中文題目：下腔靜脈十二指腸瘺管與文獻報告

英文題目：A case report of duodenal cava fistula and literature review

作　　者：王亭雅[1], 蕭伯任[2] 張牧新[3,4]

服務單位：[1]臺北榮民總醫院內科部，[2]台北榮民總醫院教學部,[3]臺北榮民總醫院腫瘤醫學部，[4]陽明交通大學生藥所

**Abstract:** Duodenal cava fistula (DCF) is a rare complication which may occur after receiving surgery or radiotherapy. We present a 44-year-old male who suffered from repeated sepsis and abdomen pain. He was diagnosed of DCF resulting from debulking surgery and subsequent radiotherapy for collecting duct carcinoma. Image of computed tomography and positron emission tomography (PET) suspected the diagnosis and exploratory laparotomy confirmed it without tumor recurrence. Literature review concentrated on diagnostic tools and therapeutic decision in different circumstance.

**Introduction:** Duodenal cava fistula (DCF) is a rare complication after retroperitoneal surgery with radiotherapy. As surgery and radiotherapy have become a part of standard treatment for urothelial carcinoma and renal cell carcinoma, the chances of DCF formation have become more apparent. The lack of specific symptoms and image finding have delayed patients from getting appropriate treatment before suffering sepsis or massive hemorrhage. This article discusses a case of DCF formation after right nephrectomy and partial inferior vena cava (IVC) resection with vessel graft and radiotherapy.

**Case Presentation:** A 44-year-old male has a history of right-collecting duct carcinoma PT4N1M0 stasis post-right radical nephrectomy, right adrenalectomy, partial hepatectomy, and partial IVC resection with vessel graft. Chemotherapy of gemcitabine and carboplatin was given for four courses along with 6000 Gray in 25 fractions at the time after surgery, abutting IVC and the right psoas muscle. Follow-up computed tomography (CT) showed tumor complete remission. One year after treatment, the patient presented to the hospital with fever and abdominal pain twice. Intermittent hematochezia was also noted, but hemorrhoids were suspected initially. On the second admission, hemodynamic instability was noted and treated with an inotropic agent. Upon the first hospitalization, blood culture indicated the presence of Lactobacillus salivarius. Two CTs were performed but showed no recurrence of cancer or a specific source of infection.

Nonetheless, ten days after the second discharge, the patient suffered from a recurrence of fever and abdominal pain again. An abdomen CT showed luminal narrowing of the infrahepatic IVC, with a suspicious presence of air bubbles and fistula formation between the IVC and adjacent duodenum (Fig. 1). Empirical antibiotics were administered. Retrograde venography showed no extravasation but an obliteration of intrahepatic IVC. Pan-endoscopy showed a food-like foreign body impacted at the depressive area at the anterior wall of the proximal second portion of the duodenum, which could not be removed by scope. Positron emission tomography (PET) showed a suspicious fistula between the duodenum and IVC, with increased F-fluorodeoxyglucose (FDG) uptake at the peri-IVC region. An active inflammation such as an abscess was suspected (Fig. 2).

A multi-discipline meeting of experts recommended surgery. Pancreaticoduodenectomy without pylorus preservation was performed and found DCF, about 2cm*/1.5cm in diameter, over the second portion of the duodenum with IVC. Drainage was removed gradually post-surgery. The patient was discharged 40 days after surgery. The patient was in no pain or discomfort and resumed a regular diet five months after surgery.

