Stoma Issues in the Obese Patient

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ABSTRACT

Stoma creation in the obese patient presents technical challenges beyond the usual considerations that surround stoma creation. Both short-term and long-term stoma complication rates are higher in the obese patient. One must always strive to create a protruding well-vascularized stoma while maximizing the potential to restore bowel continuity in the future. This article will discuss the potential complications and difficulties associated with the creation of a stoma in the obese patient. It will also discuss the traditional techniques for creating the stoma and include modifications that may be required in the obese patient. It will cover technical tips that may help to avoid the complications and pitfalls of creating a stoma in the obese patient.

KEYWORDS: Colostomy, ileostomy, obesity, parastomal hernia, stoma complication

Objectives: On completion of this article, the reader should be able to: (1) summarize the need for colostomy or ileostomy and discuss the optimal construction of the stoma; and (2) summarize the stoma complications and methods for treating and avoiding these in the obese patient.

During this time when obesity is at epidemic proportions in the United States and other developed countries, we are often faced with the challenge of creating a stoma in an obese patient. In 2009, the Centers for Disease Control and Prevention reported that only Colorado and the District of Columbia had obesity rates less than 20%. Thirty-three states had an obesity rate greater than 25% and, of these, nine states had an obesity rate greater than 30%.¹ Obesity has been shown to increase the morbidity related to colon and rectal surgery.²⁻⁴ Obese patients have a higher rate of wound infection, higher risk of wound dehiscence, and anastomotic leak. The obese patient also suffers a higher rate of stoma-related complications such as parastomal hernia, mucocutaneous separation, stoma retraction and stoma prolapse.⁵⁻⁹ In addition, there appears to be an association with higher weight and polyp formation thus lending to a greater proportion of obese patients potentially requiring colon and rectal surgery with the possi-

bility of permanent or temporary stomas.¹⁰ In this article we will examine traditional methods of stoma creation and what alterations in technique may be required to create the optimal stoma in the obese patient.

TECHNICAL CONSIDERATIONS

Preoperative Planning

When one creates a stoma, one must consider many factors at the time of planning the stoma.¹¹ This includes the indication for stoma, if one expects it to be reversed in the future and technical consideration such as where to site the stoma, what segment of the intestine to utilize, and potential postoperative complications. Careful consideration of the indication and need for permanent or temporary stomas is a discussion that is ideally had with patient and family prior to stoma creation, so that they understand the rationale for needing the stoma,

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Colon and Rectal Surgery in the Obese Patient; Guest Editor,

H. David Vargas, M.D.

Clin Colon Rectal Surg 2011;24:259-262. Copyright © 2011 by Thieme Medical Publishers, Inc., 333 Seventh Avenue, New York, NY 10001, USA. Tel: +1(212) 584-4662.

DOI: <http://dx.doi.org/10.1055/s-0031-1295689>.

ISSN 1531-0043.

its expected benefit and long-term functional outcome. In the elective setting, the trauma to the patient's psyche can be minimized by preoperative counseling with an enterostomal therapist and with other patients with a stoma in the area. Preoperative teaching can help alleviate much of the anxiety associated with the anticipated stoma and the patient will often have shorter length of stay and adapt more quickly to their stoma.^{12,13}

The creation of a stoma in the obese patient presents difficulties not encountered in patients of normal weight.¹⁴ The traditional sites may not be optimal for several reasons including body contour and abdominal wall thickness. In the elective situation, one has the option of evaluating the patient thoroughly and choosing the best site. Have the patient evaluated by a certified enterostomal therapist. Ask the therapist to mark sites both above and below the umbilicus so one can adapt to unanticipated intraoperative findings. In some cases, we must counsel the patient that although we would prefer to create a temporary diverting stoma (i.e., during restorative proctocolectomy for ulcerative colitis) their body habitus may make this so challenging that we may have to forgo the stoma and risk catastrophic complication. Another alternative is to perform a lesser procedure such as a total colectomy with end ileostomy or end loop ileostomy and then allow the patient time for weight loss before proceeding with restorative proctectomy and ileal pouch creation.

