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HOW I DO IT

Parastomal Hernia Repair

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Abstract Parastomal herniation is a common clinical occurrence. Historically, there has been a high recurrence rate after repair, and conservative management is usually recommended for patients with mild symptoms. When operative intervention is warranted, we opt for a laparoscopic mesh sublay over the fascial defect and lateralization of the stoma limb, or the Sugarbaker technique. In patients who are considered poor risk for laparoscopy/laparotomy requiring repair, we perform a fascial onlay with mesh utilizing an anterior circumstomal approach.

Keywords Parastomal hernia repair · Sugarbaker technique · Parastomal fascial onlay · Laparoscopic hernia repair

Introduction

Parastomal herniation is frequently encountered after the creation of an abdominal wall ostomy. In fact, the reported incidence is so high that some do not even consider this a complication of ostomy placement.[1] The true incidence is difficult to estimate as the criteria for the diagnosis of a parastomal hernia are somewhat arbitrary. Classification systems have been introduced to characterize these hernias,[1,2] but they are of limited clinical utility as the grades cannot be easily differentiated on physical exam.[3] CT scans have increasingly been utilized in the diagnosis of parastomal hernia, but cross sectional imaging studies probably overstate the problem as many radiologically identifiable hernias are clinically irrelevant.[4]

The formation of an intestinal stoma necessitates the creation of an abdominal wall defect. This allows intraperitoneal components such as omentum or epiploic appendages to be present in the defect without any real clinical consequence. On the other hand, the surgical defect created for an ostomy can lead to attenuation of the fascia over time which may precipitate stomal prolapse. While not a true hernia, prolapse can have a significant clinical impact and likely has been classified as a parastomal hernia previously in the literature.[3] Lack of uniformity in diagnosis contributes to widely varied reported incidences of parastomal herniation, ranging from 4 to 75 % depending on diagnostic criteria, definition of hernia, etc.[5–8] Taken together, however, the incidence of a clinically relevant parastomal hernia probably lies between 30 and 50 % in the general surgical population.[3,9]

The risk factors for hernia formation are well characterized. A retrospective study examined 41 consecutive patients who underwent abdominoperineal resection (APR) for rectal cancer to determine risk factors for parastomal hernia development.[10] Independent factors analyzed included BMI, waist circumference, chemotherapy, surgical approach, age, and sex. Forty-six percent of patients in their review developed parastomal hernias. Only waist circumference >100 cm proved to be an independent risk factor, with a probability of 75 % for hernia formation at this circumference. Table 1 demonstrates other reported risk factors for hernia formation. Colostomy has been implicated in higher rates of parastomal herniation versus ileostomy, but several studies dispute this.[11,12] Importantly, the prevalence of parastomal hernia formation increases with time, which underscores the importance of long-term follow-up in patients with stomas.[6–8]

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Table 1 Risk factors for the development of a parastomal hernia

Risk factors for parastomal hernia	
Obesity/waist size	Concomitant incisional hernia
Increased intra-abdominal pressure	Chronic obstructive pulmonary disease
Postoperative sepsis	Age
Cigarette smoking	Malnutrition
Emergency surgery	Colostomy
Steroids	

Management and Prevention

Several prospective studies have assessed the role of fascial reinforcement with mesh to prevent formation of parastomal hernias.[13–15] Serra-Aracil randomly assigned patients undergoing colostomy placement after APR for rectal cancer to prophylactic fascial sublay mesh placement or standard stoma creation.[14] After 2 years of follow up, 40 % of patients randomized to the control arm developed hernias versus 14 % in the treatment arm. The PRISM study group recently published their trial using a larger dataset.[15] This prospective trial randomized patients to either a control arm or prophylactic fascial sublay with an acellular porcine dermal matrix mesh. Colostomies and ileostomies, whether utilizing laparoscopic or open technique, were all included in the analysis; no difference in the rate of hernia formation (~13 %) was observed over 24 months of follow-up. So, there may be a role for prophylaxis, especially utilizing the fascial sublay approach, but biologic mesh appears to be inadequate. In light of the increased incidence of herniation over time, longer follow-up and larger sample size will be needed to determine the value of mesh prophylaxis. It is not our practice at present to prophylactically place mesh during creation of intestinal stomas.

