

Optimization of abdominal and pelvic scanning protocols in oncological pathology

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Introduction

Unlike radiographs, images obtained by computed tomography (CT) do not look overexposed, in the sense of being too dark or too bright. With the increasing use of computed tomography, there has been growing concern about the dose of the population received by computed tomography. The literature comes to the rescue by recommending the responsible use of CT by applying CT dose management procedures that correspond to the ALARA principles (as low as reasonably achievable) and customized adjustment of the technical scanning factors.

Keywords

imaging optimization, effective dose, computed tomography, oncological abdomen, imaging

Purpose

To evaluate the technical peculiarities of scanning imaging scans by computed tomography in patients with abdominal and pelvic neoplasms to optimize the effective dose.

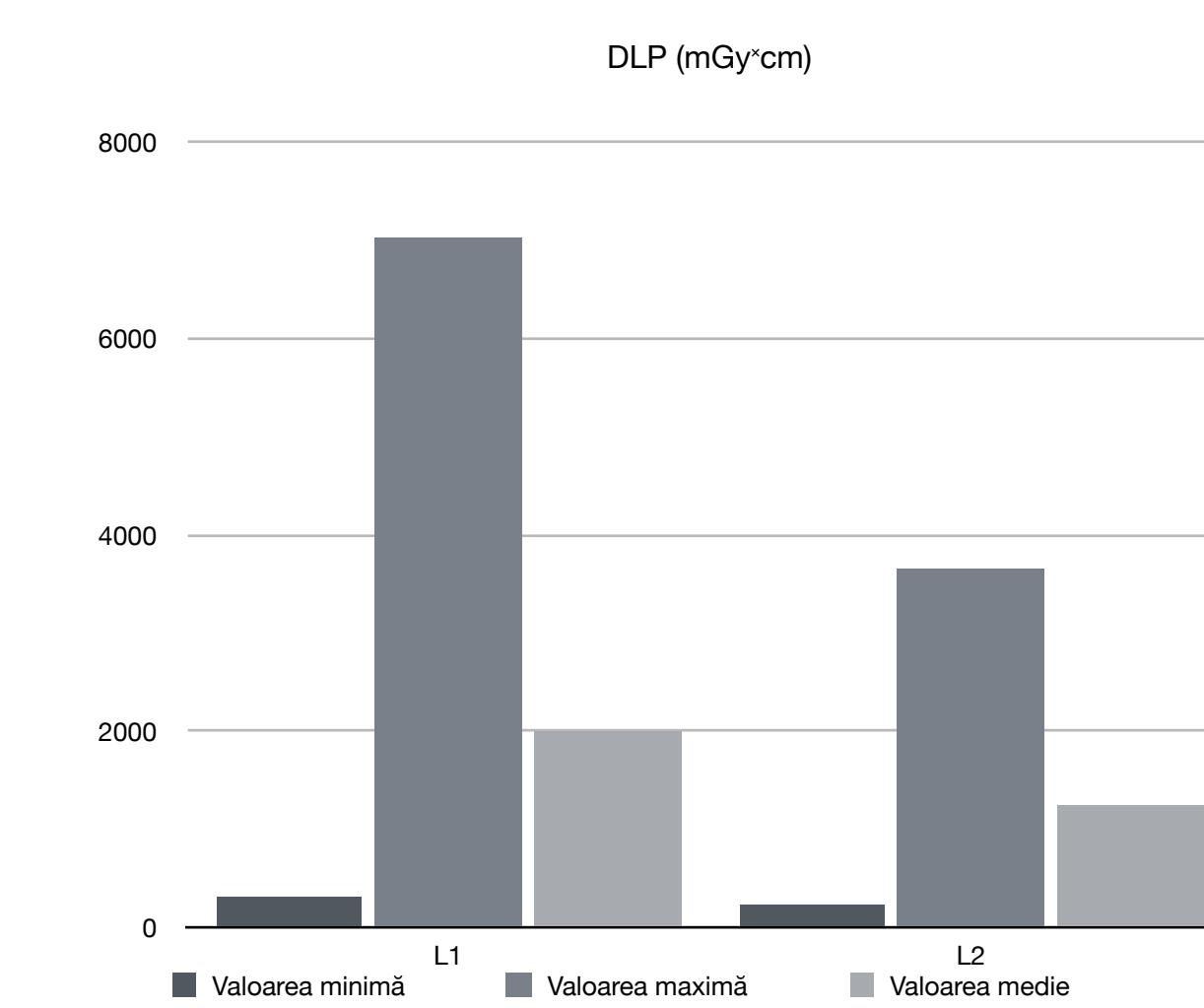
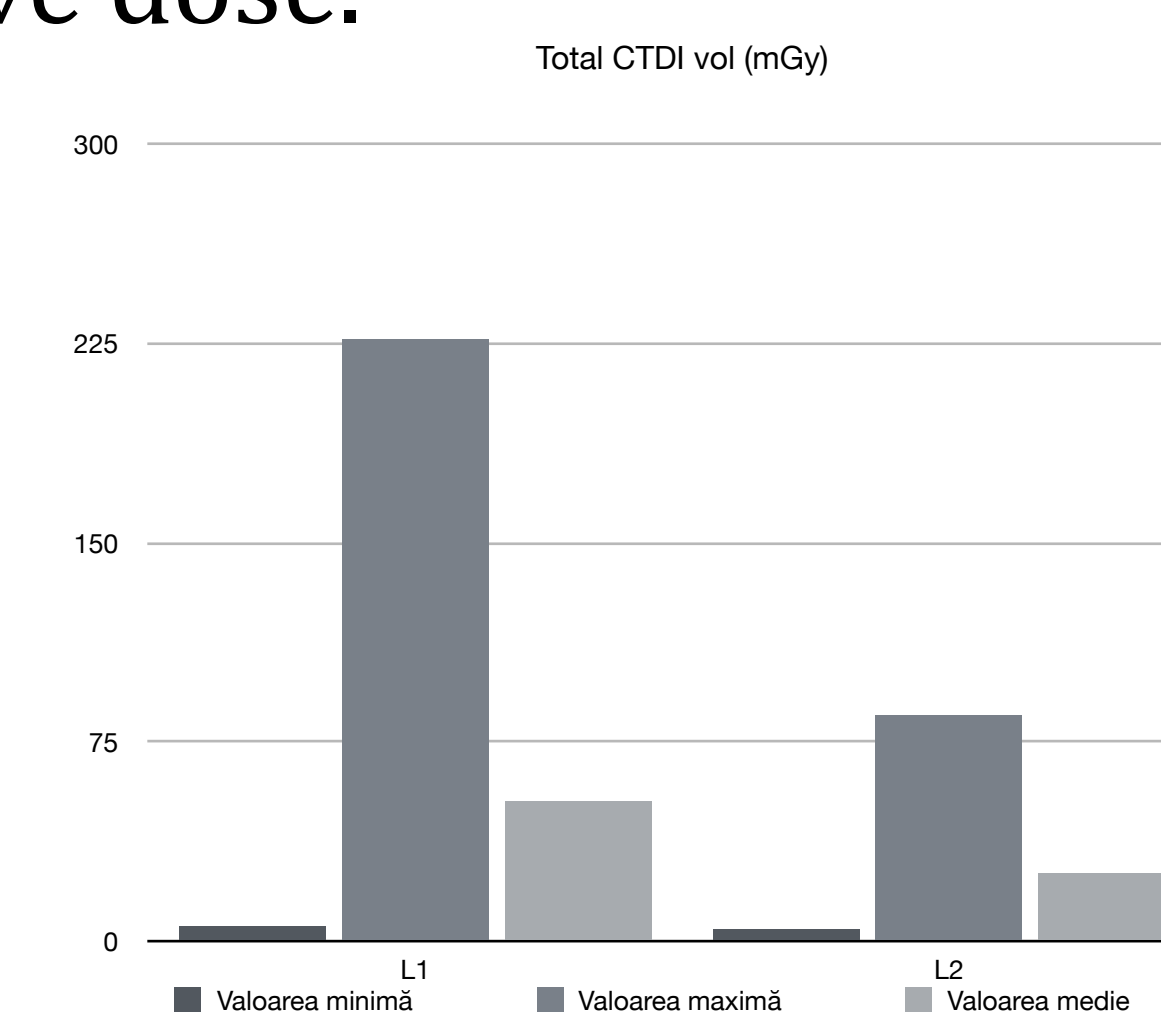
Material and methods

