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## Laparoscopic repair with cone-shaped mesh implantation for perineal hernia occurred after laparoscopic abdominoperineal resection

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## ABSTRACT

**INTRODUCTION:** Perineal hernia after abdominoperineal resection (APR) is a rare complication, and no standard surgical procedures are established. We describe a simple laparoscopic mesh implantation technique utilizing a large synthetic flat mesh.

**PRESENTATION OF CASE:** We report a case of perineal hernia after APR. We performed laparoscopic repair using a soft and large synthetic mesh with simple technique. The essence of this technique is that mesh is inserted into the abdominal cavity without trimming and it forms in a conical shape to better adjust to the pelvic cavity.

**DISCUSSION:** The perineal and laparoscopic approaches for perineal hernia repair have been performed most commonly in recent years, but the recurrence rate after repair remains high (24.1%). Using a large mesh could cover the hernial orifice with a sufficient margin, reducing a risk of recurrence caused by shrinkage and slippage of the mesh.

**CONCLUSION:** Our technique utilizing a large, lightweight, synthetic mesh can be practical and useful for perineal hernia repair after laparoscopic APR.

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## 1. Introduction

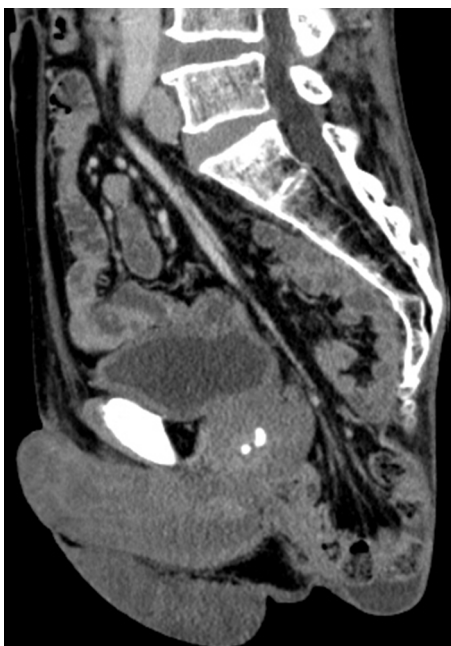
The reported incidence of secondary perineal hernia occurring after abdominoperineal resection (APR) of the rectum is 1%–13% [1]. Some repair approaches have been described for secondary perineal hernia including the perineal, laparoscopic, open abdominal, laparoscopic perineal, and open abdominoperineal approaches [2]. Although the current major approaches were the perineal or laparoscopic approach with a mesh, these approaches are technically demanding because of the complexity of the procedures. The technique of perineal hernia repair varies, and the simple repair method has not been established. Furthermore, the recurrence rate after repair remains high (24.1%) [2]. We report a case of perineal hernia after laparoscopic APR and describe a simple laparoscopic mesh implantation technique utilizing a large synthetic flat mesh.

This case report is in line with the SCARE criteria [3].

## 2. Presentation of case

A 63-year-old man underwent laparoscopic APR for lower rectal cancer. There were no postoperative complications. The postoperative pathological diagnosis was T3pN1aM0, Stage IIIB (Union for International Cancer Control [UICC] 7th edition). Adjuvant chemotherapy was administered to the patient. Six months after the surgery, the patient complained of perineal swelling and pain. Computed tomography (CT) showed the small intestine protruding through the pelvic floor into the perineal area (Fig. 1), and the diagnosis of perineal hernia was made. After adjuvant chemotherapy, laparoscopic repair with a large synthetic mesh was performed. The patient was placed in a lithotomy position under general anesthesia, a 12-mm port was placed above the umbilicus with optical technique, and a pneumoperitoneum was established. There was no adhesion in the abdominal and pelvic cavity. Two 5-mm ports were added in the right lower quadrant and right flank region, avoiding the left side with a colostomy. The hernial orifice was identified at the bottom of the pelvic floor using a flexible scope, and the size was 3.5 × 5 cm. As the hernial orifice was located in a very deep place in the narrow pelvis, it was challenging to fix the mesh to the pelvic floor (Fig. 2). Therefore, to cover the pelvic cavity sufficiently, we used a soft synthetic mesh, an oval Ventralight™ ST mesh (Davol Inc., Subsidiary of C.R. Bard, Inc. Warwick, RI) of 15.2 × 20.3 cm. The mesh was inserted into the abdominal cavity