In patients who have developed a parastomal hernia, we avoid operative repair unless there is a clear and compelling indication as nonoperative management suffices in the majority of patients. The high recurrence rate after repair as well as patient comorbidities must be strongly considered. Consultation with an experienced enterostomal therapist and a belted appliance may effectively manage many patients with mild symptoms. However, in the setting of intractable pain, obstruction, or inability to maintain a seal with the appliance, surgical intervention is warranted.

Surgical Approach

Our practice is to perform a laparoscopic Sugarbaker approach. This entails an intraperitoneal exposure for mesh sublay over the fascial defect and lateralization of the stoma limb.[16] In the operating room, a roll is placed under the ipsilateral hip to gain access to the flank. The stoma is closed with a purse-string suture and covered with gauze to absorb mucus. Then, an Ioban™ dressing is draped over the entire abdomen to isolate the stoma. We take these precautions to ensure the mesh is not contaminated when it comes into contact with the abdominal wall.

Access to the peritoneal cavity is obtained through Veress needle placement opposite the stoma. An optical trocar is then placed at this site. We utilize a 5-mm, 30 degree angled laparoscope and place two additional trocars along the same plane as demonstrated in Fig. 1. The abdomen is then inspected and adhesions taken down from the abdominal wall. We avoid thermal energy sources during this process to prevent capacitance coupling of the instruments to the bowel loops or stomal limb. Reduction of the hernia is typically accomplished with internal traction and external counterpressure (Fig. 2). If identification of the stomal limb is difficult, an assistant can carefully, so as to avoid contamination, digitalize the ostomy to differentiate the stomal limb from bowel loops and help to develop this plane. if this maneuver is performed, the assistant keeps the contaminated hand off the field until gloves are changed. then, a 4×4 in. gauze is placed over the stoma and is held in place by another Ioban™ dressing.

After adequate adhesiolysis and hernia reduction, the fascial defect is measured with an intracorporeal ruler. The mesh radius is sized at least 5 cm past this defect to ensure fascial overlap for tacking. If a concomitant incisional hernia is identified, the same mesh will cover this defect as well. We Utilize an expanded PTFE mesh to prevent mesh erosion into the stomal limb, such as GORE® DUALMESH® plus (Gore Medical, Flagstaff, AZ), as coated meshes only have an antiadhesive barrier applied to one side of the mesh. Anchoring sutures are placed at 6–7 cm intervals around the periphery of the mesh, and the stoma site is marked on the mesh (Fig. 3). This step is crucial to aid in placement of lateral anchoring sutures and avoidance of tack placement near the stoma limb.

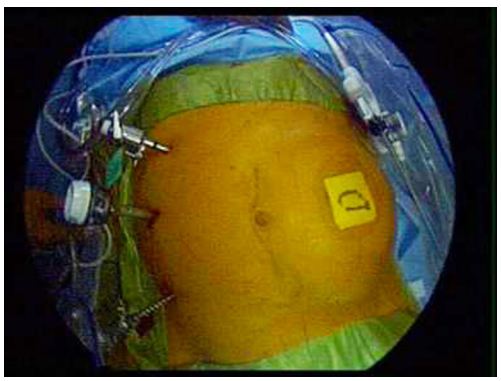

Fig. 1 Laparoscopic set-up with port placement opposite the ostomy site

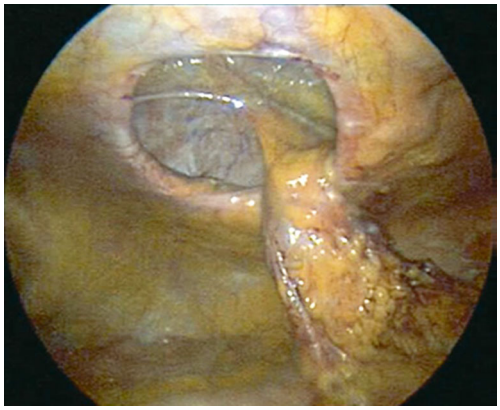

Fig 2 Fascial defect with stoma limb after reduction of the parastomal hernia

The mesh is then placed into the abdomen through the trocars. The anchoring sutures are secured to the abdominal wall in a lateral to medial fashion using a fascial closure device. Importantly, since the stoma is off midline, mesh laxity can develop if the stab incisions for the lateral anchoring sutures are not placed more laterally than expected. To pinpoint the expected position of the lateral edge of the mesh, a localizing needle can be placed through the abdominal wall. This often can aid in placement of the stab incisions in a more precise location. We take care to avoid suture placement through the hernia sac as this can precipitate a chronic seroma.[17]

To prevent herniation between sutures and to assist in mesh incorporation, we next use a tacking device to permanently fix the mesh at 1 cm intervals to the abdominal wall. The stoma limb now enters the defect from a lateral position (Figs. 4 and 5). We place tacks around the stoma limb but are prudent to allow sufficient laxity so as not to cause a point of obstruction. Frequently, desufflation of the abdomen to a more physiologic level can demonstrate realistic tension on the stoma limb from the mesh and guide tack placement. Lastly, omentum is tacked over the lateral abdominal wall to isolate the viscera from the mesh.

