

Recurrent Incisional Hernia After Laparoscopic Parietex Mesh Repair

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ABSTRACT

Incisional hernia is a very frequent sequela of laparotomy. Mesh hernioplasty is the treatment of choice. Laparoscopic hernioplasty has become a standard method of care, although it is technically challenging. Various methods of mesh fixation such as sutures, tacks, and anchors have been used, with their unique pros and cons. Mesh separation, recurrence, and postoperative pain are primary morbidities associated with this procedure. We report an interesting case of recurrent incisional hernia after laparoscopic repair with Parietex mesh (Sofradim/Tyco, France) to highlight the causes and pathophysiology of this morbidity.

Key Words: Recurrent Hernia, Omental adhesions, Laparoscopic repair.

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INTRODUCTION

Incisional hernia is a very common problem after abdominal surgery. Mesh repair by either an open or laparoscopic method is the standard of care. Recently, increasingly more incisional hernias have been repaired by the laparoscopic method. The laparoscopic method has the advantages of reduced wound complications, a faster recovery, a shorter hospital stay, and reduced postoperative pain and ileus.¹ However, most surgeons agree that transabdominal sutures are needed for adequate fixation of the mesh, and the exact number of transabdominal sutures required is not standardized. Tacks, anchors, and intracorporeal sutures may not reach the fascia, especially in individuals with a thick pad of preperitoneal fat. Unique postoperative pain associated with these transabdominal sutures can be reduced by using fewer sutures. However, this can increase the risk of recurrence.

We report a female patient who underwent laparoscopic repair with Parietex mesh (Sofradim/Tyco, France) for 2 small incisional hernias and in whom recurrence later developed because of separation of the left edge of the mesh from the abdominal wall.

CASE DETAILS

A 38-year-old woman presented with reducible swellings in the umbilical and infraumbilical regions for 6 months associated with pain. She underwent caesarian section twice, 16 years and 18 years earlier, through a lower midline incision. The findings of our examination showed a lower midline incision extending down from the umbilicus, a 2 × 2-cm umbilical hernia, and an 8 × 8-cm infraumbilical hernia to the right of the midline with a defect size of 3 × 3 cm associated with lower abdominal diastasis recti. We performed laparoscopic mesh repair

with 20 × 15 cm of Parietex, along with laparoscopy-assisted vaginal hysterectomy. We used transabdominal sutures to fix the 4 corners of the mesh and multiple intracorporeal sutures at 2-cm intervals along the edges, as well as a few intracorporeal sutures in the central part, to apply mesh to the abdominal wall.

On the third postoperative day, severe abdominal distension developed due to intestinal obstruction, which resolved in 2 days with conservative management. Six months later, the patient presented again with a 1-month history of reducible swelling at the previous infraumbilical site associated with pain. Examination showed an infraumbilical reducible swelling measuring 3 × 3 cm at the previous infraumbilical hernia site associated with lower abdominal diastasis recti. An abdominal computed tomography scan showed separation of the left edge and left half of the mesh from the abdominal wall, with bowel loops and the omen-

tum herniating into the infraumbilical defect through the gap between the mesh and abdominal wall (**Figure 1**).

Laparoscopy showed multiple omental adhesions at the visceral surface of the Parietex mesh (**Figure 2**). The mesh had shrunk to two-thirds of its original size. The upper, lower, and right edges and right half of the mesh were firmly adherent to the abdominal wall. The left edge of the mesh was hanging freely in the peritoneal cavity except at its upper and lower ends, where transabdominal sutures had been placed during the initial repair (**Figure 2**). The intracorporeal sutures previously applied to the left edge and left half of the mesh were found to be either stretched and loosened or cut through. The omentum and small bowel were herniating into the infraumbilical defect through the gap between the abdominal wall and the mesh. There were also adhesions between the omentum and parietal surface of the left half of the mesh. We

