Abdominal Wall Reconstriction With Synthetic Mesh: Avoiding Hernia Recurrence With Mesh Extrusion

Yash Jani BS[1] and David Zabel MD[2]

1. Medical College of Georgia, Augusta, GA; 2. Department of Plastic Surgery, Augusta, GA

INTRODUCTION

- Over 700,000 abdominal wall hernia repairs are performed annually in the U.S., most using synthetic mesh to reduce recurrence (1).
- While superior to suture repair, mesh introduces risk of prosthetic infection in 5–10% of open and 0–3% of laparoscopic repairs (1).
- Infected mesh often leads to chronic wounds, fistulas, and reoperation; historically, 73–90% required explantation (2).
- However, mesh removal carries a 48% recurrence rate and leaves challenging defects (3).

- Emerging data supports mesh salvage under select conditions.
- Success depends on:
  - Mesh type (macroporous > microporous),
  - Positioning (extraperitoneal planes like retro-rectus/onlay),
  - Host and wound status (4–6).

- Polypropylene mesh shows highest salvage potential (65–72% salvage rate), while ePTFE and composites are rarely salvageable (6).

- Negative Pressure Wound Therapy (NPWT):
  - Improves perfusion, lowers bioburden, and promotes granulation.
  - Used in 76–85% of salvage cases; average NPWT duration ~26 days (4–5,7).
  - Requires aggressive debridement and source control for success.

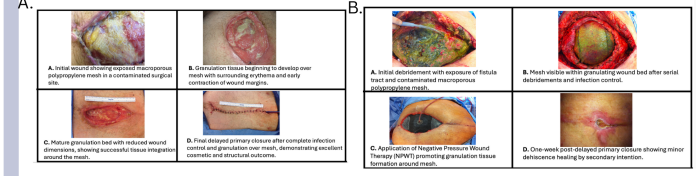
- Biologic materials (e.g., Oasis, Stravix):
  - Occasionally used in contaminated wounds or partial salvage.
  - Higher recurrence (20%) and double the cost vs. synthetic mesh (8–9).
  - Best reserved when synthetics cannot be preserved.
- This case series presents 7 patients with exposed, contaminated mesh successfully salvaged without removal.
- Emphasizes the role of polypropylene mesh, NPWT, and tailored wound care in achieving durable healing and avoiding recurrence.

CASE PRESENTATION

Clinical Characteristics and Outcomes of Patients Undergoing Synthetic Mesh Salvage in Contaminated Abdominal Wall Reconstruction

Patient	Index Operation	Wound Status at Index	Days to Mesh Exposure	Treatment	Final Closure
54M	50x50 AWR preperitoneal mesh	Closed	12 (fistula)	OR debridement POD 13, 20, 22 + NPWT	POD 94 delayed primary
68M	50x50 AWR closure fistula TAR	Fascia open, skin closed	15 (skin dehisc)	Santyl	POD 28 delayed primary
72F	30x30 AWR TAR	Skin closed	33 (skin dehisc + pyoderma)	Outpt Oasis matrix	POD 109 secondary intention
62M	Nec fasc w/ 30x30 mesh onlay	Left open	At index OR	Oasis matrix x3	POD 23 STSG
59F	30x30 AWR TAR	Skin + fascia closed	POD 14 (dehisc)	NPWT x31 days	No OR – secondary intention
73M	40x40 AWR TAR	Skin left open	POD 8 (dehisc)	Stravix matrix x3	Ongoing
48M	30x30 AWR pre-peritoneal	Fascia + skin closed	POD 7 (fistula)	OR closure POD 32	POD 32 delayed primary

Table 1. Patient characteristics, wound status, treatment strategies, and outcomes following synthetic mesh salvage in contaminated abdominal wall reconstruction.



