Hernia (2000) 4: 33-36

Hernia

Case reports

Large hernia caused by entero-cutaneous fistula after laparoscopic adhesiolysis: report of a case

S. Petersen, S. Tempel, M. Freitag, W. Albert and K. Ludwig

Department of General and Abdominal Surgery, (Chairman Prof. Dr. K. Ludwig),
General Hospital Dresden-Friedrichstadt, Teaching Hospital of Technical University Dresden, Friedrichstraße 41, D-01067 Dresden, Germany

Summary: A young and otherwise healthy man was admitted to a district hospital, for treatment of adhesional disease developed as a result of complicated appendectomy two decades before. He was treated by laparoscopy, during which seven small-bowel loops were released from the abdominal wall. Nine days later, laparotomy became necessary because of recurrent intestinal obstruction. This laparotomy revealed two small bowel leakages in the right lower abdomen with purulent peritonitis. Resection of the leaking small bowel loops was performed. When the patient was transferred to our department, he was in a serious condition with persistent fever and a few days later multiple entero-cutaneous fistulae appeared in the wound, causing a large abdominal wall defect of 31 x 16 cm. Following 8 weeks of fistula-shrinking, the size of the defect was reduced to 17 x 9 cm. After resection of intestinal loops including multiple fistulae, a large abdominal wall-defect persisted. Hernia repair was performed 8 months after resection by intraperitoneal implantation of a large 30 x 40 cm ePTFE prosthetic patch (Gore-Tex®), fixed by transfascial subcutaneous sutures. Follow-up at 20 months revealed restoration of abdominal wall integrity and good general health.

Key words: Laparoscopic adhesiolysis — Entero-cutaneous fistula — Infection – ePTFE — Intraperitoneal

Correspondence to: S. Petersen

Received April 1st, 1999
Accepted in final form December 8, 1999

Although some large studies showed the benefit of laparoscopic management of adhesional peritoneal disease, it is still difficult to predict which patients will be suitable for laparoscopic therapy [Bailey 1998, Francois 1994]. Among the most serious complications of laparoscopic treatment of adhesional disease of the small bowel are recurrent postoperative bowel obstruction and bowel leakage, potentially causing peritonitis or entero-cutaneous fistula [Bailey 1998, Federmann 1995]. Entero-cutaneous fistula usually requires protracted therapy and, for surgical measures such as resection of fistula and small-bowel loops, a repeat laparotomy as well.

A large abdominal wall defect may develop as a consequence of entero-cutaneous fistula and laparotomy in potentially infected tissue. This type of hernia, caused by recurrent laparotomy and fistula, is not adequatelly trea-

ted by conventional hernia repair. However, incisional hernia repair by prosthetic implantation should not be performed in potentially infected tissue. As a consequence, the concept of staged treatment of patients with potentially contaminated tissue by use of fistula resection and hernia repair has been suggested [Brown 1985, Dayton 1986, Okunski 1996].

We report a case of recurrent small intestine obstruction treated by laparoscopic adhesiolysis, where multiple entero-cutaneous fistula developed. After intestinal resection, a very large incisional hernia required hernia repair by an expanded polytetrafluroethylene patch (ePTFE, Gore-Tex®).

Case history

March 5, 1997: A 42-year-old man was admitted to a nearby district hospital for laparoscopic treatment of adhesional disease, which he had developed as a result of appendectomy and right pararectal revisional laparotomy because of peritonitis in the late 1970s and conventional umbilical hernia repair in 1991. Interventional adhesiolysis was indicated because of recurrent small bowel obstruction and persistent pain. Preoperative ultrasound assessment revealed an area without adhesions in the left upper abdomen. Therefore, the patient was considered suitable for laparoscopy.

The intraabdominal laparoscopic status showed some small bowel loops fixed to the abdominal wall in the right lower abdomen. A total of seven small bowel loops were laparoscopically removed from the abdominal wall by step-by-step incision and coagulation. The procedure took 3 hours.