**Discussion:** DCF is a rare but life-threatening condition. There are various causes, including penetrating abdominal injury, retroperitoneal surgery with or without radiotherapy, foreign bodies (fish bones, toothpicks), peptic ulcer disease, and complications from migrating IVC filters. Clinical symptoms can manifest as fever, sepsis, gastrointestinal bleeding, abdominal pain, or septic pulmonary embolism[1,2]. Other symptoms include weight loss, diarrhea, small bowel obstruction, respiratory distress, and stroke. Septicemia can involve gram-positive bacteria, gram-negative bacteria, or fungemia.[1] The nonspecific presentation of DCF results in delayed diagnosis. The overall mortality for DCF reaches 39.5%.[1]

One of the common causes of DCF was surgery on a retroperitoneal tumor (including renal cell carcinoma[3], sarcoma[4], metastatic colon cancer[5], and metastatic endometrial adenocarcinoma[1]). Very few reported cases have been associated with tumor recurrence[3]. Reviews suggested ulcers may be the etiology for post-irradiation DCF. Mucosal damage and fibrosis within irradiated fields progressed into ulcers, transmural penetration, or fistula formation, especially when conducted with chemotherapy that affects mucosa[6]. The time between surgery and fistula formation was, on average, of 26 months (range 6-120 months)[7]. In this case, associated symptoms occurred around 17 months after surgery.

CT plays an important role in diagnosing DCF. The presence of foreign bodies, penetrating filters, thrombus and air bubbles in the IVC lumen, or periduodenal abscesses may indicate the possibility of DCF. Air bubbles in the IVC are a relatively specific finding. However, these findings may present transiently. Therefore, a repeat CT examination may be necessary before obtaining a diagnosis. Alternative image studies can be less sensitive than a CT scan, such as contrast swallow radiography, cavography, endoscopy, or ultrasound scan.[8] There was no PET scan image of pre-intervention DCF reported in previous literature. In the case outlined above, PET/CT was performed and showed increased FDG uptake at the peri-IVC region, indicating an active inflammation such as an abscess. Our case provided an evidence that PET/CT could be an additional diagnostic tool for DCF.

Various surgical methods have been proposed for DCF, such as simple suture of the IVC and duodenum, truncal vagotomy, antrectomy, duodenal exclusion, or in the case outlined, pancreaticoduodenectomy with gastrojejunostomy plus choledochojejunostomy and division of the IVC[9]. However, morbidity rates of up to 61% have been reported after surgery[1]. Better outcomes have been found with early open surgery. Conservative treatments were considered in a few cases that were caused by foreign bodies[10]. Endovascular stents have also been used but show less successful results compared to open surgery in long-term survival[1].

**Conclusion:** DCF is rare and challenging to clinical diagnosis and treatment. Apart from CT, a PET scan can also serve as a diagnostic tool when impressions are uncertain. Different approaches have been proposed in previous literature and delicate care is needed to improve morbidity and mortality.

