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Case Report

Hybrid Laparoscopic and Anterior Approach for Postsurgical Inguinal Hernia After Iliofemoral Arterial Bypass

Tomoya Tsukada[1,2], Hiroto Saito[1], Koji Amaya[2], Itsuro Terada[2], Masahide Kaji[2], Koichi Shimizu[2]

[1]*Department of Gastroenterologic Surgery, Division of Cancer Medicine, Graduate School of Medical Science, Kanazawa University, Kanazawa, Japan*

[2]*Department of Surgery, Toyama Prefectural Central Hospital, Toyama, Japan*

Laparoscopic hernia repair has become popular due to its rapid recovery time, fewer postoperative complications, and less chronic pain compared with conventional approaches. Currently, laparoscopic hernia repair is also used for more complex pathogenesis, including extra-anatomic bypass surgery for femoral artery. To the best of our knowledge, cases of inguinal hernia after femoral arterial bypass are extremely rare. We report the case of a 77-year-old Japanese man who was diagnosed with inguinal hernia after a previous left external iliac artery–right common femoral artery bypass. We used a hybrid laparoscopic and anterior approach, and the procedure was completed successfully without perioperative complications. A laparoscopic approach is useful for the diagnosis and treatment of inguinal hernia after extra-anatomic bypass surgery for femoral artery. While complicated, the addition of anterior reinforcement should be considered in cases of insufficient preperitoneal repair using transabdominal preperitoneal patch plasty.

Key words: Laparoscopic surgery – Inguinal hernia – Hernia repair – Arterial bypass – Femoral artery

Inguinal hernia is a common medical condition and its repair is one of the most common elective operations in general surgery. Regarding surgical repair, tension-free techniques such as the Lichtenstein method, are widely accepted, and have led to a decreased recurrence rate.[1] Furthermore, laparo-

Corresponding author: Tomoya Tsukada, MD, PhD, Department of Gastroenterologic Surgery, Kanazawa University, 13-1 Takara-machi, Kanazawa, Ishikawa 920-8641, Japan.
Tel.: 81 76 265 2362; Fax: 81 76 234 4260; E-mail: tkd_tmy@staff.kanazawa-u.ac.jp

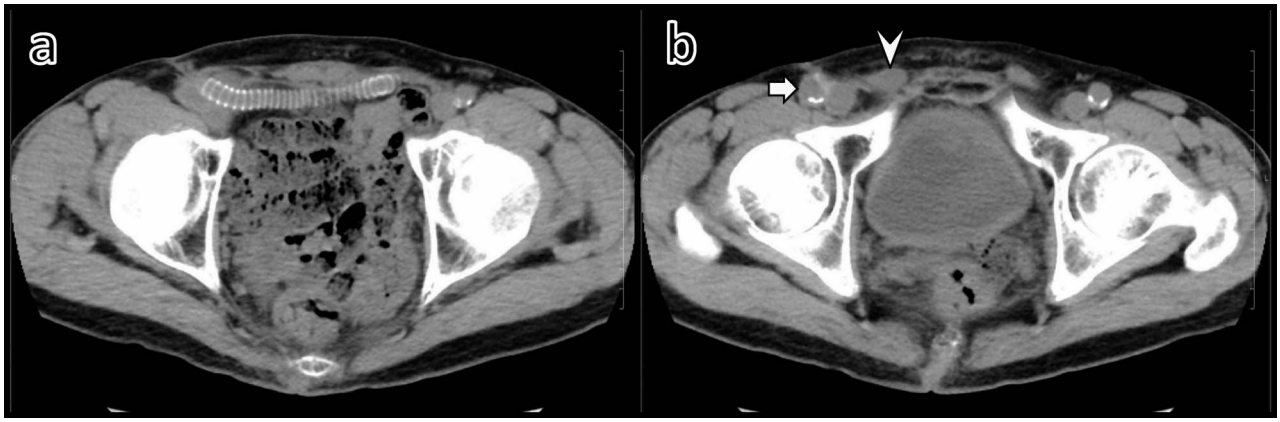

Fig. 1 Computed tomography. (a) The right femoro- left iliac bypass graft in the preperitoneal cavity. (b) The soft tissue density in the subcutaneous right groin (arrowhead) and arterial bypass anastomosis (arrow).

scopic hernia repair has also become popular due to its rapid recovery, fewer postoperative complications, and less chronic pain compared with conventional approaches, with similar recurrence rates.[2,3] Currently, various procedures have been developed and their usefulness has been widely reported. Accordingly, hernia repair is also used for more complex pathogenesis such as laparoscopic inguinal hernia repair after radical prostatectomy.[4] Interestingly, even if there is a preperitoneal surgical history, laparoscopic hernioplasty can be safely performed.

