

Clinical Anatomy Teaching: Strategies in Medical Training

Ana Olívia Dantas,¹ Laura Alícia Morais Lima Oliveira,¹ Emily Queiroga Queiroga,¹ Lauanda Ênia de Medeiros Rocha,¹ Heron Alves Vale,¹ Breno Vinícius Dias de Souza,¹ Vivianne Izabelle de Araújo Baptista,¹ Leonardo Thiago Duarte Barreto Nobre,¹ Sebastião Pacheco Duque Neto,¹ Eudes Euler de Souza Lucena¹

¹Escola Multicampi de Ciências Médicas. Universidade Federal do Rio Grande do Norte - Caicó, RN, Brazil

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ABSTRACT

Introduction: the use of simulations in the teaching of human anatomy enables a more meaningful learning by realizing the knowledge acquired in the theoretical exposition. This article aims to report a skill performed in the "Birth and Growth" module about facial skull development in a medical course with an integrated curriculum. Still, the clinical reports encourage further provocations and discussions, with the introduction of real situations that may be experienced in the work process.

Keywords: Active learning; Education in morphology; Educational Techniques; Human skull.

Introduction

In health education, the adoption of differentiated and innovative methods has been one of the alternatives used to deal with a series of changes, inclusions and new trends in relation to teaching and learning.¹ The current National Curriculum Guidelines for the Undergraduate Medical Course require several general competencies needed by the student, such as leadership and proficient mastery of semiology and clinical reasoning. This fact strengthens the need for reanalysis and reformulation of teaching practice in search of strategies that provide the basis for several of the needs of individual-professional education, with critical autonomy and reflection.²

However, among the approaches used to enhance the teaching and learning of medical students is simulation. This teaching strategy uses technologies, replicating scenarios simulating the practice, in a controlled and realistic environment, where the student actively participates in the teaching and learning process, aiming to practice exhaustively, learn, reflect and evaluate products and processes.³

The adoption of such method emerges as a tool that aims to improve the performance of students' clinical experience, as it promotes learning and reduces anxiety and stress as a consequence of its active methodology, increasing confidence and safety in the practical scenario. In addition, the use of theoretical and practical methodologies has been pointed as an effective mechanism in the training, at higher education level, of professionals with greater prudence, satisfying society and the labor market.⁴

The Undergraduate Medical Course at the Multicampi School of Medical Sciences (EMCM) has activities that cover 2 complementary teaching axes based on the PBL (Problem-based Learning)

methodology. The Tutorial Axis, which comprises activities developed in student groups and a tutor professor, as well as complementary strategies such as conferences and lectures; and the Skills and Community Axis, which comprises activities developed in simulated environments, laboratories and real practice scenarios.

Human Anatomy components is approached in both axes, with lectures followed by the use of anatomy atlas, macromodels, and study scripts with contextualization through clinical reports. To enhance practical learning, use of the SECTRA[®] table has recently been introduced, an integrative technology that enables 3D reconstruction of images from computed tomography (CT) or nuclear magnetic resonance (NMR) of cadavers and living patients.

In the 3rd semester of the course there is the module "Birth, growth and development" which proposes, in its syllabus of anatomy and medical embryology, the study of the anatomical particularities of the newborn and the stages of embryonic development. In this aspect, a skills activity was developed with the theme of osteology and cranial anatomy of the child. The approach of the theme relied on the use of innovative technologies, such as anatomical macromodels and the SECTRA[®] table, as well as participatory teaching methodologies, aiming at the development of diverse skills, such as communication, leadership, and clinical reasoning, based on an association between the basic sciences and clinical sciences - characteristics of paramount importance in the construction of medical professional skills.

Finally, this article aims to report the learning activity through simulation using the SECTRA[®] table and anatomical macromodels in a medical school in northeastern Brazil, based on the Problem-based learning methodology.

