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2017 - Cadaveric Thoracic Cavity Dissection for Use in Human Anatomy Education - Poster Presentation

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Abstract

Human cadaveric dissection provides the anatomy student structures that are difficult to investigate with textbook images or models alone. Cadavers are used to train students for forthcoming careers. The value in studying through use of cadaveric dissection lies in the enhanced comprehension of anatomical structures in the context of a human body. Their use is complementary to simulated animations and therefore a valuable resource in preparing students for success.

Introduction

Use of prosected human cadavers allows the anatomy student to visualize structures and relationships that are difficult to appreciate with two-dimensional images. The advent of technological innovations like three-dimensional animations and simulations helps students imagine structures in context, but research has shown that there is no substitute for seeing actual anatomical specimens[1-3]. Salt Lake Community College is fortunate to have access to donated human cadavers through our association with the University of Utah's Body Donor Program. With this project, we performed an advanced thoracic cavity dissection to reveal specimens for studying anatomical structures, such as the sympathetic chain ganglia and veins of the posterior thorax, that are difficult for students to visualize from most of the available resources. With these additional resources, our goal of fostering enhanced knowledge of in situ anatomical structures is gained for the development of future medical professionals.

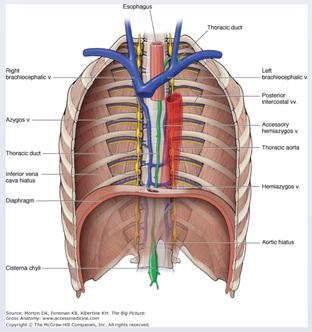

Fig. 1. Example of two-dimensional textbook image

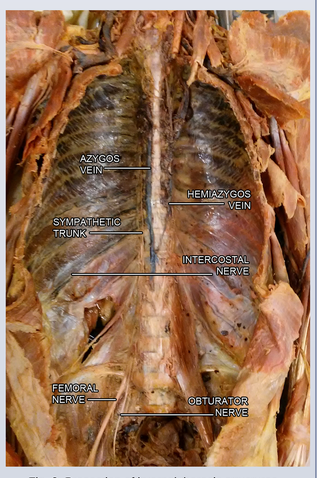

Fig. 2. Prosection of internal thoracic structures

Objectives

1. To produce a dissection that demonstrates hard-to-visualize structures in order to provide a resource for future Salt Lake Community College human anatomy students.
2. To preserve for display the major organ systems of the thoracic cavity.
3. To illustrate anatomical variability existing between textbook images and actual human cadavers.
4. To deepen and enhance our personal knowledge of human anatomy.

Methodology

1. Beginning with a partially prosected cadaver, we dissected the major organs out of the thoracic cavity and saved for preservation and presentation.
2. Next, we removed posterior thoracic musculature and connective tissue to reveal intercostal arteries, veins, and various nerves and the sympathetic chain ganglia.
3. We removed the bodies of each of the thoracic, lumbar and cervical vertebrae, as well as the anterior aspect of the sacrum to reveal the spinal cord.
4. For the final steps, we revealed the structures of the spinal cord, major nerves and plexuses in the thoracic region, and surrounding structures from an anterior aspect.
5. The dissection process was documented by photography from start to finish, with permission and direction from the University of Utah Body Donor Program and SLCC Biology faculty.

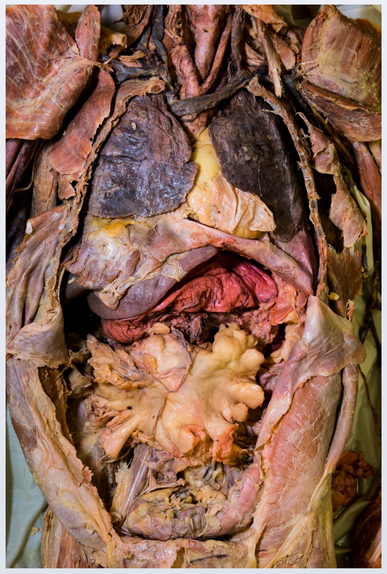

Fig. 3a. Before dissection of anterior thoracic cavity

Fig. 3b. During dissection of anterior thoracic cavity

Fig. 3c. After dissection of anterior thoracic cavity

Discussion

Cadaveric dissection continues to be the most relevant and detailed investigation and study technique for understanding human anatomical variation. A wide range of normality can be seen in cadaveric dissections that simulated models are unlikely to show[4]. The autonomic nervous system is important for many body processes. However, the anatomy is rarely visualized at the undergraduate level because the structures are difficult to reveal and the dissection requires removal of other organs that may need to be studied. The blood vessels of the posterior thorax are also rarely seen and complicated to understand. This dissection provides students a visualization of these hard-to-see structures, while preserving the removed organs for display and future study as well.

Fig. 4. Preparation of cadaver for spinal cord dissection

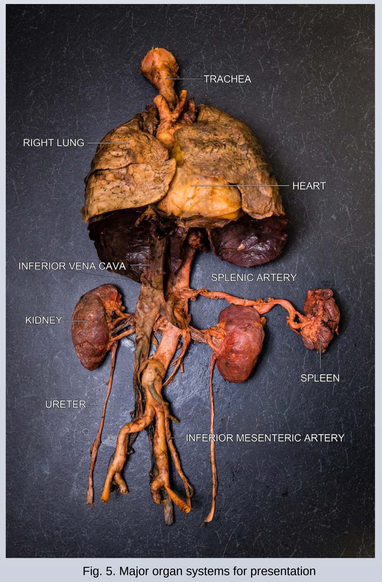

Fig. 5. Major organ systems for presentation

Conclusion

Having access to quality cadaver specimens for investigation in the use of human anatomy education is a valuable resource. The dissection we produced will be preserved and used to help future Salt Lake Community College human anatomy students visualize and comprehend anatomical structures in the context of a human body. A deepened understanding of the structure and variability of the human torso and nervous system can be gained from hands-on investigation of cadaveric dissections. Also, the organ systems removed from the thoracic cavity can now be further examined in three-dimensional discovery by students in the human anatomy lab. Many of these students will be attending nursing school and medical school and a solid understanding of normal structures provides a sound basis for clinical education. Access to cadaveric dissections, coupled with other available resources, will enable the human anatomy student to have the best opportunity for success in their chosen discipline.

Fig. 6. Vertebral bodies cut to expose spinal cord

Fig. 7. Exposed spinal cord and surrounding structures

References

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