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Short Communication

Demystifying anatomical variations- Education and clinical perspectives

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ABSTRACT

The plethora of anatomical variations in scientific literature has made it very difficult for health care professionals like surgeons and interventionists to remember anatomical variations during the procedure and there are high chances that the variations they are going to find during a procedure will always be different from the one that is already reported in some or the other way. Finding similarities and dissimilarities with previously reported versions of variations entirely depends on experience and education of interventionists. The continuous addition of variations on one side adding to our existing scientific knowledge but on other side It is almost impractical and herculean task to remember all variations and continuous addition making it more difficult to distinguish the significant from not so significant facts and apply these facts in clinical practice. Evidence based Anatomy can do justice to this situation but robust studies related to anatomical variations are still lacking as we have plenty of case reports related to anatomical variations having many scientific flaws. As an academic exercise reporting anatomical variations may be fine but in the real world such things cause confusion and affect decision-making. We must try and learn to draw a line and avoid adding gibberish to scientific literature as an extension of our professed moral duty towards science.

1. Introduction

Anatomical variation is a presentation of body structure with morphological features different from those described in several anatomy textbooks as Normal.[1] Anatomical variation is a divergence from what is generally perceived as "normal anatomy" and that may or may not be related to a disease state. "Normal" may have many meanings depending on the context in which the term is used. In context of human gross anatomy, whatever is written in the book "Gray's Anatomy: The Anatomical Basis of Clinical Practice" is assumed to be normal by most people. Anatomical variations includes any variation in muscle structure, origin/insertions and innervation, ligament attachments and morphology, branching patterns of blood vessel , nerves and their course and positions, and bone morphology and accessory bones, various foramen/foramina etc. which are frequently documented by anatomists during their routine dissection or clinicians during surgeries.

As a fact No two humans can be exactly similar externally and internally.[2] It is altogether a different matter whether such differences are 'significant' in terms of healthcare or not. A study found that experienced clinicians reported seeing variations in their practice on a monthly (39%), weekly (25%), and daily (21%) basis.[3] Reporting of anatomical variations from all over the world has become so extensive. In current era of preponderance of journals and injudicious race of publishing articles, we are adding anatomical variations irrespective of their significance or

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scientific relevance. Situation is that it is almost impossible and impractical for healthcare professionals to remember them all and incorporate in practice. In this scenario it makes perfect sense to think of an anatomical variation as a rule rather than an exception contrary to what is generally portrayed in scientific literature.

The plethora of anatomical variations in scientific literature has made it difficult for healthcare professionals dealing with gross anatomy, like surgeons and radiologists to remember or recall the variations at that time. A golden rule for them is – "always expect a variation and ponder over its significance", because the variation they are going to find will always be different from the one that is already reported, in some or the other way (depends on resolution of observation). Finding similarities or dissimilarities with previously reported versions of the variation entirely depends on the doctor's perception of it based on his or her experiences and education.

Another issue is reporting of a supposedly "rare" anatomical variation. "Rare" appears to mean that the variation is not or less reported in scientific literature. It does not necessarily mean that the variation is actually rare in the world or the community, ethnic or otherwise, to which the person belongs. The extra emphasis on the term "rare" is a problem and at times intimidating as well for the doctors, when some medical significance is not attached to it. Thus, these anatomical variations reported as case reports have many scientific flaws related to observation and reporting of findings, unnecessarily highlighting the findings irrespective of their scientific and clinical relevance, projected or anticipated correlations of findings with their functions and clinical aspects (not clinically observed in patients due to observed findings) etc.

Many anatomists and clinicians indulge in reporting anatomical variations just for the sake of increasing their publications counts for their personal benefits. Yammine[4] and Henery et al.[5] introduced a new concept in the field: evidence-based anatomy. Evidence-based anatomy applies systematic review and meta-analysis principles to appraise and synthesize previous anatomical findings to generate a large, pooled sample size that is more likely to be accurate and reflect true population statistics and associations. And inference of systemic reviews and meta-analysis has more scientific credentials. As lacking of much clinical exposures, anatomists usually speculate the clinical significances of anatomical variations found during routine dissections which may or may not be relevant in clinical practice. Most conclusive phrases illustrate vague ideas about how a surgeon or radiologist might use it in clinical practice without any actual reference to real needs. The motivations for publishing are manifold but it seems that there is much less concern for corruption of scientific literature.

The knowledge of anatomical variations is important but going to the extent of publishing each and every little variation of no apparent significance is a waste of resource, time and energy. This adds to scientific garbage and makes it difficult to distinguish the significant from not so significant. As an academic exercise it may be fine but in the real world such things cause confusion and affect decision making. We must try and learn to draw a line and avoid adding gibberish to scientific literature as an extension of our professed moral duty towards science.

2. Conflict of Interest

None.

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