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VIDEO FORUM

Laparoscopic prosthetic parastomal and perineal hernia repair after abdominoperineal resection

G. Dapri[1,2] · L. Gerard[1] · L. Cardinali[1] · D. Repullo[1] · I. Surdeanu[1] · S. H. Sondji[1] · G.-B. Cadière[1] · S. Saussez[2]

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Introduction

Abdominoperineal resection (APR), described since 1908 [1], is a procedure performed for low rectal cancer when sphincter preservation is not feasible. Patients who undergo this procedure can present some late complications, like parastomal and perineal hernias.

Parastomal hernia (PSH) is an incisional hernia located at or immediately adjacent to a stoma, reported with an incidence of up to 76% of patients with a stoma, usually occurring within 2 years of ostomy creation, but sometimes up to 20 or 30 years after surgery [2]. It is related to increasing age, abdominal obesity, poor nutritional status, corticosteroid use, increased intraabdominal pressure, and other predisposing disorders. Laparoscopy permits a more precise repair, and the preferred options are currently the Sugarbaker/modified Sugarbaker or "sandwich" techniques instead of the keyhole technique [3]. The results of PSH repair have been disappointing, with reported recurrence rates of 30–76% after local aponeurotic repair, stoma relocation, and laparoscopic repair, with, probably, the need for mesh placement at the time of stoma formation [4].

Perineal hernia (PH) is a defect between the levator ani and the coccygeus muscles, which occurs in <1–3% of patients [5–7]. It can be classified as primary (congenital or due to laxity in the pelvic floor musculature) or secondary (after APR, extralevator APR, pelvic exenteration). Secondary postoperative perineal hernia is usually asymptomatic, but it can cause discomfort while sitting, skin erosion over the herniated sac, intestinal obstruction, difficult micturition secondary to herniation of the urinary bladder or evisceration. PH occurs more frequently in female patients due to the conformation of the small pelvis, to the frequency of preexisting prolapses, and to pelvic floor fragility associated with pregnancy and parturition [5]. Other possible risk factors are previous hysterectomy, coccygectomy, preoperative pelvic radiation, long small-bowel mesentery, perineal wound infection, and non-closure of the pelvic peritoneum at the time of rectal surgery [8]. Surgical repair can be through the abdomen, through the perineum or combined.

In a patient presenting both PSH and PH, simultaneous open abdominal repair requires a quite large incision to get access to the abdomen as well as to the pelvis. Another option is to separate the open abdominal access for PSH from the open perineal approach for the PH. On the other hand, abdominal laparoscopy offers a good solution because both repairs can be performed using the same trocars disposition. Moreover, laparoscopic repair can add the known advantages of minimally invasive surgery like shorter hospital stay, reduced wound infection rate, improved patient comfort, and better cosmetic results.

The authors report a 74-years-old female, with a 30.3 kg/m^2 body mass index, with episodes of intestinal occlusions following a procedure of open APR, performed 6 years before for rectal adenocarcinoma (pT2N0M0).

Electronic supplementary material The online version of this article (doi:10.1007/s10151-016-1573-9) contains supplementary material, which is available to authorized users.

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✉ G. Dapri
giovanni@dapri.net

[1] Department of Gastrointestinal Surgery, European School of Laparoscopic Surgery, Saint-Pierre University Hospital, Université Libre de Bruxelles, 322, Rue Haute, Brussels, Belgium

[2] Laboratory of Anatomy, Faculty of Medicine and Pharmacy, University of Mons, Mons, Belgium

