



ABSTRACT

There is evidence to suggest that early exposure to clinical experiences could bolster a medical student's education and preparation to tackle the problem-based learning encountered during clinical rotations.^{1,2} We propose that by incorporating surgical procedures into the gross anatomy lab during preclinical years, students would have an enhanced and more comprehensive anatomical learning experience. Seven surgical procedures were taught as a part of this study. Surveys were provided to students and faculty who participated in the study to gauge their satisfaction of the procedures and how it was incorporated into the allotted lab time. Both students and faculty who were sampled in the study reported that they were satisfied with the procedures, that the procedures did not interfere with lab times, and that the procedures facilitated clinical learning. In addition to a novel approach to teaching surgical skills to medical students, with the potential to expand to medical programs across the country, this exercise further facilitates an osteopathic education by displaying how structure and function organize surgical practice.

INTRODUCTION

The need for coupling surgical instruction with traditional curriculum in the first two years of medical training was first identified in the 2004 Blue Ribbon Report to the American Surgical Association.³ There has already been discussion highlighting the need for novel teaching techniques and learning opportunities⁴. The goal of a more integrated curriculum is to enable medical students by giving them a unique learning experience, so that they may more readily recall the knowledge needed to deal with the complex problems of clinical work. However, such an integrated curriculum has yet to be fully implemented at other medical schools or have yet to yield a comprehensive program of pertinent surgical procedures that compliment the traditional curriculum. ^{5,11, 13}

Our aim was to determine if there was educational value in the incorporation of various procedures in the anatomy lab. We propose that an anatomy curriculum including a list of common surgical procedures amplifies medical students' skill sets and knowledge of anatomical structures, thus better preparing medical students to be more prepared for clinical rotations.⁶

METHODS

Seven surgical procedures were chosen to be conducted by commonality in surgical settings, access to materials and feasibility to be completed in the cadaver lab within 15 minutes of the 90-minute labs (Table 1). Instructional videos were distributed to students and faculty prior to the labs.

During lab, each student performed the procedures on the cadavers. At the end of the course, both students and faculty voluntarily participated in an in-class 4question* i-Clicker survey and an online 3-question survey, respectively.

The survey included:

- Rate your satisfaction with the surgical procedure skills training as presented in the anatomy lab.
- Do you feel the surgical procedures in the anatomy lab enhanced your learning experience?
- Do you feel the surgical procedures were disruptive to the learning experience in the anatomy lab?
- *How often did you view the instructional video prior to attending the associated lab?

Simulating Early Clinical Experiences with Surgical Procedures in the Anatomy Lab

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PROCEDURES/MATERIALS

PROCEDURE	EQUIPMENT	NUMBER	COST/ITEM	TOTAL
IO Needle Insertion	Power Needle Drivers	5	\$425.00	\$2,125.00
	Drill Needles (expired)	10 sets	\$40.00	\$400.00
	IO Hand-held Needles	6		\$75.00
Venous Cut Down	2-0 Silk Suture Spools, 25 yards	15	\$14.00	\$210.00
	Angiocaths (expired)	50	\$10.00	\$150.00
Surgical Cricothyroidotomy	Tracheostomy tubes (expired)	15	\$11.00	\$165.00
	10 ml syringes, Leur loc,	30	\$0.50	\$15.00
	Disposable Airbag, BVM	15	\$11.99	\$179.85
Chest Tube Insertion	Chest Tubes(expired)	30	\$10.00	\$300.00
	Curved Kelly Clamps	30	\$10.00	\$300.00
Core needle biopsy of liver	20 core needle biopsy instruments	20	\$15.00	\$330.00
Appendectomy	Babcock Clamps	20	\$15.00	\$300.00
	Curved Hemostats	30	\$5.00	\$150.00
Hysterectomy	Instruments			\$200.00

Table 1: Equipment and cost used for each procedure. The procedures are listed in sequential order.

RESULTS



Figure 1: Determining student satisfaction with the surgical procedures



Figure 2: Determining the frequency of videos viewed by students



Figure 3: Determining procedure enhancement of anatomy learning experience

In accordance with our hypothesis, the survey demonstrated that students and faculty deemed surgical procedure instruction in the anatomy lab both beneficial and non-disruptive to the learning experiences.

- watched them (Figure 2).
- enhancement to their experience (Figure 3).
- (Figure 4).

Unanticipated benefits of the program included the finding that the cadaver lungs visibly ventilated when performing the cricothyroidotomy. In addition, students had the opportunity to practice and improve suturing skills prior to and during the appendectomy procedure. These foster an osteopathic education through the direct visualization of how structure can be manipulated during surgery to influence its function.

Some limitations of this project are the minimal time allotted to learn each procedure, the lack of surgically viable organs, the non-mandatory survey participation for students, the non-mandatory viewing of the instructional videos, and that the results were collected from a single institution.

CONCLUSIONS

- anatomy curriculum.
- anatomy lab

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Figure 4: Determining if surgical procedures were disruptive to anatomy learning experience





RESULTS/DISCUSSION

• 96.5% of students indicated that they were extremely satisfied/satisfied with the surgical skills training while 3.5% reported being neutral. All faculty members reported being extremely satisfied at 100% (Figure 1).

• In response to the frequency of watching the videos prior to lab, 49% of students said very frequently, 22% frequently, 18% occasionally, 8% rarely, and 3% never

98.0% of students believed the skills enhanced their anatomy lab learning experience and 100% of faculty reported the additional procedures as an

96% of students and 100% of faculty members reported that the surgical skill training sessions were not disruptive to their overall anatomy lab experience

Students and faculty conceded that the program enhanced the learning experience without disruption of normal anatomic learning.

• A small fraction of lab time was required for the completion of the procedures.

Our research has provided support and guidelines for the potential expansion to other medical schools interested in incorporating surgical procedures into their

Successful introduction of a pilot program that is unique to anatomical education where medical students performed seven relevant surgical procedures in the

Please scan QR code for references.