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Drain versus no drain in elective open incisional hernia repair: a propensity score matching analysis using the ACHQC database.

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Disclosures

The authors have nothing to disclose

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Introduction

Approximately 100,000 Incisional hernia (IH) repairs are performed annually in the United States. Although surgery repair is the treatment for IH, patients can present with postoperative complications such as surgical site infection and collection such as seroma formation.

Drains are commonly used in different surgical specialties in an attempt to reduce fluid collection in the surgical site, seroma formation and infection.

However, there is an ongoing debate regarding the benefits of drain for wound morbidity. Studies varied regarding outcomes on wound morbidity with drain use. Some studies showed benefits with decreased seroma formation while others showed higher infection complications with drains.

Currently, there is no clear recommendation regarding the systematic use of drains after IH repair.

Hernia (2023) 27:409–413
https://doi.org/10.1007/s10029-022-02696-6

ORIGINAL ARTICLE

Retromuscular drain versus no drain in robotic retromuscular ventral hernia repair: a propensity score-matched analysis of the abdominal core health quality collaborative

B. T. Miller[1] · R. Tamer[2] · C. C. Petro[1] · D. M. Krpata[1] · M. J. Rosen[1] · A. S. Prabhu[1] · L. R. A. Beffa[1]

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- 580 patients in each group
- Rates of SSIs and SSOPIs were similar
- Logistic regression - drain placement lowered the risk of an SSO (OR 0.32, CI 0.21-0.47; P < 0.0001).
- LOS - longer for patients with drains - 2.0 days [IQR 1.0; 3.0] vs 1.0 day [IQR 1.0; 2.0], respectively; P < .0001).

J Gastrointest Surg (2017) 21:2083–2089
DOI 10.1007/s11605-017-3601-0

ORIGINAL ARTICLE

Drain Placement Does Not Increase Infectious Complications After Retromuscular Ventral Hernia Repair with Synthetic Mesh: an AHSQC Analysis

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- 581 patients – PSM: 300 drain and 100 with no drain.
- Open, retromuscular VHR with synthetic mesh
- Retromuscular drains were less likely to develop a noninfectious SSO (OR 0.33).
- Not associated with SSI (OR, 1.30) or SSOPI (OR, 0.94).

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Surgical Endoscopy (2024) 38:3564–3570
https://doi.org/10.1007/s00464-024-10871-2

Drain vs no drain placement after retromuscular ventral hernia repair with mesh: an ACHQC analysis

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- Almost 7,000 patients – univariate and logistic regression
- Drain associated with decreased SSO occurrence
- Associated with increased LOS.
- Diabetes and open approach, but not drain use, were predictors of SSI.

Hernia
https://doi.org/10.1007/s10029-023-02862-4

ORIGINAL ARTICLE

Drain versus no drain in elective open incisional hernia operations: a registry-based analysis with 39,523 patients

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- 28,182 patients with with drain, and 11,341 with no drain
- Drains used in 71.3% of elective open IH operations between 1/2009 and 12/2020
- Drain: associated with increased intraop, general, postop complications and reoperations.
- The worse outcome of patients is associated with the use of drains, independent of other infuencing factors

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Objective

We aimed to evaluate drains impact on:

surgical site occurrences (SSO) and infection (SSI)

