

Low-Cost Simulation for Benign Anorectal Disease Management: A Pilot Curriculum

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Research Article

Keywords:

Posted Date: July 7th, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-10157170/v1>

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Abstract

Purpose

Anorectal conditions are common in general and colorectal surgery, yet general surgery (GS) residents often graduate with limited procedural exposure. This study evaluated a simulation-based curriculum designed to improve junior resident experience and confidence in managing anorectal pathology.

Methods

A pilot simulation lab was conducted for PGY-1 and 3 GS residents prior to transition into consult and chief roles. Colorectal faculty and fellows facilitated a 1.5-hour lab using hemorrhoid, fistula, and abscess models adapted from previously described techniques. Procedures included hemorrhoidectomy, banding, fistula probing with seton placement, and perirectal abscess incision and drainage (I&D) with mushroom catheter placement. Pre- and post-lab surveys assessed prior experience, procedural confidence, and educational value.

Results

Seventeen PGY-1 and 13 PGY-3 residents participated, with PGY-3 residents reporting greater prior procedural exposure, though experience with hemorrhoid banding was limited across all levels. Confidence improved significantly for all procedures ($p < 0.05$). Residents rated the session favorably for clinical applicability and educational value, and 78% felt the curriculum was appropriately targeted to junior trainees.

Conclusion

This novel anorectal simulation curriculum improved resident confidence in managing anorectal conditions and procedures. While confidence gains did not equate to procedural mastery, findings suggest simulation may help bridge early technical skill gaps and support progressive competency development in surgical trainees.

Introduction

Benign anorectal conditions - including hemorrhoids, anal fissures, perirectal abscesses, and anal fistulas - are among the most commonly encountered pathologies in both general and colorectal surgical practice [1]. Despite their prevalence, many general surgery (GS) residents graduate with limited hands-on experience managing these conditions. Current Accreditation Council for Graduate Medical Education (ACGME) case requirements mandate completion of a minimum of 20 anorectal procedures during residency [2]; however, this threshold includes both diagnostic and operative interventions and may not provide sufficient exposure to the breadth of anorectal disease encountered in practice [3].

Clinical exposure to anorectal procedures during residency is variable. These operations are often performed by colorectal surgeons, fellows, or senior residents, which may limit junior resident participation or exposure. This gap is particularly consequential for residents covering emergency GS consult services, where anorectal conditions frequently present through the emergency department and often require bedside procedural management which the residents are expected to perform independently. Therefore, early procedural exposure and familiarity is an important educational priority for training programs.

The American Board of Surgery (ABS) Entrustable Professional Activity (EPA) for “Evaluation and Management of a Patient with Benign Anorectal Disease” outlines several core procedural competencies expected of graduating residents, including anal sphincterotomy, anal fistulotomy, excisional hemorrhoidectomy and rubber band ligation, seton placement, incision and drainage (I&D) of perianal abscess, and excision and fulguration of anal condyloma [4]. Beyond technical execution, the EPA also emphasizes clinical judgment in identifying patients who are not appropriate candidates for procedures such as fistulotomy, sphincterotomy, or bedside abscess drainage. This reflects the nuanced decision-making required in anorectal disease management, and the need for curricula that teaches both judgment as well as technical steps. The ABS will require EPAs, including those relevant to anorectal disease, for trainees completing training as soon as 2028.

Simulation-based education has emerged as an effective strategy for supplementing limited clinical exposure and developing procedural competency in a low-risk environment [5]. Low-cost task trainers have been shown to improve confidence and procedural performance across surgical disciplines. Although several anorectal simulation models have been described [6–9], most focus on a single procedure; moreover, few curricula address multiple key benign anorectal procedures in an integrated format.

To address these gaps, we developed a low-cost, multi-station simulation curriculum designed to expose junior GS residents to key procedures in the management of benign anorectal disease. The curriculum included stations focused on hemorrhoidectomy and rubber band ligation, fistula probing with seton placement, and perianal abscess I&D. We hypothesized that participation in the simulation would improve resident confidence and perceived preparedness in managing common benign anorectal conditions while providing a scalable educational model for residency training programs.

Methods

Study Design and Participants

This single-institution pilot study was conducted within a large GS residency program following Institutional Review Board exemption. Participants were GS residents, Postgraduate Year (PGY) 1 and PGY-3. Sessions were conducted in June 2025, approximately two weeks prior to the start of the new academic year. The timing was intentional, targeting PGY-1 residents approaching their first year of

consult coverage and PGY-3 residents transitioning to senior resident roles on acute care surgery, emergency general surgery, and colorectal services. Colorectal surgery faculty and fellows served as instructors.

