Challenging Cases: Umbilical Hernia With Colon Cancer

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A 76-year-old man's case posed a number of significant challenges for one surgery team.

One of the more challenging cases encountered by our interdisciplinary surgical oncology and plastic and reconstructive surgery team involved a 76-year-old male with a 33-year history of an umbilical hernia who developed right-sided colon cancer. He had previously undergone three ventral hernia repair procedures, the most recent with permanent mesh, but had recurrence of the hernia with the majority of his abdominal contents within the hernia sac.

The patient had a history significant for hypertension, but no significant coronary artery disease or other comorbidities. Due to his colon cancer, he would require a right hemicolectomy, but the majority of his colon was contained within the hernia sac. This patient presented multiple significant challenges in achieving a closed abdominal wall after tumor resection. First, he had a long-standing hernia with significant loss of domain with his abdominal contents almost entirely within the hernia sac. Second, he would necessarily have a bowel suture line and a potentially contaminated field. Third, he had previously failed not one, but three attempts at hernia repair.

Repair of defects in patient with a loss of domain is addressed in our center with a components separation procedure.

The intra-abdominal volume is increased and the abdominal contents restored to their proper location without diaphragmatic elevation and abdominal compartment syndrome. The standard protocol involves bilateral external oblique releases combined with a direct supported repair of the midline with midweight uncoated polypropylene mesh. Although our surgical technique would not be altered for this case, polypropylene mesh is only placed in clean cases, not those with known risk for even minimal contamination or an intra-abdominal suture line that could fistulize. The second challenge brings up an area of intense debate. What supporting material can be used safely in the potentially contaminated field? This patient would undergo a standard bowel prep with meticulous care to prevent contamination during the right hemicolectomy, and antibiotic irrigation prior to separation of parts hernia repair. But this case cannot be classified as a clean case. There are several options, including suture repair alone without the standard “direct supported repair.” This particular patient was at extremely high risk for recurrence if no support was employed. Other options include placement of bioprosthetic mesh such as Strattice or Alloderm. Although frequently used in contaminated cases, it is expensive and can be difficult to remove should an infection develop.

Additionally, our experience has demonstrated that there is a significantly higher hernia recurrence rate for components separation procedures that utilize bioprosthetic mesh when compared to polypropylene mesh.

Synthetic mesh may achieve a more durable abdominal wall repair than bioprosthetic mesh, but has been considered contraindicated in many settings due to concerns over infection, bowel adhesion, and fistulae formation. Condensed fenestrated polytetrafluoroethylene (cPTFE) MotifMesh has several unique properties including non-adhesion and bowel compatibility that may facilitate its use in difficult clinical settings. Combining the durability of traditional synthetic mesh, efficient tissue integration, and minimal adhesion formation, fenestrated cPTFE was considered for this particularly difficult case. It is our experience that MotifMesh can be easily removed in the event that an infection develops. This is likely due to the smooth surface of the mesh, which reduces the surface area to 70% less than other commercially available synthetic mesh. Additionally, in a study analyzing biofilm development with Staphylococcus aureus, cPTFE demonstrated statistically significantly fewer adherent bacteria when compared to polypropylene, polypropylene/expanded PTFE, and polyester/polyethylene glycol and collagen hydrogel.

The third challenge of multiple previous failed hernia repairs drove the discussion between the patient and the surgical team. He wanted to undergo definitive hernia repair and to minimize his risk for future hernia recurrence.

For this reason, the patient and our team decided to proceed with components separation and direct supported repair with MotifMesh if the oncologic surgeon felt that the intraoperative contamination was minimal.

In the operating room, after the oncologic surgery team performed a right hemicolectomy with minimal to no contamination, the remainder of the hernia sac

was dissected away. Due to its large size, the hernia had neatly dissected the soft tissues away from the rectus fascia to reveal bilateral semilunar lines. The external oblique muscle and fascia was divided to create bilateral sliding myofascial rectus abdominis flaps. The medial edges of the rectus muscle were cleared of scar. At this point, the left and right rectus muscles could be manually approximated to this midline. MotifMesh was then brought into the field and trimmed to an 8-cm width from the xiphoid to the pubic bone. Interrupted prolene sutures were placed under direct visualization to secure the mesh in the preperitoneal plane. Quilting sutures between the dermis and the abdominal wall were employed to collapse the dead space left by the large hernia. A total of three drains were placed, all anterior to the muscle.

This patient had an uneventful post-operative course and was discharged on postoperative day five after return of bowel function. At his six month visit, he has no signs or symptoms of hernia recurrence or infection. He has no evidence of recurrent or persistent colon cancer.

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