

EDITORIAL

Anatomy Research: Is there scope?

The study of human anatomy and research in human anatomy dates back to more than 2,000 years, to the period of Ancient Greeks. It can be divided into several broad areas namely Human gross or macroscopic anatomy, microscopic anatomy, developmental anatomy or embryology, medical genetics, imaging anatomy and most recent addition molecular anatomy.

Human anatomy is the science of studying and understanding the structure and organization of the human body. Understanding the structure and organization of the human body is the key to the practice of health and medicine and thereby research in Anatomy is essential for the further advancement in medicine.

The word "anatomy" comes from the Greek words "ana," meaning "up," and "tome," meaning "cutting." Traditionally, studies of anatomy and research in anatomy have depended on cutting up, or dissection, but recently, with imaging technology, it is increasingly possible to see how a body is made up without dissection.

In the present time the value of research in gross anatomy has been challenged, mentioning that anatomy is an already well explored and documented area of research. However, variations play a key role in everyday surgery.

Complications resulting from a new procedure can be due to the presence of an unexpected anatomical variant. The dissecting room need to be used to refine the new techniques taking this possibility into account rather than abandoning an otherwise valid surgical advance. In addition in an era where we talk about personalized medicine and where scientists are capable of developing functional ears, bones and muscle structures using 3D-bioprinting technology I totally disagree regarding the less importance in research of anatomical variations. Information from computed tomography (CT) and magnetic resonance imaging (MRI) scans can be used to create structures that are unique to each patient through the Integrated Tissue and Organ Printing (ITOP) system and this will benefit patients immensely. Anatomist's role as a member of the multidisciplinary research team is exponentially increasing each day. Emergence of 3D printing in recent years, is a promising strategy for the growth of complex tissues and organs which could replicate those of the human body.

Molecular anatomy is the subspecialty of microscopic anatomy concerned with the identification and description of molecular structures of cells, tissues, and organs. Staining with special stains,



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c r y o s e c t i o n i m a g i n g , immunohistochemistry and immunofluorescence can be used to research in neuroendocrine markers, neuroimmune connections, angiogenesis etc. Recent developments in immunohistochemistry and/or in situ hybridization, molecular cell markers and their applications and the development of advanced computer-aided three-dimensional reconstruction programs could be used to understand various aspects of embryological development. Human embryology also offers a wide field of research, which explains the variations that exist in the adult.

Few recent anatomical discoveries are mentioned to highlight the scope for anatomy research. The discovery of the presence of lymphatic system in the Central Nervous System (CNS) where the lymphatic vessels were seen in the meninges indicating relevant cross talking between CNS and peripheral immune system and perhaps affecting autoimmunity. Until this recent research findings, it was believed that lymphatics were absent in CNS and it was anatomically immune privileged due to the presence of the blood-brain barrier around it. Also unravelling the previously unknown parts of the human mesentery in adults and discovering human mesentery to be present all along the intra-abdominal gut tube established the fact that it is a continuous entity found all along the intra-abdominal gut

tube disproving the concept that it is fragmented in the adult humans. Thirdly, a recently reported discovery is the demonstration of existence of a previously unknown and unseen tissue component, 'interstitium'- a networked collagen bound fluid-filled space in a number of human organs. These fluid-filled spaces were discovered in connective tissues all over the body, including below the skin's surface; lining the digestive tract, urinary systems, lungs; and surrounding muscles.

Despite Sri Lanka being recently elevated to an upper-middle-income country, there is general concern that the culture of research in Sri Lanka is still not as healthy as it should be and as Anatomists can we contribute to the new knowledge that Sri Lanka need to be producing that could be assessed by its research output, most commonly measured by publications and patents.

I will conclude by saying it is not impossible to discover a new body part/tissue in this day and age and certainly there is high scope for Anatomy research but the Anatomist should be assisted by the newer technology, have an eye for identifying research topics and need to function in a multidisciplinary team to generate better results.

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