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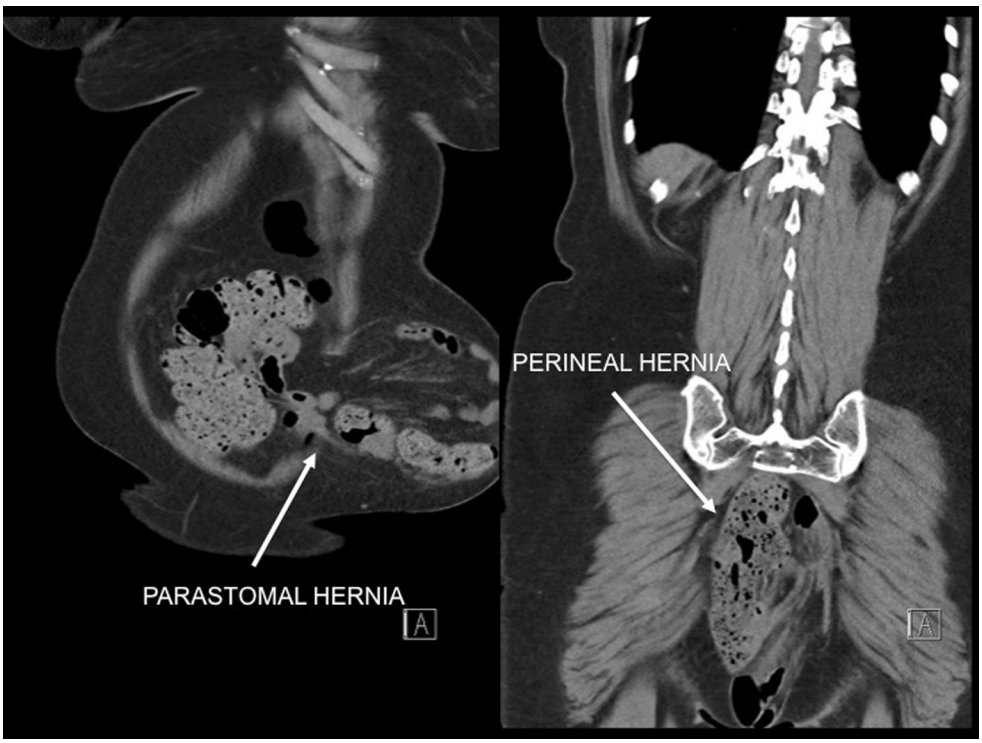

Fig. 1 Preoperative abdominopelvic computed tomography scan

Preoperative work-up, including positron emission tomography (PET)–computed tomography (CT), was negative for tumor recurrence. Abdominopelvic CT scan showed a PSH with migrated bowel loops and a PH with transposition of the cecum and small bowel loops into the pelvis (Fig. 1). A laparoscopic treatment by double dual-face prosthesis was proposed and showed in the correspondent video.

Technique (with video)

An incision in the right flank was performed, and the peritoneal cavity was reached by opening the abdominal wall plane by plane. An 11-mm reusable trocar was introduced, and pneumoperitoneum was created. Two 5-mm trocars were inserted in the right hypochondrium and in the right iliac fossa. A 10-mm, 30° rigid and standard length scope was used. The operative room table was positioned in a right-sided tilt. The PSH was identified, and the viscera that had migrated (greater omentum and small bowel loops) were retrieved. Once the hernia edges were freed from adherences, the defect was measured intracorporeally by a tape, introduced through the 11-mm trocar (Fig. 2a). The defect appeared to be 6 cm craniocaudally and 4 cm latero-laterally. The defect was firstly repaired by two figures of eight sutures using Polypropylene 1 (Fig. 2b). Extracorporeal knots (Fig. 2c) helped in the suture closure and in shortening the operative time. Once closed, the defect was reinforced by placement of a dual-face mesh of 15 cm in length and 10 cm in width (Surgimesh XB, Aspide Medical, Saint-Etienne, France). The mesh was rolled tightly and inserted into the abdominal cavity through the 11-mm trocar. The mesh was open and placed against the abdominal wall according to the Sugarbaker technique [9]. The mesh was fixed to the abdominal wall by tacks (Sorbafix, Bard Davol Inc., Warwick, RI, USA), covering the closed defect (Fig. 2d).

Subsequently, the procedure continued with the PH repair. The operative room table was maintained in the right-sided tilt, and the Trendelenburg position was adopted. A percutaneous suture, improving the pelvic exposure, temporally retracted the uterine fundus. The cecum and the right colon that had migrated into the pelvis were retrieved. An adhesiolysis between the small bowel loops and the pelvic peritoneal sheet was performed. The superior pelvic opening was measured by an intracorporeal tape (Fig. 3a, b), and it appeared to be 7 cm latero-laterally and 8 cm anteroposteriorly. A dual-face circular mesh 10 cm in diameter (Surgimesh XB, Aspide Medical) was chosen and inserted into the cavity through the 11-mm trocar. The mesh was fixed to the superior pelvic opening by two converging Polypropylene 2/0 running sutures (Fig. 3c, d). The procedure ended with removal of the uterine percutaneous suture, covering of the perineal prosthesis by a piece of greater omentum and reassessment of the small bowel loops under control.