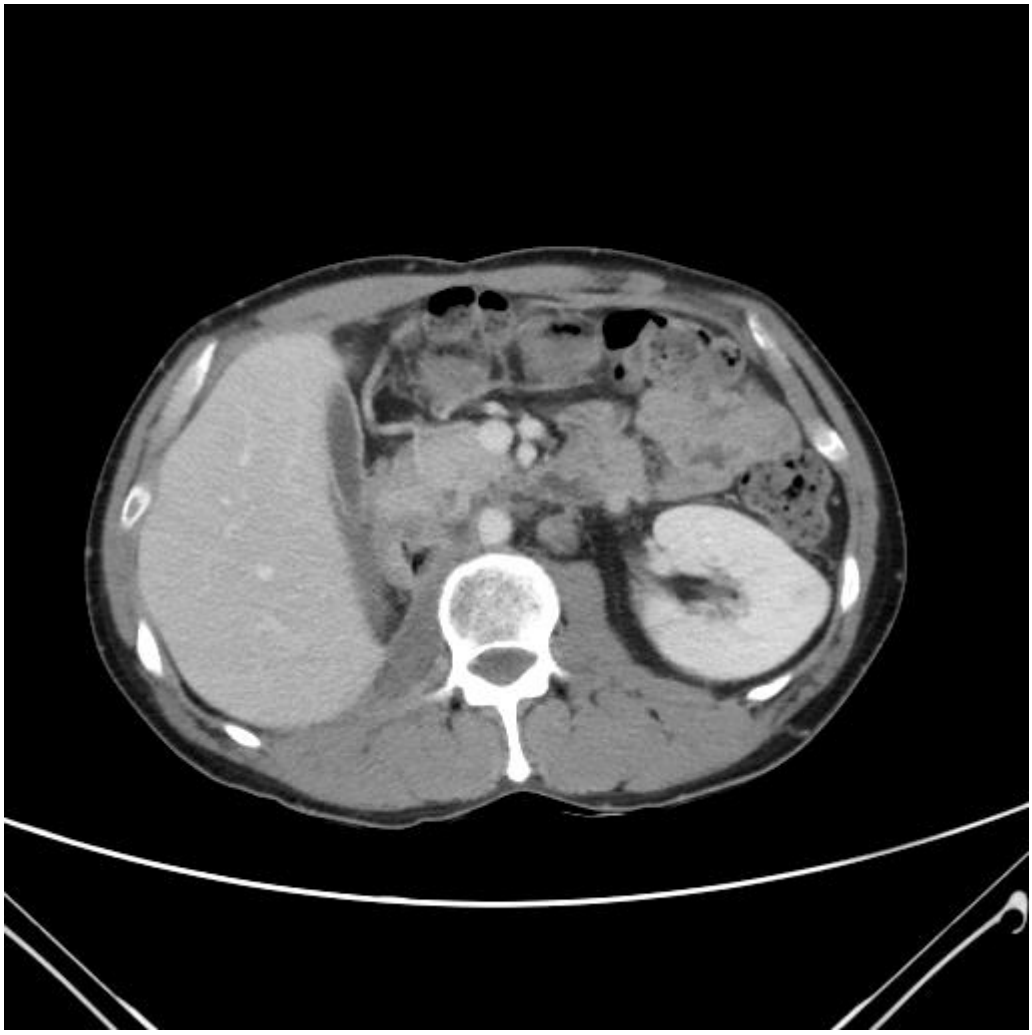

Fig 1. Computed tomography of duodenal cava fistula (DCF)

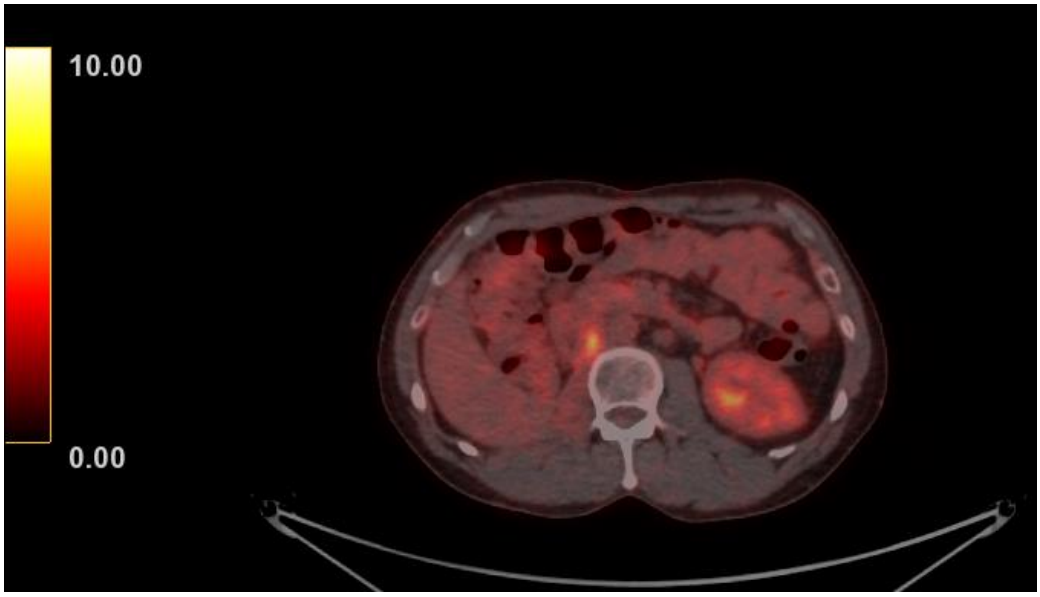


Fig 2. Positron emission tomography-computed tomography of DCF

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