cess, the fabrication of prostheses involves taking a plaster cast of the area to be treated, hand carving wax models, multiple meetings with the patient to alter this model, before making a final prosthesis in silicone. Utilising the patient's pre-existing CT images and 3D printing technology, a patient specific prostheses can be created with improved efficiency and accuracy. However a method is required to validate this process. This study demonstrates the methods used to create a patient specific eye prosthesis using CT images obtained after reconstructive surgery. These images were manipulated in a way which allowed for the intact eye to be mirrored and used to develop a 3D printed model which acted as the starting point to create silicone prosthesis. A validation method is presented which uses freely available registration software (GOM Inspect, GOM GmbH, Braunschweig) to analyse the results at various stages of the process. The benefits of using this method include reduced manufacturing time, decreased patient outpatient appointments, improved personalised outcomes and a repeatable process allowing multiple prostheses to be made.

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Poster Session : P17

Removing limiting factors for Leeds Test Object TO.10 usage

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The Leeds Test Object TO.10 is routinely used to provide a subjective estimate of Signal to Noise Ratio (SNR) as a measure of overall image quality. Currently, calibrated contrast values are provided for a limited set of discrete peak voltage (65, 70, 75, 80 kVp) and copper filtration thickness (1.0, 1.5, 2.0 mm Cu) combinations. However, it can be challenging to attain these exact settings on modern interventional imaging systems incorporating Automatic Dose Rate Controls (ADRC) and varying amounts of additional copper filtration. These limit the accuracy of results obtained thus representing significant limiting factors for the TO.10. We describe two methods of removing these limiting factors: a three-dimensional (3D) Matlab interpolation and extrapolation algorithm, and a multivariate-polynomial function, the coefficients of which can be stored in Excel. Both methods make use of the available contrast values to generate contrast curves for any kVp and mm Cu combination. Results obtained from both methods are presented as Threshold Index (H_T(A)) curves modelled by best fit log-polynomials. Their accuracies are evaluated through comparison with H_T(A) curves obtained under calibrated conditions. Both methods are found to produce more accurate estimates of detail contrasts for non-standard kVp and mm Cu combinations. Although an inherent error of approximately 15% is associated with this type of contrast detail analysis, the ability to analyse TO.10 data for non-standard kVp and mm Cu combinations offered by modern systems increases the accuracy of calculated H_T(A)'s. These methods further reduce the time required for image quality tests and room downtime.

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Poster Session : P18

A novel quantitative measure of image quality in fluoroscopy

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The aim of this work is to develop a quantitative algorithm for the assessment of image quality in fluoroscopy as an alternative to the subjective Leeds Test Object TO-10. Current possible quantitative measurements such as Detective Quantum Efficiency and Modulation Transfer Function do not assess the effects of imaging processing, such as edge-enhancement and noise reduction, on the final displayed image. A standard statistical algorithm used to calculate the contrast needed to observe an object having area size (A) against background. The algorithm was developed to produce sets of Contrast-Detail and Threshold Contrast curves. Three flat panel fluoroscopy systems in our Cardiology were examined. Sequences of uniform fluoroscopy images, obtained using 1 mm of copper as an attenuator, were acquired and then analysed remotely. For each system curves were generated for (a) different dose rates at the detector, (b) different settings of magnification, & (c) different levels of edge-enhancement. For one system different levels of noise reduction were examined. Areas under contrast-detail and threshold-contrast curves reflect changes in dose rate at the detector. The algorithm is sensitive to changes in applied edge-enhancement and noise reduction. Both sets of curves for each system exhibit characteristic spatial frequency responses. This new efficient and objective algorithm measures fluoroscopic image quality using the standard Threshold Detection Index. It tracks quality changes that depend not only on input dose rate, but also the level of image processing applied. It only requires the acquisition of a few seconds of fluoroscopy to produce images for remote analysis.

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Poster Session : P19

Hippocampal volumetrics in the diagnosis of temporal lobe epilepsy

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Most people with epilepsy control their seizures by using anti-epileptic drugs. However, one third of these patients suffer from a severe kind, resistant to medication, refractory epilepsy. These patients may be considered for surgical resection, where a portion of brain tissue involved in seizure onset is removed. In the most common form of epilepsy, temporal lobe epilepsy (TLE), structures such as the hippocampus are often found to be involved. An indicator that the hippocampus may be related to the seizure onset is the presence of mesial temporal sclerosis (mTS), which is noted by a loss of internal architecture, reduced hippocampal volume and hyperintensity on T2 weighted MRI. It has also been shown in the literature that mTS supported by hippocampal volumetry can indicate a better