

Hernia recurrence through a composite mesh secondary to transfascial suture holes

D. Barzana · K. Johnson · T. V. Clancy · W. W. Hope

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Abstract Laparoscopic ventral hernia repair is an accepted method for incisional hernia repair. Although techniques vary, transfascial suturing of the mesh to the abdominal wall has been proposed as a viable way to fixate the mesh and reduce recurrence rates. We report a 54-year-old woman who had previously undergone a laparoscopic ventral hernia repair following a laparoscopic tubal ligation using a Composix mesh. The patient presented with a symptomatic hernia recurrence. The computed tomography scan showed a periumbilical hernia containing fat. The patient underwent diagnostic laparoscopy and lysis of adhesions. During the lysis of adhesions, a recurrence through the previously placed composite mesh was encountered where holes had been made by the previously placed transfascial sutures. The hernia was reduced, mesh was removed, and an ePTFE mesh was used to repair the hernia. The mechanism of recurrence appeared to be improperly placed transfascial sutures; overly large bites of mesh caused excessive tension and ultimately a hole in the mesh. Hernia recurrence due to mesh or transfascial suture failure is rarely reported and most often caused by inadequate fixation. Our case highlights the need for meticulous placement of transfascial sutures and demonstrates a mechanism of recurrence due to inadequate placement.

Keywords Incisional hernia · Mesh · Transfascial suture · Fixation · Recurrence

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D. Barzana · K. Johnson · T. V. Clancy · W. W. Hope (✉)
Department of Surgery, New Hanover Regional Medical Center,
South East Area Health Education Center, 2131 South 17th Street,
P.O. BOX 9025, Wilmington, NC 28401, USA
e-mail: william.hope@seahec.net

Introduction

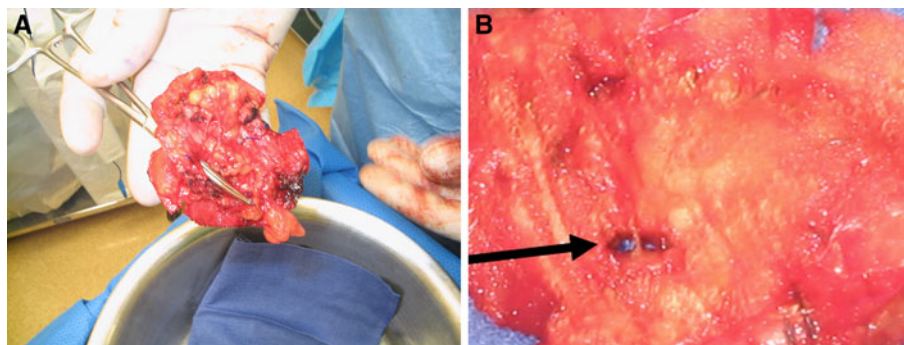
Laparoscopic ventral hernia repair has become an acceptable and popular technique for the treatment of ventral hernias. The laparoscopic repair is based on the open preperitoneal repair described by Stoppa [1] and Rives et al. [2] and includes wide overlap of mesh in the retro-muscular position, although one layer deeper than the intact peritoneum as described in the open repair. The use of laparoscopy for ventral hernia repair is increasing as large studies with long-term follow-up have shown low recurrence rates and low wound morbidity associated with this technique [3].

Despite some of the potential benefits of laparoscopic ventral hernia repair, such as decreased wound morbidity, as with the open technique hernia recurrence remains a problem. Many mechanisms have been described that contribute to hernia recurrence in both the open and laparoscopic approach, including inadequate mesh overlap, inadequate mesh fixation, missed hernia, infection, and trauma [4]. Recurrence due to primary mesh failure, sutures, or tacks are believed to be an uncommon etiology and are seldom reported in the literature [4–7]. We report a patient with a hernia recurrence with mesh failure due to the improper placement of a transfascial suture.

Patient and methods

A 54-year-old woman had undergone a laparoscopic tubal ligation in the past and subsequently developed a ventral incisional hernia. She underwent an uncomplicated laparoscopic repair of this defect with a polypropylene mesh with a non-absorbable polytetrafluoroethylene barrier

Fig. 1 Explanted mesh with small central defects related to transfascial suture placement causing the hernia recurrence (a). The arrow (b) points to the defects in the mesh likely related to the tension from the transfascial sutures



(Bard®Composix®, Davol, Cranston, RI) at an outside institution. Four years later, she presented with abdominal pain and a recurrent hernia was identified on clinical exam. To evaluate the size of the defect and location of the previous mesh, the patient underwent computed tomography scanning, confirming a hernia in the middle portion of the mesh that was thought to be an inferior recurrence where the mesh had pulled off the peritoneum.

