

The Use of Radiology in the Teaching of Gross Anatomy in Medical Schools

Beryl S Ominde* and Patrick S Igbigbi

Department of Human Anatomy and Cell Biology, Delta State University, Abraka, Nigeria

***Corresponding Author:** Beryl S Ominde, Department of Human Anatomy and Cell Biology, Delta State University, Abraka, Nigeria.

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Over the past years, dissection has been the primary method used in teaching gross anatomy of the human body. This method provides a three-dimensional view of the human body and helps to enhance dissecting skills that may be useful in surgery [1,2]. However, the use of dissection in teaching anatomy is unfeasible both technically and uneconomically in resource poor settings. It is also limited by safety risks and decreasing availability of cadavers [1]. The use of cadavers may be unnecessarily stressful to undergraduate students and promote inadequate attitude and desensitization [2]. The traditional pre-clinical didactic teaching models have been replaced with integrated problem based learning and more clinically oriented models which have been adopted by many medical schools [3]. This change occurred mainly due to the evolution of the curriculum, high cost of cadavers, increased focus on research, increased number of medical students with low number of qualified anatomists to teach [4]. This change has helped to bridge the gap between anatomy and clinical medicine thus enhance authentic learning with better comprehension and retention of knowledge [2,3].

There are several imaging modalities used clinically for diagnostic purposes and to guide clinicians during invasive therapeutic procedures [1,5]. They include radiographs, computed tomography (CT), magnetic resonance imaging (MRI), ultrasound and positron emission tomography (PET) [1]. Their advent has increasingly raised the interest on the role of radiology in the undergraduate education [4]. The digitization of these radiological methods and emergence of soft wares such as picture archiving and communication systems (PACS) makes it easy to assess the human anatomy based on image reconstructions [1,4]. The

practical aspect of radiology is commonly taught in the later years of undergraduate training. This entails late practical utilization of the anatomical knowledge hence creating a vast knowledge gap [5].

Radiological modalities provide information regarding the detailed body morphology through two or three-dimensional visualization in-vivo. They help to assess the topographical location, complex spatial relationship between anatomical structures and normal anatomical variants [2,4]. They also provide real-time dynamic information about body structures [1,6]. Using these imaging methods in teaching anatomy exposes undergraduate students with fundamental knowledge in interpretation of radiological images which will be relevant in the later years of medical training and beyond thus providing long-term benefits [1,5]. This synergy enhances understanding hence improves the students' performance in both preclinical and clinical years [1]. According to Rathan., *et al.* [5], the integration of radiology in the teaching of gross anatomy may make some students develop interest in radiology specialization and help non-radiologists improve their patient care through the promotion of positive interaction with diagnostic tests.

The use of imaging in teaching anatomy has some disadvantages. There is limited availability of medical images specifically for teaching anatomy. This therefore requires the creation of a radiology-anatomy repository for teaching anatomy [4]. According to Graham., *et al.* [7], the use of ultrasound in teaching is limited by lack of familiarity in the equipment, the need for proper technological training and collaboration between anatomy teachers and professional sonographers. Jack and Burbridge [4] suggest that

the incorporation of radiology in teaching anatomy should involve trained staff such as radiologists. Students also need to learn how to construct mental models during learning and this will help them to interpret images. The use of radiology may complicate the learning of anatomy and students may face difficulties in interpreting cross-sectional radiological illustrations and answering multiple choice radiological anatomy questions [5].

Conclusion

The combined use of cadavers and radiological images will improve the teaching and learning of anatomy. It will also equip the students with relevant skills for future clinical practice. It is therefore important to include radiologists in the teaching of anatomy in medical schools.

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