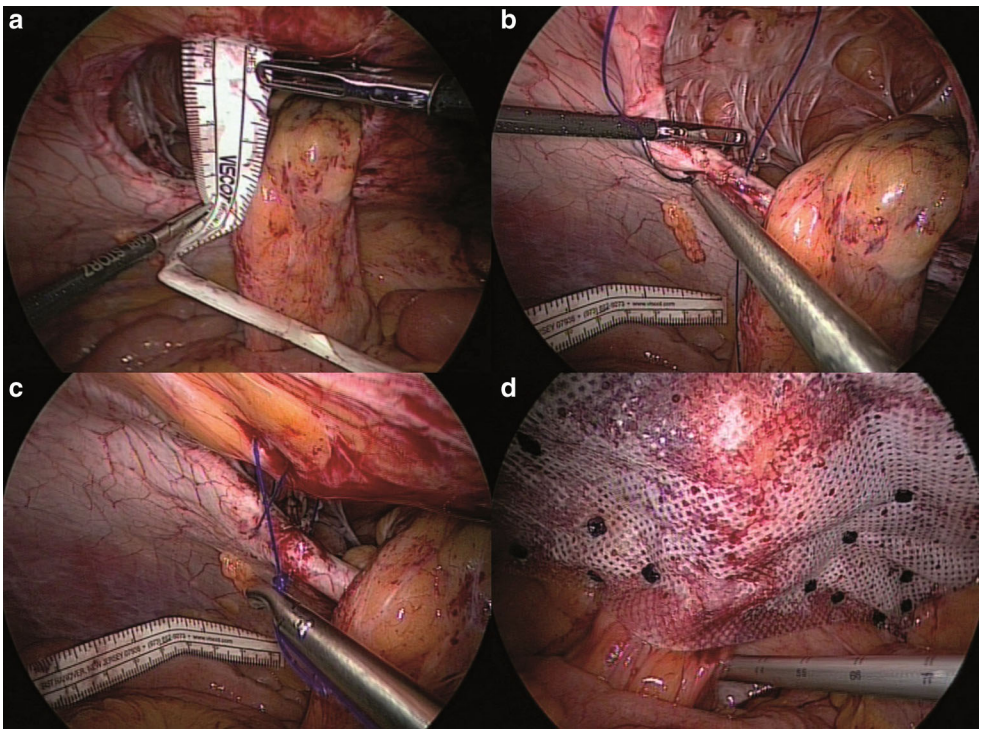

Fig. 2 Parastomal hernia: exposure (**a**), defect closure by figure of eight sutures (**b**, **c**), final result (**d**)

