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A case report



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How I do it: parastomal hernia repair and ventral post-incisional hernia repair using PCS/TAR. A case report

We present a medical case of a 61 year-old male patient who reported to the outpatient clinic with a parastomal hernia of 10 cm in diameter and a postincisional midline hernia of 15 cm in diameter. We emphasized that the patient had undergone surgery 4 years before for a rectal adenocarcinoma, in which we performed an abdominal perineal resection of the rectum with end colostomy. At the time of admission, there were no imagistic signs of local or distant relapse. The surgical technique used aimed to repair both of the abdominal defects by placing a large polypropylene mesh (30x30 cm) spanning into the retro-rectus space in a sublay position. On the colostomy side, the mesh is extended up to the median axillary line by performing TAR (transversus abdominis release), according to the technique described by Pauli, thus the colostomy side is not modified. The post-operative evolution was favourable, with the return of intestinal transit for faeces and gas on the second post-operative day. The patient was discharged on the 7th postoperative day, after the suppression of the over-prosthetic drainage.

KEY WORDS: Parastomal hernia, PCS/TAR

Introduction

Parastomal hernia (PH) is the most frequent complication that occurs after the formation of an ostomy (colostomy or ileostomy). As a definition, parastomal hernia is a type of hernia which appears in the vicinity of a stoma, a pathology wherein abdominal contents, of which more likely the bowel or greater omentum protrude through the abdominal layers, surrounded by the hernia sac at the location of the constructed stoma ¹.

Cosmin Lisencu, Emil Moiş, Florin Graur and Nadim Al Hajjar had equal contributions to the paper.

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There are different classifications of parastomal hernia, such as the ones proposed by Devlin (1973) ², Moreno-Matias (2009) ³, Seo (2011) ⁴ Szczepkowski (2011) ⁵. Some of the above are based on CT scan, others on physical examination or symptoms induced by the hernia, but none are universally accepted ⁵. Based on data available from the literature globally, the occurrence of parastomal hernia is reported as ranging between 1 and 50%, depending on the type of stoma ⁶: end colostomy 4 to 48.1%, end ileostomy 1.8 to 28.3%, loop colostomy 0 to 30.8%, loop ileostomy 0 to 6.2%. In terms of surgical procedures aimed to prevent parastomal hernias, a number of methods can be employed in corrective surgery, such as: simple corrective surgery, open technique with or without mesh, open technique with transposition of the stoma, laparoscopic approach with mesh reinforcement ^{7,8}.

Of note, the incidence of parastomal hernia recurrence is quite important, bothersome and very difficult to

repair. The various types of surgical approach are associated with a wide range of recurrence, as follows ^{6,9-12}: primary suture repair 69.4%, onlay mesh 17.2%, sublay mesh 6.9%, open Sugarbaker 15%, open Keyhole 7.2%, laparoscopic mesh Sugarbaker 11.6%, laparoscopic mesh Keyhole 11.6%, stoma transposition 35-70% at the location of the removed stoma.

In 2016, Pauli et al. ¹³ comes with a novel technique that provides the benefits of an open technique posterior component separation via transversus abdominis release (PCS/TAR), which includes the wide mesh overlap of two or more fascial defects, with the mesh located within the retromuscular plane, the stoma left in situ and a modified Sugarbaker technique.

Case Report

A 61 year-old male patient, under medical treatment for high blood pressure, who underwent surgery for a rectal adenocarcinoma pT3N0MxL1V0R0 in whom we performed an abdomino-perineal resection of the rectum with end colostomy in 2014, reported to the outpatient clinics at our Institute on December 6, 2018, accusing diffuse abdominal pain and the appearance of an abdominal bulge.

The physical examination exhibited obesity, with a body mass index of 32 and a waist circumference of 115 cm (he had gained approximately 10 kg in weight since the last surgery) and we discovered one parastomal hernia of 10 cm in diameter and one post-incisional midline hernia of 15 cm in diameter, both without incarceration, moderate pain and a positive Valsalva maneuver (Figs. 1 A, B).

Blood tests correlated with high blood pressure indicated a metabolic syndrome. Cardiopulmonary examinations were normal. The chest x-ray was normal as well. The abdominal US highlighted a hepatic hemangioma in segment V with a 10 mm diameter, simple biliary cysts of which the biggest had 19/14 mm in diameter and was located in segment VIII.

