Primary aortoduodenal fistula
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Abstract: Abdominal aortic aneurysms can result in aortoenteric fistulae. Aortoenteric fistula are either primary, arising from the aneurysm, causing the aorta to erode into the bowel or from secondary causes such as previous aortic grafting. Primary aortoduodenal fistula is a rare clinical entity that usually presents with gastrointestinal bleeding that can be occult, intermittent, or massive.

Keyword: Abdominal aortic aneurysm, aortoenteric fistula, gastrointestinal bleeding.

Introduction:
Primary aortoduodenal fistula is a rare complication of aortic aneurysms and a rare cause of gastrointestinal bleeding. It is associated with high mortality and morbidity especially because of delay in diagnosis. It should be considered the cause of UGI bleeding in patients with known abdominal aortic aneurysm unless a primary gastrointestinal bleeding source has been identified. We present a case of upper gastrointestinal bleed due to primary aortoduodenal fistula.

Case report:
A 71 year old male presented to the emergency room with complaints of four episodes of hematemesis each around 300 ml associated with postural symptoms. He had similar symptoms three days earlier for which he did not seek medical care. There was no history of abdominal pain, distension, jaundice, fever or NSAID intake. Apart from pallor physical examination was normal. Evaluation showed hemoglobin of 8.8 gm/dL. Rest of the blood investigations showed no abnormality. Gastroscopy was normal and did not reveal any source of bleed. Meanwhile he continued to have hematemesis. Two units of packed cell were transfused and Inj Pantoprazole infusion was continued. CT angiography showed a saccular aneurysm arising from anterior and left lateral wall of the infrarenal part of aorta eroding into the third part of duodenum (figure 1 and 2). Emergency graft repair of abdominal aortic aneurysm and aortoenteric fistula was done (figure 3). He did well postoperatively and was discharged on the 12th postoperative day. Thrombus culture grew Salmonella typhi. Injectable Ceftriaxone was given for two weeks and oral Azithromycin was given for six weeks. After 2 months of follow up the patient was well.

Discussion:
Aortoduodenal fistula is a direct communication between the abdominal aorta and the duodenum. There are two types of aortoduodenal fistulas. Primary aortoduodenal fistula occurs because of the spontaneous development of a connection between the duodenum and the aneurysm. Secondary aortoduodenal fistula occurs usually after repair of aortic aneurysm. Primary aortoduodenal fistula is rare, with an incidence rate at autopsy of 0.04% to 0.07% (1)(2). Primary aortoduodenal fistula was first described by Cooper in 1822 (3). Yao and Pierce identified less than 200 primary aortoenteric fistula reported in the English-language literature (4).

The pathogenesis for the formation of primary aortoduodenal fistula is direct wear and inflammatory destruction triggered by infection, foreign bodies or erosion. The combination of proteolytic inflammatory degradation and anatomic orientation and fixation of the duodenum in respect to the aorta could result in the production of a primary ADF (5). In contrast to secondary aortoduodenal fistula, mechanical factors are less likely to play a role in primary aortoduodenal fistula formation because of the absence of a prosthetic aortic graft. Primary and secondary aortoenteric fistulas occur into the duodenum, most commonly the third portion (57%) (6)(7). Eighty percent of primary aortoduodenal fistulas are from abdominal aortic aneurysm.

The most common etiology of aortic aneurysm is atherosclerosis and less common etiology being traumatic or mycotic aneurysms (8)(9)(10). Rarely radiation, metastases, pancreatic carcinoma, ulcers, gallstones, diverticulitis, appendicitis, and cystic medial necrosis can also cause aortic aneurysm. The infectious agents involved in mycotic aneurysms are most commonly Klebsiella and salmonella. However, tuberculosis, syphilis, mycosis, Staphylococcus, and Streptococcus can also be responsible. The most common clinical signs and symptoms are upper gastrointestinal bleeding (64%), abdominal pain (32%), and a pulsatile abdominal mass (25%) (11)(12). Aortoduodenal fistula should be considered in all patients with massive UGI bleeding and a history of a thoracic or abdominal aortic aneurysm or previous aortic revascularization with prosthetic graft. However diagnostic tests cannot rule out the possibility of an aortoduodenal fistula.

endoscopy, CT abdomen and angiography has value as diagnostic tools in suggesting the diagnosis and discovering other pathology to explain the upper gastrointestinal bleeding. A negative gastroscopy does not rule out an aortoduodenal fistula, and gastroscopy is not sensitive or specific in the diagnosis of primary aortoduodenal fistula.
denal fistula(13). Very few primary aortoduodenal fistulas are diagnosed with angiography. The mortality rate of untreated AEF with UGI hemorrhage is nearly 100%. Survival rates varying between 18% to 93% have been reported with treatment(11)(14)(15). Surgical repair of the aortic aneurysm and fistula is the standard treatment. The postoperative mortality rate is greater than 30% (11). Primary aortoduodenal fistula associated with infected abdominal aortic aneurysm has a worse prognosis than primary aortoduodenal fistula associated with abdominal aortic aneurysm alone, with postoperative mortality rate exceeding 50%(10). Antibiotic coverage should be given for 4 to 6 weeks after surgery if a positive culture is found during surgery and tailored to the cultured organisms(11). The current case report underlies the fact that rare causes of upper gastrointestinal bleeding such as primary aortoduodenal fistula should be considered especially in patient with known abdominal aortic aneurysm as delayed diagnosis is associated with increased morbidity and mortality.

Figure 1: CT Abdomen with contrast showing abdominal aortic aneurysm with intramural haematoma in the third part of duodenum

Figure 2: CT Abdomen with contrast showing abdominal aortic aneurysm with communication with the third part of duodenum

Figure 3: Showing repair of aorto-duodenal fistula with dacron graft and omentum placed between graft and duodenum

References:

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