



Chronic Abdominal Wall Collection after Umbilical Herniorrhaphy with Mesh: Persistent Infection versus Prosthetic Material Rejection. A Case Report

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Abstract: Background: Prosthetic mesh reinforcement is the current standard for abdominal wall hernia repair, including umbilical hernias, because it consistently lowers recurrence compared with primary closure. Mesh placement is not risk-free, however, and has been associated with seroma, hematoma, surgical site infection, visceral erosion, and, less commonly, chronic pain or immunologic reactions to the material. Distinguishing chronic low-grade infection from a foreign-body reaction is particularly difficult, since both can present as a persistent abdominal wall collection with initially negative cultures and only partial, transient improvement with antibiotics or drainage. Case Presentation: We report the case of a 72-year-old woman who underwent open umbilical herniorrhaphy with prosthetic mesh at another institution. Imaging obtained immediately afterward suggested a surgical site infection, and a persistent mesogastric abdominal wall collection was subsequently identified on follow-up MRI and CT over more than a year, initially interpreted as an organized hematoma. She presented to our institution with abdominal pain and distension; percutaneous drainage yielded serosanguinous fluid with initially negative cultures. Six days later she was readmitted with fever, chills, and hyporexia, with leukocytosis, an elevated C-reactive protein, and cultures positive for *Citrobacter* spp. after catheter repositioning returned hemopurulent fluid. The abdominal wall surgery board considered probable rejection of the prosthetic material and proceeded with open surgical drainage, debridement, complete mesh removal, and negative-pressure wound therapy. Results: Histopathology of the resected specimen showed hyalinized fibroconnective tissue with fibrin deposits and severe abscessing acute inflammation, without multinucleated giant cells or granulomas, findings that favor an active infectious process over a classic foreign-body reaction, without excluding a coexisting rejection component. The patient's postoperative course was favorable, with resolution of sepsis and continued targeted antibiotic therapy and wound care. Conclusion: In a patient with a persistent or enlarging abdominal wall collection after mesh herniorrhaphy, chronic infection and foreign-body rejection should be considered as overlapping rather than mutually exclusive possibilities, and a collection labeled as an organized hematoma that fails to resolve over time warrants active reassessment. When the plane between mesh and inflamed tissue cannot be clearly identified intraoperatively, complete mesh removal is generally safer than attempting salvage, and multidisciplinary discussion is central to management in ambiguous cases.

Keywords: Umbilical hernia, Surgical mesh, Foreign-body reaction, Surgical site infection, Case report.

INTRODUCCIÓN

Abdominal wall repair with prosthetic material is now the standard of care for most hernias, including umbilical hernias, because it consistently reduces the recurrence rate compared with primary closure (1). Despite this, mesh placement is not free of risk: seroma, hematoma, surgical site infection, visceral erosion, and, less commonly, chronic pain or immunologic reactions to the material have all been described (2). Of these, the one motivating this report is the persistence of an abdominal wall collection months after the index surgery, a scenario in which two diagnoses compete: chronic low-grade infection and so-called rejection of, or foreign-body reaction to, the mesh.

A foreign-body reaction is the inflammatory and immunologic response that any non-absorbable prosthetic material generates once implanted. It is initially mediated by neutrophils and macrophages that, on polypropylene meshes, tend to fuse into multinucleated giant cells around each filament, evolving into a chronic phase of tissue remodeling mediated by fibroblasts and collagen that seeks to wall off the material from the surrounding tissue (3,6). In some patients this response fails to resolve and is perpetuated as active inflammation, with granuloma formation, thick fibrous capsules, or recurrent periprosthetic collections.

The factors that determine why some patients develop this exaggerated response and others do not remain unclear. Proposed contributors include the type and weight of the material (greater reactivity with small-pore, higher-density meshes), the fixation technique, subclinical bacterial contamination of the surgical field, and, more recently, a possible individual immunologic predisposition, although the evidence supporting this last hypothesis remains limited and largely circumstantial (7,8). Clinically it can present as persistent pain, local induration, recurrent collections, or fistulous tracts, and its management, when symptomatic or unresponsive to conservative treatment, usually ends in removal of the prosthetic material (9,10).