Short Communication

This is an experience report about a class with the purpose of understanding osteology, the mechanisms of osteosynthesis and the particularities of the development and structures of the human skull. This class was held for the third period class, with 39 students, in the academic semester of 2018.2. The exhibition was part of the Birth, Growth and Development module of the EMCM curriculum, and it was conducted by two professors of human anatomy.

At first, the teacher gave a lecture on the mechanisms of osteosynthesis, including bone growth and remodeling and calcium deposition. Then, the other professor explained the main skull structures and their ossification processes, as well as the anatomical features of the developing skull. Subsequently, the practical block was started, with the manipulation of

3B scientific Original skull macromodels mounted on a support (Weight 0.3 kg, Dimensions 18.5 x 14.5 x 14 cm), shown in Figure 1.

For better consolidation of learning and clinical approach, the following case was used: "Child, male, suffered a 'blow' to the head when falling from a hammock. At the hospital, the doctor ordered a CT scan, which revealed a subgaleal hematoma and fracture in the left parietal bone. Also, unconsolidated fontanelles and sutures." The images obtained in this case were presented from the interactive SECTRA® table - innovative technological resource developed by SECTRA® of Sweden that offers 3D reconstruction from CT or NMR of living patients and cadavers (Figure 2). In the images, the following structures were identified and studied: anterior and posterior fontanelles; frontal, coronal, sphenofrontal, squamous, lambdoid, sagittal, sphenoid sutures and fracture.

