Small bowel obstruction due to appendix adhesion to an aortic graft

Abstract

Background: Small bowel obstruction (SBO) is a common cause of surgical consultation. Adhesion bands, internal hernias, tumors and many other causes need to be considered. If non-operative management fails, exploratory laparoscopy or laparotomy is indicated.

Case report: A 63 year old male with multiple comorbidities had undergone open aortobifemoral bypass grafting for occlusive disease. The graft failed as the patient was non-compliant with medical management and he underwent right below knee amputation. During the following 3 months, he had multiple emergency room visits for recurrent abdominal pain and vomiting. He ultimately was admitted with complete SBO and CT-scan showed a transition point in the mid-ileum. A mass in the tail of the pancreas was also found. He initially responded to non-operative management, however, upon oral challenge SBO relapsed and decision for surgery was made. On laparoscopy, the transition point was identified and strangulation was found to be caused by the appendix, which crossed the midline. The appendix base at the cecum was identified but the tip could not be found. Therefore, the appendix base was stapled off and the vascular pedicle was secured. The small bowel could be freed and the appendix was followed and cut out of dense adhesions to the aortic graft; pathology indicated chronic appendicitis. The patient recovered without complications from this surgery.

Conclusions: This is a very unusual case of SBO caused by an appendix, which became adhered to an aortic graft. It remains unclear if this pathology was caused by post-operative inflammation or if the patient had appendicitis. Laparoscopic exploration is useful in the management of SBO that does not resolve with non-operative management.

Key words: Appendicitis, aortobifemoral bypass, small bowel obstruction, laparoscopy

## Introduction

Small bowel obstruction (SBO) is one of the most common disorders requiring surgical consultation (1). SBO may be caused by a variety of conditions including adhesions after surgery, obstruction due to inflammatory, and infectious or neoplastic disorders amongst many others (2). Symptoms of obstruction can also be due to a paralytic ileus which again may be caused by a variety of conditions (2). Non operative management is initiated in most patients using decompression with a nasogastric tube with subsequent work up for the underlying pathology (3). If patient do not respond to nonoperative management surgery is indicated with laparoscopy becoming the preferred approach by many surgeons (4).

Traditionally, aortic aneurysm and aortoiliac occlusive disease has been treated by open replacement of the distal aorta but endovascular treatment has become an excellent alternative (5-7). Multiple complications may occur following open surgery including intraabdominal adhesions that may lead to SBO requiring surgical intervention particularly when using the transperitoneal approach (8). SBO may be associated with acute and chronic appendicitis (9). In the case of acute appendicitis paralytic ileus due to the inflammation or local obstruction by the inflammatory process may be encountered (10) and in the case of chronic appendicitis the appendix may get stuck to a bowel loop or to the abdominal wall thus creating a pocket with possible herniation of intestine (11).

We present a case of small bowel obstruction due to adhesion of the appendix to an aortobifemoral bypass graft.

Case report

A 63 year old male with multiple comorbidities including coronary artery disease, hypertension and chronic obstructive pulmonary disease had previously undergone open aortobifemoaral bypass grafting for aortoiliac occlusive disease. The graft failed as the patient was non-compliant with medical management, and he subsequently underwent right below-knee amputation. During the following three months, he had multiple visits to the emergency room and multiple admissions for recurrent abdominal pain and vomiting. He ultimately was re-admitted and CT scan confirming small bowel obstruction with a transition point in the mid-ileum (Figure 1). A mass in the pancreas tail was also incidentally found. He initially responded to non-operative management with bowel rest and decompression using a nasogastric tube (NGT); his pain improved, NGT output declined, and he passed gas. However, upon oral challenge he again worsened, abdominal x-ray indicated ongoing small bowel obstruction (Figure 2), and the decision was made to perform an exploratory laparoscopy.

Trocars were placed in the left upper and lower quadrants, and suprapubically in his previous midline incision. Omental adhesions were taken down and on exploration, the transition point as previously seen on the CT image was found when running the small bowel. The intestinal strangulation was caused by the appendix, which crossed the midline. The appendix base at the cecum was visualized but the tip could not be mobilized as it was stuck in the left abdomen. Therefore, the appendix base and the vascular pedicle were stapled off. The small bowel could be freed and recovered during the procedure and did not require resection. The appendix was followed and was found to be densely adhered to the anterior surface of the aortic graft. The appendix tip was cut out of the adhesions and removed in a retrieval bag, with subsequent pathology indicating chronic appendicitis.

The patient recovered without complications from this surgery but died within 6 months from metastatic pancreatic cancer.

## Discussion

Surgical approach to aortobifemoral grafting may be transperitoneal or retroperitoneal using a rather large incision but recently also laparoscopic techniques have been reported (8). Neither approach has been shown to be definitively superior to the other (12), however, some studies have indicated use of the retroperitoneal approach resulting in decreased blood loss and shorter hospital and ICU stay, and possible lower risk for ileus when compared to the transperitoneal approach (13). The transperitoneal approach more commonly results in gastrointestinal complications, due to the peritoneal defect creating significant potential for omental and/or intraperitoneal organ interaction with the graft (14). Aortobifemoral bypass has remained a procedure with a high risk for a multitude of complications (8, 15, 16) including bowel obstruction (17).