The practical problem (and what actually motivates this report) is that foreign-body reaction and chronic low-grade infection share almost all of these findings: both produce persistent collections, both can present with initially negative cultures, and both improve partially and transiently with antibiotics or drainage without fully resolving. Literature that specifically addresses how to differentiate the two, or that documents cases in which both processes coexist in the same patient, is scarce. We present the case of a patient with a chronic abdominal wall collection after umbilical herniorrhaphy with mesh, initially misinterpreted as an organized hematoma, which ultimately required surgical removal of the prosthetic material on suspicion of rejection, and in whom histopathology ultimately tipped the balance toward persistent infection. The aim of this report is to illustrate the diagnostic difficulty of this scenario and to discuss the clinical, imaging, and histopathologic elements that, even when not always conclusive, help guide diagnosis and management.

CASE PRESENTATION

Patient Information

A 72-year-old woman with a history of arterial hypertension, obstructive sleep apnea-hypopnea syndrome managed with CPAP, prior surgery for duodenal ulcer, and hysterectomy

for endometrial thickening. In December 2024, at another institution, she underwent open umbilical herniorrhaphy with placement of prosthetic mesh.

Clinical Findings

In the immediate postoperative period after that first surgery, imaging findings suggestive of surgical site infection were documented (subcutaneous emphysema, inflammatory changes in soft tissue), and months later an abdominal wall collection was identified in the mesogastrium that persisted on follow-up studies (MRI in March 2025 and CT in May 2026), interpreted at the time as a probable organized hematoma. The patient was admitted to our institution with one day of abdominal pain and distension. Six days after initial management with percutaneous drainage, she was readmitted with fever, chills, and hyporexia, with local inflammatory signs around the catheter insertion site.

Timeline

Time point	Event
12. 2024	Open umbilical herniorrhaphy with prosthetic mesh (another institution).
Immediate postoperative period	Imaging findings suggestive of surgical site infection (subcutaneous emphysema, inflammatory changes in soft tissue).
03. 2025	MRI: abdominal wall collection in the mesogastrium, interpreted as a probable organized hematoma.
05. 2026	Follow-up CT: persistence of the collection.
Day 0 (admission)	One day of abdominal pain and distension. CT: collection measuring 165 × 84 × 117 mm. Percutaneous drainage (500 mL of serosanguinous fluid; initial cultures negative). Discharged with catheter in place and amoxicillin/clavulanic acid.
Day +6	Readmission for fever, chills, and hyporexia. Leukocytosis with neutrophilia, elevated CRP. CT: cavity measuring 151 × 40 × 119 mm, thickened walls, gas bubbles. Catheter obstructed; repositioned with hemopurulent return. Piperacillin-tazobactam started. Cultures positive for <i>Citrobacter</i> spp.
Following days	Abdominal wall surgery board: suspected rejection of the prosthetic material. Open surgical drainage, debridement, and negative-pressure wound therapy (NPWT).
Postoperative period	Targeted antibiotic therapy, scheduled dressing changes, favorable clinical course. Asymptomatic bradycardia attributed to nebivolol, evaluated by cardiology.

Diagnostic Assessment

Admission CT ruled out an acute intra-abdominal process and confirmed a fluid collection of the anterior abdominal wall measuring 165 × 84 × 117 mm extending from the epigastrium to the hypogastrium, with hepatic steatosis and a hiatal hernia as incidental findings. Laboratory studies at readmission showed leukocytosis with neutrophilia and a markedly elevated C-reactive protein. Cultures, negative on the first drainage, were positive for *Citrobacter* spp. after the catheter was repositioned with hemopurulent return. Histopathologic examination of the intraoperatively resected specimen reported hyalinized

fibroconnective tissue with fibrin deposits and severe abscessing acute inflammation, a finding compatible with an active infectious-inflammatory process, without conclusive evidence of a specific foreign-body rejection reaction, as no giant cells or granulomas were described.

