Duodenal Obstruction After Elective Abdominal Aortic Aneurysm Repair: A Case Report

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Gastrointestinal tract complications after abdominal aortic aneurysm (AAA) repair are well known. The reported frequency ranges from 6.6% to 21%. However, the incidence of duodenal obstruction following AAA has probably been underestimated. This report concerns a 78-year-old male who was admitted for elective repair of an infrarenal AAA. On the ninth postoperative day, the patient presented with large quantities of bile-stained vomitus despite passing flatus per rectum. Metoclopramide and ranitidine were given under the initial impression of paralytic ileus. However, the upper gastrointestinal obstruction persisted, and on day 12, computerized tomography (CT) revealed marked distension of the gastric tube and duodenum, down to the level of the third portion, with abrupt change of caliber at the point of the superior mesenteric artery (SMA). SMA syndrome was diagnosed. After nasogastric tube aspiration, parenteral nutrition, and 11 days of conservative treatment, abdominal CT and upper gastrointestinal series showed no apparent duodenal obstruction. The patient was discharged on the 29th postoperative day; follow-up abdominal CT 4 months later was unremarkable.

Key Words: aneurysm, duodenal obstruction, superior mesenteric artery (Kaohsiung J Med Sci 2004;20:501–5)

 Reported rates of gastrointestinal complications after transperitoneal abdominal aortic surgery, usually associated with severe morbidity and increased mortality, are 6.6% [1] to 21% [2]. Paralytic ileus, upper gastrointestinal bleeding, Clostridium difficile enterocolitis, and bowel ischemia are among the most frequent complications, and paralytic ileus is the most common complication, occurring in about 10% of patients [1,2]. Duodenal obstruction is rare, with an incidence of less than 1% in Clyne and Kumar’s 225 abdominal aortic aneurysm (AAA) reconstructions [3], and only 18 cases have been reported in the last 10 years.

This report concerns a 78-year-old male who was admitted for repair of a 6.8 cm infrarenal AAA. He had profuse bilious vomiting on the ninth postoperative day, even though he had eaten and opened his bowels by the third postoperative day. Diagnosis was confirmed by computerized tomography (CT). He had an uneventful recovery after conservative treatment with nasogastric aspiration and parenteral nutrition. We present this uncommon case and review the available literature.

Case Presentation

In July 2002, a 78-year-old male was admitted electively for repair of a 6.8 cm infrarenal AAA (Figure 1). Medical history included hypertension and benign prostatic hyperplasia. Before cross-clamping the abdominal aorta, 5,000 IU of heparin was administered intravenously, and the aneurysm was reconstructed using a woven Dacron bifurcation graft (Boston Scientific Corp, Wayne, NJ, USA). The procedure was uneventful and the operative field revealed no active
bleeding or excessive oozing before the retroperitoneum was closed with continuous sutures. On the third postoperative day, bowel sounds returned to normal, and passing flatus per rectum was noted. The nasogastric aspiration tube was removed and oral intake was started on the same day. On day 9, the patient was vomiting with decreased bowel sounds. Metoclopramide and ranitidine were given under the impression of paralytic ileus. However, on day 12, despite passing flatus per rectum, the patient presented with large quantities of bile-stained vomitus. CT revealed marked distension of the gastric tube and duodenum, down to the level of the third portion, with abrupt change of caliber at the point of the superior mesenteric artery (SMA; Figure 2) with no signs of retroperitoneal hematoma compression or pancreatitis. The nasogastric tube was reinserted and partial parenteral nutrition was given. After 11 days of conservative treatment, abdominal CT (Figure 3) and upper gastrointestinal series showed no apparent duodenal obstruction. The nasogastric tube was removed and the patient resumed oral intake. He recovered smoothly and was discharged on the 29th postoperative day. Follow-up CT 4 months later was unremarkable, and at 6 months’ follow-up, the patient was doing well with no sequelae.

**Discussion**

Duodenal obstruction due to compression from an AAA, first described by Osler in 1905, is a rare but well-recognized possibility [4]. However, the occurrence of mechanical duodenal obstruction as a postoperative complication of AAA repair is less well recognized and even underestimated. A review of the English-language literature (from 1985 to 2004) revealed only 18 cases. Duodenal obstruction after AAA repair occurred from 8 to 60 days postoperatively (mean, 13.3 days) [5]. Symptoms included copious bilious vomiting, abdominal distension, nausea, and pain. Reported causes included adhesions, SMA syndrome, compression by retroperitoneal hematoma or sac seroma, and duodenal intramural hematoma [3–7]. Adhesions might be due to inflammation reaction during surgical immobilization and
handling of the retroperitoneal portion of the duodenum, or a history of prior laparotomy [2,8]. SMA syndrome was first reported by Von Rokitansky in 1861. In this syndrome, the third portion of the duodenum is compressed in the angle between the abdominal aorta and the SMA. This syndrome is often precipitated by causes that narrow the angle, such as immobilization, external compression due to body cast used to treat spinal fracture, and rapid weight loss from any cause, but particularly from major trauma or burns [5,9]. In previous reports, SMA syndrome developing after AAA repair might have been related to retroperitoneal hematoma formation around the proximal end of the graft that pushed the duodenum against the SMA [1,5]. In our case, there was no obvious retroperitoneal hematoma, but duodenal swelling was found on CT. Therefore, in our case, postoperative bowel swelling might clip-clamp the third portion of the duodenum between the SMA and graft (Figure 4), inducing upper gastrointestinal obstruction.