Lab Structure

The curriculum consisted of a 1.5-hour session beginning with a brief didactic review of anorectal anatomy, pathology, evaluation, and management principles. Surgical Council on Resident Education (SCORE®) modules [10] and recorded didactic lecture videos were provided for optional review prior to the lab. Anoscopy instruments were available for inspection and familiarization, although a dedicated anoscopy simulation station and model was not included. Residents were divided into small groups and rotated through three hands-on simulation stations: (1) hemorrhoid management, covering both excisional hemorrhoidectomy and rubber band ligation; (2) anal fistula probing and seton placement; and (3) perianal abscess I&D with mushroom catheter placement. Each station was approximately 20 minutes in duration and facilitated by colorectal surgery faculty members and fellows. PGY-1 and 3 residents were intentionally mixed within groups to facilitate near-peer teaching and collaborative learning.

Simulation Models

Hemorrhoidectomy and Rubber Band Ligation Model

To simulate hemorrhoidectomy and banding within an enclosed space, a model was created with readily available materials including a toilet paper roll, felt, Play-Doh® or modeling clay, a double layered foam sheet, and tacky glue spray (Fig. 1).

A foam sheet was layered in two using tacky glue spray to achieve the desired thickness and strength, which then served as the skin and mucosa of the anal canal. Modeling clay was rolled into 0.5-1.0 cm masses and placed under the double-layered foam to simulate the hemorrhoidal tissue for hemorrhoidectomy or band ligation. Felt was placed under the modeling clay to simulate the submucosa. The model was encapsulated by a toilet paper roll and placed into a large foam holder, serving as the sphincter and muscle layers, to simulate typical surgical conditions (Fig. 2-A) (Online Resource 1).

During the lab, residents used DeBakey forceps and a McGivney band ligator for the banding model. For the hemorrhoidectomy model, they used a scalpel, Metzenbaum scissors, Kelly forceps, and Adson forceps to excise the hemorrhoid, and 2 – 0 Vicryl suture to close the resultant defect. The total estimated material cost for the hemorrhoid model was \$2.98 per model.

Anal Fistula Probing and Seton Placement Model

The fistula simulation model was constructed using a blue Pool Noodle Booster foam ring as the structural base, which served to simulate the anorectal sphincter complex and surrounding tissue (Fig. 2-B). The foam ring was circumferentially wrapped in Coban self-adherent wrap and secured with hot glue to provide tissue-like tactile resistance and a surface consistent with operating room tissue handling. Multiple tracts were then created by piercing the wrapped foam at varying depths and angles relative to the central lumen, simulating fistula tracts of differing anatomic complexity and orientation consistent with inter-sphincteric and trans-sphincteric subtypes (Online Resource 1). The central opening of the model represented the anal canal opening.

Participants used standard lacrimal probes to navigate each tract, identifying the internal opening within the simulated anal canal. Vessel loops were then threaded through the identified tract and secured as setons, simulating the technique for staged fistula management. Each participant practiced probing at multiple angles to reinforce three-dimensional spatial reasoning for fistula identification. Due to the foam nature of the model, hydrogen peroxide was not used to help identify the tracts. Instructors provided real-time feedback on probe angulation, tract navigation, and seton placement technique. The total estimated material cost for the fistula model was \$7.75 per model.

Abscess Incision and Drainage and Mushroom Catheter Placement Model

The perianal abscess model was developed using readily available materials, with the abscess cavity simulated using a latex balloon filled with a mixture of oatmeal and psyllium fiber to approximate the consistency and drainage characteristics of purulent fluid (Fig. 3). This balloon was embedded within low-loft polyester batting to mimic surrounding soft tissue and placed between two layers of felt, which were secured with hot glue adhesive in an arched configuration to approximate the contour, subcutaneous fat, and hypodermis of the buttocks. To enhance durability and allow for repeated practice, two balloons were incorporated into each model, enabling multiple I&D attempts per model (Online Resource 1).

An additional layer of plastic tablecloth material was applied to simulate the dermal layer, and the model was reinforced with an adhesive loban™ drape to maintain structural integrity and to simulate the epidermis layer. The completed abscess model was affixed using Velcro® to a commercial plastic pelvic anatomy model, allowing for interchangeable attachment and localization relative to perianal anatomy. The plastic pelvic model was then placed in a foam patient headrest in a lateral position to represent lateral decubitus positioning often encountered during bedside I&D procedures. Participants performed the I&D using standard instruments, including a scalpel, hemostat forceps, Metzenbaum scissors, and kerlix packing material. The total cost for the abscess model was \$7.62 due to the purchase of a pelvic model; future lab iterations are expected to cost \$4.28 per model.

All materials for model creation were selected to optimize cost-efficiency, reproducibility, and scalability (Table 1).