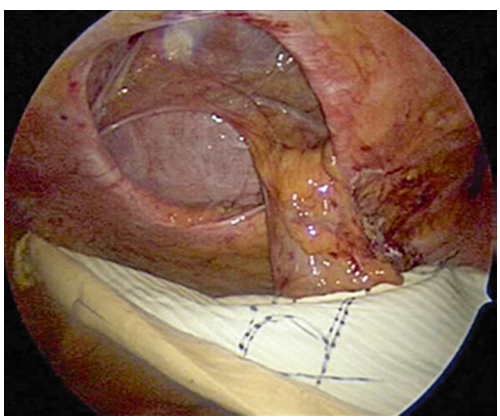

Fig. 3 Mesh with anchoring sutures at 6–7 cm intervals around the periphery, with stoma and limb markings

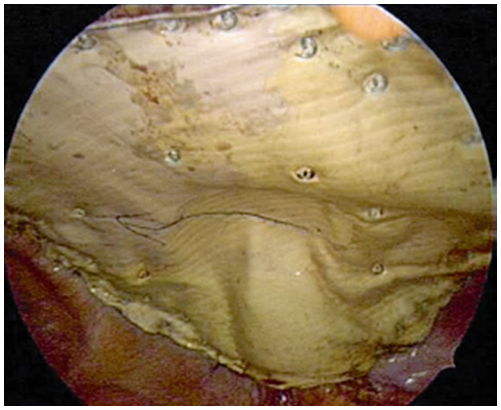

Fig. 4 Intraoperative mesh placement. Sutures are secured beginning laterally

In patients who have a hostile abdomen or who are otherwise prohibitive laparoscopic candidates, we do perform a parastomal fascial onlay *using an open technique*. We acknowledge the higher recurrence rate, but our experience has been such that these recurrences can often be managed nonoperatively. When performed, a U-shaped *skin* incision is made lateral to the stoma at the border of the stoma wafer. This is carried down through the subcutaneous tissue until bowel is identified. The hernia sac is identified and reduced; we continue to sharply define the fascia around the entire stoma. Heavy, interrupted polypropylene sutures are placed to primarily close the defect. We leave a defect larger than one finger breadth to ensure that the stoma limb can easily exit. A biologic mesh is then fashioned over this primary closure with a 5-cm overlap using absorbable suture.

Conclusion

Parastomal herniation is exceedingly common after creation of an abdominal wall stoma. Historically, there is a high rate of recurrence after repair,[18,19] highlighting the argument for conservative management. When surgery is considered, we

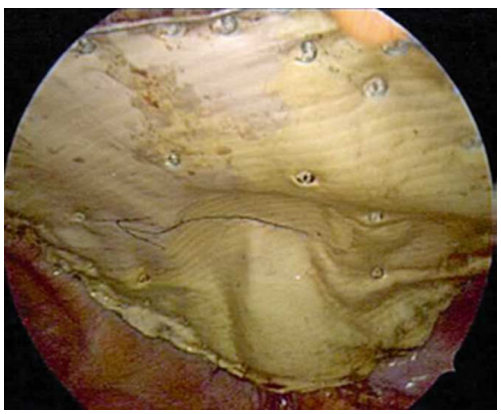

Fig 5 Mesh secured with sutures and tacks. The stoma has been lateralized as it exits the fascia

perform a laparoscopic mesh sublay with the Sugarbaker lateralization technique. The keyhole, or slit, technique has been described,[20] but there is a higher risk of recurrence due to widening of the aperture over time.[21,22] Fascial onlays have been described and are utilized in our group in prohibitive risk patients. It seems intuitive, however, that sublay techniques may prove superior with regard to recurrence: intra-abdominal pressure continues to fix the mesh to the abdominal wall in the sublay position as opposed to a fascial onlay. Further research regarding the long-term outcomes regarding this technique, however, will be needed.

Conflict of Interest None

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