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**DAHİLİ TIP BİLİMLERİ**/ *MEDICAL SCIENCES*
***Araştırma Makalesi/ Research Article***

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

*Vena Kava İnferior Greft Penetrasyonuna Sekonder Duodenokaval Fistullerde Cerrahi Yaklaşım*

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Fistula formation between the duodenum and inferior vena cava (IVC) is a rare entity. It may be diagnosed after upper gastrointestinal bleeding. Here in, we present a case of IVC graft- duodenal fistula manifesting with hematemesis and melena which was diagnosed by upper gastrointestinal (GI) endoscopy**.** Abdominal computed tomography (CT) was reported as normal. At laparotomy, an IVC dacron graf with erosion into the adherent duodenum was explored. The graft was removed and the duodenum was repaired by double-layer continuous suture with omental patch application. Surgery is the best therapeutic approach for treatment of dudodenocaval fistula. Double-layer continuous suture of duodenum supported by the application of an omental patch can be an option for surgical approach.

Keywords: ***Inferior Vena Cava, Graft Penetration, Enteric Fistula***

Duodenum ve inferior vena kava (İVK) arasında fistül oluşumu nadir bir durumdur. Üst gastrointestinal kanamalardan sonra tanı konulabilir. Burada, hematemez ve melena ile belirti gösteren, üst gastrointestinal (Gİ) endoskopi ile tanı konulan İVK greft – duodenal fistül vakasını sunmaktayız. Abdominal bilgisayarlı tomografisi normal olarak rapor edildi. Laparotomide, İVK Dakron greft ile bitişiğindeki duodenumun erozyonu gözlendi. Greft çıkarıldı ve duodenum iki kat kontinü sütürle omental yama uygulanarak onarıldı. Cerrahi, duodenokaval fistülde en iyi tedavi yaklaşımıdır. Duodenumun iki kat kontinü sütür ile omental yama desteği cerrahi yaklaşımda bir seçenek olabilir.

Anahtar Sözcükler: ***İnferior Vena Kava, Greft Penetrasyonu, Enterik Fistül***

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 on admission. 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. 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

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endoscopy procedure, the patient was referred to our clinic. Radiologic investigations were performed and computed tomography (CT) angiography findings were normal. We performed a laparotomy procedure. On inspection there was dense retroperitoneal fibrosis due to previous right nephrectomy operation. After lysis of dense fibrotic adhesions we performed a wide Kocher maneuver and visualized IVC and we were able to sharply dissect the duodenum from the anterior wall of the IVC. We observed that Dacron graft had migrated through posterior medial wall of the second portion of the duodenum and penetrated into the lumen **(Figure 2).** There was no bleeding from IVC due to the dense fibrotic changes around the vessel. The graft was removed and the duodenal wall was repaired with double-layer continuous sutures **(Figure 3).** Between the IVC and duodenal wall an omental flap was placed and the surgery was completed without any complications. She did well postoperatively and she was discharged from the hospital after 12 days.