Assessment Instruments

Pre- and post-lab surveys were administered to all participants immediately before and after the simulation session, respectively (Online Resource 2), via Qualtrics [11]. The pre-lab survey assessed prior clinical experience, including self-reported case volumes as observer and active participant for hemorrhoidectomy, rubber band ligation, abscess drainage, and fistulotomy, procedural confidence in such cases, and prior self-directed or formal education in benign anorectal disease. Procedural confidence was assessed using a 5-point Likert scale (1 = not at all confident, 2 = somewhat confident, 3 = confident, 4 = very confident, 5 = extremely confident) for eleven tasks. All confidence items were included in both the pre- and post-lab surveys. Post-session surveys additionally evaluated simulation realism, educational value, applicability to clinical practice, and timing of the curriculum. Open-ended questions solicited qualitative feedback.

Statistical Analysis

Differences in prior procedural experience between PGY-1 and 3 residents were compared using Welch's t-test. Pre- and post-lab procedural confidence were compared using paired t-tests. Statistical analyses were performed using R, with significance defined as a two-sided p-value < 0.05.

Results

Participant Characteristics and Prior Procedural Experience

Thirty total GS residents participated in the simulation curriculum, including 17 PGY-1 and 13 PGY-3 trainees. Depending on the survey item analyzed, 19–21 participants completed both pre- and post-simulation surveys and were paired; remaining participants only completed one or neither of the surveys.

As expected, PGY-3 residents reported significantly greater prior experience than PGY-1 residents across the majority of assessed procedural domains (Table 2). PGY-3 residents reported higher exposure to digital rectal examinations (DRE) (mean 39.0 (SD 11.7) vs 6.8 (4.4), $p < 0.001$) and diagnostic anoscopy (17.8 (5.1) vs 4.7 (4.1), $p < 0.001$). Senior residents also reported greater active participation in abscess drainage (13.9 (11.6) vs 2.1 (1.7) cases, $p = 0.024$), fistulotomy (5.6 (3.1) vs. 1.4 (1.4), $p = 0.005$), and bedside abscess I&D (15.9 (7.2) vs. 1.8 (2.7), $p = 0.001$).

Although differences in hemorrhoidectomy and rubber band ligation did not reach statistical significance, exposure to these procedures remained limited overall. PGY-1 residents reported participating in fewer than one banding case on average, while PGY-3 residents reported fewer than six cases, highlighting limited resident experience with this commonly performed procedure regardless of training level.

Procedural Confidence

Self-reported procedural confidence improved significantly following the simulation for all eleven assessed tasks among respondents with paired survey data ($p < 0.05$ for majority of comparisons; Table 3). The greatest relative improvement was observed for rubber band ligation, for which pre-lab confidence was the lowest of all tasks assessed (mean 1.53), increasing to a post-lab mean of 2.74 ($p < 0.001$). Excisional hemorrhoidectomy demonstrated the second-greatest relative improvement (1.63 → 2.63, $p < 0.001$). Among the abscess-related tasks, confidence in performing perirectal abscess I&D improved (1.95 → 2.81, $p < 0.001$) as did perianal abscess I&D (2.33 → 3.24, $p < 0.001$).

Confidence in mushroom catheter placement and I&D improved from a mean of 2.00 to 2.84 ($p = 0.006$) across all participants. This improvement was driven primarily by PGY-1 residents amongst whom confidence in mushroom catheter placement increased from 1.46 to 2.84 ($p = 0.001$ for PGY-1 subgroup), compared to a non-significant change among PGY-3 residents - a finding consistent with the higher baseline experience in this domain among more senior trainees. Confidence in seton placement increased from 2.11 to 2.89 ($p = 0.004$) and confidence in managing fistula disease from 1.84 to 2.42 ($p = 0.007$).

Confidence in performing and documenting DRE and anoscopy also improved significantly despite the absence of a dedicated hands-on anoscopy simulation station in this iteration of the lab. Confidence in DRE performance increased from 2.05 to 2.65 ($p = 0.002$) and in anoscopy performance from 1.90 to 2.55 ($p = 0.001$).

Simulation Feedback

Post-lab feedback was provided by 18 to 20 respondents depending on the survey item analyzed (Table 4). Overall applicability to real-world clinical scenarios was rated favorably, averaged between moderately and very useful with a mean score of 3.5/5 (SD 1.05). Residents reported the highest perceived skill development in hemorrhoid management (3.6/5, SD 0.99) followed by abscess management (3.3/5, SD 1.13) and fistula management (3.25/5, SD 1.16). Ratings for anoscopy skill development were lower (2.95/5, SD 1.08), consistent with the lack of a dedicated hands-on anoscopy model.

Model function and realism received a mean rating of 3.37/5 (SD 1.12), while timing of the session within the academic year was rated 3.56/5 (SD 1.04). Fourteen of 18 respondents (77.8%) agreed that the curriculum was appropriately targeted for PGY-1 and PGY-3 learners.