At the bulges' site, ultrasound revealed a large parastomal hernia with intestinal loops inside, complemented

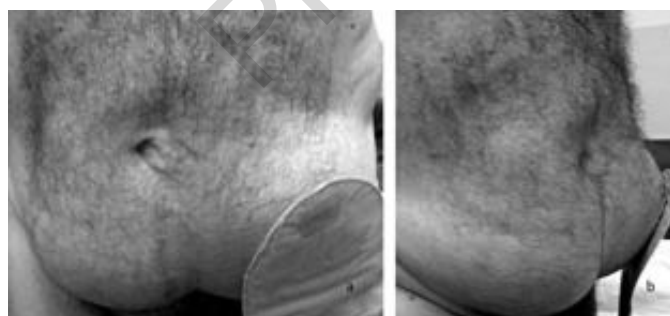


Fig. 1: A) Preoperative Anterior aspect; B) Preoperative Lateral aspect.

with a post-incisional midline hernia with omentum inside and intestinal loops, which according to Smietanski ⁵ classification is at grade IV (large parastomal hernia with coexisting midline incisional hernia, with front abdominal wall deformity). Preoperative investigations included a complete blood count, electrolytes' levels, coagulation tests and an EKG, revealing slight dehydration which had been remedied by the time of surgery. In this report, we have presented a successful open-technique repair of a parastomal hernia with coexisting midline incisional hernia using Pauli's et al. ¹³ approach.

SURGICAL TECHNIQUE

A full midline laparotomy incision is made and visceral adhesions to the anterior abdominal wall and pelvis are fully lysed. This is important to allow medial mobility of the posterior abdominal wall components. Hernia contents are reduced and the stoma is left in situ.

Using electrocautery, an incision is made in the posterior rectus sheath 0.5 cm lateral to the linea alba. This incision is extended superiorly and inferiorly, spanning the length of the rectus muscle. Utilizing blunt dissection, the plane is continued laterally to the linea semilunaris at the lateral border of the rectus muscle, where the anterior and posterior rectus sheaths fuse. Care is taken to preserve the stoma, the epigastric vessels on the posterior rectus abdominis muscle, and the intercostal neurovascular structures.

One-half cm medial to the linea semilunaris, the posterior rectus sheath is incised, exposing the transversus abdominis muscle. By dividing the muscle fibers them-

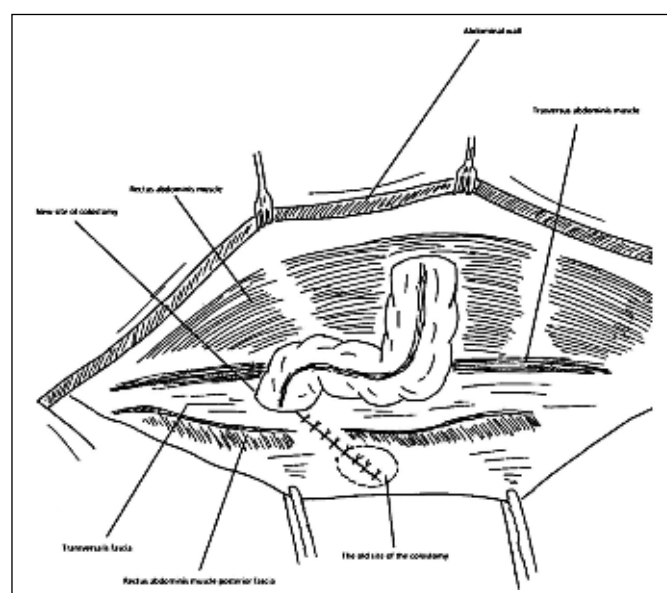


Fig. 2: Lateralization of the ostomy loop.

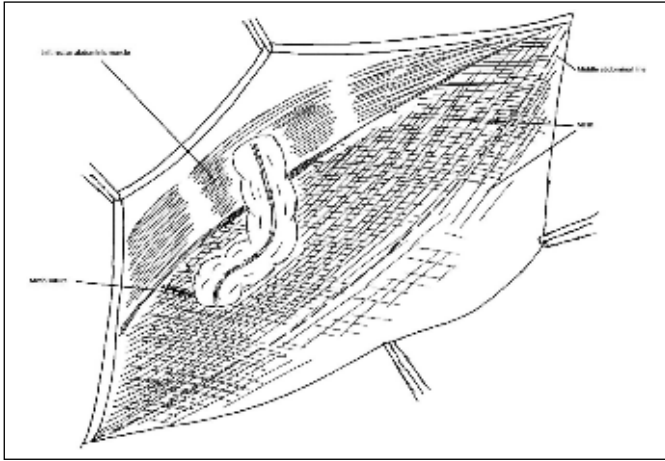


Fig. 3: The suture lateral to the mesh.