after open elective incisional hernia repair with synthetic mesh

using the Abdominal Core Health Quality Collaborative (ACHQC) database

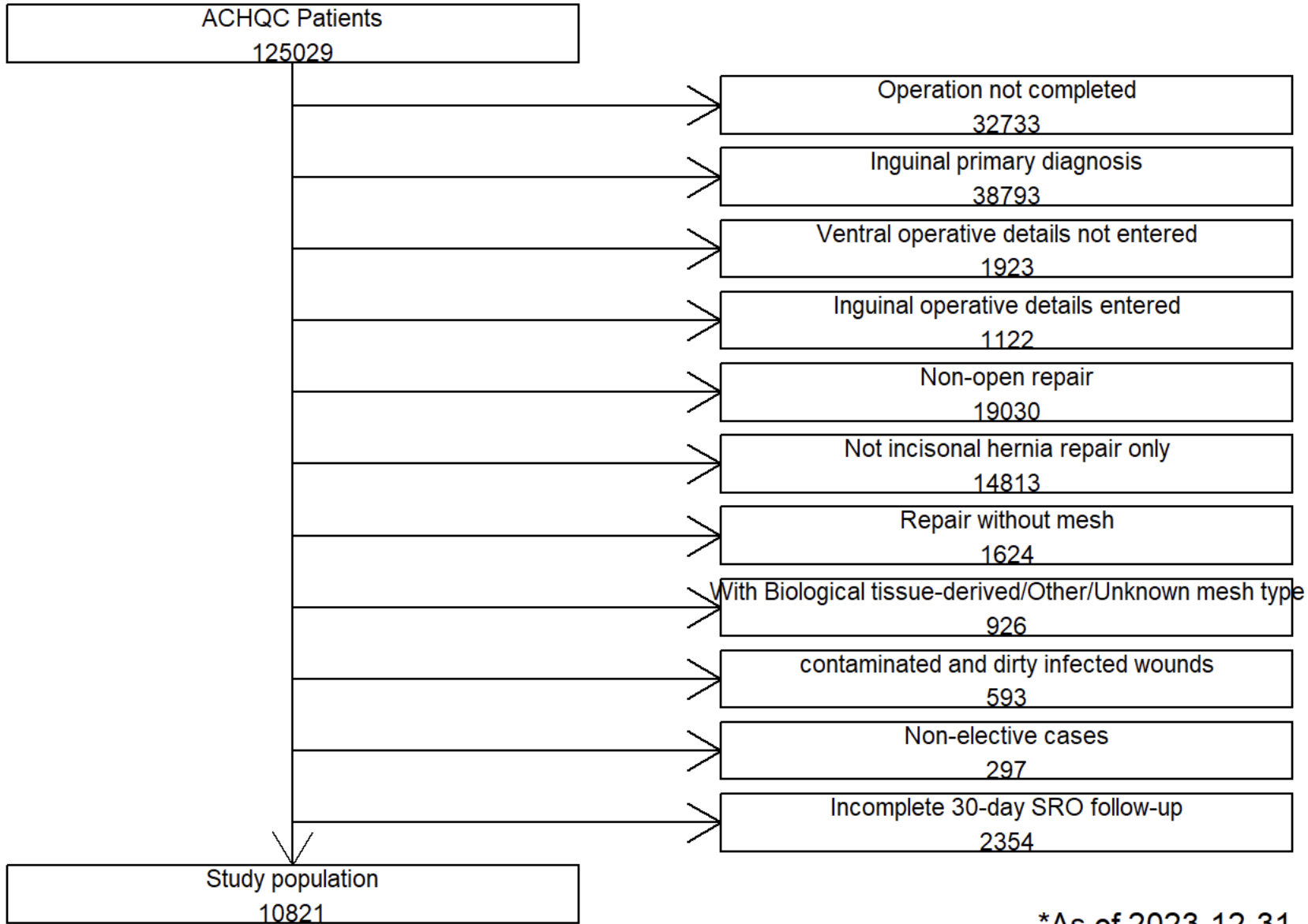
Outcomes of interest

Primary outcomes: SSI an SSO at 30 days

Secondary outcomes: readmissions, Length of stay, reoperation at 30 days

Inclusion criteria

- Adult patients
- Incisional hernia
- Operative approach: Open
- 30 day follow up completed
- Wound class: clean or clean contaminated
- Mesh used –permanent synthetic or resorbable synthetic
- Elective cases



