

SPECIAL COMMUNICATION

The role of traditional dissection in medical education

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Abstract

Dissection is being sidelined in medical education .Computers and other alternative teaching tools are replacing cadavers in the modern anatomy curriculum. Evidence based literature suggests that cadaver dissection is highly effective in establishing and retaining anatomy concepts. The newer teaching modalities must be reassessed in terms of their affectivity in establishing core knowledge rather than their convenience. The traditional dissection laboratory must remain the center for teaching and learning anatomy.

Keywords: dissection, anatomy education, cadaver.

Introduction

Anatomy as a subject has been overly didactic, traditional, banausic and archaic. It has failed to evolve and adapt with changing times, so it is an obvious target for novel curricula changes. Modern educationalists consider it to be dogmatic and full of superfluous, clinically irrelevant details. As a result, it does not blend in as a contemporary, clinically trimmed subject of the 21st century medicine. The cadaver dissection used to be revered as the very "essence of anatomy". With the vast advances in technology, information and imaging tools, the resources for teaching anatomy have made giant leaps in the education system. There are a large number of methods and instruments available, ranging from computers, to live body scans, virtual three dimensional images, plastic models, plastinated, prosections and

synthetic simulators which seem as good as a real human part. These modern teaching tools are durable, clean, odor less, aesthetical and hassle free in the sense that the students are not required to undergo training; unlike a traditional dissection session. These advances in technology have procured many supporters in the medical education community. In the current educational scenario, the anatomists have polarized into two belief systems: the modernists who regard the cadaver dissection as obsolete and dispensable and the traditionalists who think that dissection is the keystone of anatomy education. This transformation in the perceptions of educationalists is an issue that needs to be analyzed in a greater light because it deals with the process of educating and training our future health professionals who will one day encounter living patients.

Discussion

Dissection as a learning tool has been marginalized from medical curricula, in spite of the raving despair of its patrons (1, 2). The long hours spent over dissection in the traditional anatomy curriculum have been insidiously replaced by plastic models, prosections, plastinated, computer assisted learning and many other demonstration tools (3, 4, 5). The teaching methods adopted are largely based on an institution's internal policies, available resources and individual perceptions of the educationalists. Lack of consensus on a common curriculum has resulted in numerous new autonomous curricula to be introduced in institutions, without any prior audit or validation. (6) However, the one common factor that underlines all the new course modules is the loss of "active dissection time" from the gross anatomy course.

The current trend of significantly reduced dissection hours and replacement of the cadaver by alternative teaching modalities should be a cause of serious pondering over by the key stake holders of the anatomy education community.

Is the current anatomical knowledge of medical personnel in the midst of a downward spiral? Does the dissection being "squeezed out" of the modern medical curriculum have anything to do with this decline in core knowledge? Is the cadaver dissection obsolete and old fashioned in the current educational scenario? Must it be readily discarded and are the replacements as good as they seem on surface? Perhaps it is not so.

Anatomy is obviously essential for all branches of medicine, be it surgeons performing invasive procedures, physicians performing emergency procedures or teachers imparting vital theoretical concepts. As the methods of education are undergoing a metamorphosis, anatomy seems to have fallen below a safe level (1, 2, 5, 6). Consequently, anatomical errors in general surgery with accidental damage to associated

structures have increased (7). According to some educationalists, the shift from a descriptive "cadaver oriented anatomy" to a "clinically trimmed, computer oriented anatomy" may not be good in the assimilation and sustenance of core knowledge. (6)

Many educationalists hold the view that lessons learnt from the actual feel of human flesh are incomparable (5, 8, 9). Computers, however advanced they may be, will remain an artificial synthetic medium. Computer simulation and technology can never equate with the complex and miraculous reality of a human body. (10) A cadaver dissection laboratory allows the first visual and tactile experience of "human body and life" for aspiring future physicians. (11) Dissection prepares the medical students to confidently face the picture of death that is so important in treating life. There is no "short cut" way around it. As stated by Granger "the cadaver provides an appreciation of human life through an understanding of death and dying" (12). Three-dimensional visualization has the most significant impact on the teaching and learning of gross anatomy and since times immemorial, the main source of haptic three-dimensional learning has been cadaver dissection. It allows students a first-hand access to the actual structures and three dimensional spatial relationships of the body (13). The experience of cutting through various layers of the body to discover clinically vital structures is unparalleled. Student contact with cadavers is important in order to enhance communication and teamwork (14).

