

Poster #: 11

Title of Abstract: Impact of commercially available iterative reconstruction algorithms (ASiR, SAFIRE) on image quality and radiation dose in CT enterography exams.

Institution: Massachusetts General Hospital

Authors: Yasir Andrabi MD, MPH, Oleg Pianykh PhD, Avinash Kambadakone MD, Aditya Yadavalli BE, Dushyant V. Sahani MD.

Modality: CT

Organ System: GI

Intro: Iterative reconstruction (IR) enables us to significantly reduce the radiation dose while preserving the image quality. Various IR algorithms have been introduced by different vendors. We evaluated the impact of ASiR and SAFIRE on image quality and radiation doses in CT enterography exams.

Purpose: To evaluate the impact of two commercially available iterative reconstruction (IR) algorithms ASIR and SAFIRE on the image quality and radiation dose in CT enterography exams in a busy academic practice.

Methods Used: We reviewed 37 consecutive adult CT enterography exams performed on either GE Healthcare or Siemens scanners between Dec12 to June 13. A total of 11/37 exams were reconstructed using FBP while 26/37 exams were processed using IR (ASIR=16 and SAFIRE =10). Two radiologists blinded to image reconstruction and scanning technique independently reviewed the CT exams for image quality (IQ) and diagnostic acceptability. CTDI within patient cohorts was compared using ANOVA.

Results of Abstract: All 37 CT exams were rated of diagnostic quality with higher IQ for the IR group compared with FBP

group ($p < 0.05$). Overall the CTDI was substantially lower in IR group over FBP exams (CTDI, IR: 7.1 ± 2.4 , FBP: 10.7 ± 2.9) ($p < .0001$), corresponding to a 34% reduction in radiation dose in IR group. However, the CTDI was comparable for each IR subgroup (CTDI mean, ASIR: 7.3 ± 2.7 , SAFIRE: 6.9 ± 2.3) ($P > .05$).

Discussion: CT enterography exams performed with IR preserves the diagnostic acceptability of images with significant reduction in radiation dose irrespective to the type of commercial IR algorithm.

Scientific and/or Clinical Significance? Introduction of commercially available IR techniques are beneficial to CT practice for lowering substantial radiation dose in a busy practice while yielding diagnostic quality images irrespective of the manufacturer's algorithm.

Relationship to existing work To the best of our knowledge this is the first study comparing various IR algorithms in CT enterography exams.

N/A