Intraoperative Techniques

While preoperative planning of the site of the ostomy has been shown to have the best possible outcome, there are emergent indications for colostomy and ileostomy that do not always allow for choosing the optimal site for an ostomy. In the emergent situation the need for a stoma is often the result of perforation and sepsis in the patient with diverticulitis or tumor. Other indications include obstruction or inflammatory bowel disease. In many of these situations preoperative planning is complicated by the distended abdomen and choosing the site of the stoma becomes more difficult. In addition, many of these patients are too sick to comply with the position changes required to accurately choose the best site for their stoma. Some patients are intubated and in critical condition and thus may not be able to be placed in the sitting position to assess for skin folding at the potential stoma site.

In these situations traditional surgical teaching for placement of the stoma should be the starting point. With that in mind one should look at the "ostomy triangle" for stoma location. The "ostomy triangle" is bounded by the anterior superior iliac spine, the pubic tubercle, and the umbilicus. One must attempt to place the stoma within the rectus muscle within this triangle as it has been shown to lend support to the stoma and

decrease the risk of stoma prolapse. In addition, placing the stoma five centimeters away from the incision, avoiding bony prominences such as the costal margin and anterior superior iliac spine, and significant skin folds is optimal so that a stomal appliance can stick to the skin.

These are the steps we take in most patients; however, the traditional ostomy triangle may not be the ideal location for a stoma in the obese patient. In the lower abdomen the obese patient may have a thicker abdominal wall secondary to a large panniculus. In the patient with a large panniculus the umbilicus can be displaced caudal and thus not truly reflect the position of the intra-abdominal organs.¹⁵ Regardless of the potential ostomy site, one must take into account the thickness of the abdominal wall and create an intestinal conduit of sufficient length to traverse the abdominal wall to create a well-vascularized stoma that sits sufficiently above the skin so that pouching is successful. In addition, many obese patients cannot visualize their lower abdomen due to the contour and size of their abdomen and thus would not be able to see the stoma in the lower abdomen to care for it. In this case one must consider placing the stoma in the upper abdomen. The upper abdomen above the umbilicus is often thinner than the abdomen below the umbilicus. The upper abdomen above the umbilicus becomes the ideal site as the patient is able to visualize the stoma and it is a more realistic trajectory of the patient's internal abdominal anatomy.

Often, reviewing the CT scan with an eye to measuring the subcutaneous fat in the abdominal wall both above and below the umbilicus can aid in choosing the site. In addition, place a radio opaque marker on the umbilicus and assess its relation to the anterior superior iliac spines and other bony landmarks of the abdomen on plain upright abdominal film. If the umbilicus is below the anterior superior iliac spine it will be a flag that the lower abdominal wall may fall below the abdominal cavity and thus not be a good location for a stoma.

We must also take time to consider the segment of intestine to be utilized to create the stoma and give this similar consideration to creating a conduit for an anastomosis. It may require more extensive mobilization of the colon in the obese patient to reach to abdominal skin than it would to create a tension-free anastomosis and thus one must often weigh the relative risk and morbidity in creating a stoma versus creating an anastomosis in this less than optimal situation. In the obese patient who is in need of an end sigmoid colostomy, one may have to mobilize the left colon as if creating a conduit for a colo-anal anastomosis so as to have adequate length to traverse the abdominal wall. This may require mobilization of the entire left colon including the splenic flexure with division of the inferior mesenteric artery and vein to achieve enough length with viable conduit to create a viable stoma. In this

situation the risk of anastomosis may be less than the risk of stoma complication and it may be best to proceed with an unprotected anastomosis.

Once an adequate conduit is created then we have to bring it through a thick abdominal wall. This is often the most difficult part of creating a stoma. Although the aperture in the abdominal wall may be increased so as to accommodate this large thick segment of bowel this may contribute to increased parastomal hernia rates. There are techniques that assist in bringing a thick fatty segment of bowel through a thick abdominal wall. One is the use of the Alexis disc wound protector as an aid to pulling the stoma through the anterior abdominal wall.¹⁶ The wound protector is placed through the aperture created for the stoma and rolled to compress the subcutaneous tissues and fascia. Pulling that segment of bowel through the wound protector is often easier than through the skin, subcutaneous tissue and fascia, as the wound protector can compact these tissues and one can use lubrication to facilitate pulling the bowel through the wound protector. Then once enough bowel is above the level of the skin the wound protector is cut and removed. This can help facilitate ostomy construction in the laparoscopic and open setting.