It is a perfect learning tool, because what could demonstrate the miraculous configurations of man's body better than a cadaver itself? It is unparalleled in establishing integrated concepts of body systems. Dissection may also increase the likelihood of cognitive permanence of anatomical data (15). The psycho-visual-tactile multi sensory stimuli that are part of a dissection ritual leave an indelible mark on the observer's minds and aid retention of anatomic data among its learners. According to Marks, "The cognitive morphological information gained during dissection has improved mental

imagery and recall capacity" (16). The role of active sensory experiences in retaining a "mental image" of a structure was also discussed in Granger's work (12). These multi sensory experiences of dissection provide a direct memory link (10). In a nut shell, dissection is an active learning process which keeps the student absorbed and interested till the end. It is better at assimilation of core anatomical knowledge (5, 15, 17-19).

There is no doubt that advanced digital teaching modalities provide excellent opportunities for spatial concepts and provide an understanding of particularly "hard to access" areas (20, 21). Computerized programs, in addition to decreased cost and labour, allow a sequence of pictures to build up in a sort of layering effect which is fast, reversible and repeatable. Despite these added advantages, computer-generated models are lacking in the variations and pathology of a real human body (13). The abandoning of the cadaver may breed a generation of "incompetent anatomists and healthcare professionals, leaving patients to face dire repercussions" (5).

Interestingly enough, while the modern educationalists seem to be turning away from dissection towards technology; students and general public still have high regard for the cadaver dissection. A significant majority of the students perceive dissection to be important for deep understanding of anatomy, making learning interesting and introducing them to emergency procedures (8, 9, 22). The general public people feels that introduction to a real body is a must for all doctors during their preclinical years (23). Public fascination with the human body is increasingly evident from the huge popularity of plastinated body exhibitions and the recent concept of anatomical art shows (24).

However, there are obviously some drawbacks of dissection as would be part of any other tool. Although this approach imparts excellent concepts in identification and configuration of the body systems, physical manipulation of cadavers to obtain diverse viewpoints is usually tedious and

often, impossible. The active efforts required to reveal structural details can be cumbersome for students as well as teachers at times, especially when there are student over load and time constraints. Reduced numbers of "dissection qualified" anatomy teachers, (25) health risks associated with dead bodies, (26, 27) extended formalin exposures (28), decreased availability of bodies (29) and ethical issues (30) have played directly upon the dissecting room. Dissection is essentially a one way process and "what has been done cannot be undone". It prevents reconstruction of the structures once they have been cut. So maintenance of dissection laboratories is not very cost effective. Furthermore, ethical and emotional biases and tedious legal procedures have made it difficult to obtain sufficient human bodies to meet the rising cadaver-student ratio.

Despite everything, the benefits still outweigh the odds. Doing away with the cadaver may seem to be a cost-effective, fast track approach and may still allow all health service tasks to be done by following certain protocols, yet, it will be "learning without understanding" and cannot be regarded as a deep approach to learning (6). It will not provide a strong base for future development and adequate training ground for aspiring doctors. The knowledge of gross anatomy is far too important for our future doctors to leave it to the bumbling experimentations of today.

Conclusion

There is no ideal teaching tool or an ideal learning tool when it comes to imparting and assimilating anatomical knowledge. The aim of this study is not to establish the supremacy of one methodology over another but to maximize the learning benefits available from the different methods. In an analysis of teaching and learning, it is necessary to examine the curriculum, the mode of teaching, the quality of how this is delivered and the infrastructure within which it is delivered. There is yet no convincing evidence on the

superiority of modified curricula over the traditional one. The new teaching modalities must be reassessed in terms of their affectivity in the assimilation of core knowledge rather than their time and cost effectiveness. Dissection has an established value in medical education and is supported by many students, clinicians, anatomists and the general public. The dissected cadaver remains the most captivating means of presenting anatomy .It allows specialists to practice safely and also provides a dynamic basis for future clinical developments. The student--cadaver--patient encounter is paramount. Dissection has survived the test of times and must not be dismissed as obsolete. Cadaver dissection and the modern technological resources represent different approaches to learning anatomy, and some characteristics of each are necessary to develop practical, theoretical and ethical skills among students. Computers can increase spatial knowledge and dissection can enhance lexical information. Complementary amalgamation of the two modalities would work best for the teachers as well as learners and will perhaps create an ideal situation for acquiring anatomical skills and knowledge.

Recommendation

Dissection can also be used as an opportunity for independent, self directed learning where student groups can voluntarily dissect at their own convenient times rather than adhering to the constraints of a fixed college timetable. This innovative approach will help to overcome the student overload and time constraint issues of the modern medical academia.

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