How Much Overlap Is Enough?

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Introduction

When fascia is closed, what mesh overlap is needed to minimize the risk of hernia recurrence after ventral hernia repair?

The recommendation for 3-5cm of mesh overlap beyond ventral fascial defects is founded in early data from laparoscopic hernia repair wherein fascial defects were not routinely closed. With modern hernia repairs, does absolute overlap predict recurrence?

Methods

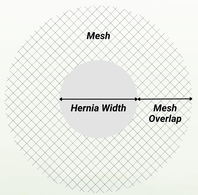
Retrospective review of the ACHQC database for cases between 2013-2022

Inclusion:

- Clean or Clean-Contaminated cases
- Ventral hernia repairs
- Permanent synthetic mesh
- Intact 1 year follow up

Cohorts: Mesh overlap >5cm vs <5cm beyond original fascial defect, after closure of defect

Primary Outcome: pragmatic recurrence at 1 year



Demographics	Before PSM		After PSM		
	<5cm N = 1981	≥5cm N = 2623	<5cm N = 1662	≥5cm N = 1662	P-value
Age	58	60	**59**	**60**	**0.62**
Gender (Female)	44%	52%	**45%**	**48%**	**0.21**
Race (non-white)	12%	10%	**11%**	**11%**	**0.74**
Diabetes	15%	22%	**16%**	**18%**	**0.21**
COPD	4%	7%	**5%**	**6%**	**0.5**
Current Smoker	7%	6%	**6%**	**6%**	**1**
Avg BMI (continuous)	31	32	**31**	**32**	**0.36**
Recurrent hernia	21%	45%	**25%**	**26%**	**0.36**
Operative approach					**0.076**
Open	72%	66%	**69%**	**66%**	
MIS	28%	34%	**31%**	**34%**	

Table 1. Cohort demographics and preoperative characteristics before and after propensity score matching (PSM)

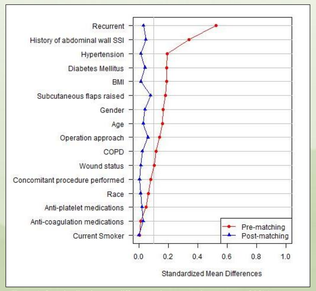


Figure 1. Standardized mean difference demonstrating success of PSM

Results

	<5cm N = 1662	5cm and above N = 1662	P-value
Median (IQR) Mesh Width cm	10 (6-14)	30 (18-30)	<0.001
Median (IQR) Hernia Width cm	3 (2-7)	9 (5-13)	<0.001
History of Component Separation	2%	3%	0.1
Myofascial release	27%	75%	<0.001
Posterior Rectus	87%	80%	<0.001
TAR	23%	73%	<0.001
Fascial Closure – suture material			
Absorbable	68%	87%	<0.001
Permanent	33%	14%	<0.001
Mesh Position			<0.001
Onlay	5%	7%	
Inlay	4%	1%	
Sublay	91% (1517)	92% (1532)	
Retrorectus	31%	78%	<0.001
Preperitoneal	37%	36%	0.64
Intraperitoneal	37%	15%	<0.001

Table 2. Operative Details

	<5cm N = 1662	5cm and above N = 1662	P-value
Recurrence at 1 year	12% (198)	9% (150)	0.007

Hernia recurrence occurred more frequently at 1 year when mesh overlap was less than 5cm compared to the original fascial defect.

	<5cm N = 1662	5cm and above N = 1662	P-value
Surgical Site Infections (SSI)	2% (28)	4% (59)	<0.001
SSO requiring procedural intervention	2% (34)	4% (69)	<0.001
Length of Stay (IQR)	0 (0-2)	3 (1-5)	<0.001
Readmission	3% (45)	5% (85)	<0.001
Recurrence within 30 days	0% (6)	0% (0)	0.014
Any complication within 30 days	12% (204)	21% (353)	<0.001
HerQLes score change at 1 year	+25	+32	0.004

Table 3. Additional outcomes

- Hernia-specific quality of life metrics improved more significantly with larger mesh overlap
- SSI, SSO, LOS, Readmissions at 30 days occurred more frequently with larger mesh overlap
- There was not a significant difference in early recurrence

Discussion

- Mesh overlap still matters despite advanced repairs and fascial closure; more overlap prevents long term recurrence
- Absolute risk reduction is meager at 3%; **the risks inherent to obtaining larger overlap must be weighed against the risk of later recurrence**
  - >5cm overlap: Longer operations, longer lengths of stay, more SSO/SSIs, more readmissions
  - Repairing small hernias with larger meshes in positions that can accommodate them may sacrifice positions needed later for larger repairs
- The complexity of repairs involved (>90% of mesh was placed in retrorectus position irrespective of hernia size or mesh overlap) may indicate that these results are not generalizable to all practice patterns
- Multiple confounders in mesh positions, myofascial releases, fascial closure techniques
- 5cm is arbitrary. There is a trend toward lower recurrence with more overlap
- Future investigations will seek to identify position-specific overlap recommendations, mesh to defect ratios

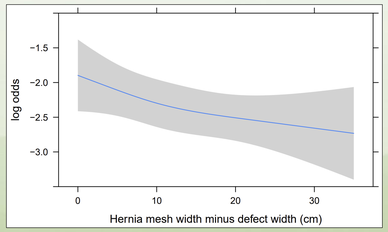


Figure 2. Logistic regression of 1 year recurrence