Outcomes of Combined Complex Hernia Repair and Panniculectomy in Abdominal Wall Reconstruction: A Single-Center Retrospective Review

Helen Hsiao[1], Daphne Lu[1], YuWei Yang[1], Zaima Chowdhury[2], Tracy Scott[1], Nancy Van Laeken[2]
[1]Faculty of Medicine, University of British Columbia [1]Division of General Surgery, University of British Columbia [2]Division of Plastic Surgery , University of British Columbia

Introduction

- The rising incidence and complexity of abdominal wall hernias result in significant variations in surgical management.
- Key differences include mesh selection, plane placement, and the choice between open or minimally invasive techniques.
- Many patients require both functional and cosmetic corrections, requiring collaboration between plastic and general surgeons.
- While ventral hernia repair outcomes are well-studied, there is limited literature on combined hernia repair and panniculectomy for abdominal wall reconstruction.

Objectives

- **Primary objective:** To evaluate outcomes in patients undergoing abdominal wall reconstruction with single stage open hernia repair with panniculectomy
- **Secondary objective:** To compare patient outcomes based on location of mesh placement

Methods

- **Study Design:** Single-center retrospective cohort study.
- **Population:** Patients >18 years old who underwent elective ventral hernia repair with concomitant panniculectomy at St. Paul's Hospital (Jan 2014 – 2024).
- **Exclusions:** Parastomal hernia repairs.
- **Outcomes:** Hernia recurrence, surgical site complications, and 30-day adverse events.
- **Statistical Analysis:** Descriptive summary statistics using Wilcoxon rank sum and Fischer's exact test; p-value <0.05 considered statistically significant.

Results

- **Patient Cohort Overview**
  - Total: 57 patients
  - Mesh-based hernia repairs: 52 patients (91.2%)
  - Previous hernia repair: 27 patients (50.9%)
  - Average BMI: 35.1
  - History of smoking within last year: 6 patients (10.5%)
  - Diabetes: 17 patients (29.8%)
- **Equal number of of underlay vs onlay mesh placement**
  - No statistically significant differences in demographics

Table 1. Patient demographics

	Underlay mesh (n= 24)	Onlay mesh (n=24)
Male (%)	4 (16.7%)	2 (8.3%)
Age Mean (SD)	60 (13)	62 (9)
BMI Mean (SD)	36 (10)	34 (8)
History of smoking (%)		
Never	19 (79.2%)	12 (50%)
Within last year	2 (8.3%)	3 (12.5%)
Ever	3 (12.5%)	9 (37.5%)
Diabetes (%)		
Yes	6 (25%)	9 (37.5%)
No	18 (75%)	15 (62.5%)
Immunosuppression (%)		
Yes	0 (0%)	1 (4.2%)
No	24 (100%)	23 (95.8%)
COPD (%)		
Yes	1 (4.2%)	1 (4.2%)
No	23 (95.8%)	23 (95.8%)
Recurrent incisional hernia (%)		
No	10 (41.7%)	11 (45.8%)
Yes	14 (58.3%)	13 (54.2%)
History of prior abdominal wall infections		
Yes	8 (33.3%)	6 (25%)
No	16 (66.7%)	18 (75%)

- **Average Weight of Pannus Resected:** 2730.8g
- Most common mesh was synthetic polypropylene mesh in overlay and dual layer for underlay
  - 4 patients received biologic mesh
- **Length of Hospital Stay**
  - Median Length for Underlay Repair: 4.5 days (IQR 3-7)
  - Median Length for Onlay Repair: 5.5 days (IQR 3-7)

Table 2. Operative Details (w) Wilcoxon rank sum test (f) Fisher's exact test

	Underlay mesh (n= 24)	Onlay mesh (n=24)	P-value
CDC Wound Class			
1	22 (91.7%)	21 (87.5%)	1 (f)
2	0	0	
3	0	0	
4	2 (8.3%)	3 (12.5%)	
Type of Mesh			<0.001(f)
Phasix	2 (8.3%)	1 (4.2%)	
Polypropylene	1 (4.2%)	18 (75%)	
Dual layer (e.g. Ventrio, Ventralight)	19 (79.2%)	0	
Biodesign Surgisis mesh	1 (4.2%)	1 (4.2%)	
Surgimend Biologic	0	2 (8.3%)	
Missing	1	2	
Fascial release			
Performed	1 (4.2%)	0	1 (f)
Not required	23 (95.8%)	24 (100%)	
Midline fascia closed			
Yes	21 (87.5%)	22 (91.7%)	0.61 (f)
No	3 (12.5%)	1 (4.2%)	
Hospital length of stay (days) Median (IQR)	4.5 (3 – 7)	5.5 (3 – 7)	0.6 (w)

- **Overall Surgical Site Complications (Table 3)**
  - Infection: 21.1%
  - Seroma: 21.1%
  - Skin/Soft Tissue Ischemia: 7.0%
  - Stitch Abscess: 5.3%
  - Chronic Pain (>6 months): 5.3%
  - Mesh Infection: 3.5%
- No statistically significant difference in surgical site complications between underlay and onlay mesh placement
- **Overall 30-Day Adverse Events (Table 4)**
  - **Acute Kidney Injury:** 6 patients (10.5%)
  - **Ileus:** 2 patients (3.5%)
  - **Prolonged Ventilation (>48 hrs):** 2 patients (3.5%)
- No statistically significant difference in 30-day adverse events between underlay and onlay mesh placement

Table 3. Surgical site complications

	Underlay mesh (n= 24)	Onlay mesh (n=24)	P-value
Reoperation /Procedure	5 (20.8%)	1 (4.2%)	0.19 (f)
Acute kidney injury	3 (12.5%)	3 (12.5%)	1 (f)
Ileus	0	2 (8.3%)	0.49 (f)
Pulmonary embolism	0	1 (4.2%)	1 (f)
Prolonged ventilation >48h	1 (4.2%)	1 (4.2%)	1 (f)
Blood transfusion required	2 (8.3%)	0	0.49 (f)

- **Long Term Outcomes**
  - **Hernia Recurrence**
    - Hernia recurrence: 2 patients (3.5%)
    - Clinical and radiologic diagnosis (diagnosed 886 days and 954 days after surgery)
    - Both used biologic mesh
    - Both associated with surgical site infections
- **Average time from surgery to last follow up of cohort 333 days** (median 106 days)

Table 4. 30-day adverse events and complications

	Underlay mesh (n= 24)	Onlay mesh (n=24)	P-value
Surgical Site infection	4 (16.7%)	6 (25%)	0.72
Seroma	5 (20.8%)	3 (12.5%)	1
Hematoma	0	0	NA
Skin or soft tissue ischemia	3 (12.5%)	1 (4.2%)	0.61
Stitch abscess	2 (8.3%)	0	0.49
Infected or exposed mesh	0	1 (4.2%)	1
Chronic Pain	3 (12.5%)	0	0.23

Figure 1. Pre-op vs post-op

Before





After





Conclusion

- **Outcomes:** Low hernia recurrence rates and high success in fascial closure with open hernia repair and panniculectomy.
- **Mesh Placement:** No significant difference in surgical site complications or 30-day adverse events between underlay and onlay mesh.
- **Conclusion:** Findings support the feasibility of both underlay and onlay mesh placements in complex abdominal wall reconstruction.

Reference

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