Nine days later, after an initial asymptomatic period, the patient developed symptoms of recurrent small bowel obstruction and peritonitis, requiring laparotomy via a right pararectal incision. This revealed two small bowel leakages with purulent peritonitis. The leaking intestinal loops were resected and anastomoses were performed by biofragmentable Valtrac®-rings. Staged abdominal lavage was planned for the next days. Two days later, increasing biliary secretion appeared in the abdominal wound. March 21, 1997: The patient was transferred to our department. At that time he was in a serious condition with persistent fever. He had developed multiple entero-cutaneous fistulae in the lower abdomen with an abdominal wall defect of 31 x 16 cm (Fig. 1). The fistulous system excreted more than 2 liters of biliary fluids per day. To collect the fluids, a large stoma device covering the fistulae was used for a period of 8 weeks. During this period, the abdominal wall defect decreased in size to 17 x 9 cm (Fig. 2).

May 20, 1997: Laparotomy for fistula resection was performed. Via a median laparotomy the fistulous system was released from its abdominal wall adhesions and two small bowel loops of approximately 20 cm length were resected. Anastomoses were sutured by absorbable monofilament sutures in two layer-technique and the small bowel was protected by a "Miller-Abbot" catheter device. Abdominal wall closure was performed without suturing the fascial edges of the pararectal wall defect at this time. Wound healing was protected for 7 days by approximating the fascial edges by a temporary steel-wire Ventrofil® -device. The patient was well and able to leave the hospital after abdominal wound healing within 14 days.

January 18, 1998: After regaining body-weight, the patient was readmitted for planned repair of the giant incisional hernias caused by the previous median and right pararectal laparotomies (Fig. 3). A laparotomy via a pararectal incision revealed loss of parietal peritoneum and the decision was made for hernia repair by underlay prosthesis implantation in an intraperitoneal position. For this procedure, a 2 mm-thick expanded polytetrafluoroethylene soft tissue patch (ePTFE) (Gore-Tex® W.L. Gore, Flagstaff, AZ, USA) sized 30 x 40 cm was implanted and fixed with transfascial subcutaneous fixation sutures. The healthy fascial edges were identified, but it was not possible to close them above the patch. The patient was discharged from hospital 10 days after hernia repair.

At a recent follow-up examination 20 months after incisional hernia repair, the patient was asymptomatic and had restored abdominal wall integrity without recurrent hernia (Fig. 4).

Discussion

Laparoscopy is an attractive option for recurrent adhesional disease, aiming at improvement of either bowel obstruction or chronic abdominal pain [Francois 1994]. Laparoscopic management simultaneously gives the opportunity for both diagnostic and therapeutic measures, thus allowing treatment of certain cases of small bowel obstructions [Ibrahim 1996]. Reduced perioperative pain and hospital stay may be additional advantages of laparoscopic treatment [Bailey 1998]. However, the procedure can be associated with serious complications such as persistent bowel obstruction or small bowel leakage [Bailey 1998, Federmann 1995]. Because of these possible complications, the indications for laparoscopic management must be restrictive, especially after previous laparotomies.

The present case demonstrates a potentially life-threatening bowel leakage after therapeutic laparoscopy, resulting in a very large hernia from entero-cutaneous fistula. The complicated treatment of small bowel fistula was time-consuming and hernia repair in this situation required special consideration.

