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Surgical Resection and Scarification for Chronic Seroma Post-Ventral Hernia Mesh Repair

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

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Conflict of interest: None declared

Patient: Male, 52
Final Diagnosis: Seroma
Symptoms: Abdominal discomfort • abdominal mass
Medication: —
Clinical Procedure: Excision and evacuation of the complex seroma
Specialty: Surgery

Objective: Unusual or unexpected effect of treatment





Background: The aim of this report is to present a new surgical approach in the definitive management of challenging cases of abdominal wall seroma following herniorrhaphy with mesh.

Case Report: We describe the case of a 56-year-old male with a 4-year history of a complex abdominal wall seroma. He had undergone fluid aspiration twice without success. On physical examination, the mass was supraumbilical and measured 15×10 cm. Computer tomography (CT) scan revealed a complex encapsulated formation overall measuring 10.1×17.3×17.3 cm in AP, transverse, and craniocaudal dimensions, respectively. In this case complete resection was not safe due to the anatomic relationship of the posterior aspect of the pseudocapsule and the mesh. Intraoperatively, the anterior and lateral aspects of the pseudocapsule were resected and an argon beam was used to scarify the residual posterior pseudocapsule and prevent recurrence. This technique was successful in preventing reaccumulation of the seroma.

Conclusions: Capsulectomy and scarification of the remnant pseudocapsule is an acceptable and safe surgical option for complex chronic abdominal wall seromas.

MeSH Keywords: Abdominal Wall • Hernia, Ventral • Seroma

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Background

Seroma formation is one of the most common events following ventral hernia repair. The use of mesh increases the risk of seroma [1,2]. The surgeon's choice of mesh and the position of incorporation are critical in reducing the incidence of postoperative seroma by affecting the tissue plane dissection, closure, and subsequent healing process [3,4].

Most seromas are not clinically relevant because they are asymptomatic and resolve within weeks with expectant management, with the latter being our preferred initial practice. On the other hand, seromas can become infected and predispose to various wound complications. In many cases of persistent or complicated seromas, fluid aspiration fails to provide final resolution of the collection. Furthermore, fluid aspiration carries the risk of introducing infection, which can be detrimental following mesh placement. In this report we present a case of a chronic complex seroma that warranted surgical excision. Our approach of combination open capsulectomy and scarification has not been previously described in the literature.

Case Report

A 56-year-old male with a history of end-stage liver disease secondary to hepatitis C cirrhosis and hepatocellular carcinoma who underwent successful orthotopic liver transplantation, presented to the outpatient office for his 6-month scheduled follow-up complaining of discomfort associated with a midline abdominal wall bulge. This dated back to a few months following an open ventral hernia repair with mesh at an outside institution 4 years prior to the encounter. The mass was consistent with a seroma and each of 2 separate fluid aspirations at an outside institution failed to provide resolution.

On physical examination, the lesion was supra-umbilical, non-mobile, semi-solid in consistency, and measured approximately 15×10 cm. It was inferior to the bilateral subcostal incision utilized for the liver transplantation (Figure 1). Computer tomography (CT) scan revealed a complex formation with amorphous areas of internal soft tissue, overall measuring 10.1×17.3×17.3 cm in AP, transverse, and craniocaudal dimensions, respectively (Figure 2).

Having recovered and doing well after his liver transplantation, the patient underwent an excision and evacuation of the complex seroma and pseudocapsule. A 16-cm midline incision was made in line of the previous incision used for the hernia repair. The pseudocapsule of the seroma was encountered when the subcutaneous tissue was incised. The incision was carried superior, inferior, and laterally and $\frac{3}{4}$ of the capsule was exposed (Figure 3). At this point, the seroma was opened and 1.3



Figure 1. Abdominal mass consistent with complex seroma.

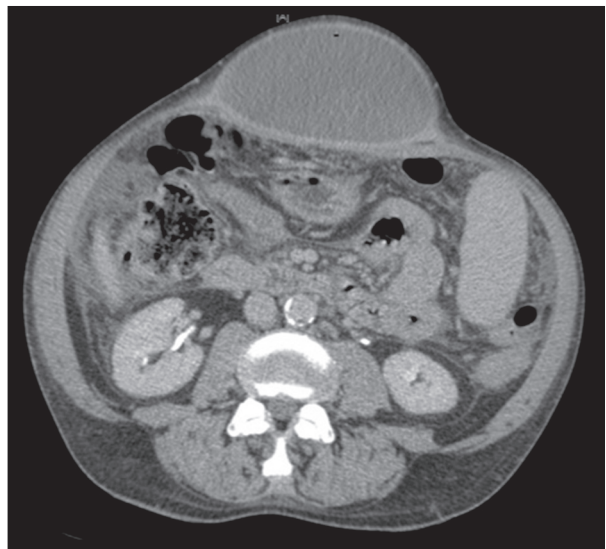


Figure 2. Abdominal CT image of the encapsulated seroma.

