Successful Salvage of Infected Bioresorbable Mesh (Poly-4-Hydroxybutyrate) Following Hernia Repair: A Case Series and Systematic Review

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Purpose

Bioresorbable mesh is becoming increasingly common for ventral hernia repair (VHR) in complex cases. However, the outcomes of mesh salvage (conservative treatment without complete mesh removal) following complicated VHR with bioresorbable mesh have not been well-characterized. This contrasts with traditional permanent polypropylene mesh, which has been the mainstay of VHR for decades.

We report a series of four cases involving the salvage of poly-4-hydroxybutyrate (P4HB) bioresorbable mesh following VHR to add to the literature.

Methods

We completed a systematic review of the literature investigating salvage outcomes in VHR cases using bioresorbable mesh. Our case series includes patients who presented with postoperative complications following VHR using P4HB mesh at Tampa General Hospital (TGH) in Florida, USA.

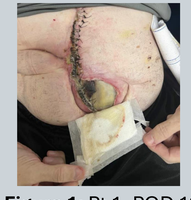


Figure 1: Pt 1, POD 19



Figure 2: Pt 1 eight WPS

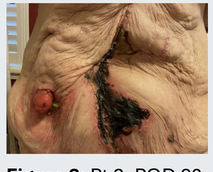


Figure 3: Pt 2, POD 30



Figure 4: Pt 2 eight WPS



Figure 5: Pt 3, POD 63

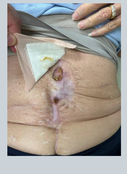


Figure 6: Pt 3 nine WPS



Figure 7: Pt 4, POD 29

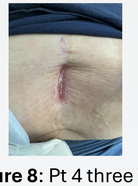


Figure 8: Pt 4 three WPS

WPS = weeks post salvage

Table 1. Literature review of mesh salvage in ventral hernia repair using bioresorbable mesh

Authors	Type of Study	# of pts	Age	Salvage technique	Mean follow-up	% successful salvage, mesh type	% Hernia recurrence	Additional findings
Kyriakoulis & Mallico 2022	Case Study	1	57	Wound VAC, oral abx	3 yrs	100% (1/1 P4HB)	0%	Infected permanent mesh removed, repair using biosynthetic mesh and conservative measures
Siegal et al., 2020	Retrospective Cohort Study	2	55 and 68	I&D, debridement, NPWT, abx	21.5 mo (3-39.9 mo)	100% (2/2 P4HB)	0% (but only 3 mo follow-up in 1 case)	Retromuscular placement was better documented; onlay placement had limited (3 mo) follow-up
Claessen et al., 2021	Retrospective Cohort Study	17	n/a	Abx and NPWT	20 mo	58.8% (3/10 P4HB, 7/7 PGA/TMC)	Not directly reported	PGA/TMC mesh did not require explantation (100% salvage); P4HB had 30% salvage

Table 2. Patient demographic data at initial VHR

Pt	Age	Gender	BMI
1	49	M	27.37
2	70	F	28.25
3	66	F	22.86
4	55	F	43.76

Table 3. Perioperative data

Pt	Mesh Placement	P4HB mesh size	Recurrent incisional hernia
1	Onlay	400cm^2	Yes
2	Onlay	500cm^2	Yes
3	Bridging	32cm^2	No; intra-op consult, abdominal closure by surgical oncology
4	Not reported	150cm^2	Yes

Table 4. Postoperative data

	Complications				Post-op procedure		NPWT Placement		Long-term outcome		
Pt	Necro-sis	Dehis-cence	Infec-tion	Exposed Mesh	I&D	Debride-ment	Initial surgery	Postop procedure	Failed closure	Salvage of mesh?	POD to postop complications
1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	19
2	Y	Y	Y	N	Y	Y	Y	Y	N	Y	30
3	N	Y	Y	Y	N	N	Y	Y	N	Y	63
4	N	Y	Y	N	Y	N	N	Y	N	Y	29

Results

Our initial search gathered 143 references, of which three were included for analysis (Table 1). These studies comprise a total cohort of 20 patients; 13 had P4HB mesh and 7 had polyglycolic acid/ trimethylene carbonate (PGA/TMC) mesh, a faster-resorbing material (full resorption in 6-7 months, vs 12-18 months for P4HB).

Four reported cases of mesh infection with P4HB were analyzed at our institution, TGH (Figures 1-8, Tables 2-4). The mean time to hospital presentation for postoperative complications was 35.3 days, with a median of 29.5 days. Complications included infection and dehiscence (4/4 cases), necrosis (2/4), and exposed mesh (2/4). Postoperative procedures included incision and drainage (3/4) and debridement (2/4). Mesh salvage was successful in all cases. Complete mesh removal was not required in any case. Negative pressure wound therapy (NPWT) was utilized in all cases after wound dehiscence and infection. One patient experienced chronic diarrhea and incomplete wound closure after 12 months. One patient had hernia recurrence after 19 months.

Conclusion

Mesh infection in a percentage of complex hernia repairs is inevitable. Salvage outcomes following complicated VHR using bioresorbable mesh are rarely documented in the literature. Salvage of P4HB mesh in complicated VHR was successful in all reported cases at our institution.

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