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Conventional and partially ECG-gated triple-rule-out computed angiotomography: Comparative radiation dose and imaging quality

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Background: Triple-rule-out is a CTA (Angiotomography) for acute chest pain, with assessment of acute coronary syndromes, aorta and pulmonary embolism. In this context, evaluation of the abdominal aorta is also necessary to characterize the extent of eventual aortic dissection.

Aim: The aim is to compare conventional and partially ECG-gated triple-rule-out CTA acquisition with triple-rule-out CTA with extension to the abdominal aorta regarding radiation dose and diagnostic quality.

Methods: In this prospective study, patients, who had previous exams of the same modality with the conventional protocol (Protocol A) and underwent a new protocol (B) from January 2018 to June 2018 were selected. The exclusion criteria were obese and non-collaborative patients. CTA-acquisitions were performed in the 128-rows scanner, with protocol A: ECG-gated during the total acquisition; and protocol B: ECG-gated phase, which covers the entire thoracic aorta and a second acquisition that covers the abdominal aorta, without trigger, with the same reference dose. Radiation dose analysis was performed, using conversion factor 0.015. Attenuation measurements were made in HU with ROIs (Regions Of Insteresting).

Results: The sample number is 55 patients. The data demonstrated a reduction of approximately 50% of effective dose of ionizing radiation with mean of DLP of 2327.30 in protocol A, totaling 34.9 mSv and 1115.28 in protocol B with 16.72 mSv, with mean of density of 429 and 431 HU, respectively ($p<0.05$).

Conclusions: The optimized protocol provides a considerable dose reduction, maintaining image quality in CT studies for triple rule out with extension to the abdominal aorta.

Biography

Pamela Bertolazzi is a Biomedical Scientist. She has completed her Graduation in 2011 and has worked with diagnostic imaging at Sirio Libanes Hospital for seven years. Currently, she is working as a Sr. Clinical Application Specialist at Siemens Healthineers. During her time at Hospital, she was invited to teach in the first Biomedical Residence Program in Brazil. She is a PhD student with a project focused on cerebral changes of obese children in University of Sao Paulo. Her work has a great repercussion around the world and she hopes that her work will help people in the near future.

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Notes:

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