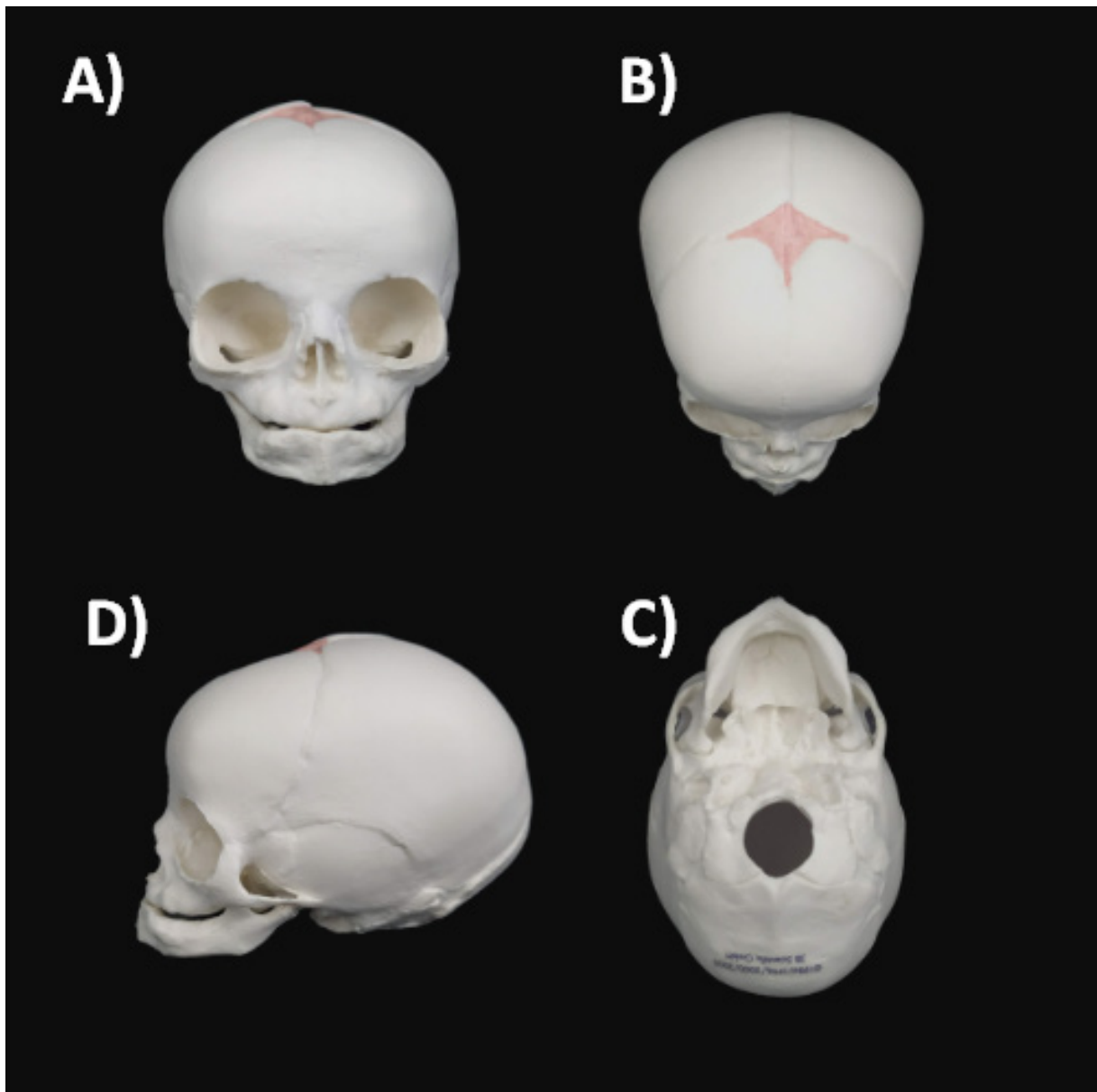


Figure 1. Skull macromodel (3B scientific). A- Frontal view. B- Superior view. C- Inferior view. D- Lateral view.

