Introduction

Hands-on learning has been shown to promote retention of learned concepts and integration of abstract knowledge.\(^1\)

The COVID-19 pandemic, however, has pushed medical school anatomy courses even further towards virtual-based course materials.

Procedure-focused anatomy courses enhance examination scores and operative confidence over virtual or lecture-based courses.\(^2,3\)

Currently, many senior medical students do not possess baseline procedural skills by the time of transition to residency.\(^4\)

Objectives

In this project, we aimed to create a specialty-driven, procedure-based anatomy dissection elective consisting of (1) at-home dissection video pre-work, (2) hands-on anatomical pathology dissection (3) surgical procedure practice, and (4) clinical case presentations.

Materials and Methods

Workshops took place during the Spring of 2021. Medical students had previously taken a virtual-only anatomy class the previous semester.

(1) Prior to hands-on workshops, students were given access to virtual dissection tutorials with identification of anatomical landmarks on a real cadaver.

(2) Dissection workshops were 2–3 hours each, and facilitated by 1 anatomy course professor, 1-2 subspecialty surgeons, and 3-4 senior students and surgical residents. Cadavers with pre-existing pathology were specially dissected and students were given tutorials of relevant pathological structures.

(3) Students were guided in performing select surgical procedures including laminectomy, humeral head removal, knee exposure, and spinal pedicle screw placement.

(4) Case presentations concluded the workshops and were delivered by subspecialty surgeons in the field of focus for that day.

Results

Virtual Dissection Videos
- 90% of students watched the assigned videos before the workshops.
- 76% rated as “very helpful”, 14% as “somewhat helpful”
- Endorsed benefits:
  - Increased self-direction & decreased faculty dependence.
  - Improved comprehension of dissection technique.
  - Improved anatomical knowledge.
- Endorsed future uses:
  - Supplement to anatomy dissection lab.
  - Supplement to lectures.
  - Supplement to course in both lab and lecture.

Hands-on Procedure-Based Workshop
- 52% of students interested in 2- to 3-week specialty-focused dissection elective during D&D.
- 29% interested in elective during pre-clinical.
- Endorsed as most useful in an elective: inclusion of cases, radiology/imaging, clinical skills, and surgical approaches.

Conclusion

In this study, we aimed to bolster baseline anatomy knowledge for preclinical medical students from three complementary perspectives: normal anatomy, anatomical pathology, and surgical procedures.

- Students were encouraged to apply new knowledge to execution of surgical procedures.
- Opportunity for greater student engagement, better retention of learned material, and preparation for basic procedural demands of residency.

A vast majority of students found preparatory dissection videos to be very helpful, and more than half indicated that they would take a similarly designed elective after clinical year.

Literature Cited


Figure 1. Schematic of areas of learning and components of the implemented procedure-based workshops.

Figure 2. (A) Sequential layered dissection of cadaver with recent hip arthroplasty to emphasize surgical procedure and post-operative course. (B) Exposure of distal femur in an arthritic knee with cartilage degeneration. (C) Exposed knee with arthroplasty and patellar resurfacing. (D) Exposed thoracic spine with thoracic instrumentation.

Acknowledgements

The authors would like to thank the individuals who have donated their remains for use in education and research.

Special thanks to Dr. Paulette Bernd, Director of Clinical Gross Anatomy & Anatomical Donor Program.

-Contact info: jak2314@cumc.columbia.edu