Energy Limits in Second Generation High-pitch Dual Source CT - Comparison in an Upper Abdominal Phantom

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OBJECTIVES
The aim of our study was to find out how much energy is applicable in second-generation dual source high-pitch computed tomography (CT) in imaging of the abdomen.

MATERIALS AND METHODS
We examined an upper abdominal phantom using a Somatom Definition Flash CT-Scanner (Siemens, Forchheim, Germany). The study protocol consisted of a scan-series at 100 kV and 120 kV. In each scan series we started with a pitch of 3.2 and reduced it in steps of 0.2, until a pitch of 1.6 was reached. The current was adjusted to the maximum the scanner could achieve. Energy values, image noise, image quality, and radiation exposure were evaluated.

RESULTS
For a pitch of 3.2 the maximum applicable current was 142 mAs at 120 kV and in 100 kV the maximum applicable current was 114 mAs. For conventional abdominal imaging, current levels of 200 to 260 mAs are generally used. To achieve similar current levels, we had to decrease the pitch to 1.8 at 100 kV - at this pitch we could perform our imaging at 204 mAs. At a pitch of 2.2 in 120 kV we could apply a current of 206 mAs.

CONCLUSION
We conclude our study by stating that if there is a need for a higher current, we have to reduce the pitch. In a high-pitch dual source CT, we always have to remember where our main focus is, so we can adjust the pitch to the energy we need in the area of the body that has to be imaged, to find answers to the clinical question being raised.

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