Qualitative feedback highlighted the particular value of structured, step-by-step procedural exposure with faculty guidance, with residents noting that anorectal procedures are frequently performed by fellows or attendings in clinical practice, limiting PGY-1 visibility into the procedural sequence. Representative comments noted that despite not fully replicating tissue fidelity, the models were functionally adequate and enabled meaningful procedural practice. The most frequently cited area for improvement was the need for a longer session, with several participants noting that the lab felt rushed and that additional time for didactic content and hands-on practice would enhance the educational experience (Table 5).

Discussion

This pilot study demonstrates the feasibility of implementing a low-cost, multi-station simulation curriculum to supplement resident education in benign anorectal disease. Participation in the simulation session was associated with significant improvements in self-reported procedural confidence across all assessed tasks, including hemorrhoidectomy, rubber band ligation, abscess I&D, and fistula management.

Notably, the greatest improvement in confidence was observed for rubber band ligation and excisional hemorrhoidectomy, which are procedures for which residents reported the lowest baseline experience. These findings likely reflect the limited opportunities trainees have to perform these procedures during routine clinical rotations. Overall, resident-reported confidence increased for all procedures. While the absolute value of each mean rating only increased incrementally, these scores reflect realistic skill development for junior trainees. Participation in the lab shortened the educational gap, but continuous practice and integrated knowledge reinforcement are essential for comprehensive skill acquisition. Simulation training for these procedures therefore represents a valuable adjunct to clinical education, allowing residents to develop familiarity with instrumentation, spatial orientation, and procedural sequencing prior to performing them in patient care settings.

Existing anorectal simulation curricula, however, have largely addressed individual procedural techniques in isolation rather than the combined skill set expected of graduating general surgeons. One simulation-based training study described the use of a mason jar to practice and assess resident dissections, knot-tying, and suturing in a restricted space, simulating the restricted space a surgeon has when performing hemorrhoidectomies or banding [7]. Another model utilized a PVC pipe and fabric components to facilitate the use of anosopes and rubber band ligation [12]. While existing models affirm the feasibility of creating simulation-based anorectal task-trainers, they fail to simulate both excision and banding as expected in the current GS curriculum. Additionally, not all models adequately simulated the restricted space that is characteristic of hemorrhoid operations, warranting the development of a model with greater ecological validity.

A previously described basic I&D model utilized an oatmeal-filled latex balloon to simulate an abscess [13]. However, this model was constructed on a flat surface and lacked anatomic fidelity, limiting its ability to replicate the procedural approach encountered in real patient presentations. Beyond this model, there is a paucity of described anorectal I&D simulation platforms that allow for both anatomical realism and technical skill practice. Finally, published simulation models specifically designed for fistula probing and seton placement in the context of GS resident training are limited. Joosten et al. described an inanimate, foam-based simulation model for surgical correction of anorectal malformations in pediatric colorectal surgery training, demonstrating the feasibility of low-cost task trainers for perineal and perianal procedures [9].

Several practical challenges were encountered during development of the simulation models. Although the materials used were inexpensive and readily available, construction of the models required more

time than anticipated. Additionally, the use of Play-Doh® within the hemorrhoid model proved suboptimal, as the material hardened over time and reduced model durability. Future iterations will explore alternative materials that maintain flexibility, such as non-drying modeling clay or Sculpey®, while improving reproducibility and longevity of the models.

Participants also noted that the session felt rushed and would benefit from additional time for hands-on practice and procedural discussion. Future implementation of this curriculum will extend the session length and incorporate a dedicated didactic component, potentially delivered through pre-session asynchronous learning materials, including online videos. Pre-lab educational modules may allow in-person simulation time to focus more heavily on procedural skill acquisition and individualized feedback.

This study has several limitations. As a single-institution pilot study with a relatively small sample size, the findings may not be generalizable to other training programs. Outcomes were limited to short-term measures of self-reported confidence, and the study did not assess objective procedural skill performance or long-term retention. Additionally, the simulation models did not fully replicate the tactile fidelity of live tissue, although participants reported that the models were sufficiently realistic to facilitate meaningful practice. Finally, a lack of a dedicated anoscopy model limits interpretation of the reported improved confidence in DRE and anoscopy. Despite these limitations, the results suggest that low-cost simulation training can effectively address educational gaps in anorectal disease management. By providing structured procedural exposure early in training, simulation may help residents develop foundational technical skills and clinical confidence that can be further refined through supervised clinical practice.

Future work will focus on improving model reproducibility, incorporating objective technical skill assessment, and evaluating longitudinal outcomes such as operative participation and procedural competence during residency. Iterative integration of simulation and didactic education may provide a scalable approach for strengthening resident training in this common but often underrepresented domain of GS practice.