The treatment of duodenal obstruction after AAA repair has been either surgical or conservative. Generally, early postoperative small bowel obstruction requiring surgical intervention has a mortality rate exceeding 17%, with high morbidity, including abdominal and wound infection, fistula formation, wound disruption, and persistent obstruction, while nasogastric decompression is successful in avoiding reoperation in 73% of patients [10]. Therefore, conservative treatment seems to be reasonable during the immediate postoperative period. The mean time until resolution of duodenal obstruction is 22 days (range, 7–66 days), and in 83% of patients treated conservatively, the obstruction resolved in 2 weeks [4]. In addition, the causes of duodenal obstruction are related to treatment result. Although sometimes, adhesion bands are found on CT, it is difficult to make the differential diagnosis between external compression of the duodenum and adhesion, except by exploratory laparotomy [6]. However, conservative treatment is successful mostly for duodenal obstruction caused by external compression due to, for example, hematoma, aneurysm sac seroma, and SMA syndrome, and mechanical obstruction caused by adhesion seems unlikely to resolve spontaneously but needs repeat surgical intervention [4–6]. Therefore, the determination of the cause is essential in choosing treatment. Contrast-enhanced abdominal CT and upper gastrointestinal series can assist in determining the mechanism. Nasogastric tube decompression with parenteral nutrition is suggested as initial treatment in most patients, and repeat surgical intervention is necessary only when the duodenal obstruction is caused by adhesive bands or when it fails to resolve after 2 weeks of conservative treatment.

**CONCLUSION**

Mechanical duodenal obstruction is a rare complication after AAA repair, and the patient may present with copious bile-stained vomitus, abdominal distension and pain, typically within 2 weeks postoperatively, even when flatus per rectum or normal bowel sounds are noted. Cardiovascular surgeons should be alert to this complication, and the differential diagnosis should include paralytic ileus, gastrointestinal bleeding, neoplasia of the duodenum, pancreatitis, and duodenal intramural hematoma. Contrast-enhanced abdominal CT and upper gastrointestinal series

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**Figure 4.** (A) Anatomic picture reveals the relationship among the abdominal aorta, duodenum, and superior mesenteric artery (SMA). (B) Sagittal view shows that the duodenum may be clip-clamped between the SMA and the aortic graft.
can assist in diagnosis. Conservative treatment seems to ensure excellent results among patients with a duodenum obstructed by external compression due to hematoma, SMA syndrome, aneurysm sac seroma and so on. Repeat surgical intervention is necessary only when adhesion bands are found or when the duodenal obstruction fails to resolve after at least 2 weeks of conservative treatment. Since adhesions and retroperitoneal hematoma account for most duodenal obstructions after AAA repair, delicate surgical techniques, careful hemostasis, ligation of the retroperitoneal lymphatic tissue, and snug closure of the retroperitoneum at the end of the procedure may be important to prevent this complication.

REFERENCES


預定性腹主動脈瘤術後
併發十二指腸阻塞之案例報告

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預定性腹主動脈瘤術後造成腸胃道併發症並非少見，發生率介於 6.6% 到 21%。但在預定性腹主動脈瘤術後十二指腸阻塞的發生率卻可能被低估，這篇報告是關於一位 78 歲男性病患，在預定性切除及原位重建腹主動脈瘤後，即使病患有衰竭，於術後第九天仍發生大量含膽汁的嘔吐，在麻醉性腸阻塞的監測下，先給藥物治療但上消化道阻塞仍持續，術後第十二天腹部電腦斷層檢查發現胃部及十二指腸擴張大，一直到十二指腸第三節份在上腸胃膜動脈相關位置管徑突然變小，經診斷為上腸胃膜動脈症狀，經過十一天鼻胃管抽吸及靜脈營養補充的保守治療，追蹤的腹部電腦斷層檢查及上腸胃膜動脈造影顯示無明顯十二指腸阻塞，之後病人在術後第二十九天順利出院，而且術後四個月追蹤的腹部電腦斷層檢查也無異狀。

關鍵詞：主動脈瘤，十二指腸阻塞，上腸胃膜動脈
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