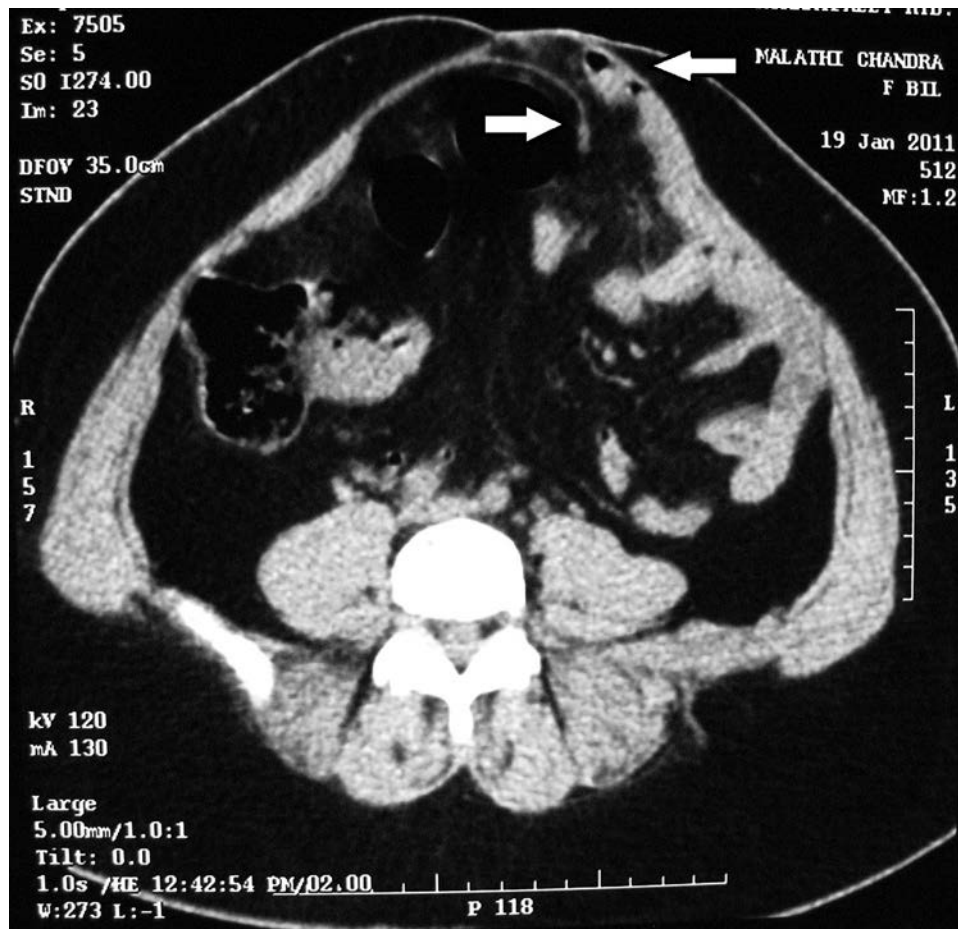


Figure 1. Coronal view of computed tomography scan showing herniated bowel with omentum (top arrow) and separated edge of mesh (bottom arrow).

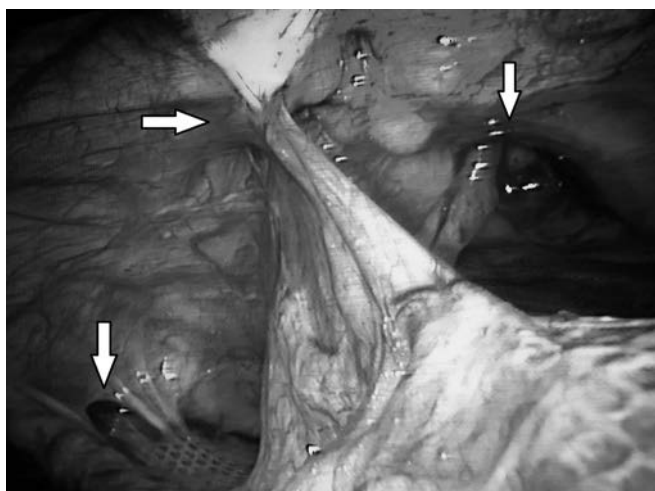


Figure 2. Laparoscopic view showing the infraumbilical defect (top vertical arrow), the left edge of the mesh (bottom vertical arrow), and one of the loosened intracorporeal suture sites (horizontal arrow).

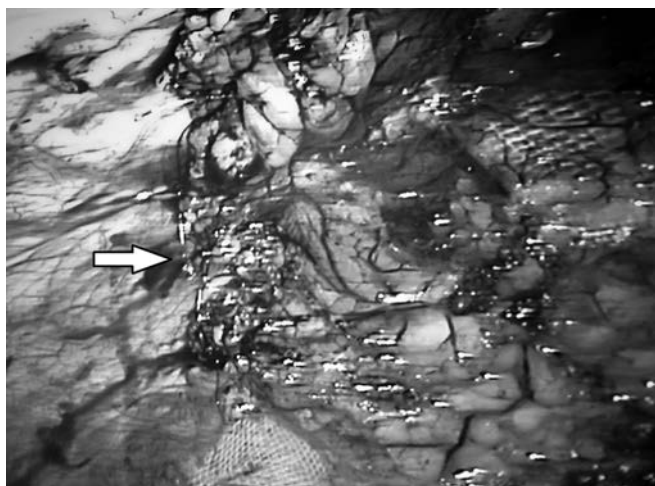


Figure 3. Laparoscopic view of fixation of mesh to abdominal wall with transabdominal and intracorporeal sutures (arrow).

performed laparoscopic adhesiolysis, reduction of hernial contents, and re-fixation of the left edge of the Parietex mesh using transabdominal sutures at 4-cm intervals and intracorporeal sutures at 1-cm intervals (**Figure 3**). The patient is asymptomatic at 3 months' follow-up.