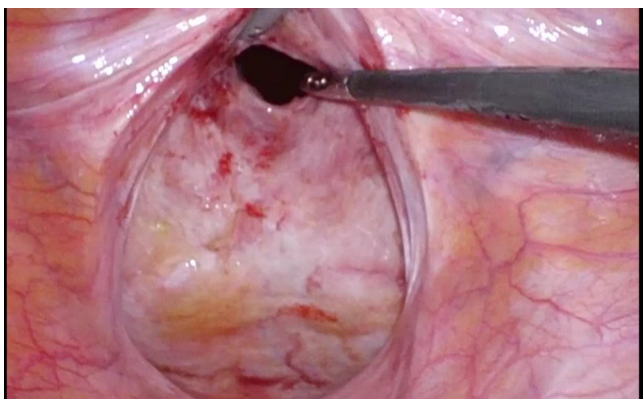
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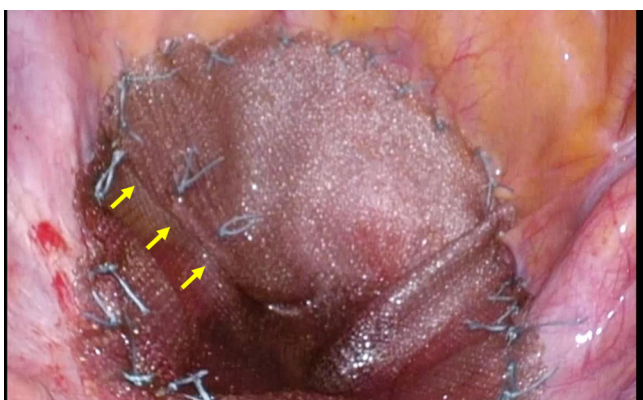
**Fig. 1.** Preoperative CT shows the protrusion of the small bowel through the pelvic floor into the perineal region.



**Fig. 4.** CT after 3 months from surgery shows the seroma in the perineal region and no recurrence of perineal hernia. Arrows show the hernial orifice.



**Fig. 2.** Laparoscopic view of the pelvic cavity. A part of the hernial orifice was slightly visible by lifting the bladder.



**Fig. 3.** Mesh covering the pelvic cavity. Arrows show the folded part of the mesh.

without trimming and expanded in the pelvic floor. One portion was then folded into a conical shape to better adjust to the pelvic cavity. The mesh was fixed circumferentially to the pelvic wall with a nonabsorbable interrupted suture (Fig. 3). The operative time

was 180 min with minimal blood loss. The patient was discharged on postoperative day 5 without any complications. Postoperative symptomatic seroma developed but was reabsorbed after 4 months of observation with no intervention. Thirteen months after the repair, there was no hernia recurrence based on both CT and physical examination (Fig. 4).

### 3. Discussion

Perineal hernia after APR is a rare complication, and no standard surgical procedures are established. According to a recent systematic review, a perineal hernia repair was performed using the perineal approach in 69%, laparoscopic approach in 23%, and open abdominal approach, laparoscopic perineal approach, and open abdominoperineal approach in a few percent. The perineal and laparoscopic approaches have been performed most commonly in recent years [2]. We performed the laparoscopic repair of the secondary perineal hernia following APR with cone-shaped mesh implantation. The mesh implantation is anatomically difficult to cover the hernial orifice that is typically located at the base of the pelvic cavity in this type of hernia. Moreover, the mesh fixation is also challenging due to considerations for preventing injuries to major pelvic nerves and vessels. Taking above considerations into account, our technique has several advantages. Using a large mesh could cover the hernial orifice with a sufficient margin, reducing a risk of recurrence caused by shrinkage and slippage of the mesh. Cone-shaped implantation by folding a mesh can be well fitted at the base of the pelvic cavity without the necessity of trimming the mesh before implantation (Fig. 5). When fixing the mesh to the peritoneum with suturing, careful attention should be paid in preventing injuries to nerves, vessels, and ureters. Our procedure can

