

Old Dog, New Tricks: A Practical Approach to Incorporating Thoracic Radiology into Anatomy Teaching

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Introduction

Knowledge of radiological anatomy and competence interpreting diagnostic imaging are becoming an integral component of preclinical medical training[1, 2]. Integrating radiology into preclinical anatomy has been documented as early as 1950 [3] and 80% (U.S) to 100% (NZ/Aus) of modern medical schools utilize at least some degree of radiology as part of their anatomy curricula[4, 5]. Teaching anatomy using radiology enhances student understanding of three dimensional anatomy[6, 7], demonstrates the immediate relevance of anatomical learning and bridges the gap between pre-clinical training and professional practice[8].

In response, many medical schools employ radiologists to deliver anatomy modules and the Anatomical Society and the European society of Radiology have provided guidelines for radiological integration into anatomy education [9, 10].

However, the role of radiology in undergraduate anatomy education, suggested delivery methods and recommended time allocation to radiology remains ambiguous, especially in the context of specific modular anatomy components, such as thoracic anatomy.

In the current study, we propose a transferrable model to integrate clinically relevant X-rays, CT, MRI and Angiography into thoracic anatomy laboratory sessions as part of a four week programme delivered to first year medical students.

Materials and Methods

The study was performed in the anatomy dissection theatre (DT) of our institution, Trinity College Dublin (TCD) over a four week period. The DT consists of 12 stations each with an osteology/plastic model station, a cadaver station and a 36 inch monitor displaying radiology. During practical sessions, students rotated every 45 minutes between the three stations. A final 45 minutes was allocated to group tutorials integrating all three modalities. Medically qualified staff assisted with the course. The radiology station demonstrated images similar to the other two stations and portrayed X-Rays, MRI, CT, angiography and echos. Our suggested timetable is outlined in Table 1:

	Radiology Station	Osteology/ plastic models	Cadaver Station
1	Labelled and unlabelled chest X-Rays.	Bony anatomy of the chest wall, osteology of ribs, vertebrae and sternum.	Superficial dissection of anterior chest wall.
2	Labelled and unlabelled CT chest; lung window.	Study plastic models of lung segments and bronchopulmonary segments.	Dissect out both lungs, identify lung lobes and impressions.
3	CT chest, arterial phase demonstrating aorta and branches. CTPA to visualise pulmonary trunk.	Models demonstrating superior mediastinum major vessels of the thorax.	Dissect the great vessels of the thorax. Review cadaveric cross sections.
4	Cardiac CT, Cardiac MRI, echo, Coronary angiogram.	Plastic models of the heart including coronary vessels. Internal structures of the heart.	Dissect the middle mediastinum. Remove the heart and review heart chambers, valves and coronary vessels.

Table 1: Timetable for the 5 week course

Results

Four self-directed radiological presentations were successfully incorporated into thoracic anatomy practical sessions over a four week period. Our 3-station layout is outlined in figures 1 and 2 below:

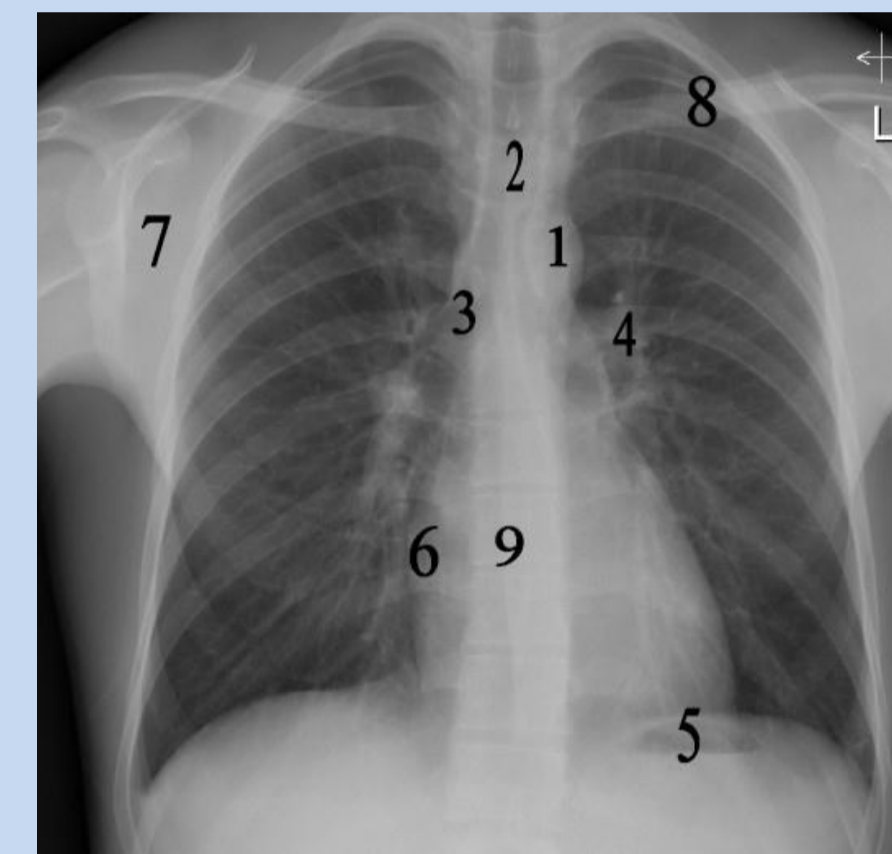


Figure 1: Week 1 Objectives demonstrating all three modalities

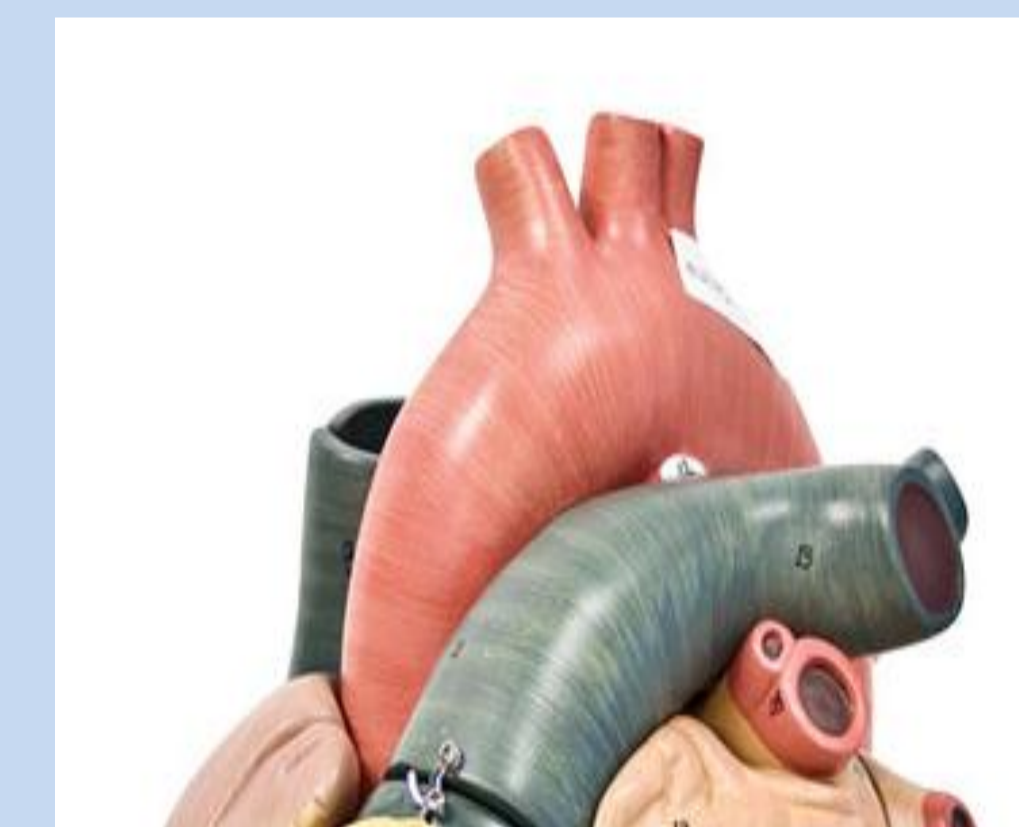
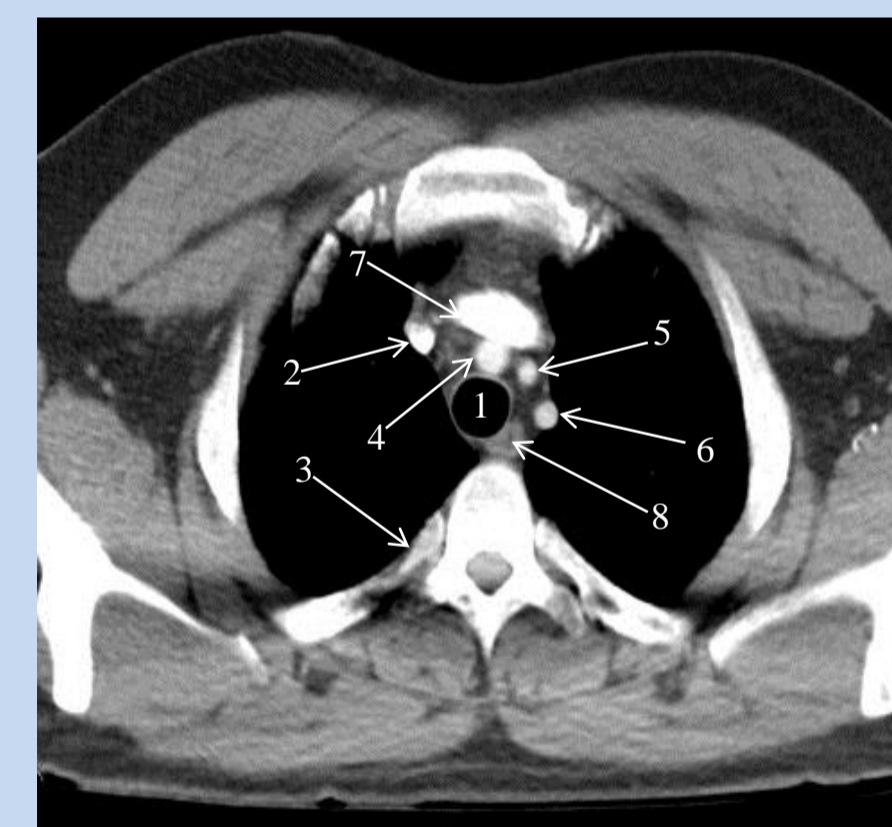


Figure 2: Week 3 Objectives demonstrating all three modalities

Conclusion

We have detailed the process of integrating radiology into undergraduate thoracic anatomy practical sessions delivered to first year medical students. Student opinion of integrating radiology in anatomy practicals was positive. Upon completion, many students were proficient at identifying key anatomical landmarks on various imaging techniques.

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