Therapeutic Intervention

Initial management consisted of ultrasound-guided percutaneous drainage, obtaining 500 mL of serosanguinous fluid, with outpatient antibiotic therapy using amoxicillin/clavulanic acid. Given septic readmission, coverage was broadened to piperacillin-tazobactam, and support from internal medicine and infectious disease was requested. Given persistence of the collection despite antibiotic therapy and percutaneous drainage, the abdominal wall surgery board considered probable rejection of the prosthetic material and elected to proceed with open surgical drainage, debridement, and placement of a negative-pressure wound therapy system.

Under general anesthesia, an incision was made over the scar of the prior herniorrhaphy, with identification and opening of the collection capsule, extending the approach proximally and distally with electrocautery. Purulent material and debris were removed along with apparent foreign-body remnants, revealing a granulomatous capsule with multiple fibrinopurulent membranes adherent to the bed.

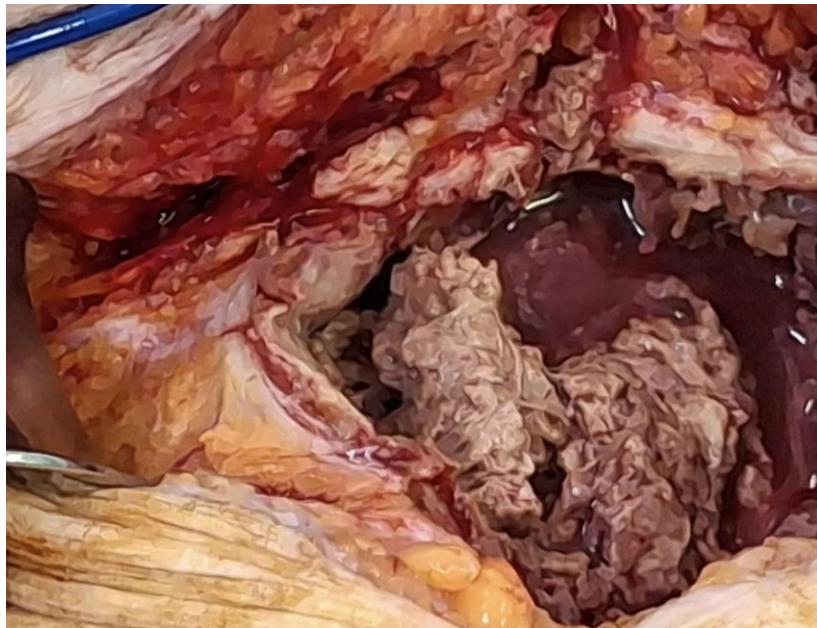


Image 1: Intraoperative finding of encapsulated collection

The intraoperative finding was an encapsulated collection measuring 13 × 12 cm, with turbid fluid and severe wall inflammation that did not allow clear distinction between the margins of the prosthetic mesh and the surrounding tissue; complete removal along with the compromised tissue was therefore chosen. Curettage and mechanical debridement were performed until a macroscopically clean bed was obtained, with copious irrigation using hydrogen peroxide and iodine solution until clear return. After hemostasis was confirmed, a negative-pressure system (Granular Foam® polyurethane foam, size M) was fitted to the

entire cavity, secured with adhesive drapes over the abdominal wall midline and connected to a canister with continuous suction at -125 mmHg. Samples were taken for aerobic and anaerobic culture and histopathologic study. The procedure was completed without complications, with minimal estimated blood loss (10 mL).



Image 2: Negative Pressure Wound Therapy

Follow-up and Outcomes

Postoperatively, the patient continued on targeted antibiotic therapy, with scheduled dressing changes for the negative-pressure system, evolving favorably without signs of sepsis. Asymptomatic bradycardia was documented incidentally during hospitalization, attributed to recently started nebivolol and evaluated by cardiology, without need to discontinue antihypertensive therapy. At the time of writing, the patient continues to be managed with a favorable clinical course, awaiting completion of the culture-directed antibiotic regimen and determination of the timing for definitive closure of the abdominal wall.

