Ottava Giornata della Ricerca della Svizzera Italiana
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Modulo per la sottomissione abstract di ricerca CLINICA

Titolo (massimo **15 parole**)

A simple method for low-contrast detectability, image quality, and dose optimization with CT iterative reconstruction algorithms and model observers

Autori (cognome e iniziali, es: Grassi L.)

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Testo (massimo **250 parole**, preferibilmente in italiano (accettato anche in inglese), suddiviso in Introduzione, *Metodi*, *Risultati*, *Conclusioni* e *Finanziamento*

Purpose: The aim of this work was to evaluate detection of low-contrast objects and image quality in computed tomography (CT) phantom images acquired at different tube loadings (i.e. mAs) and reconstructed with different algorithms, in order to find appropriate settings to reduce the dose to the patient without any image detriment.
Methods and Materials: Images of supraslice low-contrast objects of a CT phantom were acquired using different mAs values. Images were reconstructed using filtered back projection (FBP), hybrid and iterative model-based methods. Image quality parameters were evaluated in terms of modulation transfer function; noise, and uniformity using two software resources. For the definition of low-contrast detectability, studies based on both human (i.e. four alternative forced-choice test) and model observers were performed across the various images.
Results: Compared to FBP, image quality parameters were improved by using iterative reconstruction (IR) algorithms. In particular, IR model-based methods provided a 60% noise reduction and a 70% dose reduction, preserving image quality and low-contrast detectability for human radiological evaluation. According to the model observer, the diameters of the minimum detectable detail were around 2 mm (up to 100 mAs). Below 100 mAs, the model observer was unable to provide a result.
Conclusion: IR methods improve CT protocol quality, providing a potential dose reduction while maintaining a good image detectability. Model observer can in principle be useful to assist human performance in CT low contrast detection tasks and in dose optimization.

Visto superiore (prego indicare Nome e Cognome del superiore)

Stefano Presilla

Criteri per sottomissione Abstract:
NO Case report
NO Abstract senza nessun risultato
VISTO da un superiore

Invio Abstract