Extra-anatomic bypass surgery for femoral artery is also a difficult situation from the viewpoint of surgical modification to the groin area. To the best of our knowledge, reports of inguinal hernia after femoral arterial bypass are limited,[5] and a systematic study has not been performed and a recommended procedure has not been established. Hence, we report a case of inguinal hernia that developed after iliofemoral artery bypass, and our subsequent hybrid laparoscopic and anterior approach.

Case Report

A-77-year-old male patient was referred to our hospital with right inguinal swelling. He had a history of Y-graft replacement for abdominal aortic aneurysm at the age of 74 years, and at the age of 76 years, began experiencing pain while walking that extended from the right hip to the anterior thigh. The right branch of the Y-graft was to be occluded, and left external iliac artery and right common femoral artery bypass were performed consecutively.

Upon physical examination, we observed swelling in the upper right inguinal portion of the scrotum in the standing position, with positive silk glove signs. However, the swelling disappeared in the supine position. CT showed a cord-like soft tissue density in the subcutaneous right groin, but an obvious inguinal hernia sac was not observed. The femoro-iliac bypass graft existed along the right inguinal soft tissue density (Fig. 1a and 1b).

In case of past surgical history to the groin, such as anterior femoral incisional approach, it becomes difficult to operate as well as recurrent cases. We selected a laparoscopic approach, which also serves as an accurate diagnosis and primary repair, if dissection around the shunt is possible. The right hernia sac and the bypass graft were easily identified, and a diagnosis of right indirect hernia was made (Fig. 2a). Peritoneal dissection was simple on the lateral side of the hernia sac (Fig. 2b), although on the median side, the peritoneum was firmly adherent and the ileopubic tracts were not visible due to the presence of the graft. The mesh had been cut and fixed around the hernia orifice using a narrow margin (Fig. 2c and 2d), and we determined that the reinforcing hernia orifice in the median side was insufficient, and thus added an anterior mesh replacement using the Liechtenstein method (Fig. 3a and 3b). The postoperative course was uneventful, and the patient was discharged on the third postoperative day. There have been no signs of recurrence of the hernia in the follow-up period of 12 months.