Another method to accomplish this in the open operation is to mobilize the skin and subcutaneous tissue off the fascia via the midline wound as one would do to expose the lateral abdominal wall for relaxation incisions. You must mobilize this flap until the stoma aperture has been entered medially. Then start first by bringing the segment of bowel one has chosen for the stoma through the fascia and pull the bowel through so that an adequate length is now in the subcutaneous fat that would allow a tension free segment to be above skin level. Then as a second step, bring this same loop of bowel through the subcutaneous tissue and out the skin aperture that was created for the stoma. Ideally, the ligation tie on the marginal artery should be at or above the level of the skin so that there is adequate blood supply to the cut end of the bowel. One can then tack the subcutaneous tissue back down to the fascia so that the midline wound does not communicate with the colostomy site. One potential complication is that if one develops distended bowel in the immediate post-operative period, a parastomal hernia may develop which can decompress into the midline wound and present as an acute evisceration.

In addition, if one is creating a temporary loop ileostomy in this fashion, one must be prepared that there may be significant adhesions to the midline wound in the subcutaneous tissue at the time of stoma closure and may increase the difficulty of the ostomy closure procedure. In these cases a formal laparotomy to close the temporary stoma may be necessary.

In the emergent situation, we are often focused on the issue at hand, however, we should take a moment to

consider future operations that may be necessary to reestablish bowel continuity. In the case of an obstructing rectosigmoid cancer or diverticulitis that involves the distal sigmoid or cul de sac, we should consider the best stomal option for the patient to increase the possibility of reestablishing bowel continuity in the future. In these situations, the creation of the colon rectal anastomosis with a protective diverting loop ileostomy may increase the likelihood that the ostomy is reversed in the future. In this case the second laparotomy carries less risk (i.e., closing a loop ileostomy) and avoids the potential morbidity of locating a low rectal stump with its attendant risk of bleeding, or injury to the bladder or nerves of sexual function.

PARASTOMAL HERNIA

Parastomal hernia is a significant complication of stoma creation and has been shown to occur more frequently in obese patients.¹⁷⁻²¹ While there is not standard agreement on the definition of parastomal hernia or its rate of complication, there is a body of literature looking at this now. Parastomal hernia rates are thought to be as high as 50% at one year in the general population and could potentially be higher in the obese population. There is growing evidence that suggests that parastomal hernia rates may be lower if mesh is placed around the stoma at the time of surgery.²²⁻³¹ These studies have relatively short follow up although one author has now followed his surviving patients for 5 years and the results remain promising.

The technique that is advocated is to place mesh in the retrorectus space at the time of primary stoma creation. A hole is cut in the mesh and the segment of bowel is pulled through the mesh and the mesh is placed in the retrorectal space. Suture fixation of the mesh is not universally utilized. Both polypropylene mesh and biologic mesh have been utilized and seem to have similar results and complication rates. There was no increase in peristomal infection or fistula formation. The parastomal hernia rates are 0-22% in the patients with mesh placed at index operation and 30-74% in patient where mesh was not placed at index operation. The follow up in these studies ranged from 6 months to 5 years. The mean BMI did not exceed 27 in any of the studies in which BMI was reported.

This is a relatively new technique and initial reports are promising. The limitations of these studies are that this technique has not been looked at specifically in the obese patient and the studies are small with limited follow up. There is not standardization of the definition of parastomal hernia and the techniques utilized to diagnose parastomal hernia. In addition, the mesh utilized and the technique for placing it has also not been uniform in all studies. In the face of the poor results traditionally reported for repair of parastomal

hernia, it is a promising technique and one that deserves more study.

In conclusion, the creation of a stoma in the obese patient presents many challenges. One must consider all factors including body contour, segment of intestine utilized, the potential risk of complication, and the possibility that bowel continuity may not be restored in these challenging patients. It is therefore in the best interests of our patients to create the best stoma at the time of their index operation so that the patient may have the most favorable outcome of their stoma.

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