Only few appendix-related complications associated with aortic grafts have been published. Graft complications involving acutely inflamed appendices are very rare, making up 0.6-5% of all secondary aorto-enteric prosthetic fistulas. The few known cases demonstrated a fistula between the graft and the appendix, which may be acutely or chronically inflamed and being in a retro-ileal position allowing the appendix to interact with the aortic prosthesis (18-25). Such a fistula may occur even with retroperitoneal closure. The pathology is more likely due to mechanical factors such as graft dehiscence and/or anastomotic aneurysm than due to paraprosthetic infection following acute appendicitis (18, 26). The majority of patients with

aorto-appendiceal fistula present with hematochezia (18, 19, 21, 22, 24, 25). Management includes replacement of the graft with simultaneous appendectomy.

Our patient presented with a SBO and only during laparoscopy the unusual pathology could be identified and treatment consisted of a simple appendectomy. As the graft did not show any signs of infection the aortobifemoral graft was left in situ, with the patient being carefully monitored post-operatively for any signs of infection. Final pathology indicated inflammation of the appendix but it cannot be determined if chronic appendicitis was the cause of the condition or if the appendix tip developed adhesions to the graft with a subsequent inflammatory reaction.

As the SBO did not resolve within few days with bowel rest and decompression using a nasogastric tube, the patient underwent laparoscopic exploration revealing this unusual case. The appendectomy released the strangulated small bowel segment and the patient made a quick recovery. Therefore, we confirm that exploratory laparoscopy should be considered in the management of small bowel obstruction that does not resolve with non-operative management (4, 27).

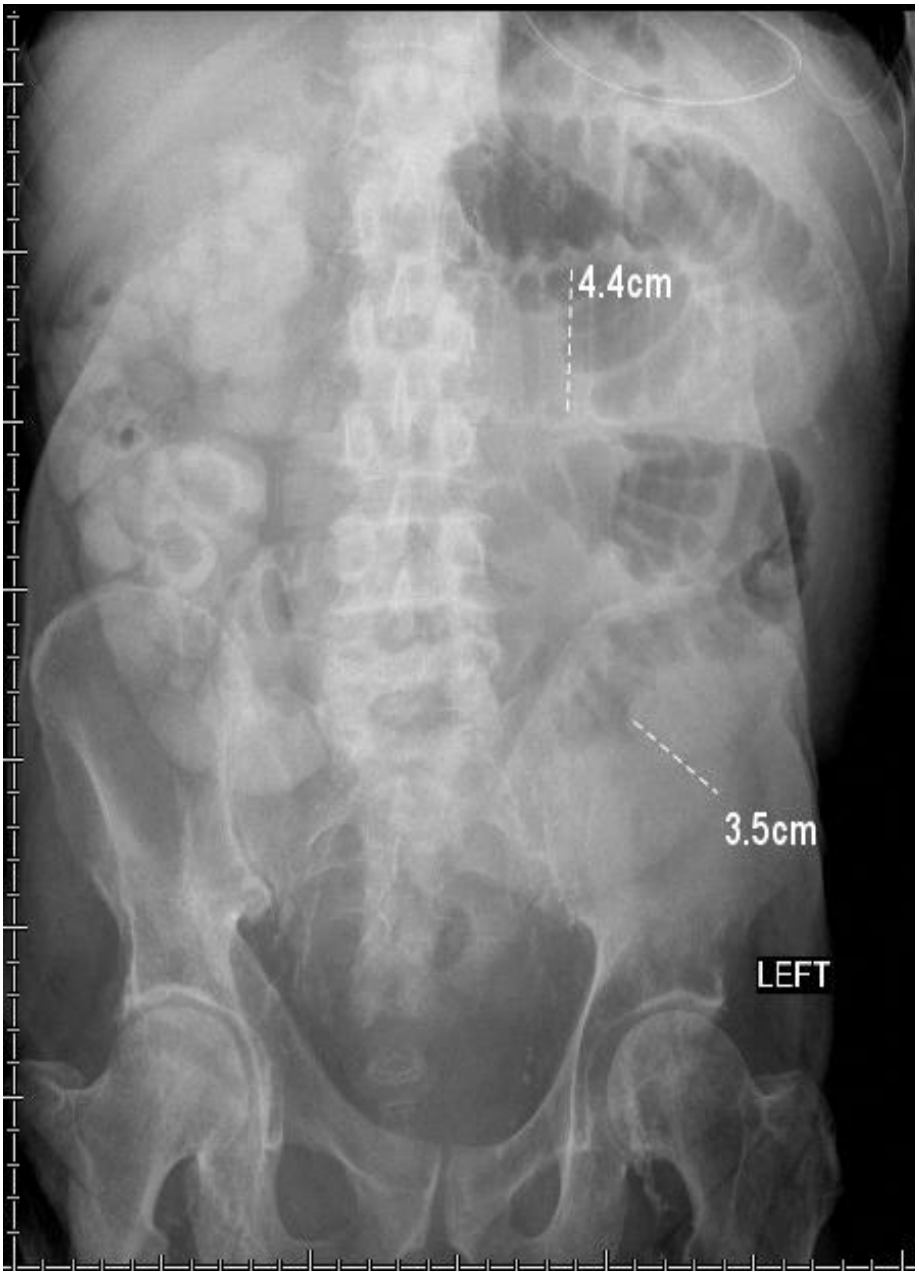
Figure legends

Figure 1: CT-scan with transition point where appendix crossed the small bowel loop (arrow)

Figure 2: Abdominal X-ray: ongoing small bowel obstruction with dilated loops up to >4cm, some oral contrast had passed into the ascending colon

Figure 1

Figure 2




Statement
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