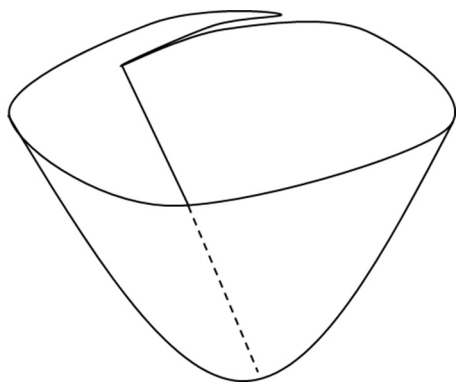


Fig. 5. A schema of a cone-shaped mesh.

be applied with minimum visualization of the deep hernial orifice. While the perineal approach might have a difficulty of bowel reposition and potential risk of organ injury, the laparoscopic approach has several advantages including better visualization, easier reposition of hernia contents, and secure mesh fixation. There has been some reports [4,5] of perineal hernia repair with the laparoscopic approach, in which a mesh covered the hernial orifice directly and was fixed to the levator ani muscle and sacrum by sutures and/or tacks. In this procedure, however, there seems to be insufficient overlap of the hernial orifice, and there can be a risk of recurrence. The same situation could occur in the perineal approach. The guidelines of International Endohernia Society (IEHS) recommend that the mesh should overlap the hernial orifice by at least 3 or 4 cm in all directions in the laparoscopic treatment of ventral and incisional wall hernias. Goedhart-de Hann et al. [6] reported 12 patients who underwent repair with cone-shaped 10 × 15 cm mesh, but 3 of them had recurrence. The authors considered that the way of mesh trimming was caused by recurrence. In this point of view, our technique could overcome the disadvantages of previous reports. In the present case, we performed laparoscopic repair with a large synthetic mesh that is mainly used for incisional hernia. As this mesh is highly flexible, it meets required features for covering a complex hernial orifice with sufficient overlap width. Initial laparoscopic surgery for rectal cancer might minimize postoperative bowel adhesions in the pelvic cavity. Therefore, the laparoscopic approach can be an option for perineal hernia repair.

#### 4. Conclusion

Our technique utilizing a large, lightweight, synthetic mesh can be practical and useful for perineal hernia repair after laparoscopic APR.

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There is no funding for the case report.

#### Ethical approval

A case report is exempt from ethical approval in our institution.

#### Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

#### Author contribution

All authors have contributed significantly in this case. The first author have performed the surgery and rest of the authors helped in collecting data, designing, organizing to write the manuscript.

#### Registration of research studies

Non applicable.

#### Guarantor

Koichi Teramura.

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#### Conflicts of interest

The authors have no conflicts of interest to declare.

#### References

- [1] G.D. Musters, C.J. Buskens, W.A. Bemelman, P.J. Tanis, Perineal wound healing after abdominoperineal resection for rectal cancer: a systematic review and meta-analysis, *Dis. Colon. Rectum* 57 (2014) 1129–1139.
- [2] A. Balla, G. Batista Rodríguez, N. Buonomo, C. Martinez, P. Hernandez, J. Bollo, et al., Perineal hernia repair after abdominoperineal excision or extralevator abdominoperineal excision: a systematic review of the literature, *Tech. Coloproctol.* 21 (2017) 329–336.
- [3] R.A. Agha, A.J. Fowler, A. Saeta, I. Barai, S. Rajmohan, D.P. Orgill, The SCARE statement: consensus-based surgical case report guidelines, *Int. J. Surg.* 34 (2016) 180–186.
- [4] M. Casasanta, L.J. Moore, Laparoscopic repair of a perineal hernia, *Hernia* 16 (2012) 363–367.
- [5] J.L. Dulucq, P. Wintringer, A. Mahajna, Laparoscopic repair of postoperative perineal hernia, *Surg. Endosc.* 20 (2006) 414–418.
- [6] A.M. Goedhart-de Haan, B.S. Langenhoff, D. Petersen, P.M. Verheijen, Laparoscopic repair of perineal hernia after abdominoperineal excision, *Hernia* 20 (2016) 741–746.

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