Diagnosis and Management of Parastomal Hernias

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CASE SUMMARY: A 63-year-old woman with history of stage II rectal adenocarcinoma status postneoadjuvant chemoradiation and subsequent abdominoperineal resection presented with worsening bulge and inability to pouch stoma. CT scan revealed a 4-cm parastomal hernia. After discussion with the patient regarding management options, she elected to undergo repair of hernia defect. A robot-assisted laparoscopic parastomal hernia repair with synthetic mesh via the Sugarbaker technique was performed. After a short stay in the hospital, the patient recovered well and reported no recurrent symptoms.

CLINICAL QUESTIONS

- What are the diagnosis and classification of parastomal hernia?
- Should we use watchful waiting or surgical intervention?
- What are options for surgical management of parastomal hernia?

BACKGROUND

Diagnosis and Management

With the incidence of parastomal hernia >30% at 12 months, 40% at 2 years, and >50% at longer follow-up duration, surgeons must increasingly understand diagnosis and management of this entity.[1] Although there exists a 2015 American Society of Colon and Rectal Surgeons Clinical Practice Guideline on Ostomy Creation with a subsection discussing parastomal hernia,[2] there is currently no consensus on the prevention and management of this potentially debilitating and costly complication.

Classification

One reason for a lack of consensus on the prevention and management begins with minimal agreement on the diagnosis and classification of parastomal hernia. There remains a lack of a diagnostic gold standard, because providers use history and physical examination, imaging techniques such as CT scan or ultrasound, and/or intraoperative findings at the time of ostomy reversal to define the presence of a parastomal hernia.[1] This lack of a standardized diagnostic modality yields different classifications of parastomal hernias. To counter this, the European Hernia Society developed a new classification system in 2014 that defined 4 types of parastomal hernia based on defect size and the presence of concomitant incisional hernia.[3] Although not yet widely recognized, it behooves clinicians to focus on a standardized methodology for diagnosing and classifying parastomal hernias to further develop best practices in prevention and management.

PRESENTATION

Although the incidence of parastomal hernia varies depending on the type of stoma, with colostomy demonstrating higher rates compared with ileostomy, there is a paucity of data to suggest definitive association of most technical factors with hernia occurrence.[1] Size of aperture is thought to influence hernia formation, and data suggest that a fascial defect <25 mm is associated with lower rates of parastomal hernia formation.[4] When this size is not technically feasible, the surgeon should create a defect as small as possible through the abdominal wall without causing ischemia.[1] Another technical consideration is an intraperitoneal versus an extraperitoneal approach to ostomy creation. A 2012 meta-analysis showed significant reduction in hernia formation with the extraperitoneal approach[5]; however, long-term data are lacking, and patient factors such as morbid obesity may limit applicability.

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These technical factors aside, recent trials have investigated the use of prophylactic mesh at the time of ostomy creation for the prevention of parastomal hernia, with most studies involving open or laparoscopic end colostomy creation. A recent meta-analysis found the rates of parastomal hernia to be 16.4% in the mesh group versus 36.6% in the nonmesh group (OR = 0.24 (95% CI, 0.12–0.50); $p < 0.001$).[6] Given these findings and others demonstrating the cost-effectiveness of prophylactic mesh placement,[7] the latest recommendations from the European Hernia Society advocate its use at time of ostomy creation.[1] Because of conflicting and generally weak data on the effect of prophylactic mesh for the prevention of parastomal hernias,[8] especially when considering the potential for infections, fistula formation, and increased cost, its use in the United States is not currently widely accepted. More study is needed to help determine optimal methods for ostomy creation.

MANAGEMENT

Consensus on management is difficult to obtain, because the presence of a parastomal hernia does not necessitate surgical repair. Hard indications for emergent surgical intervention include severe abdominal pain, nausea, vomiting, and obstipation associated with incarcerated or strangulated parastomal hernia. Soft indications for surgical repair include bulge around the stoma, poorly fitting appliance, discomfort at site, and recurrent symptoms of partial bowel obstruction. With insufficient data on watchful waiting versus elective repair,[1] the decision to pursue surgery is tailored to patient preference after considering all potential surgical risks against the possibility of future hernia strangulation. For patients and surgeons choosing nonoperative management, consultation with an enterostomal therapy nurse for assistance with appliance leakage and fitment of a hernia belt or support garment is suggested.

