Comparison of the image quality of virtual monochromatic images generated by two different algorithms

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Purpose

The aim of this work was to study the image quality of virtual monochromatic images generated by two different algorithms (Mono and Mono+), the latter of which includes a noise-reduction feature.

Methods

Catphan 504 modified with iodinated contrast of varying concentrations
The Phantom Laboratory Inc. (Salem, NY)

Dual Energy CT scanner
Siemens SOMATOM Definition Flash (80/140Sn kVp)

Monochromatic images generated
Mono and Mono+ syngo.via

Image quality study
ImageJ

Results

A significant noise reduction was found at low keVs using the Mono+ algorithm, with a maximum reduction of 50% at 40 keV, compared to the Mono images.

The Mono+ images also provided an increased iodine CNR at lower keVs moving the optimum CNR from 60 keV to 40 keV, compared to the Mono images.

![Graph showing noise reduction](image1)

![Graph showing iodine CNR](image2)

Iodine concentration: 4 mg/ml

Conclusion

In general, the Mono+ algorithm was shown to be superior to the Mono algorithm for the creation of virtual monochromatic images, resulting in better image quality, especially for low keVs.