Surgical Approach for Duodenocaval Fistula Secondary to Inferior Vena Caval Graft Penetration

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A fistula is a pathological connection between two epithelial surfaces. Fistula formation may happen between the gastrointestinal tract and many organs such as skin, aorta, biliary system, inferior vena cava (IVC) and pancreas.

There are previously published cases of fistula formation between the duodenum and IVC. Nontraumatic duodenocaval fistula happens rarely and it may result in massive gastrointestinal bleeding which may be associated with fever and sepsis. Foreign body ingestion, peptic ulcer disease, penetrating abdominal injury, migrated IVC filters, liver transplantation and radiation therapy are some of the risk factors for fistula formation (1-15).

In this paper we described a female patient with a IVC graft penetrating into the duodenal lumen.

Report Of Case

A sixty-four year old female patient was admitted to the emergency room with hematemesis and melena. She has not had fever, nausea or hematochezia. She was hemodynamically stable with a blood pressure of 118/78 mmHg. The clinical examination of abdomen was unremarkable and nontender. She was hospitalized with the prediagnosis of upper gastrointestinal bleeding. The clinical examination of abdomen was unremarkable and nontender. She was hospitalized with the prediagnosis of upper gastrointestinal bleeding. At her medical history, she had a right nephrectomy for renal abscess which was performed 12 years ago. At this operation inferior vena cava was injured. The vessel was repaired with a graft application. Upper GI (gastrointestinal) endoscopy confirmed a foreign body penetrating to duodenal lumen without causes bleeding. (Figure 1). The foreign body was thought to be the graft of IVC vein protruding through the duodenal lumen. After...
Figure 1. Upper gastrointestinal endoscopy revealed the migrated graft to second portion of duodenum.

Figure 2. IVC graft removed from the duodenal penetration site (a). Graft resected from IVC (b).

Figure 3. Duodenal wall was repaired with double-layer continuous sutures.

Discussion

Duodenocaval fistula (DCF) is a rare entity and usually it is observed in male gender between ages 40 to 50 (1, 5). Inferior vena cava (IVC) filters, peptic ulcer disease, penetrating abdominal injury, transmural migration of ingested foreign bodies (including toothpicks, chicken bones etc.) and radiation therapy are the etiologies which can result in duodenocaval fistula formation. In the present case, the etiology of the duodenocaval fistula formation was the IVC graft penetrating to the duodenal lumen which was the first case to be reported in the English medical literature.

DCF formation is a long process. The average time from prior surgery to fistula formation in case with fibrosis was 26 months (range, 6-120 months) (5). The time between caval filter placement and the occurrence of the fistula was 6 years on average.
If a DCF is suspected, it is recommended that CT or MRI should be the first line diagnostic modality. However, in a review of 38 cases with DCF, 10 patients had CT analysis but in only 5 of these patients (50%) CT revealed accurate diagnosis. CT analysis of DCF patients reported in literature revealed gas or an incarcerated foreign body within the IVC, migrated caval filter or a periduodenal abscess. But these findings are not usually present. In our case, the CT and CT angiography were reported as normal. In the previous review it was also reported that other diagnostic modalities including contrast swallow radiography (38%), cavagraphy (33%), endoscopy (30%) were often nondiagnostic.

A duodenal ulcer with an active bleeding in DCF on upper endoscopy may be helpful in the diagnosis but the depth of penetration of the ulcer may not be estimated. A case report of air embolism has been reported after upper endoscopy in a patient with DCF. If an upper endoscopy is planned in patients with a suspected DCF, air embolism should be kept in mind.

The reported mortality rate for DCF is about 40% (1,7). The postoperative mortality is very high (60%). The skill and experience of the surgeon is important in the prognosis. Although patients may die after surgery due to sepsis or bleeding, most of the deaths occur in patients before they could have an operation (12,17).

An emergency laparotomy is usually performed in clinically unstable cases and various surgical techniques are described depending on the mechanism of fistula formation and the presence of IVC thrombosis (18). Most of these techniques involve simple suturing of the duodenum and IVC. An epiploic or jejunal patch is applied to prevent recurrence as well (1,7). Double-layer continuous suturing with an omental patch application as in our case is proven to be a successful solution. Pancreaticoduodenectomy with gastrojejunostomy and choledochojejunostomy and division or excision of the IVC with graft interposition have also been described (1,7).

Conclusion

Fistula between IVC and duodenum are rare. Patients usually diagnosed after investigations for upper gastrointestinal bleeding. However, IVC graft migration to duodenum is the first case described in literature. Surgical repair is the best choice of treatment. Results of double-layer continuous suturing with omental patch appliance are satisfactory and safe when performed by surgeons experienced in both vascular and gastrointestinal surgery.