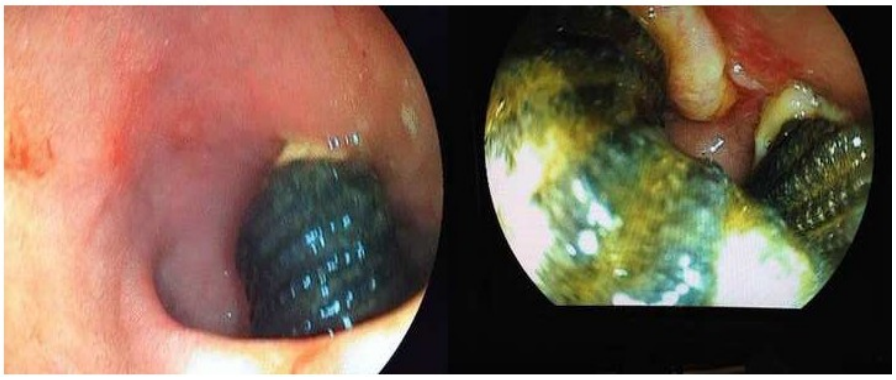

**Figure 1**. Upper gastrointestinal endoscopy revealed the migrated graft to second portion of duodenum.

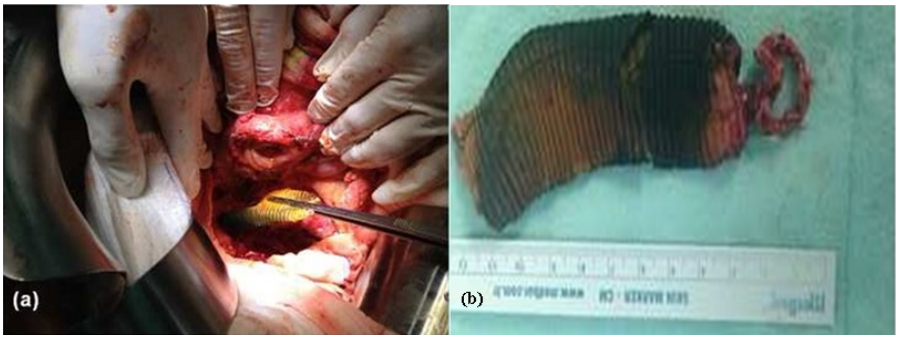


**Figure 2.** IVC graft removed from the duodenal penetration site (a). Graft resected from IVC (b).

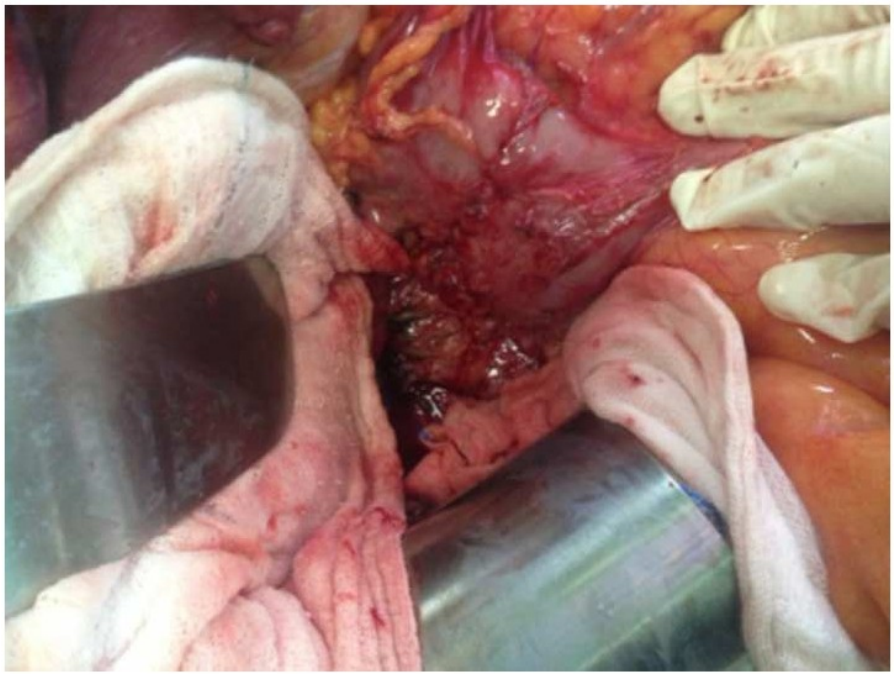

**Figure 3.** Duodenal wall was repaired with double-layer continuous sutures

## 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

(range 7 days to 11 years) (7). In our case, the migration of IVC graft into the duodenal lumen has taken place during a period of 12 years.

If a DCF is a suspected diagnosis, it is recommended that CT or Magnetic Resonance Imaging (MRI) should be the first line diagnostic modality (3). 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 (**7**). 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 (1,7,15). 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 (7).

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 (**7**). A case report of air embolism has been reported after upper endoscopy in a patient with DCF (**8**). 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 (16), 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

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