*As of 2023-12-31

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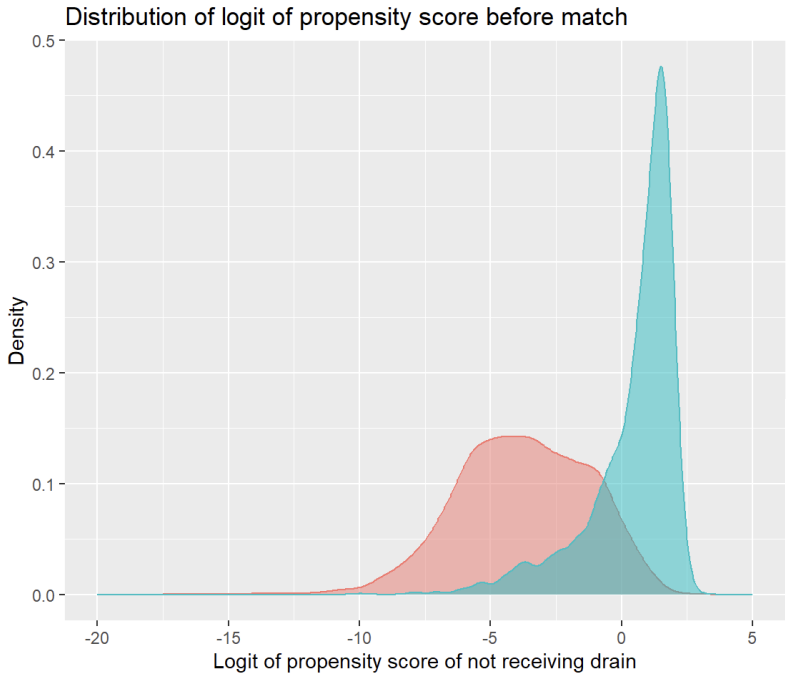
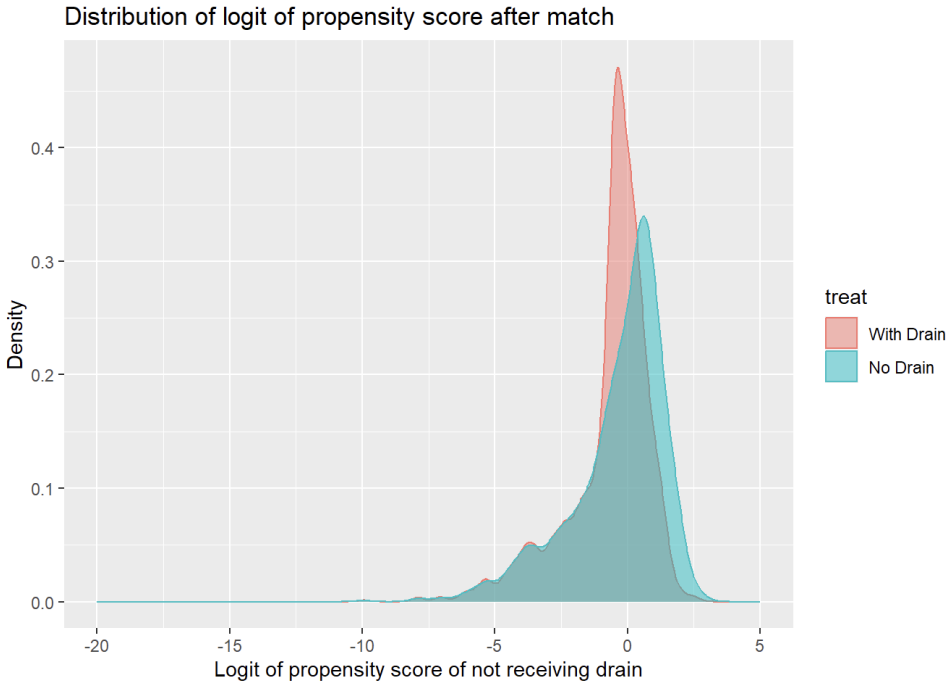
Propensity Score matching

- Sex,
- Diabetes mellitus,
- BMI,
- ASA,
- Smoking status,
- wound status,
- defect size (width and length),
- Need for TAR,
- mesh location





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Demographics

	With Drain N = 1,337	No Drain N = 1,337
Median BMI (IQR)	31 (27, 36)	31 (27, 36)
Median Age (IQR)	59 (50 - 68)	60 (48 - 69)
Sex		
Female	709 (53%)	727 (54%)
Male	628 (47%)	610 (46%)
Diabetes Mellitus	268 (20%)	250 (19%)
Current smoker within 1 month	134 (10%)	132 (9.9%)
ASA class		
I	56 (4.2%)	66 (4.9%)
II	555 (42%)	548 (41%)
III	687 (51%)	677 (51%)
IV	36 (2.7%)	40 (3.0%)
History of AAA	20 (1.5%)	16 (1.2%)
Anti-coagulation medications	89 (6.7%)	89 (6.7%)
Anti-platelet medications	191 (14%)	219 (16%)
COPD	86 (6.4%)	97 (7.3%)
HTN	690 (52%)	664 (50%)
Immunosuppressants	78 (5.8%)	71 (5.3%)

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Hernia characteristics

	With Drain N = 1,337	No Drain N = 1,337	p-value
Recurrent	607 (45%)	437 (33%)	<0.001
Median hernia defect (IQR)	38 (20, 60)	24 (12, 55)	<0.001
Median Hernia length (IQR)	8.0 (6.0, 11.0)	6.0 (4.0, 10.0)	
Median Hernia width (IQR)	6.0 (4.0, 8.0)	5.0 (3.0, 7.0)	
EHS hernia classification			
M1	142 (11%)	119 (8.9%)	0.13
M2	728 (54%)	640 (48%)	<0.001
M3	871 (65%)	825 (62%)	0.065
M4	536 (40%)	338 (25%)	<0.001
M5	164 (12%)	92 (6.9%)	<0.001
Indication for Surgery			
Enlarging / interfering with activities	942 (71%)	846 (64%)	<0.001
Pain	1,136 (86%)	1,127 (85%)	0.8
Asymptomatic	20 (1.5%)	26 (2.0%)	0.4
Prior mesh present	425 (32%)	283 (21%)	<0.001