The study included 52 patients, repeatedly investigated by computed tomography in 2013-2019, a total of 127 examinations, of which 120 prospective examinations and 7 retrospective examinations, aged between 25 and 77 years, with primary tumors of abdomen and pelvis.

Results

Technical radiological indicators (kV, MAs, DLP, total CTDI), specific oncological indicators (tumor origin, secondary tumor, tumor histology, response to therapy, follow-up), scanning time, scanning step, post-processing programs and iterative reconstruction techniques were analyzed in the experimental group L2.

The results of the study show that the concomitant examination of the abdomen and pelvis, which accounted for 78 examinations out of a total of 127 (61.4%) requires continuous scanning, which helps to reduce the scanning time without avoiding overlapping doses and as a result there was a decrease in the mean value of Total CTDI vol to -50.7% and the mean value of DLP to -37.4%, compared to the control group L1 - as a result we obtained a lower effective dose.



Conclusions

Correct positioning of the patient in the CT gantry, adjustment of the technical scanning parameters to the anatomical characteristics of the patient, use of mA modulated by AEC, to the detriment of a fixed value, automatic selection of kV, choice of noise index depending on the indication clinical and concomitant examination of the abdomen and pelvis contribute to the personalization of imaging examinations with the optimization of irradiation doses in the dynamic evaluation of the treatment of cancer patients.