

# Does drain placement in robotic retromuscular hernia repairs influence wound morbidity?

Benjamin T. Miller, MD

Associate Staff

Center for Abdominal Core Health

Cleveland Clinic Foundation, Cleveland, OH



# Authors & Participating Institutions

Benjamin T. Miller, MD<sup>1</sup>, Robert Tamer, MPH, MPA<sup>2</sup>, Clayton C. Petro, MD<sup>1</sup>, David M. Krpata, MD<sup>1</sup>, Ajita S. Prabhu, MD<sup>1</sup>, Michael J. Rosen, MD<sup>1</sup>, Lucas R. A. Beffa, MD<sup>1</sup>

1. Cleveland Clinic Center for Abdominal Core Health  
Cleveland Clinic Foundation  
Cleveland, Ohio
2. Department of Surgery  
The Ohio State University  
Columbus, Ohio



# Disclosures

- Benjamin Miller, MD: none
- Robert Tamer, MPH, MPA: none
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# Introduction

- Robotic retromuscular ventral hernia repair is an emerging technique

## Two robotic approaches:

1. Extended-view totally extraperitoneal (eTEP)
  2. Transversus abdominis release (TAR)
- Create a large retromuscular space for mesh reinforcement

# Introduction

- Drains may be left in the retromuscular space, but they are controversial

## Disadvantages

- ✓ May be painful
- ✓ May facilitate bacterial translocation to mesh

## Advantages

- ✓ May decrease seroma formation



# Introduction

**Aim:** Assess the effect of retromuscular drains on wound morbidity after robotic retromuscular ventral hernia repair



# Methods

## Abdominal Core Health Quality Collaborative

- Robotic retromuscular ventral hernia repairs with mesh
  - eTEP and TAR included
- 30-day follow-up
- 2013 - 2022

## Propensity score matching using a 1:1 ratio

- Retromuscular drain at surgery vs no drain



# Methods

## Outcomes

- Surgical site occurrences (SSO)
- Surgical site infections (SSI)
- Surgical site occurrences requiring procedural interventions (SSOPI)
- Hospital length of stay



# Results

2172  
Patients met inclusion criteria

580  
Patients with drains

vs

580  
Patients without drains



# Results

## Patient characteristics

	Drain N=580	No Drain N=580	P value
Gender (female)	320 (55.2%)	302 (52.1%)	0.289
Age (years)	59.0 [IQR 49.5,68.0]	59.0 [IQR 49.5,67.5]	0.786
BMI	32.6 [IQR 29.0,37.1]	32.3 [IQR 28.5,36.9]	0.353
Hypertension	303 (52.2%)	338 (58.3%)	<b>0.039</b>
Current smoker	59 (10.2%)	69 (11.9%)	0.349
Diabetes	115 (19.8%)	128 (22.1%)	0.348
COPD	29 (5.0%)	41 (7.1%)	0.139
History of abdominal wall infection	82 (14.1%)	85 (14.7%)	0.802
Immunosuppression	31 (5.3%)	36 (6.2%)	0.529
Recurrent incisional hernia	208 (35.9%)	196 (33.8%)	0.460

Abbreviations: BMI, body mass index; COPD, chronic obstructive pulmonary disease

# Results

## Operative details

	Drain N=580	No Drain N=580	P value
Elective operation	573 (98.8%)	576 (99.3%)	0.363
CDC wound class			0.368
1	553 (95.3%)	545 (94.0%)	
2	23 (3.98%)	33 (5.69%)	
3	3 (0.52%)	1 (0.17%)	
Operating room time (minutes)			0.846
60 - 119	17 (2.9%)	14 (2.4%)	
120 - 179	99 (17.1%)	108 (18.6%)	
180 - 239	197 (34.0%)	199 (34.3%)	
240 +	267 (46.0%)	259 (44.7%)	
Prophylactic IV antibiotics	572 (98.6%)	573 (98.8%)	0.795

Abbreviations: CDC, Centers for Disease Control

# Results

## Operative details

	Drain N=567	No Drain N=567	P value
Hernia width (cm)	8.0 [IQR 6.0,10.0]	8.0 [IQR 5.0,10.0]	0.399
Hernia length (cm)	15.0 [IQR 9.0,20.0]	14.0 [IQR 8.0,20.0]	0.191
Mesh width (cm)	27.0 [IQR 20.0,30.0]	23.0 [IQR 16.0,28.0]	<.0001
Mesh length (cm)	30.0 [IQR 30.0,35.0]	30.0 [IQR 24.0,32.0]	<.0001
Transversus abdominis release	409 (70.5%)	408 (70.3%)	0.949
Enterotomy			1.000
Partial thickness	5 (100.0%)	15 (93.8%)	
Full thickness	0 (0.0%)	1 (6.3%)	
Concomitant GI procedure	2 (0.3%)	10 (1.7%)	0.020
Estimated blood loss (mL)	25.0 [IQR 5.0,50.0]	25.0 [IQR 10.0,45.0]	0.773

# Results

## Surgical Site Occurrences at 30 days

	Drain N=567	No Drain N=567	P value
<b>SSO</b>	33 (5.7%)	99 (17.1%)	<b>&lt;.0001</b>
Cellulitis	2 (0.3%)	3 (0.5%)	1.000
Wound dehiscence	0 (0.0)	0 (0.0)	
Fascial dehiscence	1 (0.2%)	0 (0.0)	1.000
Serous drainage	2 (0.3%)	0 (0.0%)	0.500
Purulent drainage	0 (0.0)	0 (0.0)	
Seroma	22 (3.8%)	88 (15.2%)	<b>&lt;.0001</b>
Hematoma	6 (1.0%)	11 (1.9%)	0.229

# Results

## SSOPIs at 30 days

	Drain N=567	No Drain N=567	P value
<b>SSOPI</b>	11 (1.9%)	6 (1.0%)	0.222
Wound opening	7 (1.2%)	5 (0.9%)	0.562
Wound debridement	5 (0.9%)	3 (0.5%)	0.726
Percutaneous drainage	1 (0.2%)	3 (0.5%)	0.624
Mesh removal (partial)	0 (0.0)	1 (0.2%)	1.000
Mesh removal (complete)	0 (0.0)	1 (0.2%)	1.000

# Results

## Surgical Site Infections at 30 days

	Drain N=567	No Drain N=567	P value
<b>SSI</b>	16 (2.8%)	10 (1.7%)	0.234
Superficial	6 (1.0%)	8 (1.4%)	0.591
Deep	9 (1.6%)	4 (0.7%)	0.163
Organ space	1 (0.2%)	1 (0.2%)	1.000



# Results

## Predictors of SSOs

Predictors	Odds ratio	95% CI	P value
Gender (male)	0.913	0.63 - 1.32	0.629
Age (years)	1.00	0.99 - 1.02	0.497
BMI	1.043	1.01 - 1.07	0.005
Current smoker	1.491	0.89 - 2.51	0.132
Diabetes	0.919	0.59 - 1.43	0.709
History of abdominal wall infection	2.009	1.29 - 3.14	0.002
Hernia width (cm)	1.043	0.99 - 1.10	0.105
Hernia length (cm)	1.007	0.98 - 1.04	0.648
Retromuscular drain	0.317	0.21 - 0.47	<.0001

# Results

## Hospital length of stay

**Drain:** 2 days [IQR 1.0;3.0]

$P < 0.0001$

**No drain:** 1 day [IQR 1.0;2.0]



# Conclusions

- Retromuscular drain placement during robotic retromuscular ventral hernia repair is associated with decreased seroma occurrence
- Retromuscular drains were not associated with lower rates of SSOPIs





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