The management of a large contaminated abdominal wall defect is one of the most frustrating and difficult clinical situations. Repair of a large incisional hernia by conventional techniques like the Mayo procedure is associated with high recurrence rates of up to 20 - 50% [Paul 1997]. Therefore, hernia repair by prosthetic implantation may be considered [Leber 1998, Stoppa 1989, Trupka 1998]. The use of non-absorbable mesh in contaminated wounds may cause long-term complications such as chronic infection on mesh erosion into the bowel or through the skin [Bleichrodt 1993, Brandt 1995, Okunski 1996, Vix 1997]. Nearly 90% of patients with hernia

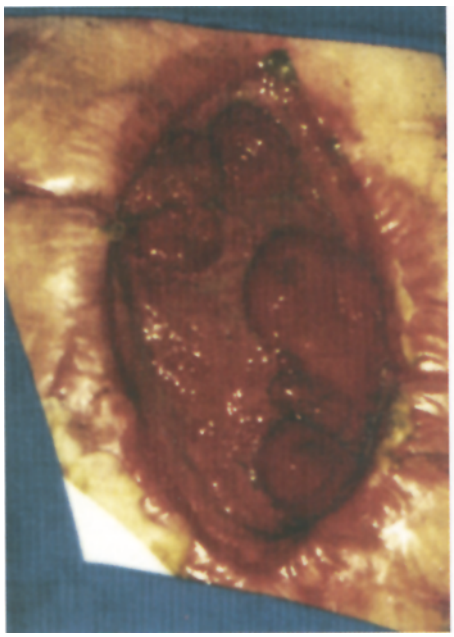

Fig. 1
Multiple entero-cutaneous fistulas with an abdominal wall defect of 31 x 16 cm in the right lower abdomen.

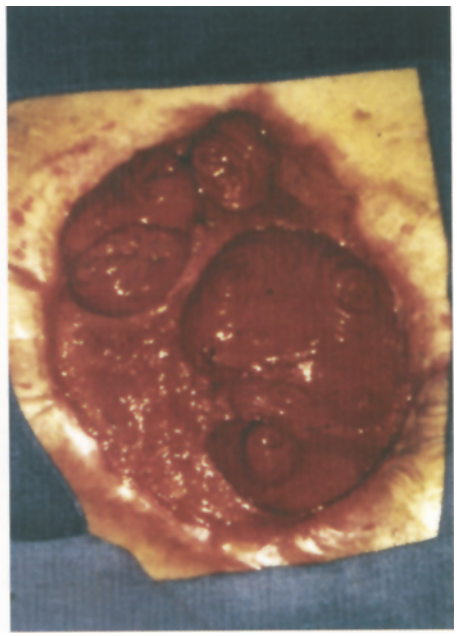

Fig. 2
Fistula shrinking to a size of 17 x 9 cm within 8 weeks.

Fig. 3
Large incisional hernia in the lower abdomen in right pararectal and umbilical site.

Fig. 4
Reinforcement of the abdomen after hernia repair by intraperitoneal ePTFE patch, fixed by transfascial subcutaneous sutures: result after 20 months.

repair and contaminated wounds needed removal of the mesh at some time in the postoperative period [Dayton 1986, Taylor 1999]. Additionally, hernia repair by absorbable mesh in contaminated tissue is likely to cause hernia recurrence in a high percentage of cases [Dayton 1986].

From our point of view, staged treatment for contaminated tissue, i.e. initial wound closure and delayed hernia repair, seems to be appropriate. In this case, we regarded 8 months as a sufficient time-frame from fistula resection to prosthetic implantation, even it may have been possible to perform hernia repair at an earlier time. At present, there is little knowledge regarding the specific properties of prosthetic materials for abdominal wall reinforcement in the presence of infection or delayed hernia repair in contaminated tissue [Okunski 1996, Vix 1997].

The Stoppa procedure by prosthetic implant in the preperitoneal plane avoids contact of patch and bowel. Thus, the use of polyester mesh seems reasonable [Leber 1998, Stoppa 1989, Trupka 1998, Wantz 1991]. Due to multiple operative procedures, in the present case there was no peritoneum remaining to prevent direct contact of mesh and bowel. Therefore ePTFE was the material of choice in the intraperitoneal position [Gillion 1997]. The decision to use an ePTFE-patch was based on its smooth surface and low inflammatory response. Furthermore, an ePTFE-patch can be placed adjacent to bowel without risk of erosion or recurrent fistulization.