When parastomal hernia repair is indicated, the first choice in the patient with undesired or temporary ostomy is closure of the stoma. However, in addition to the risks of ostomy reversal, there exists up to a 32% chance of developing incisional hernia with simple suture closure of the fascial defect.[4] Recently, a single-institution study evaluating the placement of mesh at the time of ostomy closure showed a significantly decreased rate of hernia formation (1.0% vs 17.3%; $p < 0.001$) and similar rates of infection compared with patients not receiving mesh reinforcement.[9] Because there are no randomized controlled trials evaluating this question, the surgeon must weigh the proposed benefits of prophylactic mesh placement with potential complications of infection, fistula formation, chronic pain, increased cost, and worsened quality of life. Additional study is needed to clarify best practices.

In the patient with a permanent ostomy or contraindications to ostomy closure, parastomal hernia management options include stoma resiting or hernia repair. Resiting of the ostomy is less commonly performed because of similar risk of parastomal hernia at the new stoma position, along with risk of ventral hernia formation at the site of the previous ostomy.[4] Historically, the initial approach to hernia repair without resiting the stoma was direct approximation of fascia via suture, resulting in recurrence rates >50%.[4] Because of this unacceptable recurrence rate, various options for hernia repair with mesh have since been developed.

Sugarbaker[10] first published his technique of hernia repair with intraperitoneal mesh placement in 1985, with no recurrences in a 4- to 7-year follow-up period for 7 patients. This repair involved reducing the hernia sac intraperitoneally, securing a ring of prosthetic mesh in an underlay fashion deep to the fascial defect, and lateralizing the bowel immediately proximal to the stoma exit with a small gap to allow the intestine to pass through the mesh (Fig. 1).[10] Byers et al[11] later published the intraperitoneal keyhole approach in 1992 using 2 strips of underlay polypropylene mesh on either side of the intestine as it exited the abdominal cavity (Fig. 2). There were no reported recurrences in 9 patients at a mean follow-up of 13 months. These approaches remain the most common to date, with extensive literature supporting good outcomes. However,

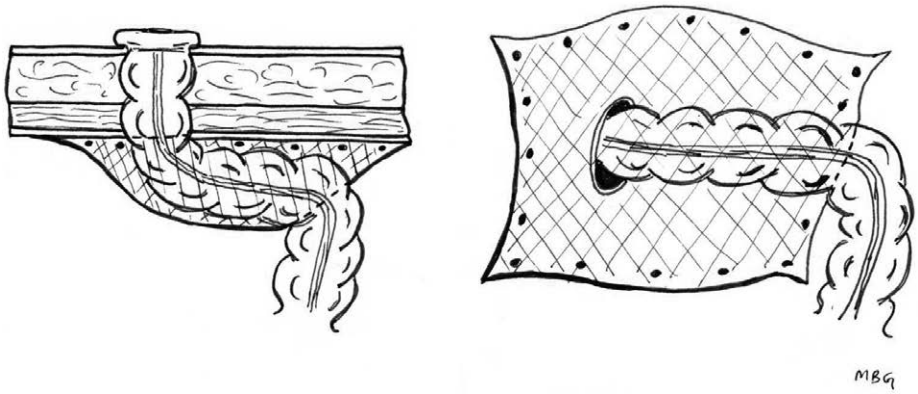


FIGURE 1. Visualization of the Sugarbaker technique for parastomal hernia repair.

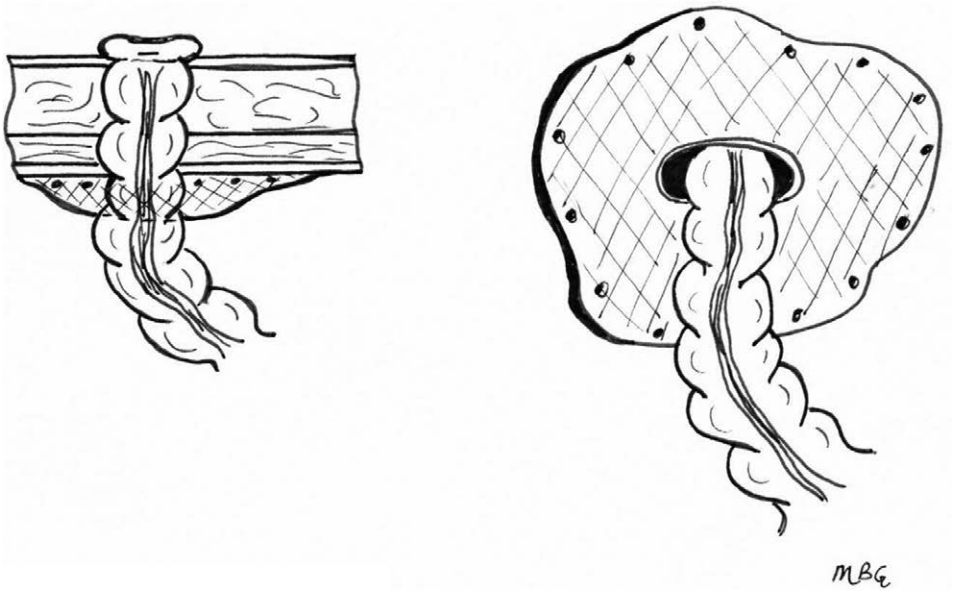


FIGURE 2. Visualization of the modern keyhole technique for parastomal hernia repair.