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Perioperative outcomes

	With Drain N = 1,337	No Drain N = 1,337	p-value
Operative time			< 0.001
0 - 59	70 (5.2%)	266 (20%)	
60 - 119	394 (29%)	615 (46%)	
120 - 179	454 (34%)	292 (22%)	
180 - 239	233 (17%)	90 (6.7%)	
240 +	186 (14%)	74 (5.5%)	
Intraoperative complications	29 (2.2%)	22 (1.6%)	0.3
History of component separation	41 (3.1%)	29 (2.2%)	0.15
Myofascial release	814 (61%)	520 (39%)	<0.001
TAR	198 (15%)	138 (10%)	<0.001
Number of meshes used			0.037
One Mesh	1,307 (98%)	1,321 (99%)	
Two Meshes	30 (2.2%)	16 (1.2%)	
Mesh type			<0.001
Permanent Synthetic	1,251 (94%)	1,296 (97%)	
Resorbable Synthetic	86 (6.4%)	41 (3.1%)	

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Perioperative outcomes

	With Drain N = 1,337	No Drain N = 1,337	p-value
Mesh location			<0.001
Inlay	53 (4.0%)	44 (3.3%)	
Onlay	105 (7.9%)	124 (9.3%)	
Sublay	1,179 (88%)	1,169 (87%)	
Sublay mesh placement			
Intraperitoneal	105 (8.2%)	253 (20.2%)	<0.001
Preperitoneal	242 (18.9%)	401 (32%)	<0.001
Retromuscular	937 (73%)	597 (47.8%)	<0.001
Mesh width (IQR)	15 (12, 20)	12 (8, 15)	<0.001
Mesh fixation	1,116 (83%)	1,061 (79%)	0.006
Suture	996 (90%)	940 (89%)	0.5
Tacks	89 (8.0%)	78 (7.4%)	0.6
Adhesives	146 (13%)	106 (10%)	0.023

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Perioperative outcomes

	With Drain N = 1,507	No Drain N = 1,507	p-value
Length of stay	3 (1, 4)	1 (0, 3)	<0.001
Readmission at 30 days	65 (4.9%)	42 (3.1%)	0.023
Reoperation at 30 days	27 (2.0%)	20 (1.5%)	0.3
Recurrence at 30 days	3 (0.2%)	4 (0.3%)	>0.9
SSI	55 (4.1%)	35 (2.6%)	0.032
SSO	152 (11%)	179 (13%)	0.11
SSOPI	63 (4.7%)	46 (3.4%)	0.1
Seroma	73 (5.5%)	116 (8.7%)	0.001
Hematoma	22 (1.6%)	23 (1.7%)	0.9

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Multivariable Logistic regression

	OR	95% (CI)	p-value
SSI			
Drain	1.5	1.00 - 2.4	0.055
Hernia length	1.02	0.98 - 1.07	0.33
Hernia width	1.01	0.94 - 1.09	0.695
TAR	1.36	0.7 - 2.4	0.32

Multivariable Logistic regression

	OR	95% (CI)	p-value
SSO			
Drain	0.81	0.64 - 1.03	0.082
Hernia length	1.02	0.99 - 1.04	0.21
Hernia width	1.02	0.98 - 1.06	0.371
TAR	0.81	0.54 - 1.19	0.29

Multivariable Logistic regression

	OR	95% (CI)	p-value
Length of Stay			
Drain	2.76	2.2 - 3.5	<0.001
Hernia length	1.08	1.05 - 1.1	<0.001
Hernia width	1.06	1.03 - 1.1	<0.001
TAR	1.66	1.23 - 2.2	<0.001

Multivariable Logistic regression

	OR	95% (CI)	p-value
Readmission			
Drain	1.52	1.03 - 2.3	0.037
Hernia length	1.05	1.01 - 1.1	0.018
Hernia width	1	0.93 - 1.07	0.97
TAR	0.83	0.43 - 1.51	0.553

Limitations

- Retrospective data
- Performance bias
- Attrition bias
- Voluntary input of data in the database
- Dedicated Abdominal Wall repair surgeons

Conclusions

- Drain placement during elective open incisional hernia repair with mesh was associated with:
- decreased seroma formation
- No difference in SSI or SSO
- But increased LOS, and readmission at 30 days.

Thank you!

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