Conclusion

A low-cost, multi-station anorectal simulation curriculum was feasible to implement and associated with significant improvements in resident confidence managing common benign anorectal conditions and procedures. The curriculum addressed areas of limited clinical exposure, particularly hemorrhoidectomy and rubber band ligation, while providing a scalable and reproducible educational model for residency programs. Integration of simulation with structured didactic education may represent an effective strategy for strengthening anorectal procedural training within GS residency.

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Tables

Table 1. Estimated Material Costs for Simulation Models

Item	Package / Unit Size	# Needed	Unit Cost (\$)	Item Cost (\$)
Hemorrhoidectomy & Banding Model – 30 models total				
Toilet paper rolls	Roll of 30	1	\$13.00	\$13.00
Felt	3 sq. yards	1	\$17.00	\$17.00
Play-Doh® or air-dry clay	1 lb	1	\$10.00	\$10.00
Packing foam sheets	50 ft roll	1	\$17.00	\$17.00
Tacky glue spray	1 can	1	\$7.00	\$7.00
Hot glue	1 gun + glue	1	\$20.00	\$20.00
Foam rings	1 each	3	\$1.75	\$5.25
Total supply cost (30 models): \$89.25 Cost per model: \$2.98				
Abscess Model – 30 models total				
Latex balloons	Pack of 100	1	\$6.00	\$6.00
Oatmeal	2.6 lb	1	\$5.00	\$5.00
Psyllium fiber powder	12 oz	1	\$12.00	\$12.00
Polyester batting	100 g	1	\$8.00	\$8.00
Felt	3 sq. yards	1	\$17.00	\$17.00
Hot glue sticks	Pack	1	\$7.00	\$7.00
Plastic tablecloth	1 each	1	\$1.50	\$1.50
Ioban™	17 x 23 in	6	\$12.00	\$72.00
Pelvic model (reusable base)	1 each	1	\$100.00	\$100.00
Total supply cost (30 models): \$228.50 Cost per model: \$7.62				
Cost per mode without pelvic model included: \$4.28				
Fistula Model – 4 models total				
Foam ring	1 each	4	\$1.75	\$7.00
Coban wrap	Pack of 6	1	\$8.00	\$8.00
Hot glue sticks	Pack	1	\$7.00	\$7.00
Foam head rest	1 each	1	\$9.00	\$9.00
Total supply cost (4 models): \$31.00 Cost per model: \$7.75				

Costs reflect bulk purchase prices for the quantities listed; per-model costs were calculated by dividing the total supply cost for each model type by the number of models constructed.

Table 2. Prior Procedural Experience by PGY Level

Procedure	PGY-1 Mean (SD) n=17	PGY-3 Mean (SD) n=13	p-value
Digital Rectal Exam (DRE)	6.8 (4.4)	39.0 (11.7)	< 0.001
Diagnostic Anoscopy	4.7 (4.1)	17.8 (5.1)	< 0.001
Hemorrhoidectomy (active participant)	1.9 (1.6)	10.8 (15.5)	0.124
Rubber Band Ligation (active participant)	0.5 (0.8)	5.7 (8.9)	0.172
Abscess Drainage (active participant)	2.1 (1.7)	13.9 (11.6)	0.024
Fistulotomy (active participant)	1.4 (1.4)	5.6 (3.1)	0.005
Bedside Abscess Incision & Drainage (I&D)	1.8 (2.7)	15.9 (7.2)	0.001

Table 3. Paired Self-Reported Procedural Confidence Before and After Simulation

Task (n=19)	Pre-Lab Mean (SD)	Post-Lab Mean (SD)	Mean Difference	p-value
Perform DRE ^a	2.05 (0.76)	2.65 (0.81)	+0.60	0.002
Document DRE ^a	2.00 (0.65)	2.50 (0.69)	+0.50	0.004
Perform Anoscopy ^a	1.90 (0.72)	2.55 (0.89)	+0.65	0.001
Document Anoscopy ^a	1.70 (0.80)	2.30 (0.86)	+0.60	0.002
Perform Perianal Abscess I&D ^b	2.33 (1.20)	3.24 (0.94)	+0.90	< 0.001
Perform Perirectal Abscess I&D ^b	1.95 (0.92)	2.81 (0.75)	+0.86	< 0.001
Perform Hemorrhoidectomy ^c	1.63 (0.83)	2.63 (0.76)	+1.00	< 0.001
Perform Rubber Band Ligation ^c	1.53 (0.77)	2.74 (1.05)	+1.21	< 0.001
Place Mushroom Catheter ^c †	2.00 (0.94)	2.84 (0.76)	+0.84	0.006
Place Seton ^c	2.11 (0.88)	2.89 (0.66)	+0.79	0.004
Manage Fistula Disease ^c	1.84 (0.69)	2.42 (0.51)	+0.58	0.007

All comparisons by paired t-test; 5-point Likert scale: 1 = not at all confident, 2 = somewhat confident, 3 = confident, 4 = very confident, 5 = extremely confident.

