Ultra-low dose dual-source high-pitch computed tomography of the paranasal sinus: diagnostic sensitivity and radiation dose

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BACKGROUND
Today's gold standard for diagnostic imaging of inflammatory diseases of the paranasal sinus is computed tomography (CT).

PURPOSE
To evaluate diagnostic sensitivity and radiation dose of an ultra-low dose dual-source CT technique.

MATERIAL AND METHODS
Paranasal sinuses of 14 cadaveric heads were independently evaluated by two readers using a modern dual-source CT with lowest reasonable dosage in high-pitch mode (100 kV, 10 mAs, collimation 0.6 mm, pitch value 3.0). Additionally the head part of an anthropomorphic Alderson-Rando phantom was equipped with thermoluminescent detectors to measure radiation exposure to the eye lenses and thyroid gland.

RESULTS
Diagnostic accuracy regarding sinusoidal fluid, nasal septum deviation, and mucosal swelling was 100%. Mastoid fluid was detected in 76% and 92%, respectively. In the phantom study, average measured eye lens dosage was 0.64 mGy; radiation exposure of the thyroid gland was 0.085 mGy.

CONCLUSION
Regarding evaluation of inflammatory diseases of the paranasal sinus this study indicates sufficient accuracy of the proposed CT protocol at a very low dosage level.

type: journal paper/review (English)
date of publishing: 19-04-2012
journal title: Acta Radiol (53/4)
ISSN electronic: 1600-0455
pages: 435-40