CASE REPORT JSLS

Laparoscopic-assisted Primary Repair of a Complicated Ventral Incisional Hernia

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ABSTRACT

Postoperative wound dehiscence is a difficult problem for the general surgeon. Often, patients are too sick, or the wound environment is too hostile, to undergo primary repair. When an eventual repair is performed, a variety of methods are available, but most are associated with unacceptably high morbidity rates, specifically high incidences of recurrences and poor cosmetic outcome. We present here a case of postoperative wound dehiscence following a colostomy takedown repaired in a previously undescribed way—a laparoscopically assisted ventral incisional hernia repair. The method of repair is described, and the current literature regarding alternatives is reviewed.

Key Words: Buttressing, Dehiscence, Ventral hernia.

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Disclosure: The authors have no financial interest in any commercial device, equipment, or instrument mentioned in this article.

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INTRODUCTION

The treatment of ventral incisional hernias has undergone a significant evolution in the age of laparoscopy. Laparoscopic surgery has offered the advantages of minimal pain, ease of dissection of adhesions, quicker return to activities, shorter stay in the hospital, and the ability to identify additional defects. It also has a lower recurrence rate compared with that with primary repairs and open mesh repair. Many general surgeons now consider the laparoscopic method the method of choice for the repair of incisional hernias.

The problem remains of what to do with the ventral incisional hernia that occurs after a wound dehiscence. These defects are very large, with thin overlying skin that is prone to vascular compromise. Even after laparoscopic repair, the patients are often unhappy with the cosmetic appearance of their wound. We propose a combination of the 2 approaches to maximize the benefits of the primary repair, specifically the cosmetically pleasing single midline incision, with the multiple benefits of laparoscopy, specifically the low recurrence rate, ease of adhesiolysis, and the ability to identify other defects of laparoscopic surgery.

CASE REPORT

The patient is a 52-year-old male who is HIV positive and underwent an emergent Hartmann's procedure for a rectosigmoid perforation secondary to a foreign body. The patient recovered from that procedure well, then underwent an uneventful colostomy takedown. This postoperative course was complicated by a wound infection at the midline incision and eventual complete wound dehiscence. The wound was allowed to heal by secondary intention. The patient presented 2 years later with a very large ventral incisional hernia and requested laparoscopic repair. After an appropriate preoperative workup, the patient was taken to the operating room where an uneventful laparoscopic ventral incisional hernia repair with a Bard Composix mesh was performed. The overlying skin of the defect was thin, but viable. Postoperatively, the patient did well initially, however, still did complain about the size of his scar

and his increased (and unchanged) waist size. At 4-weeks after surgery, the patient was noted to have erythema and induration at the midpoint of his defect. He was started on oral antibiotics and the cellulitis resolved. At subsequent follow-up, mesh was exposed **(Figure 1)**. The patient was then offered excision of the mesh and another repair of the ventral incisional hernia in a "laparoscopic-assisted" fashion.

The patient was taken to the operating room, and an initial exploratory laparoscopy was performed. An extensive lysis of adhesions was accomplished and an additional, occult hernia defect at the previous colostomy site was identified. The insufflation was then released and a scar revision, followed by exploratory laparotomy, was performed. Two 8 x 10-inch pieces of Surgisis Gold mesh were placed into the abdomen through the midline incision. The midline defect was closed primarily with interrupted figure of 8 sutures of #1 PDS. Two drains were placed in the subcutaneous tissues, and the skin was closed with staples. The abdomen was then reinsufflated, and the meshes were fixated to cover both defects with an approximate 7-inch overlap with an Autosuture Hernia Tacker. The patient was treated for a significant amount of postoperative pain, however, at one-month follow-up, had a straight, single midline incision, minimal pain, and noted a decrease in his waist size of 6 inches **(Figure 2)**. At 6-month follow-up, the patient had no evidence of recurrence and was pain free **(Figure 3)**.

Figure 1. Cosmetic appearance at 4-month follow-up after initial laparoscopic repair with exposed mesh present at mid-point of incision.

Figure 2. Initial postoperative appearance after second operation: laparoscopic-assisted repair.

DISCUSSION

Any incision in the abdominal wall weakens it, and no current method for incisional closure is perfect. Incisional hernias complicate approximately 10% of laparotomies.[1] They are even more common in the presence of wound infection or elevated body mass index (BMI). The choice of repair depends on many factors, including anatomy of the abdominal wall, contamination, the condition of the patient, BMI, surgeon preference, and location/size of the defect. This has lead to a variety of methods for closure of the hernia defect. Common methods for closure include primary closure, open or laparoscopic mesh repair, and component separation technique.

The primary suture repair of a defect is followed by recurrence in 20% to 50% of patients.[1–3] Open mesh repairs have a recurrence rate of 10% to 20% with an associated high-morbidity rate related to pain, infection, and seroma formation. The component separation technique is useful in large abdominal wall defects but is associated with a high recurrence rate. In one series, 12 of 43 patients had recurrences, possible explanations thought to be recurrence secondary to tension on the repair and ischemia from transection of perforating branches of the epigastric artery.[4] Other methods for repair include tissue expansion, pedicled flap, and free flap techniques, but these are limited in their availability to the average general surgery patient.