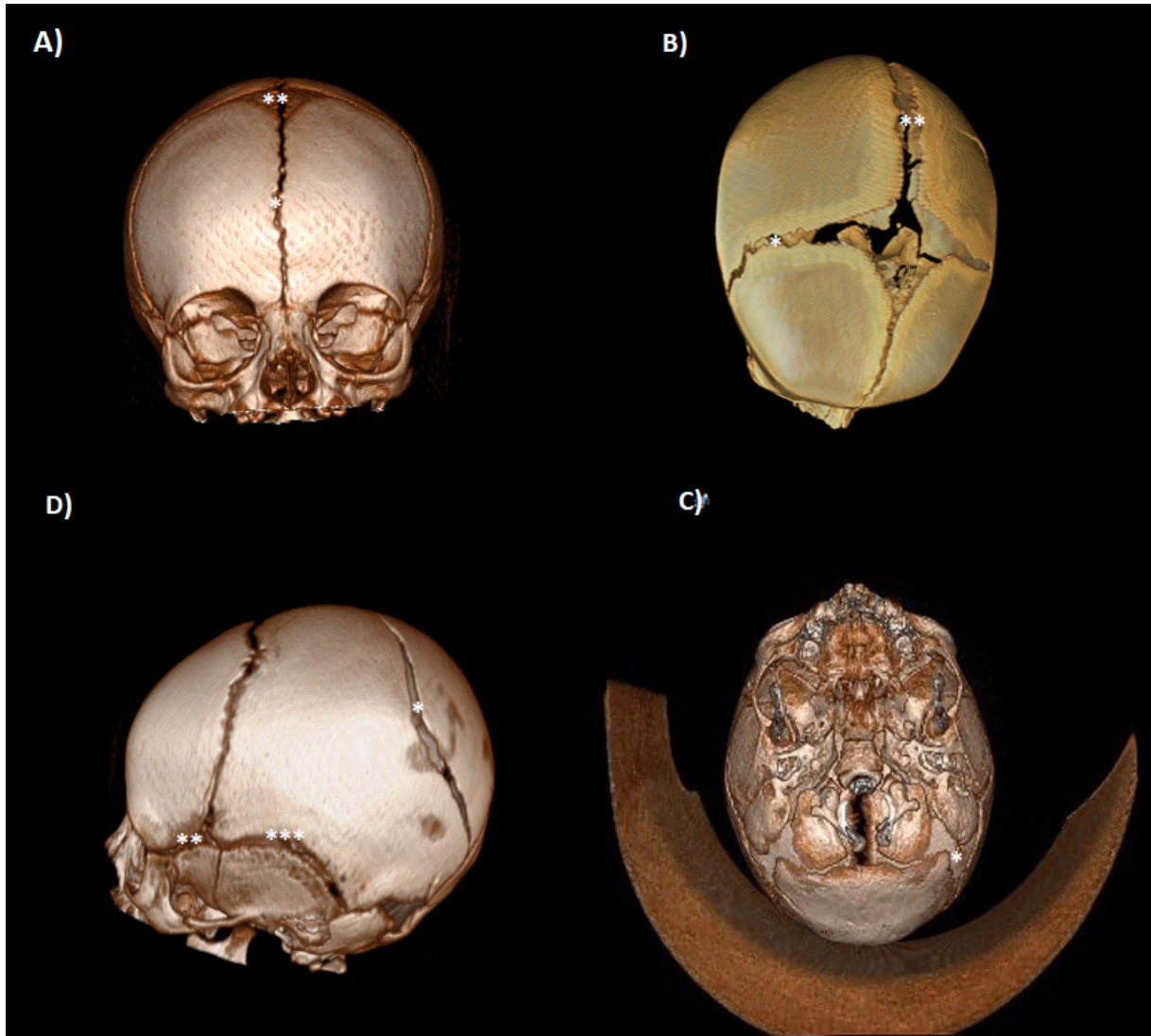


Figure 2. Newborn cranial CT (SECTRA®). A- Frontal view (*Frontal Suture; **Anterior Fontanelle). B- Superior view (*Coronal Suture; **Sagittal Suture). C- Inferior view (*Lambdoid Suture). D- Lateral view (*Fracture; **Squamous Suture; ***Sphenofrontal Suture).

Discussion

In light of andragogy learning theory, adults need the practical sense to effect the acquisition of knowledge, being especially interested in the immediate applicability of the content taught to the proper performance of their social role and profession.⁵ Thus, the simulations using the skull macromodels and the SECTRA® table allow the consolidation of student learning. The existence of the synthetic parts of the infant skull allows for a more reliable anatomical analysis of the structures in the child and allows the establishment of comparisons with the adult skull, drawing a parallel with the child's growth and development and how these differences are expressed in the clinic.

The SECTRA® table generates an undoubted increase in the teaching-learning dynamics, by confronting the pathological and the physiological, as well as providing the discussion of real cases, with imaging exams from the university's own database. It

also allows dynamic, three-dimensional visualization with precision and proportionality of the anatomical structure.

Interactive 3D digital models improve understanding of complex anatomical structures, their special relationship and help improve manual skills and hand-eye coordination.⁶ Thus, the use of images and plays, allied to the clinical reports presented, strengthen the clinical reasoning of the students, still under construction, since the understanding of morphology is placed in communion with recurrent situations in medical practice.

In addition, the division of the class into small groups provided a more detailed discussion on the subject, as it ensures the confluence of different interpretations and hypotheses for the defined case. In this context, collective deliberations are strengthened in the search for more efficient results and maintains the active and dynamic participation of each student to achieve the established goals. Anatomy teaching methods have

evolved over the past two decades with the evolution of new technology and curriculum changes.⁷ But the will of researchers to understand the human body has managed to overcome these difficulties to enrich anatomy knowledge. Thus, all the anatomy we learn

and study today is the result of great enthusiasm.⁸ Therefore, the constant use of these new strategies and technologies is indispensable, so that there is adequate student training, as well as the enhancement of clinical reasoning, very expensive for medical training.

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Corresponding author

Ana Olívia Dantas

anaodantas@hotmail.com