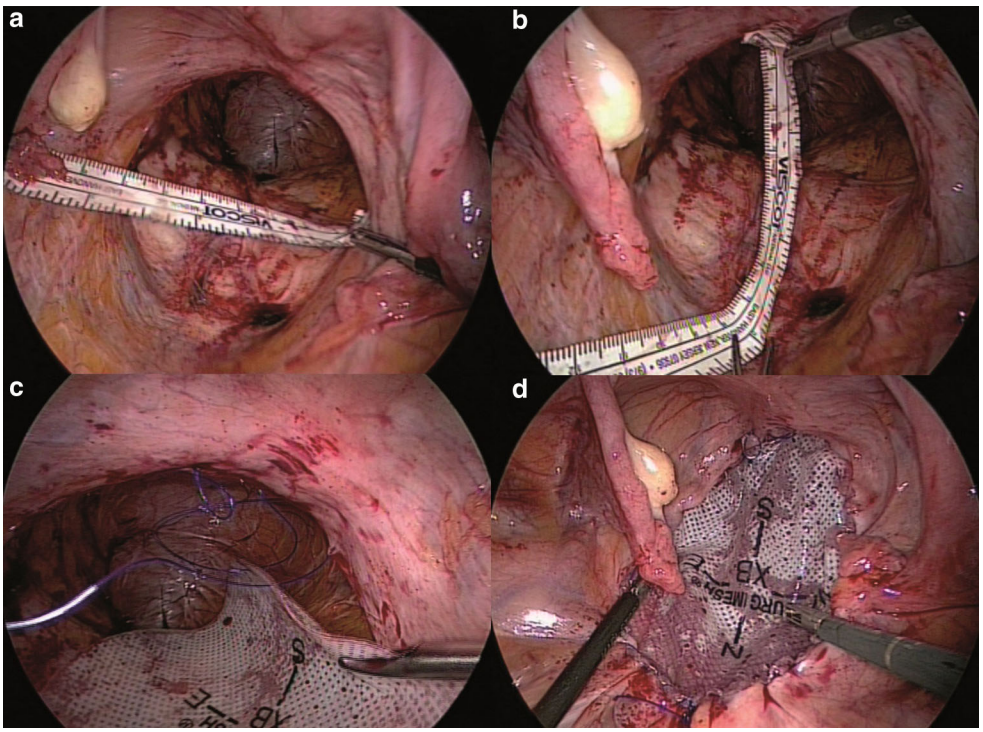

Fig. 3 Perineal hernia: superior opening of the pelvis (**a**, **b**), mesh fixation by two converging running sutures (**c**), final result (**d**)

Results

Operative time for PSH was 72 min and for PH 95 min. Intraoperative bleeding was insignificant. The postoperative course was uneventful, and the patient was discharged on the 3rd postoperative day. At follow-up visits, the patient was doing well, without signs of recurrence at 1 year.

Discussion

Simultaneous treatment of PSH and PH by laparoscopy allowed the repair of both defects with the same trocars placement and avoided large abdominal incisions, in the abdomen as well as in the perineum. Moreover, thanks to laparoscopy, both defects were clearly seen and precisely measured. Measurements were performed intracorporally using a tape because we considered this technique more appropriate to estimate the defect. Under direct vision, it was also possible to remove the viscera that had migrated into both defects and to control organ vitality. As regards PH, the superiority of a specific type of repair has not been demonstrated because few surgeons have had experience with more than 1 or 2 PH patients [6]. It is fundamental to follow the principles of hernia repair, like the identification of the sac and defect, removal of the contents, use of tension-free mesh repair, and fixation to the healthy tissue [7].

Treatment of PSH consisted of the closure of the defect, followed by the placement of the prosthesis as described by Sugarbaker [9]. The defect was closed using figure of eight sutures and extracorporeal knots. This technique permitted to save time, to avoid the skin punctures around the stoma with the transfascial sutures, and to eliminate the risk of suture infection because no cutaneous sutures were placed close to the stoma. As recommended, the mesh was applied with overlapping between the mesh and the edges of the defect (before the defect closure) of 4.5 cm craniocaudally and 3 cm latero-laterally.

Treatment of PH was performed through the abdomen because the trocars placed for the PSH repair could also be used for safe pelvic adhesiolysis and removal under direct vision of the viscera that had migrated. This was probably the main advantage of the abdominal approach over the perineal approach in PH repair, because with access through the perineum, vision and the exposure are worse and the risk of iatrogenic enterotomy is higher [5]. Moreover, the abdominal approach makes it possible to confirm the absence of cancer recurrence. Another technical option was to cover the levator ani with a prosthesis and to remove the excess perineal skin with reapproximation of the remaining muscles [7], but we did not make any perineal incisions or sutures to avoid potential complications. With the technique reported here, the perineum was excluded by the mesh placement at the superior opening of the pelvis and the potential side effect was the patient discomfort due to excess skin, but this symptom was not reported during the follow-up consultations. Technically, the mesh was fixed around the superior opening of the pelvis by 2 converging running sutures and not by tacks, because the sutures could be placed with better control in regard to peripheral structures (ureters). Obviously a dual-face prosthesis had to be adopted to prevent adhesions and consequent episodes of occlusion.

Our operative time was acceptable. It was influenced by the surgical learning curve in performing intracorporeal sutures and by the patient's adhesions from the previous rectal surgery.

Our patient was discharged after 3 days, ambulating, tolerating a regular diet, and with a fully functional ostomy, like other authors have reported [5, 7].

Follow-up of these patients is absolutely necessary because the PSH recurrence has been reported in up to 76% of patients [4] and PH disruption with hernia recurrence in up to 15.8–37% [6, 8]. In order to check for hernia recurrence and other possible complications, the clinical examination of the patient has to be followed by abdominal CT scan in case of doubt.

Conclusions

Prosthetic PSH and PH repair can be performed at the same time by laparoscopy with the same trocars positioning, adding the advantages of minimally invasive surgery and avoiding large laparotomy.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent Informed consent was obtained from all individual participants included in the study.

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