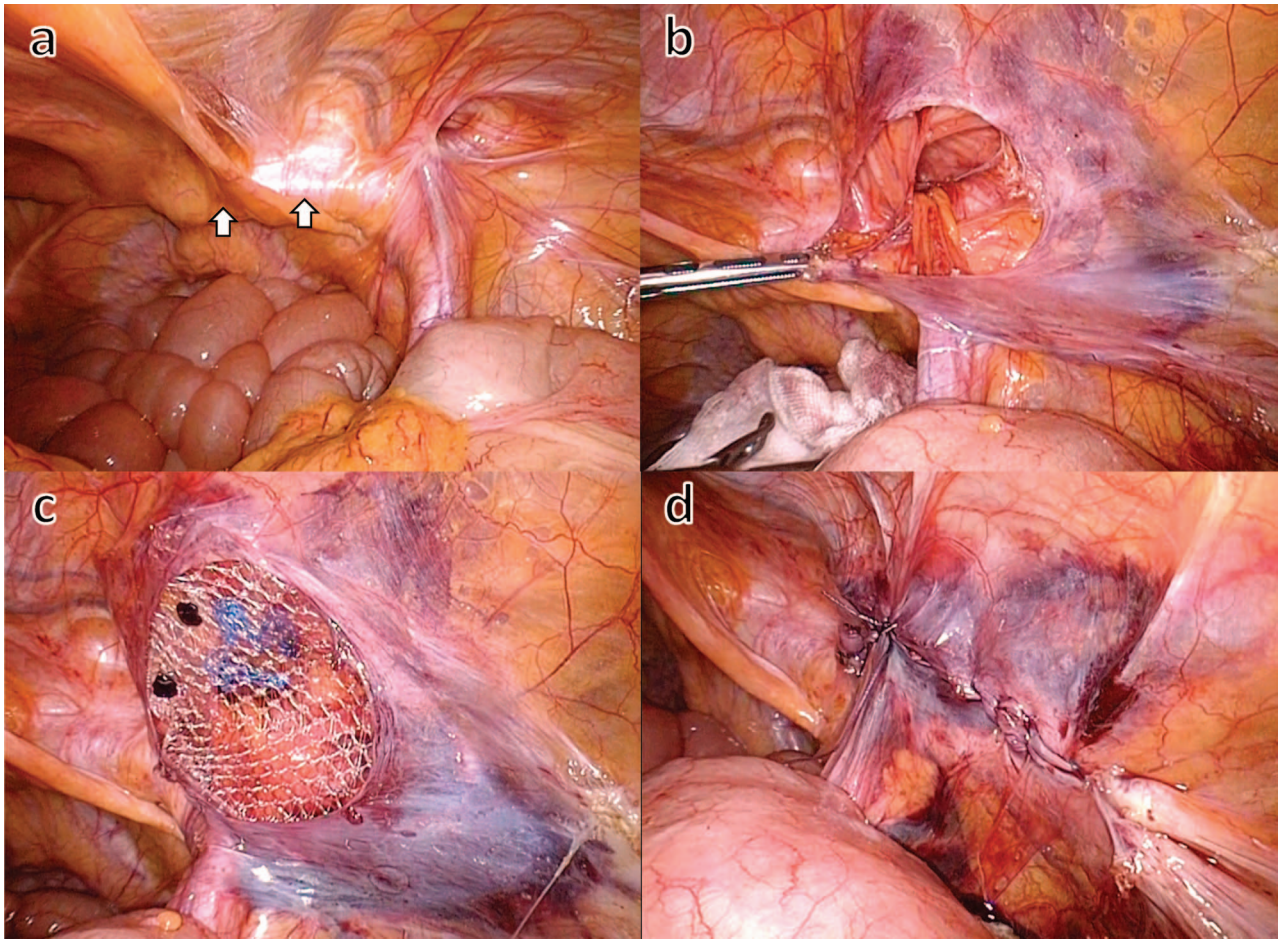

Fig. 2 Surgical findings. (a) The arterial bypass graft (arrows). (b) Peritoneal dissection and the hernia orifice. (c) The mesh was cut and fixed around the hernia orifice using a narrow margin. (d) The closure of the peritoneum.

Discussion

Inguinal hernia is one of the most common medical conditions among men, and is observed throughout the world. The lifetime risk for undergoing reparative surgery for inguinal hernia has been estimated to be 27% for men and 3% for women.[6] Many different operative procedures have been devised to treat this condition, and the concept of a tension-free technique using prosthetic mesh-material (the Lichtenstein method) has been widely accepted in recent years.[1] Consequently, hernia recurrence rates have decreased dramatically of late.[7]

Furthermore, the laparoscopic approach has also become popular, given its reduced postoperative pain and minimal invasiveness. Among laparoscopic approaches, transabdominal preperitoneal patch plasty (TAPP) offers the greatest opportunity to confirm diagnosis in atypical cases of suspected hernias, and identify additional hernias (ipsilateral and contralateral). TAPP can also detect other causes of inguinal swelling, and increases the probability of incidental findings.[8–10] As well, while TAPP is technically difficult, the recurrence rate is not inferior to the anterior approach, and is actively introduced for recurrent, bilateral, and primary unilateral inguinal hernias.

The purpose of the laparoscopic procedure is to identify the hernia orifice from the abdominal cavity and to open the preperitoneal cavity widely. As a result, mesh repair can be both necessary and sufficient. However, some surgeons worry that the laparoscopic technique becomes more difficult in complicated cases, such as those with surgical history in the preperitoneal cavity. Inguinal hernia after radical prostatectomy is an example of a complicated case, and some cases have been

