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Incarceration of the appendix into silicone drain holes without signs of appendicitis

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ABSTRACT

A surgical drainage simple surgical procedure that enables elimination of pathological effluent from operative wounds or other anatomical spaces, as well as removal of possible pathological exudates (blood, pus, enteric content, pancreatic juice, etc.). Nowadays, silicone drains are used for draining of the peritoneal cavity. In this study we presented a case of 42-year old female patient who underwent surgery after traumatic injury of intraabdominal organs and fracture of pelvic ring bone structure. Postoperative drain placed into the rectovesical space could not be removed on day 17 post surgery. Additional diagnostics could not identify the actual reason of failing to remove the drain, thus relaparotomy was required. Intraoperative diagnosis revealed incarceration of the antimesenteric part of the appendix into two circumjacent side perforations in the drain, without signs of acute inflammation. This paper presents an unusual and rare case of peritoneal drainage complication. The drainage of peritoneal cavity should be performed only in appropriate clinical situations, i.e. when the procedure is surgically indicated.

1. Introduction

Drainage, various drainage procedures and materials used for drain manufacturing date back to the very beginnings of surgery. Drainage in surgery implies surgical procedure that enables elimination of pathological effluent from operative wounds or other anatomical spaces, as well as removal of possible pathological exudates (blood, pus, enteric content, pancreatic juice, etc.). The process encompasses appropriate indication, technique for drain placement and selection of sets of accessories. Surgical drainage implicates surgical monitoring, early identification of possible complications and their adequate management.

2. Case report

A 42-year old female patient was referred to the Clinic for Abdominal, Endocrine and Transplantation Surgery in

Novi Sad by the urgency surgery. The patient suffered head, chest, abdominal and pelvic ring injuries in a car accident. Hemodynamic instability, pronounced hypotension and tachycardia and suspect abdominal bleeding were established for admission to the clinic and urgent laparotomy was indicated. During surgical exploration splenectomy, multiple sutures of the small intestine and mesenteric root, chest drainage and orthopedic stabilization of pelvic ring were performed. The drainage of peritoneal cavity included intraoperative insertion of silicone drains into the left subphrenic space, subhepatic space and rectovesical space with an exit site in the right lower abdominal quadrant.

During the postoperative period, after removing the drain from the left subphrenic and subhepatic space, the patient was transferred to the clinic for orthopedics and traumatology for definitive treatment of injuries of pelvic ring bone structures. After cessation of blood and ichor drainage from the drain placed in the rectovesical space, drain removal was attempted on day 17 post surgery. Two days later, relaparotomy was indicated.

Intraoperative finding did not reveal any severe adhesions or free intraperitoneal fluid. Silicone drain placed into the

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rectovesical space became, through its side-holes, adhered to the antimesenteric part of the appendix. Adipose tissue of the mesoappendix has proliferated the drain perforations at two adjacent levels, and coalesced. This coalescence resulted in drain retaining. A longitudinal incision along the drain detached the appendix enabling drain withdrawal and subsequent appendectomy. Postoperative course was normal, without complications.



Figure 1. Silicone drain–lateral perforations marked with instruments, appendix incarceration sites.

3. Discussion

The most common complications of peritoneal drainage include reactions of surrounding tissue, bowel obstruction and perforation, adhesions, bowel incarceration, anterior abdominal wall hernias, loosening of intestinal anastomosis and infections^[1]. Improper handling during insertion of surgical drains can result in their folding or knotting, thus requiring surgery as the only possible way of drain removal^[2].

Prophylactic drainage enables early identification of possible complications in the intraperitoneal space, such as bleeding or anastomosis leakage^[3]. The application of abdominal drains is not completely unambiguous. Intraperitoneal drain may result in increased rates of abdominal infections, abdominal pain, decreased lung function, prolonged hospitalization period or organ damage^[4–6].

Drainage complications may result from the drain itself (contamination, content retention) or inappropriate drain positioning (collision with large blood vessels, bowel erosion and formation of fistulas, compromised anastomosis due to a contact decubitus).

The drain should be removed once the drainage has stopped or becomes less than about 25 mL/24 h. The drain inserted into the cavity which has the low secretory potential (capillary bleeding) is removed after 24 h. Drainage of cavities containing exudates of bacterial origin is prolonged for 24 to 72 h. Furthermore, the drain can be progressively shortened by withdrawing them gradually for 2 cm/24 h allowing the site to heal. Drain removal is to be considered when patient's

discomfort is evident. Drain-related pain is an indication for drain withdrawal, taking into consideration administration of pain relief prior to removal.

Duraker reported an appendiceal evisceration through the incision in the anterior abdominal wall at the drain-removal site, suggesting avoiding application of drains with side holes^[7]. In researching Medline database Kjossev identified four cases of appendiceal evisceration through the anterior abdominal wall at the site of a drain^[8].

So far there were no reports on the incarceration of the appendix into the drain holes. The incarceration was most probably the result of prolonged drainage. The mechanism of this complication associated with the reaction of the adjacent tissue (in this case, adipose tissue of the mesoappendix) was addressed in the research of Van Hee^[1].

It must be emphasized that peritoneal drainage should be applied with particular precautions and only when absolutely indispensable because of possible complications. If the placement of peritoneal drains is indicated, strict precautions must be taken to protect adjacent organ structures and blood vessels. Recognizing and being aware of this possible complication of peritoneal drainage should draw surgeon's attention to cautious application of drainage systems only in situations when it is surgically indicated.

Conflict of interest statement

The authors declare that there are no conflicts of interest.

Reference

- [1] Van Hee R. Complications of drainage. *Acta Chir Belg* 1983; **83**(5): 340–344.
- [2] Loh A, Jones PA. Evisceration and other complications of abdominal drains. *Postgrad Med J* 1991; **67**: 687–688.
- [3] Dougherty SH, Simmons RL. The biology and practice of surgical drains. Part II. *Curr Probl Surg* 1992; **29**(9): 633–730.
- [4] Pai D, Sharma A, Kanungo R, Jagdish S, Gupta A. Role of abdominal drains in perforated duodenal ulcer patients: a prospective controlled study. *Aust N Z J Surg* 1999; **69**: 210–213.
- [5] Alvarez Usler R, Molina H, Torres O, Cancino A. Total gastrectomy with or without abdominal drains. A prospective randomized trial. *Rev Esp Enferm Dig* 2005; **97**: 562–569.
- [6] Liu CL, Fan ST, Lo CM, Wong Y, Ng IO, Lam CM, et al. Abdominal drainage after hepatic resection is contraindicated in patients with chronic liver diseases. *Ann Surg* 2004; **239**: 194–201.
- [7] Duraker N, Buyukasik K, Helvacioğlu Y. Drain site evisceration of the appendix: report of a case. *Surg Today* 1997; **279**(7): 651–652.
- [8] Kjossev KT, Losanoff JE. Complications of prophylactic intraperitoneal drainage. *Dig Dis Sci* 2001; **46**(11): 2456.