Figure 3. Postoperative appearance 3 months after laparoscopic-assisted repair.

The laparoscopic mesh repair has rapidly become accepted among general surgeons for multiple reasons. It was first reported in 1993, and it has a remarkably low recurrence rate across many series. Berger et al[5] reported 4 recurrences in 150 patients after laparoscopic repair with no reported mesh infections. Carbajo and colleagues[6] described a remarkably low recurrence rate of 4.4% after an average 4 years of patient follow-up. Just recently, Gillian et al[7] reported a consecutive series of 100 patients undergoing laparoscopic ventral incisional hernia repair with only one recurrence and that was repaired laparoscopically. Other authors[8] have highlighted the lower incidence of perioperative complications and shorter hospital stay in patients undergoing laparoscopic hernia repair. Another value of the laparoscopic approach has been the improved visualization offered by the laparoscope to reduce the incidence of missed hernias. One study[6] reported an average of 4.8 abdominal wall defects identified during the laparoscopic approach to incisional hernias. Lastly, any surgeon who has performed laparoscopy will offer the ease of adhesiolysis and the ability to place a larger mesh than during open surgery. The benefits of laparoscopy in the obese patient with regards to exposure and decreased wound complications make the laparoscopic approach ideal.[9] Still some problems with the laparoscopic approach remain, including the frequency of seromas, unchanged scar appearance, and the limitations based on surgeon experience. Some authors[10] also argue that the recurrence rates are comparable to those for open mesh hernioplasty for larger hernias.

The treatment of a wound dehiscence is even more complicated. A high incidence of recurrence exists no mater what method is used to "close" the abdomen. Frequently, very dense adhesions limit the amount of fascia available for wound closure. The use of special devices to allow the gradual closing of wound edges together, such as Velcro-like products (Wittmann Patch) that are sutured temporarily to the fascial edges to allow sutureless reentry and primary closure as abdominal swelling decreases, are still complicated by infection, bowel injury during multiple reentries, and recurrent incisional hernias. Laparoscopic repair is hampered by vascularity of the thick overlying tissue—the granulation tissue from secondary wound healing or skin grafting are both very susceptible to vascular compromise during adhesiolysis after a laparoscopic repair is performed.

A marriage of 2 techniques—combining the multiple benefits of laparoscopic hernia repair with the improved cosmetic outcome of primary repair—should maximize the benefits of both. By combining the 2 techniques, the ultimate outcome would be the minimal recurrence similar to laparoscopic mesh repair with the cosmetic appearance of a single, midline incision. A similar technique has been described in open, complicated incisional hernia repair. A method for closing large midline incisional hernias by using both the fascia and a mesh was described with no recurrences in 10 patients with large ventral incisional hernias (median follow-up 1 year 5 months).[11] By using a laparoscopic-assisted approach as described in this case report, several benefits accrued to this patient: first, the easy placement of 2 very large pieces of mesh through an open abdomen to be later fixated to the abdominal wall rather than creating incredibly large tissue flaps that are prone to seroma formation; second, the ease of adhesiolysis especially in this patient where an inflammatory response to an infected mesh occurred; third, an additional defect was recognized that was not detectable by physical examination and was easily repaired laparoscopically. The patient also voiced extreme satisfaction with the repair on several follow-up visits and noted his

single, midline scar, where previously a rather large accumulation of granulation tissue was present, and the decrease in his waist size from a size 38 to a 32. We used an absorbable, bioprosthetic mesh in this patient because of the presence of infection. Several such meshes are currently available, and all provide a 3-dimensional lattice for tissue ingrowth while enhancing wound strength. Ultimately, they are completely absorbed and replaced by the body's own scar tissue. The difficulties with placing a nonabsorbable mesh in an infected field are obvious.

Other authors have suggested "combining minimally invasive" and "open" surgery techniques. Schneider and colleagues[12] recently described the combination of laparoscopic and open dissection in melanoma patients. By using endoscopic deep pelvic dissection combined with superficial open inguinal dissection, they accomplished a complete oncologic dissection while decreasing the morbidity associated with open deep iliac node dissection. The vascular literature is also currently seeing a marriage of endovascular and laparoscopic techniques. As surgeons become more familiar with the laparoscope, minimally invasive techniques will likely become more and more a part of, rather than a replacement for, traditionally "open" procedures.

CONCLUSION

We recommend a combination of approaches, first a laparoscopic adhesiolysis, then an open scar revision, placement of mesh and primary hernia repair, to be followed by a laparoscopic "buttressing" of the primary repair and repair of any additional defects if present. This combined method achieves a better cosmetic outcome than the completely laparoscopic ventral incisional hernia repair and still takes advantage of the multiple benefits afforded to laparoscopic surgery.

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