^a n=21; ^b n=20; ^c n=19

† Confidence in mushroom catheter placement rose significantly among PGY-1 residents specifically (1.46 → 2.84, mean difference +1.38, $p = 0.001$); the change among PGY-3 residents was not statistically significant.

Table 4. Post-Lab Feedback

Survey Item	n	Mean	SD
How useful was the simulation for applying your knowledge to real-world scenarios? ^a	20	3.50	1.05
To what extent did the simulation help you develop specific skills in management of hemorrhoids? ^a	20	3.60	0.99
To what extent did the simulation help you develop specific skills in management of fistulas? ^a	20	3.25	1.16
To what extent did the simulation help you develop specific skills in management of abscesses? ^a	20	3.30	1.13
To what extent did the simulation help you develop specific skills in management of general anoscopy? ^a	19	2.95	1.08
How well did the simulation models function? ^a	19	3.37	1.12
Was the timing during the year of this lab ideal? ^a	18	3.56	1.04
Is this lab appropriate for PGY-1s and 3s? ^b	18	4.00	0.97

^a 1 = not at all useful, 2 = slightly useful, 3 = moderately useful, 4 = very useful, 5 = extremely useful

^b 1 = definitely not, 2 = probably not, 3 = neutral, 4 = probably yes, 5 = definitely yes

Table 5. Representative Resident Quotes from Post-Lab Free-Response Feedback

s	Representative Quote	Participant
Hands-on practice with procedural models	<i>"Helpful to work on models and discuss with attendings."</i>	PGY-1
	<i>"Hands on of basic skills."</i>	PGY-1
Real-world clinical applicability	<i>"Applicable to bedside or OR procedures that we will likely be doing."</i>	PGY-1
	<i>"Tips on the DRE from faculty in a teaching setting as opposed to over the phone at night in the ED."</i>	PGY-1
Step-by-step procedural visualization	<i>"Being able to see the steps of the procedures. A lot of times there is a Fellow or chief in these procedures so as an intern, you don't get to see step-by-step what they do."</i>	PGY-1
Platform for teaching and discussion	<i>"I thought the model was good and gave a good platform to teach and discuss the procedural skills."</i>	PGY-1
Pacing and time allocation	<i>"I think it was a bit rushed so I would appreciate having a little more time."</i>	PGY-1
Model fidelity	<i>"It's always difficult to simulate real life tissue but they were very creative and worked well enough to go through the procedures even if they wouldn't feel exactly the same."</i>	PGY-1
	<i>"They worked really well and communicated the idea appropriately"</i>	PGY-1

Figures

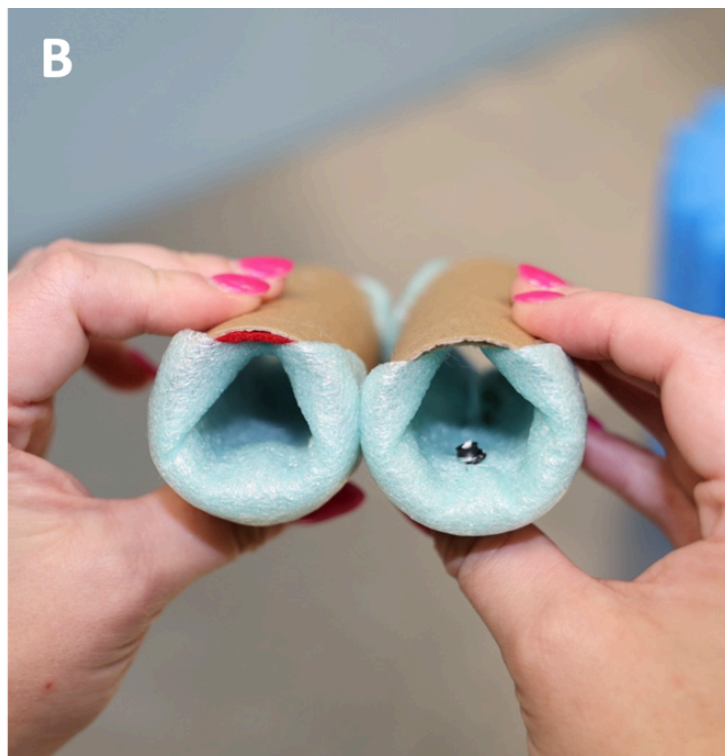
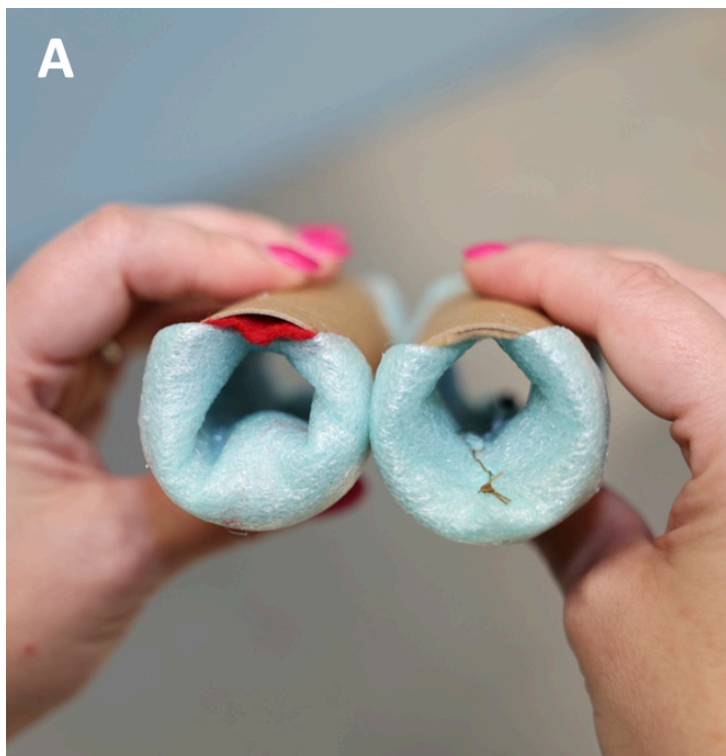