DISCUSIÓN

This case brings together, over a little more than a year, two processes that in clinical practice are almost always considered separately (surgical site infection and foreign-body reaction) but that in an operated abdominal wall end up intertwined to the point that, even with serial imaging, cultures, and histopathology, the distinction between the two remained less than fully clear.

One point stands out: the collection was initially read, both on the March 2025 MRI and the May 2026 CT, as a probable organized hematoma. This reading is not unusual; hematomas and chronic abdominal wall collections share much of their imaging appearance (heterogeneous density, well-defined capsule, initial absence of gas or marked enhancement), and only persistence or growth of the collection, together with the clinical picture, eventually points toward an active process. In retrospect, the failure of a collection labeled as a hematoma to resolve over more than a year should, on its own, have been a warning sign to rule out an infectious or foreign-body component earlier.

Late presentation is also not exceptional. Series on prosthetic infection describe a broad spectrum, from acute presentations in the first weeks to late-onset infections (months or even years after implantation), for which the exact mechanism remains unclear; subclinical bacterial colonization of the material from the time of surgery itself, with delayed clinical expression via biofilm, has been proposed (2,11). The isolation of *Citrobacter* spp. in this patient's cultures is consistent with this spectrum: it is an enteric gram-negative bacillus that, while not among the most frequent pathogens in mesh infection (where *Staphylococcus aureus* and *Escherichia coli* predominate), has been documented in microbiological series of infected meshes and in isolated reports for nearly two decades (11,12).

The decision to remove the mesh, rather than attempt salvage with negative-pressure therapy alone, deserves separate comment. Recent evidence on prosthetic salvage with NPWT shows success rates between 76% and 85% when the material retains adequate tissue integration, with active smoking being one of the few factors consistently associated with failure (13,15). In this patient, however, the intraoperative finding of inflammation so severe that it precluded distinguishing the mesh margins from the surrounding tissue tipped the decision toward complete resection along with the compromised tissue, a reasonable approach when the plane of the prosthetic material is no longer recognizable and the risk of leaving non-viable material outweighs the potential benefit of preserving it (14,16).

Histopathology helped but did not settle the question. The report described abscessing acute inflammation over hyalinized fibroconnective tissue, without multinucleated giant cells or granulomas, which supports an active infectious process over a classic foreign-body reaction (3,6). This absence, however, does not fully exclude an underlying rejection component: foreign-body reaction and chronic infection are not mutually exclusive, and it is plausible that persistent inflammation against the material favored secondary bacterial colonization, or that the sample analyzed did not include the areas with the highest density of giant cells. Evidence on whether polypropylene can trigger systemic autoimmune phenomena remains, at best, circumstantial (7,8).

Beyond the definitive diagnosis, what did become clear was the value of discussion at the abdominal wall surgery board in guiding the surgical decision, and the value of closer imaging follow-up for any persistent collection in a patient with mesh, even when the first read suggests a benign finding such as a hematoma. Literature that explicitly documents cases in which both processes (chronic infection and possible rejection) coexist and compete as diagnostic hypotheses over more than a year is, as far as we reviewed, practically nonexistent, which gives this report part of its value.

CONCLUSIONS

Differentiating chronic prosthetic infection from a rejection reaction to the material remains, in practice, more a clinical exercise than a definitive diagnosis, because both entities share clinical, imaging, and even histopathologic findings.

A persistent or enlarging abdominal wall collection after mesh placement should not be definitively labeled as an organized hematoma simply because the initial imaging suggests it; failure to resolve over time warrants active reassessment.

When the margins of the prosthetic material cannot be clearly distinguished from the inflamed tissue intraoperatively, complete mesh removal is generally safer than attempting salvage, even with negative-pressure therapy available.

Multidisciplinary management (abdominal wall surgery, infectious disease, and internal medicine) was central to this patient's favorable outcome, reinforcing the recommendation to discuss such cases at a surgical board when the diagnosis is not evident on admission.

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