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Data Article

Subjective and objective evaluation of 10–30% dose reduced coronary artery phantom scans reconstructed with Forward projected model-based Iterative Reconstruction SoluTion (FIRST)

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ABSTRACT

The data presented in this articles are related to the research article entitled “The feasibility of Forward-projected model-based Iterative Reconstruction SoluTion (FIRST) for coronary 320-row computed tomography angiography: a pilot study” (E. Maeda, N. Tomizawa, S. Kanno, K. Yasaka, T. Kubo, K. Ino, R. Torigoe, K. Ohtomo, 2016) [1]. This article describes subjective and objective evaluations of 2 mm–4 mm coronary artery phantom scanned with 100% dose and reconstructed with hybrid iterative reconstruction, and 90%, 80% and 70% dose reconstructed with full iterative reconstruction.

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Specifications Table

Subject area	Radiology
More specific subject area	Effect dose reduction on image quality in CT images reconstructed with full iterative reconstruction.
Type of data	Table, image, text file
How data was acquired	Coronary phantoms were scanned with computed tomography at various doses. 100% dose images were reconstructed with hybrid iterative reconstruction, while other dose images were reconstructed with full iterative reconstruction. Subjective and objective image quality of each images were assessed.
Data format	Raw, Analyzed
Experimental factors	The subjective and objective image quality of coronary artery phantom scanned with various dose were evaluated by 3 radiologists.
Experimental features	The relationship between the degree of dose reduction and image quality was determined for images reconstructed using Forward-projected model-based Iterative Reconstruction SoluTion (FIRST).
Data source location	Hongo, Bunkyo-ku, Tokyo 35° 42′ 45.64″ N; 139° 45′ 43.16″ E
Data accessibility	The data are available with this article

Value of the data

- The data is the description of the effect of FIRST reconstruction for –10 to –30% dose reduced CT images.
- Researchers can compare the radiological appearance of coronary phantoms in different diameters (4 mm, 3 mm, and 2 mm) in various doses reconstructed with FIRST.
- This data allows other researchers to determine how much tube current can be lowered when using full iterative reconstruction in clinical settings.

1. Data

The data was acquired as a preliminary study for the research article entitled “The feasibility of Forward-projected model-based Iterative Reconstruction SoluTion (FIRST) for coronary 320-row computed tomography angiography: a pilot study ” [1]. The dataset of this article provides objective and subjective evaluations of 2 mm–4 mm coronary artery phantom scanned with 10%, 20% and 30% reduced dose from AIDR3D group and reconstructed with FIRST with 3 to 6 boards on each sides of the phantom. Fig. 1 represents the CT image of the phantom and 4 ROIs used for objective evaluation. Tables 1–4 show objective image quality in standard deviation, and subjective scores for each diameter of coronary artery phantom. Table 1 represents data for 3 boards (representing patients weighing 40–49 kg), Table 2 represents 4 boards (50–59 kg), Table 3 represents 5 boards (60–69 kg), and Table 4 represents 6 boards (70–79 kg).

2. Experimental design, materials and methods

2.1. The phantom

Three polyethylene tubes 4 mm, 3 mm, and 2 mm in diameters were filled with contrast material (Iopamiron 370, 370 mg/mL; Bayer, Osaka, Japan) and was perpendicularly fixed in a polypropylene cylinder. The cylinder was filled with water and was sealed with polypropylene. Three to six acrylate

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