Figure 1

Hemorrhoid model for (a) hemorrhoidectomy with a larger hemorrhoid and (b) banding with a smaller hemorrhoid.

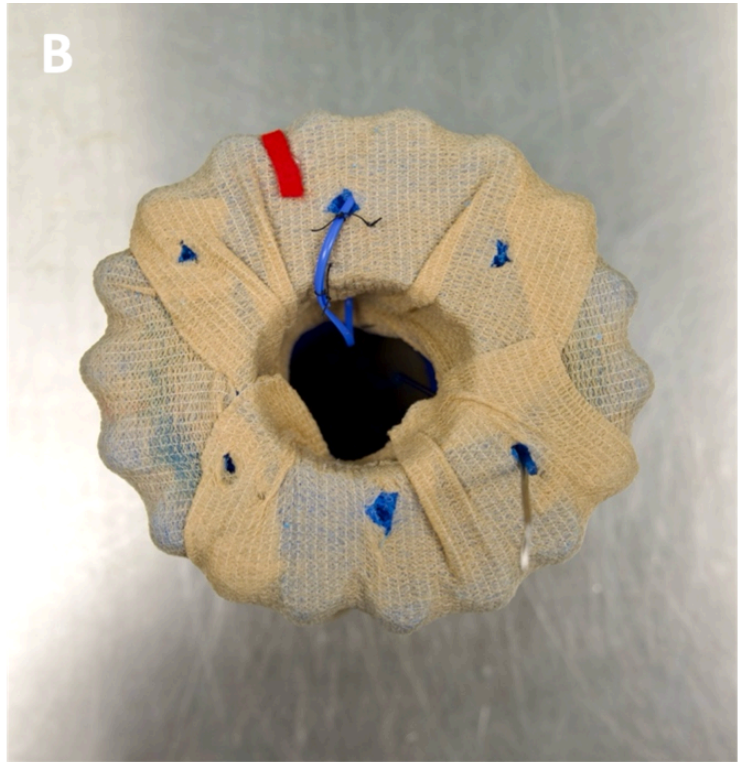
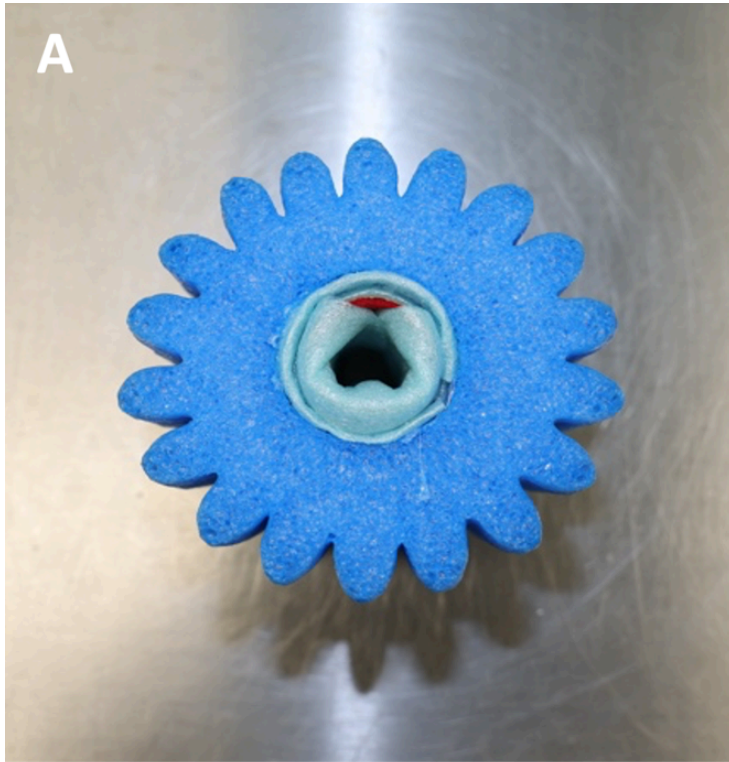