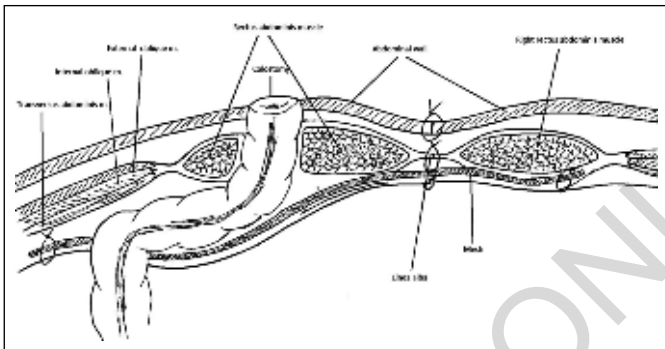


Fig. 4: Final aspect.

selves, TAR is accomplished, permitting entrance into the pre-peritoneal/transversalis fascia plane, which extends lateral beyond the linea semilunaris to the psoas muscle. Again, care is taken to preserve the intercostal neurovascular structures that enter the posterior rectus belly and to carefully work around the lateral boarder of the stoma. Next, the defect in the posterior sheath through which the stoma passes is extended far laterally with scissors. The bowel proximal to the stoma is subsequently delivered into the retromuscular plane and the posterior pre-peritoneal/transversalis fascia plane is closed from the now lateralized bowel to the medial defect from whence the stoma originated.

On the contralateral side, retrorectus dissection is performed. This provides a space for wide overlap of the mesh to across over the midline defect, thus midline hernia is resolved as well on a sublay manner¹⁴. The right and left posteriors layers are closed in the midline, recreating the visceral sac. Utilizing a trans-fascial suture passer, mesh is positioned in the retro-rectus space in a sublay position in a fashion similar to a modified Sugarbaker parastomal herniorrhaphy. Laterally, the mesh is placed around the bowel by creating a hole in the mesh for

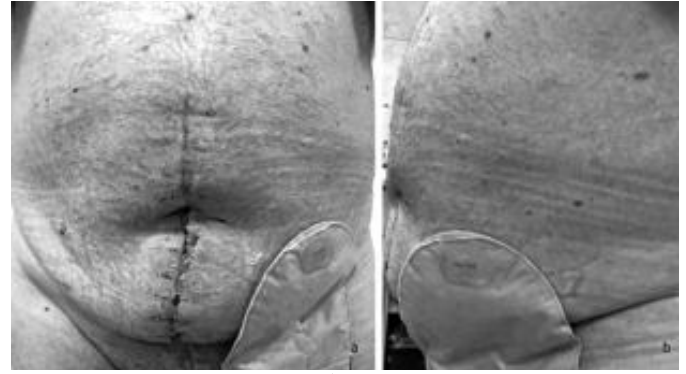


Fig. 5: A, B) One month postoperative aspect.

the ostomy loop and then sutured the mesh laterally (Fig. 3). Medially, the mesh is extended to the contralateral linea semilunaris to provide full reinforcement of the midline. With the mesh circumferentially secured (Fig. 3), the parastomal defect can be closed primarily before the linea alba is recreated by suturing the anterior rectus sheaths to one another in the midline. The subcutaneous tissues are closed in layers with absorbable suture and the skin closed with staples (Fig. 4).

Results

Our patient underwent a surgical intervention guided by Pauli's technique for parastomal hernia with coexisting post-incisional midline hernia. Following a thorough pre-operative preparation, the surgery was performed under general anesthesia, and involved the cure of the parastomal hernia and the post-incisional midline hernia, by using a retromuscular dissection with a posterior component separation via transversus abdominis release. The post-operative evolution was favorable, with the return of intestinal transit for feces and gas on the second post-operative day, and the administration of food on the first post-operative day. The surgical wound had a positive evolution and was cleansed and bandaged daily, without any post-operative complications. During the patient's hospitalization, he was subjected to two control abdominal ultrasound examinations, yielding a negative result for intraabdominal collections or hematoma, seromas or abscess in the abdominal wall. The patient was discharged after 6 days of hospitalization. In the post-operative phase, during the one-month check-up, an abdominal ultrasound revealed no post-operative or recurrent complications of the two hernias. The patient was tracked for 6 months after surgery (Figs. 5 A,B).

Discussion

The recurrence rates after PH repairs vary widely with the highest were being after primary suture repair with-

out mesh ranging from 46 to 100%^{9,10,12,15,16}. Recurrence rates after PH repairs involving mesh are somewhat more favorable with rates ranging from 6.9 to 17 %⁷.

Raigani et al. recently reported their experience with stoma relocation, posterior component separation via transversus abdominis release, and retromuscular mesh placement during 48 PH repairs¹⁷. With a mean follow up of 13 months, 11 % of patients had recurrences occurring at the location of the cruciate mesh incision made to accommodate the ostomy. Of note, nearly 70 % of their patients had concomitant midline hernias.