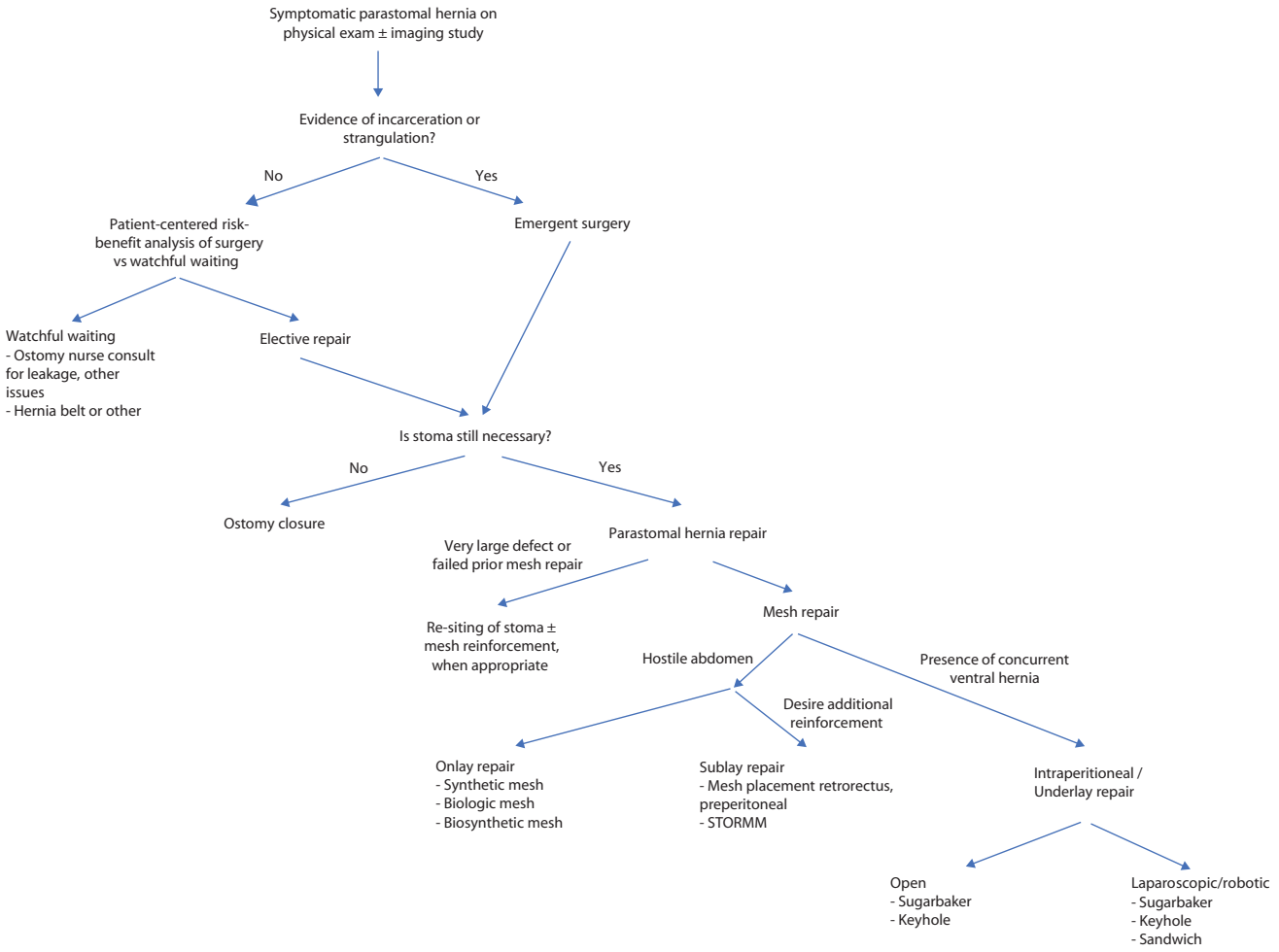
other approaches have also been described, including onlay and sublay mesh repairs.[4] More recent reports describe variations on traditional repairs, including the sandwich,[4] inverted top hat,[12] and stapled transabdominal ostomy reinforcement with retromuscular mesh[13] approaches. The sandwich technique essentially combines a Sugarbaker repair over a keyhole repair, whereas the inverted top hat approach involves placement of a mesh construct that effectively closes the circumferential stoma/fascial angle to prevent recurrence.[12] The stapled transabdominal ostomy reinforcement with retromuscular mesh approach is a complex, novel procedure involving posterior component separation through which the conduit is brought, followed by stapled fixation of a synthetic mesh to the underside of the anterior sheath using an EEA stapler. The conduit is then brought through this defect and matured.[13] Unfortunately, prospective trials and long-term data are lacking for many of these newer techniques, which further complicates any attempt at management consensus.