Figure 2

(a) Anal hemorrhoid model placed in foam holder to simulate operating in a deep, restricted field; (b) fistula seton placement and probing.

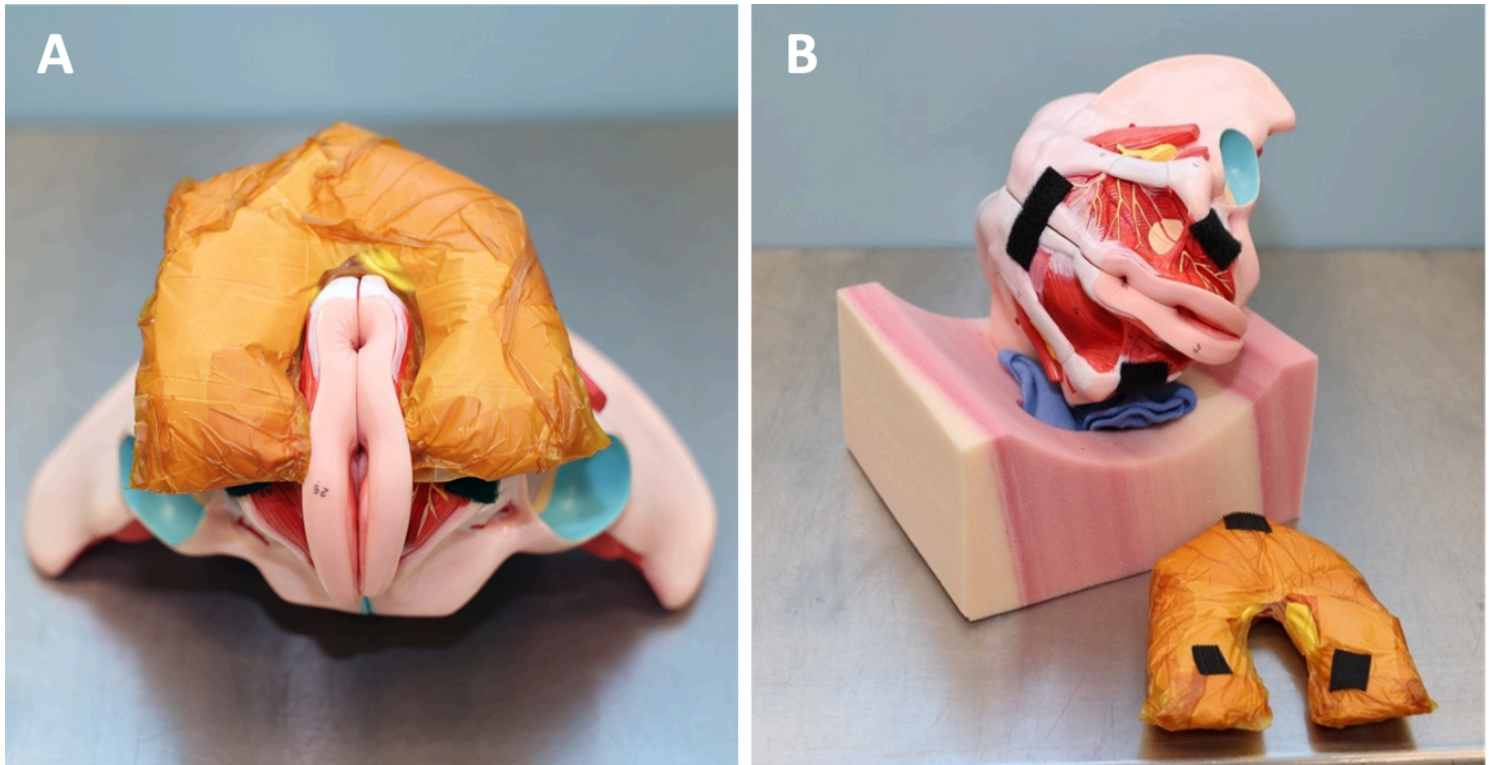


Figure 3

Perianal abscess model for (a) incision and drainage (b) using a pelvis model as the base.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [AJH1.pdf](#)
- [AJH2.pdf](#)