

ABSTRACT

This study aims to determine relationship between water-equivalent diameter (D_w) and low-contrast detectability (LCD) for various reconstruction filters. The water phantoms were Hitachi phantoms with diameters of 16, 22.5, 30, and 38 cm. The phantoms were scanned with a 64-slice Hitachi CT Scanner and reconstructed with various reconstruction filters (i.e., bone, head and abdomen filters). The D_w values were automatically calculated using IndoseCT software. The noise and minimum detectable contrast (MDC) of LCD were automatically calculated using IndoQCT software. It is found that D_w corresponds to the phantom diameter and is not affected by any of the reconstruction filters. Noise is affected by phantom diameter and reconstruction filter. Minimum detectable contrast is strongly affected by the phantom diameter and reconstruction filter. The minimum detectable contrast increases with the increase of the phantom diameter. Therefore, optimization needs to be done for different patient sizes and different filter reconstruction for clinical applications.

Keywords: *Low-contrast detectability, water-equivalent diameter, Hitachi water phantom*