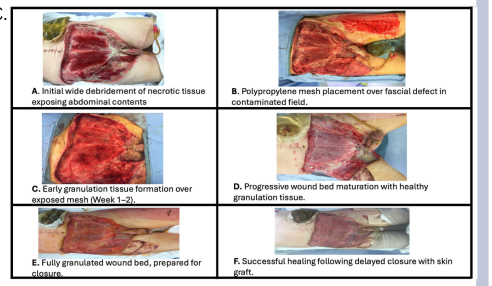


Figure 1. Clinical progression of three patients (A, B, C) undergoing abdominal wall reconstruction with exposed synthetic mesh in contaminated fields. Each panel illustrates the sequential stages of wound management, including initial contamination, granulation tissue development, and delayed closure. All cases demonstrate successful mesh salvage using Negative Pressure Wound Therapy (NPWT), debridement, and tailored wound care strategies.

DISCUSSION

Mesh Salvage Prevents Recurrence & Reoperation
- Salvage of exposed/infected mesh was successful in all 7 patients, including those with:
  - Deep wound dehiscence
  - Soft tissue infections
  - Enteroatmospheric or enterocutaneous fistulae
- No hernia recurrences observed during follow-up
- Contrasts with historical recurrence rates of up to 48% after mesh explantation for infection (3)
- Preserving well-integrated mesh avoids complex re-repairs and maintains structural integrity

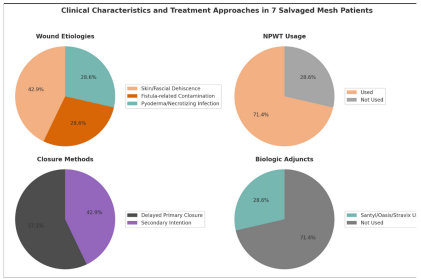
NPWT: Cornerstone of Salvage Strategy
- Used in 5 of 7 patients; mean duration ~3–4 weeks
- Promotes:
  - Granulation tissue formation
  - Exudate control
  - Bacterial clearance
- Literature supports salvage success rates of ~76% with NPWT (5)
- Our cohort mirrored these outcomes with 100% wound healing and no mesh removal

Biologic Adjuncts: Supportive, Not Substitutive
- Santyl, Oasis, and Stravix were used in 2 patients to stimulate granulation
- CAMPs provided scaffold support, not mesh replacement
- Aligns with evidence showing synthetic mesh outperforms biologics in durability and cost-effectiveness (9)
- Strategic use may reduce downstream costs related to explant and reoperation

Mesh Type & Position Are Critical
- All cases used macroporous polypropylene mesh (≥1.5 mm pores)
- All placed in extraperitoneal positions (retro-rectus or onlay)
- Literature shows:
  - Salvage rates of 65–72% for extraperitoneal polypropylene
  - Near-zero salvage for microporous materials like ePTFE or composite PTFE (6)
- Porosity and plane of placement directly influence salvage potential

Clinical & Economic Implications
- Salvage avoids reoperation, reduces hospital stays, and preserves functional outcomes
- A trial showed $27,000 savings per patient when using synthetic mesh in contaminated fields vs. biologics (9)
- Supports a paradigm shift toward mesh preservation in selected patients with contamination

RESULTS



Time to Healing:
- Average time to complete wound healing was 71 days (range: 23–109 days).

Surgical Management:
- All patients underwent aggressive debridement to preserve mesh integrity.

Outcomes:
- No hernia recurrences during follow-up
- No cases of postoperative sepsis, organ-space abscess, or recurrent infection
- No patients required reoperation
- All patients demonstrated favorable cosmetic and functional outcomes at final closure

CONCLUSION

- Traditional management of infected mesh centered on explantation, often resulting in high recurrence and morbidity.
- Our series shows that salvage of macroporous polypropylene mesh is safe and effective—even in contaminated fields.

Key Takeaways:
- 100% wound healing without mesh removal.
- No hernia recurrences, reoperations, or infections.
- NPWT and biologic adjuncts aided granulation and closure.
- Debridement and tailored closure were essential to success.

Why It Matters:
- Salvage reduces morbidity and cost, avoids reoperation, and maintains abdominal wall integrity.
- Supports a paradigm shift: preservation over removal in select patients.
- With proper technique, “throwing out the mesh” is no longer the default.

WORKS CITED

SCAN FOR COMPLETE LIST OF REFERENCES.