Regarding the results published by Pauli et al. he underwent this repair on three patients (one female, average age 51.3 years, average body mass index of 33.5 kg/m², average American Society of Anesthesiologists class 2.7). One patient had prior PH repair. Two patients had concomitant ventral hernias. The average combined (parastomal and ventral when present) defect size was 187 cm² (range 48-474 cm²). Two patients had end colostomies, one following abdomino-perineal resection for rectal cancer, and the other as the result of an anastomotic leak after low-anterior resection for colon cancer. One patient had an end ileostomy following total abdominal colectomy for ulcerative colitis and underwent a completion proctectomy during PH repair. All patients underwent repair with intermediate-weight polypropylene mesh. The average length of stay was 5.7 days (range 5-6). There were no wound-related postoperative complications. One patient had urinary retention requiring Foley catheter insertion. Average follow up time was 160 days (range 60-300). There were no stoma related complications, mesh erosions, or obstructions. Routine imaging at 1 month demonstrated no seromas or hernia recurrences³.

Sustaining the TAR procedure, there is another article by Novitsky YW et al.¹⁸ in which they performed this surgery in 42 patients with massive ventral defects between the end of 2006 till the end of 2009. Thirty-two (76.2%) patients had recurrent hernias. The average mesh size used was 1,201 ± 820 cm² (range, 600-2,700). Secondary 10 (23.8%) patients develop wound complications and in 3 patients reoperation or debridement was necessary. At a median follow-up period of 26.1 months, there have been 2 (4.7%) recurrences.

To quote other results based on Oprea V et al.¹⁹ research, between November 2014 and July 2016 they used TAR in 24 patients (14 males) with large median ventral incisional hernias. The recurrence in various degrees was present in 18 patients (75%). The average size of the defect was 18,3 cm. in width (12 to 28 cm). Five patients (21%) developed various wound complications requiring reoperation. After a median follow-up of 11,8 months without recurrence concluding that TAR seems to be the "ideal" approach for complex hernias with good immediate outcomes.

Furthermore, another research²⁰ in which Pauli is author stating that TAR technique is reliable and durable, with

a 5 percent recurrence rate at 2 years. Although wound complications occur with a frequency similar to that of other techniques, they tend to be less severe, rarely requiring operative debridement. The technique is applicable to a broad range of hernias, including midline, flank, subcostal, parastomal, and recurrent hernias after prior component separations being associated with a low perioperative morbidity and a low recurrence rate.

Overall, TAR release may be an important addition to the armamentarium of surgeons undertaking major abdominal wall reconstructions.

Conclusion

This technique ensures an open approach with PCS/TAR based on setting a wide retromuscular mesh, which can overlap coexisting parietal defects (parastomal hernia, midline incisional hernia). Moreover, this approach includes the Sugarbaker technique which was modified, as specified by Pauli, by lateralizing the bowel retro-muscularly, not intraperitoneally, (as the original technique says) despite we preferred to do a keyhole to the mesh, which is different from the Pauli's technique where he just placed the mesh in a sling around the bowel. Another benefits of this technique is the fact that it leaves the stoma in situ, avoiding complications that occur at the level of the disbanded stoma and the risk for mesh contamination. As follows from the above, this innovating technique comes to the aid of the other techniques to eliminate the relapse and postoperative complications.

However, this novel approach is technically difficult, requires advanced knowledge of abdominal wall anatomy and is advisable to be performed by an experienced surgeon.

Riassunto

Presentiamo il caso di un paziente di 61 anni portatore di un'ernia para-stomale di 10 cm di diametro e un laparocèle mediano di 15 cm di diametro che si è rivolto al nostro ambulatorio. Si trattava dell'esito di un intervento di resezione addomino-perineale di un cancro del retto risalente a 4 anni prima, con colostomia definitiva. Al momento del ricovero non c'erano segni di recidiva locale o metastasi a distanza.

La tecnica chirurgica utilizzata è stata finalizzata a riparare entrambi i difetti della parete addominale con il posizionamento di una grande rete di polipropilene (30x30 cm) disposta nello spazio creato dietro i muscoli retti. Sul lato della colostomia, la rete viene estesa fino alla linea ascellare media eseguendo il piano del muscolo trasverso dell'addome secondo la tecnica descritta da Pauli, senza modificare la colostomia. L'evoluzione postoperatoria è stata favorevole, con il ritorno del transito

intestinale per feci e gas il secondo giorno post-operatorio. Il paziente è stato dimesso il 7° giorno postoperatorio, dopo la soppressione del drenaggio posto al di sopra della protesi.

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