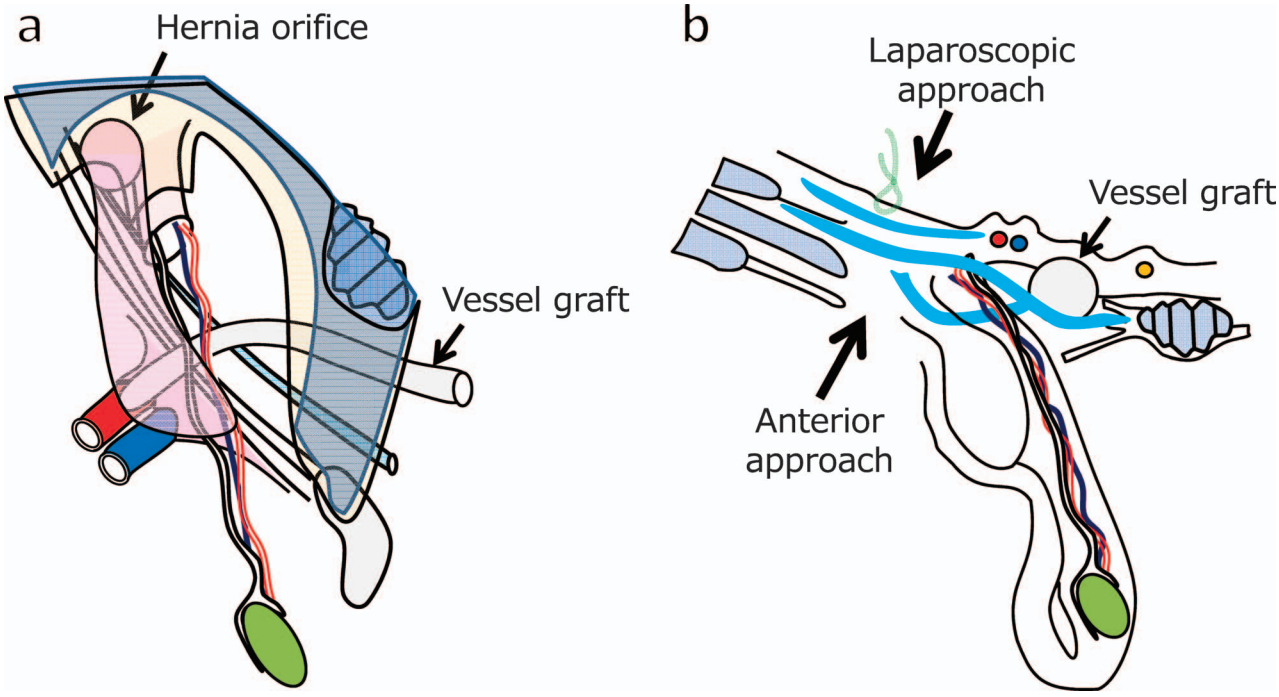

Fig. 3 The schema of this case. (a) The schema of the anterior view. (b) The schema of the mesh replacement.

reported,[11,12] although the laparoscopic technique is considered safe by experts in TAPP or TEP.[13]

Extra-anatomic bypass surgery for femoral artery is another difficult surgical modification of the groin area. In contrast to the post prostatectomy state, extra-anatomic bypass surgery for femoral artery exhibits firmer adhesion that requires dissection of the peritoneal cavity and the anterior subcutaneous groin area. Our case also exhibited firm adhesion of the peritoneum and vessel graft. Currently, Lichtenstein or laparoscopic approaches are recommended for recurrent hernias that are considered complicated cases. However, to the best of our knowledge, only 1 case of laparoscopic hernia repair after femoral arterial bypass has been reported.[5] We selected the laparoscopic approach, and an excellent view and easy identification of the hernia orifice was achieved. However, adhesiolysis of the hernia sac and vessel graft was difficult, and therefore the sac was transected. Although sac removal is desirable[14] in cases of firm adhesion or a large indirect sac, sac transection at the level of the inner inguinal ring is required to prevent organ injury.

Regarding mesh placement for hernia repair, at least 3-cm margin in all directions from the hernia orifice, and a size of 10 × 15 cm, are recommended by the IEHS guidelines.[13] However, sufficient preperitoneal space is not available in cases of firm adhesion, which results in insufficient reinforcement. Additionally, while trimming of the mesh is not recommended for narrow preperitoneal cavities, in cases of insufficient peritoneal dissection, trimming of the mesh should be considered. In the present case, the preperitoneal space dissection was insufficient and the margin for the hernia orifice was minimal. Thus, we were forced to trim the mesh, which is insufficient as reinforcement for TAPP. Knowing that recurrence risk is higher in such cases, we added anterior reinforcement using the Liechtenstein method. In general, preoperative determination of the extent of adhesions is difficult. In this case, it is expected that identification, dissection and processing of sac become more difficult only by anterior approach, because of past surgical history to the groin. Actually, in the anterior view, the adhesion between the hernia sac and vessel graft was extremely firm. Without the findings from the abdominal cavity, it is possible that the exact orientation would never have been detected. In contrast, laparoscopic approach can easily diagnose and identify the sac. TAPP hernioplasty had insufficient results, but we would like to emphasize that an additional anterior approach could be smoothly performed, owing to exact diagnosis and anatomic orientation from laparoscopic views.

In conclusion, the laparoscopic approach is useful for the diagnosis and treatment of inguinal hernia after extra-anatomic bypass surgery for femoral artery. While complicated, the addition of anterior reinforcement should also be considered in cases of insufficient preperitoneal repair by TAPP. This method may help lower the recurrence rate for similar treatments in the future.

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