A Paraprosthetic-Enteric Fistula Associated with a Duodenal Tumor

Robert Dachs, MD, Ronald E. Clement, MD, Bruce Dziura, MD, and Joel Berman, MD, Springfield, Massachusetts

An unusual etiology and presentation of a paraprosthetic-enteric fistula is reported involving a duodenal tumor. Review of the possible mechanisms of graft-enteric fistula formation and diagnostic evaluation is presented. Initial insertion of an extraanatomic bypass followed by graft excision was performed in the present case and is encouraged in hemodynamically stable patients. Additionally, resection of the eroded duodenum with end-to-end anastomosis was performed in order to restore intestinal continuity. (Ann Vasc Surg 1990;4:65–68)

KEY WORDS: Paraprosthetic-enteric fistula; duodenal tumor; graft-enteric fistula.

Aortoenteric fistula is an uncommon yet devastating complication of aortic surgery. Whether these fistulae are the result of primary graft infection or mechanical erosion of the bowel remains controversial. Malignancy has only rarely been associated with primary aortoenteric fistulae [1–3] and never with graft-enteric fistulae. This report documents the first case of a secondary aortoduodenal fistula as a result of an infiltrating tumor.

CASE REPORT

A 77-year-old man was referred for surgical evaluation at Baystate Medical Center in June 1987, having previously undergone resection of a ruptured abdominal aortic aneurysm in March 1980. An ultra-lightweight, Dacron aortobiliac graft had been used for initial reconstruction. He subsequently did well until January 1987 when he noted a 20 pound weight loss, anorexia, and easy fatigability. Additionally, he noted intermittent passage of melanic stools during the preceding four weeks. He denied any gastrointestinal disturbances or episodes of fever or chills.

Physical examination at the time of admission revealed a thin, elderly, white man with stable vital signs. The abdomen was soft and non-tender with active bowel sounds and no masses. Rectal examination revealed occult blood.

Admission laboratory data showed a hemoglobin level of 6.6 and hematocrit of 21.3%, with a white blood cell count of 12,600. CT scan of the abdomen displayed several small loculations of gas within an abnormal soft tissue density that surrounded the aortic graft (Fig. 1). Endoscopy revealed a considerable amount of fresh blood within the duodenum. No duodenal ulcer or prosthetic graft was visualized. After stabilization, the patient was taken to the operating room with the preoperative diagnosis of an aortoduodenal fistula.

Initially a right axillobifemoral bypass was performed with an 8 mm PTFE graft. All incisions were then closed prior to laparotomy. Using a retroperitoneal approach, a thick, fibrotic inflammatory reaction surrounding the body of the aortic graft was noted. Careful dissection revealed a 6 cm hemorrhagic erosion of the posterior wall of the third portion of the duodenum in direct contact with the body of the aortic graft. Soilage of the graft was
noted. There was no evidence of pseudoaneurysm formation, disruption of the suture line, or breakdown of the graft material. The graft was excised and the aortic stump and common iliac arteries oversewn. A 13 cm segment of duodenum containing the erosion was resected and an end-to-end anastomosis performed. After a lengthy postoperative course, the patient was discharged home.

Histopathologic examination of the duodenum revealed a malignant, poorly differentiated spindle and epithelioid cell neoplasm associated with the hemorrhagic ulceration (Fig. 2). Immunoperoxidase stains suggested an epithelial origin of the tumor, and a final diagnosis of poorly differentiated adenocarcinoma was made.

DISCUSSION

Since Brock reported the first case of a graft-enteric fistula in 1953 [4], two distinct types of secondary aortoenteric fistulae have been described. First, direct communication between the lumen of the bowel and a disrupted aortic suture line results in a true aortoenteric fistula. In contrast, erosion of the bowel wall next to the vascular prosthesis without involvement of the suture line is a well-recognized entity termed paraprosthetic-enteric fistula by Elliott, Smith, and Szilagyi [5], which was apparent in our patient. In 1983, Bunt reviewed 256 cases of aortoenteric fistula and 38 cases of paraprosthetic fistula since Brock’s initial report [6]. In neither that review, nor subsequent reports, has an aortoenteric or paraprosthetic fistula been associated with malignancy. Thus, the present report documents the first case of a secondary aortoduodenal fistula associated with a tumor.

Opinion remains divided as to whether primary infection of the prosthesis or mechanical erosion of the bowel wall by a noncompliant graft is the initiating event in the development of these fistulae. Animal studies have supported each of these hypotheses [7,8]. As for the development of paraprosthetic fistulae, it is apparent that the bowel wall is eroded by the mechanical pulsations of the aortic prosthesis. In the present case, a highly anaplastic adenocarcinoma infiltrated the third portion of the duodenum and fixed this portion of bowel to the aortic graft. We hypothesize that mechanical forces transmitted by the graft caused eventual erosion of the duodenum since the erosion involved only that portion of bowel overlying the graft.

While aortoenteric fistulae classically present as a “herald” bleed followed by a significant gastrointestinal hemorrhage, paraprosthetic-enteric fistulae are more frequently associated with signs of sepsis. O’Mara and Imbembo reviewed 21 cases of paraprosthetic fistulas and noted that the majority of the patients presented with signs of sepsis [9]. Other authors have also stressed the septic presentation of these patients [10–14]. Yet, as the present case demonstrates, occult gastrointestinal bleeding may...