L of fluid was evacuated. There was some particulate matter resembling inspissated tissue and coagulated blood. The anterior and lateral aspects of the pseudocapsule were excised.

The posterior aspect of the pseudocapsule was not excised to avoid injury to the mesh and intra-abdominal contents. However, the posterior aspect and all remaining tissue of the pseudocapsule was scarified using an argon beam coagulator; this was done to decrease its secretory capacity as will be described below. To manage the significant amount of redundant skin, an ellipse of skin was removed from each side of the central portion of the wound overlying the seroma. The wound was closed in primary fashion. A size 7 Jackson-Pratt drain was left in the bed of the wound (Figure 4). An abdominal compression dressing was applied.

The patient was kept overnight for observation and was subsequently discharged the following day without incident. The abdominal compression dressing and Jackson-Pratt drain were discontinued on postoperative day 7, at which point there were



Figure 3. Intraoperative view of the pseudocapsule.



Figure 4. Appearance of the wound following redundant skin excision and primary closure.

no signs of recurrence. The incision was intact and the cumulative output from the drain was minimal for 3 consecutive days prior to its removal.

The pathology of the capsule showed densely fibrotic fibroadipose tissue and associated fibrin clot.

Discussion

The pathophysiology of seroma formation is unclear. Most studies have involved post-mastectomy patients and have suggested lymphatic processes, with contribution from inflammatory and fibrinolytic reactions as the main etiologic factors [5–8].

In herniorrhaphy with mesh, although there is disruption of lymphatic channels to some degree, the role of inflammation appears to be central. Mesh placement triggers a local inflammatory reaction, which in combination with poor vascularization due to the disturbed tissue planes, significantly inhibit wound healing [1,3,9,10]. This ultimately results in fluid secretion within the space created by the dissection and excision of the hernia sac. Albino et al. emphasized the importance of recruiting well-vascularized tissue as well as preserving the

perforators during herniorrhaphy in order to optimize vascularization and thus wound healing [3]. In our case study the operative report of the herniorrhaphy performed at an outside facility was unavailable and the details of the mesh and its incorporation were unknown.

Several different methods for treating complicated abdominal wall seromas have been described and include sclerotherapy, capsulectomy, intracavity steroid injections, and minimally invasive evacuation, or various combinations of each. The challenge in our case stemmed from the chronicity of the seroma and the patient's liver condition, which took priority. This allowed formation of a chronic inflammatory state and a thick pseudocapsule anterior to the mesh and along the entire circumference of the inner abdominal wall, resulting in persistent fluid secretion.

It is worth noting the significant similarities between chronic encapsulated seromas and giant pseudocysts. These are rare and are characterized by late presentation, large size (greater than 10 cm in diameter), and presence of a pseudocapsule isolating it from the underlying mesh, and are definitively treated by surgical resection [11].

Capsulectomy and scarification of the pseudocapsule over the mesh using an argon beam was performed. This device was chosen based on its thermal properties. The argon beam coagulator produced tissue coagulation and desiccation to prevent further fluid secretion, while limiting the insult to the superficial tissue of the pseudocapsule, thus preserving the integrity of the mesh.

Other options would have been to leave the wound open or place quilting sutures to close the dead space [12]. Neither of these strategies has been well studied in this setting and it was felt that the use of compression dressing alone would suffice to obliterate the dead space. Drain suction seems to be the most common practice following operative repair, with little evidence of significant benefit in the literature.

Conclusions

Seroma formation following ventral hernia repair with mesh is a common event. In this case, given the complexity and chronicity of the seroma, we decided that capsulectomy and scarification of the remnant pseudocapsule was the best treatment option. Based upon our follow-up, that decision has yielded an acceptable result.

Conflict of interest

The authors have no conflicts of interest regarding this article.

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