This case illustrates the successful management of a very large hernia due to entero-cutaneous fistula by staged fistula resection and delayed prosthetic hernia repair by ePTFE patch.

Acknowledgement. We are grateful to Dr. Carsten Nieder (Dept. Experimental Radiation Oncology, M.D. Cancer Center, Houston TX) for carefully editing this manuscript.

References

Bailey IS, Rhodes M, O'Rourke N, Nathanson L, Fielding G (1998) Laparoscopic management of acute small bowel obstruction. Br J Surg 85: 84-87

Bleichrodt RP, Simmermacher RK, van der Lei B, Schakenraad JM (1993) Expanded polytetrafluoroethylene patch versus polypropylene mesh for the repair of contaminated defects of the abdominal wall. Surg Gynecol Obstet 176: 18-24

Brandt CP, McHenry CR, Jacobs DG, Piotrowski JJ, Priebe PP (1995) Polypropylene mesh closure after emergency laparotomy: morbidity and outcome. Surgery 118: 736-740; discussion 740-731

Brown GL, Richardson JD, Malangoni MA, Tobin GR, Ackerman D, Polk HC, Jr. (1985) Comparison of prosthetic materials for abdominal wall reconstruction in the presence of contamination and infection. Ann Surg 201: 705-711

Dayton MT, Buchele BA, Shirazi SS, Hunt LB (1986) Use of an absorbable mesh to repair contaminated abdominal-wall defects. Arch Surg 121: 954-960

Federmann G, Walenzyk J, Schneider A, Bauermeister G, Scheele C (1995) Laparoscopic therapy of mechanical or adhesion ileus of the small intestine-preliminary results. Zentralbl Chir 120: 377-381

François Y, Mouret P, Tomaoglu K, Vignal J (1994) Postoperative adhesive peritoneal disease. Laparoscopic treatment. Surg Endosc 8: 781-783

Gillion JF, Begin GF, Marecos C, Fourtanier G (1997) Expanded polytetrafluoroethylene patches used in the intraperitoneal or extraperitoneal position for repair of incisional hernias of the anterolateral abdominal wall. Am J Surg 174: 16-19

Ibrahim IM, Wolodiger F, Sussman B, Kahn M, Silvestri F, Sabar A (1996) Laparoscopic management of acute small-bowel obstruction. Surg Endosc 10: 1012-1014; discussion 1014-1015

Leber GE, Garb JL, Alexander AI, Reed WP (1998) Long-term complications associated with prosthetic repair of incisional hernias. Arch Surg 133: 378-382

Okunski WJ, Sonntag BV, Murphy RX, Jr. (1996) Staged reconstruction of abdominal wall defects after intra-abdominal catastrophes. Ann Plast Surg 36: 475-478

Paul A, Korenkov M, Peters S, Fischer S, Holthausen U, Kohler L, Eypasch E (1997) Mayo duplication in treatment of incisional hernia of the abdominal wall after conventional laparotomy. Results of a retrospective analysis and comparison with the literature. Zentralbl Chir 122: 862-870

Stoppa RE (1989) The treatment of complicated groin and incisional hernias. World J Surg 13: 545-554

Taylor SG, O'Dwyer PJ (1999) Chronic groin sepsis following tension-free inguinal hernioplasty. Br J Surg 86: 562-565

Trupka AW, Hallfeldt KK, Schmidbauer S, Schweiberer L (1998) Management of complicated incisional hernias with underlay-technique implanted polypropylene mesh. An effective technique in French hernia surgery. Chirurg 69: 766-772

Vix J, Meyer C, Rohr S, Ch. B (1997) The treatment of incisional and abdominal hernia with a prosthesis in potentially infected tissues - A series of 47 cases. Hernia 1: 157-161

Wantz GE. (1991). Atlas of Hernia Surgery. Raven Press: New York.