The patient was counseled regarding surgery, specifically a laparoscopic hernia repair with possible removal of the previous mesh. Safe abdominal access was obtained with the use of a Veress needle and placement of a 5-mm trocar using the optical trocar technique. Diagnostic laparoscopy showed dense omental adhesions at the periumbilical area. On initial dissection, there was no obvious hernia recurrence around the area of the adhesions and mesh. Dissection was then carried out above the mesh, as it was evident the mesh would likely have to be removed. The mesh had good ingrowth, but, on further dissection, had a small defect in the mesh with herniated omentum. The entire omentum was dissected off the mesh with sharp dissection, and the omentum that had herniated through the mesh was reduced. The remainder of the mesh was then taken off of the peritoneum with sharp dissection. Following mesh removal, the hernia was measured intracorporeally and noted to be an 8 × 7 cm defect. The mesh was removed through a 12-mm trocar and examined. There were multiple transfascial sutures in the inner portion of the mesh. There was a hole in the central portion of the mesh where transfascial sutures had been placed and where the omentum had herniated (Fig. 1a, b). The remaining hernia defect was repaired with an 18 × 24 cm ePTFE mesh (DualMesh®, Gore, Flagstaff, AZ). The mesh was fixated by placing 5-mm spiral tacks (ProTack™, Covidien, Mansfield, MA) at the periphery of the mesh approximately 1–1.5 cm apart with additional full thickness nonabsorbable sutures (0-0 Prolene™, Ethicon, Somerville, NJ) circumferentially every 3–6 cm as described by Heniford et al. [3]. The patient tolerated the surgery well and was discharged home on postoperative day 2. At 10-months follow-up, the patient is doing well with no hernia recurrence.

Discussion

Despite the widespread adoption of laparoscopic ventral hernia repair, debate continues regarding the type and technique of mesh fixation. Various methods have been described including sutures, tacks and, recently, surgical glues. In the largest reported series on laparoscopic ventral hernia, Heniford et al. [3] described a method of fixation using transfascial sutures placed every 3–6 cm followed by 5-mm spiral tacks every 1–1.5 cm around the circumference of the mesh. With a mean patient follow-up of 20 months, they reported a recurrence rate of 4.7% with 6 of 35 patients who recurred having mesh placed without transfascial sutures [3]. Based on these observations and other animal experiments involving the strength of sutures and tacks, this group has been a strong advocate for suture fixation [8]. Based on review of this literature, we have routinely placed transfascial sutures for fixation in our laparoscopic ventral hernia cases. Although many believe suture fixation is needed in hernia repair, this is not without risk, and many surgeons have tried to reduce the operating room time and possible postoperative pain by reducing or eliminating the number of sutures placed.

Carbajo et al. [9] report the largest series without the use of sutures and described their “double crown” technique in 270 patients. Using this approach, tacks are placed 1–2 cm apart around the periphery of the mesh with a second row of tacks surrounding the fascial defect. A recurrence rate of 4.4% was noted over a 44-month follow-up period [9].

Various other series have reported using a variety of approaches for mesh fixation with and without transfascial sutures. LeBlanc reviewed 23 series and 12 comparative studies in an attempt to identify the best method of mesh fixation during laparoscopic ventral hernia repair [10]. He reported that there was insufficient evidence to recommend one technique over another and the issue could not be settled without randomized trials using consistent bioprosthesis [10].

Our report describes a ventral hernia recurrence through the site of a prior transfascial suture. The “suture hernia” has been described previously by Muysoms et al. [6]. They

reported two patients in which the hernia defect was at the periphery of the mesh and who were treated with a laparoscopic repair using a larger intraperitoneal mesh covering the previous mesh [6]. Although our mechanism of recurrence is similar to that reported by Muysoms, there are some subtle differences. In our patient, the recurrence was in the central aspect of the mesh, and this was truly a mesh failure. The mesh failure, however, is believed to be due to the improper placement of the transfascial sutures, with overly large bites on the mesh resulting in excessive tension and ultimate mesh failure. Based on review of the previous operative note, the defect was not intentionally placed by the surgeon to allow easy passage of the transfascial suture, rather it was likely due to too much tension on the mesh from too large a bite. Our treatment also differed from that reported by Muysoms et al. Although it would have been possible to take down the omental adhesions, reduce the hernia, and place a larger intraperitoneal mesh overlapping the previous mesh, in our patient, the etiology of the recurrence was more complex than a recurrence on the periphery of the mesh. Therefore, extensive adhesiolysis and dissection of the edges of the mesh were important to delineate the central hernia recurrence. If the adhesions were able to be lysed completely from the mesh and this central defect was seen, then likely we would have just placed a larger mesh to cover the recurrence. However, we propose that “suture hernias” should be considered as a possible etiology for hernia recurrence.

Conclusions

Central mesh defects and hernia recurrences related to transfascial sutures are a rare event but should be kept in the differential of patients undergoing reoperative hernia

surgery. Although the optimal fixation method for laparoscopic ventral hernias remains undetermined, the use of sutures and tacks can lead to hernia formation if not placed appropriately. This patient highlights the importance of meticulous placement of transfascial sutures and gives surgeons another potential mechanism for hernia recurrence.

Conflicts of interest The authors have no financial or personal relationships with people or organizations that could inappropriately bias their work.

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