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CT Imaging In The Anatomy Lab

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Abstract:
Competency in basic radiology is an essential skill for graduating physicians. In preclinical courses at Larner College of Medicine, imaging instruction is delivered via asynchronous modules and on still images. Student feedback indicated a need for improved exposure to radiology at an earlier stage of training. This project was developed to improve first-year medical students' ability to interpret cross-sectional imaging and aid students' learning of anatomy by introducing CT scans into the gross anatomy lab. To guide future directions of this curricular development and the potential development of best practices for other schools interested in using similar techniques, this study was designed to assess if there is an advantage or perceived benefit to learning on CT scans of cadavers versus scans of living individuals. Students were placed in three CT groups: *CT Group 1* learned from images of the cadaver they were dissecting; *CT Group 2* learned from images of a cadaver they were not dissecting; *CT Group 3* learned from non-contrast images of a normal living individual.
CT scans were uploaded to Pacsbin, a web-based DICOM viewer, and were accessible to students on iPads in anatomy lab and outside of lab on personal devices. Students learned how to utilize common DICOM features as well as how to identify and label anatomical structures through instructor-led e-modules. During lab dissection, students were assisted in the use of Pacsbin and identification of anatomical structures on CT scans by Radiology residents. Student knowledge was assessed on laboratory practical exams and CT image questions were administered via iPads, allowing students to view labeled structures in sagittal, coronal, or axial planes. This intervention was implemented only for the thorax and abdomen portions of the anatomy curriculum. Students were assessed specifically on their overall anatomy practical performance, the ability to correctly identify structures on cross-sectional images, and the ability to correctly identify spatial anatomical relationships. Surveys were administered before and after the intervention to evaluate students' perceptions of their anatomical, pathological, and cross-sectional imaging knowledge, as well as student satisfaction with the intervention.
Results did not reveal a statistically significant difference between the three study groups in practical examination scores, ability to correctly identify anatomical structures on CT images, or spatial anatomical knowledge. When compared with the performance of the previous class, there were no significant differences in practical exam scores for the thorax and abdomen. Survey data showed that students received the intervention positively. Students indicated improved anatomical and imaging knowledge after the course and most students reported feeling better prepared to use imaging software and interpret diagnostic imaging.

Conclusions:
There was no academic advantage observed on practical exams between groups learning cross-sectional imaging from CT scans of cadavers versus living individuals. Positive outcomes were observed as a result of the intervention, as students reported improvements in anatomical knowledge, ability to interpret CT images, and utilize DICOM viewers similar to those seen in the clinical environment. While others have used post-mortem CT imaging in anatomy, none to our knowledge have compared it with scans from living individuals or made DICOM viewers available at each student table.

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