

Cadaveric Dissection vs Homemade Model: What is the Best Way to Teach Endoscopic Totally Extraperitoneal Inguinal Hernia Repair?

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BACKGROUND: Endoscopic totally extraperitoneal inguinal hernia repair (TEP-IHR) requires practice and training to perform well. We developed a simple, low-cost, inanimate model to teach surgical residents inguinal anatomy and the technique of mesh insertion for a safe, endoscopic TEP-IHR. The objective of this study was to compare our model vs cadaveric dissection for teaching anatomy and mesh insertion.

METHODS: A total of 14 general surgery residents participated in an institutional review board approved, prospective, and randomized study. Participants received a timed, web-based, interactive pretest assessing relevant anatomy and operative-based techniques. They then performed endoscopic TEP-IHRs on either a cadaver or our low-cost model. Participants then received a timed, web-based interactive posttest consisting of the same questions. Participants were surveyed anonymously regarding the degree to which either the model or the cadaver was educationally effective.

RESULTS: Both groups of trainees (cadaver = 7, low-cost model = 7) scored higher on the posttest ($p < 0.05$) with similar improvement (cadaver group: pretest = 78% correct, posttest = 87%; low-cost model group: 77% vs 86%). Survey results revealed the trainees preferred for both initial learning and understanding of mesh placement using low-cost models (5 out of 5, 4.8/5, respectively) over cadavers (4.0/5, 3.8/5, respectively; $p < 0.05$). Trainees preferred the cadaver (4.7) over the low-cost model (3.9, $p < 0.05$) in overall experience. No differences were found

in the trainees' preference between the cadaver (4.5) and low-cost model (4.7) in the overall educational value.

CONCLUSION: While the overall educational experience of 14 learners favored a cadaver experience to learn TEP-IHR, initial anatomical learning and placing the mesh was better with an inanimate model. Given the educational value of the 2 methods was equivalent, the \$1500 cost for cadavers make the inexpensive and repeatable inanimate model an attractive early resource for learning TEP-IHR. (J Surg Ed 1:1111-1111. Published by Elsevier Inc on behalf of the Association of Program Directors in Surgery)

KEY WORDS: simulation, totally extraperitoneal inguinal hernia repair, homemade model, general surgery

COMPETENCIES: Patient Care and Procedural Skills, Medical Knowledge, Practice-based Learning and Improvement, Interpersonal and Communication Skills, Professionalism, Systems-based Practice

INTRODUCTION

Endoscopic totally extraperitoneal (TEP) inguinal hernia repair (IHR) is a procedure that has been performed with increasing frequency during the last 24 years at our institution.¹ However, this relatively straightforward procedure requires training and repetitions to perform well. Extrapolated data from a Veterans Affairs (VA) study of hernia repairs suggests that some 250 operations of TEP-IHR may be needed to achieve recurrence rates that are equivalent or superior to open IHRs with mesh.² The average chief resident in the United States in general surgery performs a total of 80 IHRs (usually 2/3 are open, 1/3 are minimally invasive surgery) in 5 years of training; this puts our graduating surgeons at risk of having greater recurrence and complication rates, as well as poorer functional

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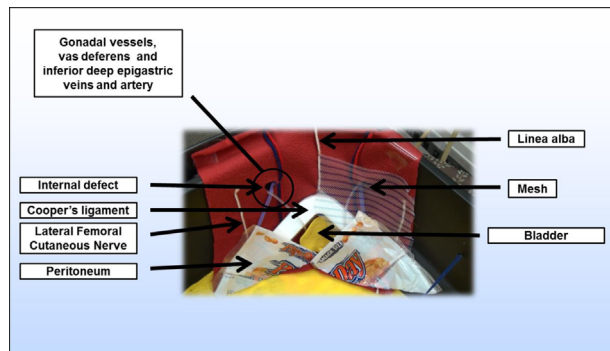


FIGURE 1. TEP inguinal hernia repair task trainer.

outcomes for their patients undergoing IHRs. Our group has shown that simulation can accelerate the learning curve of TEP-IHR.³ As resident training time is limited and available funding for training is restricted, alternatives to traditional teaching models must be developed.⁴ We have recently developed a simple, low-cost model constructed of easily obtainable materials to teach surgical trainees the anatomy of the inguinal region as well as the technique of mesh insertion in a safe and reliable manner for endoscopic TEP-IHR. The objective of this study was to compare the use of our model vs cadaveric dissection for teaching the anatomy of the inguinal region as well as the basic principles of mesh placement.

METHODS

The 2 models (simulators) were constructed using affordable, low-cost materials. A plastic box was used to simulate the pelvis. Red felt (fabric) was used to simulate pelvic musculature, yellow felt was used to simulate the bladder, and a piece of Styrofoam was used to simulate the pelvic bone and Cooper ligaments. A plastic PayDay candy bar



FIGURE 2. Graphic representation of trainees performing on task trainer.

wrapper was fashioned into the shape of the peritoneum and taped in place. Yarn was used to simulate veins, arteries, the linea alba, and the vas deferens. Tan-colored fabric was used to represent the skin (Fig. 1). Polyester stretch mesh fabric was used to simulate the mesh. The cost per model was less than \$25.00.

A total of 14 general surgery trainees (5 PGY 4 trainees, 5 PGY 3s, 2 PGY 2s, and 2 interns) participated in an institutional review board approved, prospective, randomized study. Participants received a timed, web-based, interactive pretest consisting of 20 questions assessing relevant anatomy and operative-based techniques. Trainees were randomly divided into 2 groups based on their PGY levels (Table 1): groups A and B, with 7 trainees in each

TABLE 1. Participants Characteristics and Mean and SD of Pretest and Posttest Scores and Times in Both Groups

		Group A		Group B		
PGY 4		3		2		
PGY 3		2		3		
PGY 2		1		1		
Interns		1		1		
		Pretest		Posttest		
		Mean	SD	Mean	SD	p Value
All trainees	Score (%)	75	8	85	3	0.05
	Time (sec)	404	65	228	30	0.05
Group A	Score (%)	78	10	87	4	NS
	Time (sec)	420	100	210	30	0.05
Group B	Score (%)	77	7	86	3	NS
	Time (sec)	400	60	350	30	0.05

SD, standard deviation; NS, not significant.

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