DISCUSSION

The ultimate aim of incisional hernia repair is to prevent recurrence. Adequate mesh fixation is necessary to reduce the rate of recurrence after laparoscopic incisional hernia repair.² Incorporation of the mesh into the abdominal wall

provides the strength of the repair, but there is a risk of mesh migration even when the mesh is becoming incorporated if it is not properly stabilized.³ Studies have confirmed that the strength of transabdominal sutures is significantly greater than that of tacks or anchors in mesh fixation to the abdominal wall.⁴ Most advanced laparoscopic surgeons accept that the routine use of transabdominal sutures reduces the chance of mesh migration and recurrence. Application of transabdominal sutures is standard in our practice. However, there is no universal consensus on the number of transabdominal sutures to be used. In small defects and Swiss cheese defects with adequate mesh overlap, 4 sutures are usually sufficient.⁵ In obese individuals or patients with large defects, more transabdominal sutures are required, placed at 4- to 5-cm intervals. Adequate mesh overlap (minimum of 3 to 5 cm) is also necessary to counter the effect of mesh shrinkage.

Effective laparoscopic hernia treatment requires a combination of transabdominal sutures and tacks. The sutures are placed every 4 to 5 cm and the tacks at 1-cm intervals to prevent exposure of the parietal surface of the mesh to the bowel and omentum while the mesh becomes incorporated into the abdominal wall.⁶ To reduce the cost of incisional hernia repair, we adopted a method using additional intracorporeal sutures in place of tacks or anchors. Depending on the size of the hernia, we use transabdominal sutures either at all 4 corners or at 5-cm intervals. Because the hernias were small in our patient, we used only 4 transabdominal sutures at the corners during initial hernia repair. Several intracorporeal sutures were applied at 2-cm intervals along the edges and a few in the middle to approximate the mesh to the abdominal wall.

For laparoscopic incisional hernia repair, use of dual-layer meshes is recommended to prevent significant adhesions and bowel perforation.⁷ Dual-layer meshes have a nonabsorbable parietal layer and absorbable visceral layer. By the time the visceral layer becomes absorbed, the mesh becomes extraperitonealized. Adhesions can occur even after the use of dual-layer meshes. Generally, these occur on the exposed parietal side of the mesh as a result of inadequate lateral fixation, leading to curled mesh edges, or improper handling of the mesh, leading to damage to the absorbable film, or at the site of nonabsorbable tacks, anchors, or sutures. Some authors recommend using delayed absorbable sutures and tacks to reduce the incidence of adhesions. Adhesions can occur even at the visceral surface of a dual-layer mesh. However, these are generally omental, flimsy, and easily separable. If Prolene (Ethicon, Somerville, New Jersey) or expanded polytetrafluoroethylene meshes are

used, then significant dense bowel adhesions can occur, resulting in intestinal obstruction and erosions.

A recurrent hernia developed in our patient because of separation of the left edge and left half of the mesh from the abdominal wall. Bowel loops and the omentum were herniating through the gap between the mesh and abdominal wall into the infraumbilical defect. Although it has been claimed that composite mesh prevents or reduces adhesions, we found several adhesions of the omentum to the visceral surface of the mesh. It is important to note that the mesh is adherent at the upper and lower corners of the left edge where transabdominal sutures were placed initially.

Postoperatively, severe abdominal distension after initial laparoscopic mesh repair might have caused disruption of the intracorporeal sutures. The usual causes of recurrence after laparoscopic mesh repair are inadequate mesh size, inadequate mesh overlap, failure to use transabdominal sutures, mesh migration, and mesh contraction. Although herniation of bowel loops between the mesh and abdominal wall was described, its occurrence is rare.^{8,9} Such a recurrence can occur if the mesh is not closely applied to the abdominal wall by means of additional fixation with tacks, anchors, or intracorporeal sutures to close the gaps between the transabdominal fixation sites. Even after additional fixation, a recurrence can still occur if any force disrupts the additional fixation.¹⁰ To prevent or reduce such recurrences, more transabdominal sutures should be used at intervals of 4 to 5 cm or less, even for smaller hernias. However, if the disrupting force is strong enough, then even transabdominal sutures can break down, resulting in recurrence. Application of such sutures causes the unique problem of pain at the fixation sites. This is thought to be due to entrapment of the nerves or ischemia of the entrapped local muscle tissue. Pain is proportional to the number of transabdominal sutures applied. Pain usually resolves spontaneously or with conservative management such as analgesics or local anesthetic injections. However, recurrence requires surgical treatment. On the basis of these findings, increasing the number of transabdominal sutures to reduce the risk of recurrence with perhaps an increased risk of pain is preferable to using fewer sutures with a reduced incidence of pain but with perhaps an additional increased risk of recurrence.

CONCLUSIONS

After laparoscopic mesh repair, recurrent incisional hernia occurring through the gap between the mesh and abdominal wall is very rare. It occurs because of inadequate fixation between the transabdominal suture fixation sites by means of additional fixation with tacks, anchors, or intracorporeal sutures or because of forces disrupting these additional fixation sites, resulting in separation of mesh edges from the abdominal wall. Using more transabdominal sutures even for smaller hernias is advisable to prevent such a recurrence, albeit at the cost of more postoperative pain.

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