Systematic reviews and analyses have evaluated multiple parastomal hernia repair techniques to guide management consensus. Unfortunately, interpretation is limited by the considerable heterogeneity of the studies, including patient factors, surgical techniques, and types of mesh used (synthetic versus biologic). Current data do not indicate a difference between open and laparoscopic approaches to repair, nor is a difference noted in specific approach, such as Sugarbaker or keyhole. Sublay and intraperitoneal repair approaches have been found superior to onlay from a recurrence standpoint, with each approach demonstrating different complication profiles.[4] Regarding the type of mesh used, there are proponents on both sides advocating the use of synthetic and biological products. Questions remain regarding the true risk of infection and fistula formation when using a synthetic mesh versus the risk of recurrence and seroma formation when biological meshes are used. Additional study is necessary before a more definitive recommendation can be made.

CONCLUSION

Parastomal hernias are common complications of stoma creation regardless of technique used. Evaluation involves history and physical examination, followed by imaging if diagnostic uncertainty exists. After diagnosis, there are multiple management options, which are illustrated in the proposed treatment algorithm (see Evaluation and Treatment Algorithm). When possible, closure of the ostomy is the best management option for parastomal hernia. When not possible, there is insufficient prospective data to recommend one method for hernia repair over the other, especially if newer techniques are considered. Additional studies are needed to guide physicians in the management of this common complication.

Evaluation and Treatment Algorithm



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Expert Commentary on Diagnosis and Management of Parastomal Hernias

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I am grateful for the opportunity to review this well-written and concise summary on the diagnosis and management of parastomal hernias by Drs Okorji and Kasten. With over 30 years of attempting repairs of parastomal hernias, I can say one thing for certain: parastomal hernias are the "gifts that keep on giving." My first and major recommendation when considering repair is that the surgeon should get to know the patient well, because he or she will have a long relationship that will most commonly involve multiple repairs.

Regarding management, the authors have nicely pointed out that "watchful waiting" is an option. I believe this to be the best option for most of these hernias. Only when the patient has signs of obstruction, obstipation, severe pain, or strangulation should repair be done. Repairing a parastomal hernia for cosmetic indications or minor pain issues becomes a "major pain" for the surgeon.

The lack of consensus among surgeons on both sides of the Atlantic regarding optimal management of parastomal hernias is self-explanatory. Surgeons cannot even get consensus on the definition of the parastomal hernia itself, let alone the timing of repair and techniques that can be attempted. This lack of consensus has led to a wide variety of repair techniques and modifications of "accepted," or at least "recognized" procedures.

Dr Okorji and colleagues' review nicely points out that primary repair of a parastomal hernia results in a >50% recurrence rate in patients, once a decision has been made to attempt repair. In my own experience, the 50% recurrence rate reported is because most of the other 50% did not return for follow-up and had the repair done by another surgeon. The primary repair of a parastomal hernia should be reserved for the times when the patient is in extremes and no time is available to perform mesh-supported repair. These primary repair recurrence rates, as well as those from mesh repair, are almost linear with BMI, so any attempted repairs need to be combined with aggressive counseling and a support system for weight management.

Multiple factors should be considered before embarking on the journey of repairing parastomal hernias in patients with permanent stomas. Establishing appropriate patient expectations of results is of high priority. The next decision to be made regarding repair is whether to re-site the hernia, or attempt to repair at its current location. With re-siting, one is essentially creating another hernia to fix a hernia. Re-siting, in my opinion, should be reserved for cases when all options of repairing at the same site have been exhausted.

The section on decision making for the procedure to be used is well-written by Dr Okorji. The tried-and-true Sugarbaker repair method, when done correctly with an adequate segment of bowel being lateralized proximal to the ostomy, has relatively good prognosis for a durable repair. The keyhole repair, with a small opening placed in the mesh prosthesis, is the most common repair, and multiple modifications of the concept have been published. Again, as noted, consensus on repair methods is nonexistent.

SUMMARY

Repairing the parastomal hernia is fraught with risks and complications, recurrence of the hernia being foremost. When a decision is made to repair these hernias, the surgeon needs a well-thought-out plan, attention to detail, and the creation of realistic expectations, so both patient and surgeon are content with the outcome.

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