracranial metastatic melanoma deposits can be visualised on the pre-contrast scans to evaluate if these patients can undergo surveillance with unenhanced brain MRI scans.

Methods and Materials: A retrospective study was conducted. Consecutive patients attending for MRI brain scans with intravenous GBCA for metastatic melanoma were reviewed for the period of January 2016 to December 2016. The pre-contrast T1 coronal sequence was compared to the post-contrast 3D sequence.

Results: 195 patients were evaluated. An intracranial metastatic deposit was reported in 13.9% of the scans, out of which only 25.9% of the scans showed identifiable metastasis on the pre-contrast scan.

Conclusion: The results demonstrate that the use of GBCA is essential in brain scans for metastasis detection in patients with melanoma as the majority of lesions are not identifiable without contrast enhancement. However, at our institution the pre- and post-contrast sequences are not identical, this difference could account for some of the number of lesions detected. Using the same sequence for pre- and post-contrast scans for further investigation would help in a more accurate comparison.

10:30 - 12:00

Room M 1

Cardiac

SS 603

Update on large trials, registry and adverse event assessment

Moderators:

C.D. Claussen; Tübingen/DE
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B-0562 10:30

Correlation of a new formula measuring carotid-femoral pulse wave velocity with cardiovascular risk factors, major adverse events and mortality

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Purpose: Carotid femoral pulse wave velocity (PWV) is a strong predictor of cardiovascular mortality and methods using external distance measurements are not reliable as they are prone to confounding factors. A new formula for PWV calculation was derived from whole-body magnetic resonance angiograms (WB-MRA) and we aim to examine if this formula correlates better with cardiovascular risk factors, major cardiovascular adverse event (MACE) and mortality.

Methods and Materials: Arterial pathlengths were measured from WB-MRA from the TASCFORCE study group and backwards linear regression was applied to derive the formula: $\text{carotid femoral pathlength} = 100.36 + (0.70 \times \text{age}[\text{years}]) + (137.81 \times \text{height}[\text{m}]) + (0.51 \times \text{weight}[\text{kg}]) - (0.18 \times \text{pulse}) + 46.25$ [if female], 53.89 [if male]. This was then applied to two population study groups. From this, correlation between the new PWV calculations (PWV_{NEW}) versus external measurements (PWV_{CAER} and PWV_{SUM}) and cardiovascular risk factors were calculated using Pearson and Spearman correlation co-efficients. Significant difference was assumed when $p < 0.05$.

Results: There were 1242 SUMMIT study participants and 825 Caerphilly study participants. There were no loss of correlation between PWV_{NEW} with age, blood pressure or creatinine levels ($p < 0.01$). In both the SUMMIT and Caerphilly cohort, the PWV_{NEW} showed a loss correlation with obesity and waist circumference. The hazard ratio was 1.11 and 1.17, respectively, for cardiovascular mortality and MACE and is unchanged for all PWV measurements.