CASE REPORT
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Duodenorenal Fistula as a Complication of Radiofrequency Ablation of Hepatic Metastasis of Renal Cell Carcinoma

Renal Hücreli Karsinomun Karaciğer Metastazında Radyofrekans Ablasyonun Komplikasyonu Olarak Gelişen Duodenorenal Fistül

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Abstract

Duodenorenal fistula is a rare condition. The right kidney and the second part of the duodenum are in close anatomic proximity. Although unusual, fistulae can occur between these two anatomic structures. We report a patient who presented with duodenorenal fistula after radiofrequency ablation for renal cell carcinoma and its hepatic metastasis.
Keywords: Renal cell carcinoma, radiofrequency ablation, hepatic metastasis, duodenorenal fistula

Öz

Duodenorenal fistül nadir görülen bir durumdur. Sağ böbrek ve duodenumun ikinci kısmı anatomik olarak yakın yerleşimlidir. Sık olmasa da bu iki anatomik yapı arasından fistül gelişebilir. Bu çalışmada, renal hücreli karsinom ve karaciğer metastazı nedeniyle radyofrekans ablasyon uygulaması sonrası duodenorenal fistül gelişen bir hasta bildirilmektedir.
Anahtar Kelimeler: Renal hücreli karsinom, radyofrekans ablasyon, karaciğer metastazı, duodenorenal fistül

Introduction

Fistulous connection between the duodenum and the kidney is a rare pathologic event. Duodenorenal fistula develops mostly as a result of renal inflammation, however, tumor and interventional procedures have also been reported to cause duodenorenal fistula (1). Percutaneous radiofrequency ablation (RFA) is a common procedure used to treat various tumors including hepatic metastases and renal tumors. Several complications can be seen after RFA, such as bleeding, infectious complications and injury to the surrounding tissue (2). We report a patient in whom a duodenorenal fistula developed after RFA for renal cell carcinoma (RCC) and its hepatic metastasis. de Arruda et al. (3) reported the only case of a duodenorenal fistula after renal RFA for RCC, however, to the best of our knowledge, this is the first report of a duodenorenal fistula after syncronous hepatic and renal RFA for RCC and its metastatic lesion.

Case Presentation

Our patient is a 56-year-old man who underwent partial nephrectomy for RCC three years ago. Postoperatively, the patient received interferon-alpha for RCC for one year. During the follow-up, a new 1.2 cm RCC in the remnant kidney and a 2.2 cm hepatic metastasis in segment 6 were discovered. He was treated by ultrasound-guided RFA for both kidney and the liver along the same tract. A renal abscess developed one month after the RFA procedure and it was successfully treated by ultrasound-guided catheterization and drainage.

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Three months after RFA (2 months after renal abscess), the patient presented with epigastric pain and recurrent urinary tract infection due to resistant *Escherichia coli.* He had been hospitalized 3 times for urinary tract infection before being admitted to our hospital. He reported normal bowel habits and no previous urinary symptom.

On physical examination, his abdomen was non-tender. His blood pressure was 125/85 mmHg and pulse was 92 beats/minute.

His hemoglobin level was 13.2 g/dL, white blood cells (WBCs) and renal functions were initially normal. After presentation, WBC count was 16.000/mm^3. Abdominal X-ray did not show any pathology. Preoperative abdominal computed tomography (CT) revealed free gas in the partial nephrectomy zone, which was consistent with duodenorenal fistula (Figure 1).

Laparotomy was performed; dense adhesions were present between the liver, right kidney and duodenum. A duodenorenal fistula was identified, right nephrectomy was performed and the defect on the duodenal wall was repaired primarily (Figure 2).

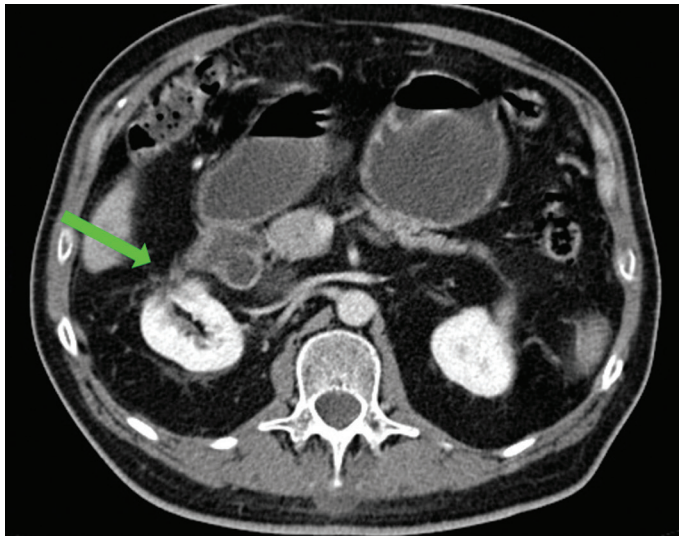

Figure 1. Contrast-enhanced abdominal computed tomography shows the fistula between duodenal bulbus wall and right kidney

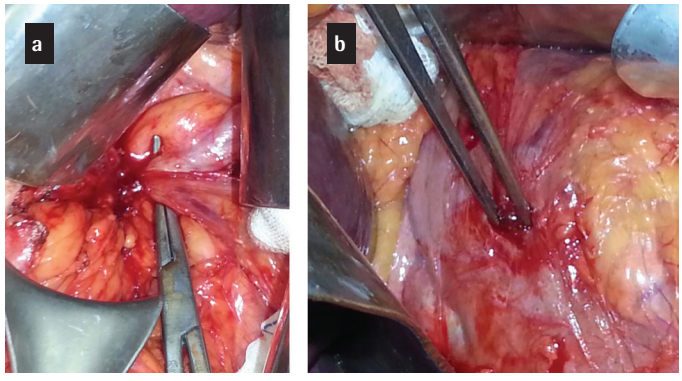

Figure 2. a) Duodenorenal fistula, b) Duodenal part of fistula

Pathological examination confirmed not only the presence of duodenorenal fistula and chronic inflammation process but also recurrent RCC in another site of the right kidney, which was apart from the RFA and fistula site.

Discussion

Reno-alimentary fistulae are rare conditions. The most prevalent form is colorenal fistula followed by duodenorenal fistula (4). They mostly occur on the right side as a result of anatomic proximity, although a few cases of fistulae from left kidney to the third portion of duodenum have been reported (5).

Duodenorenal fistula has been reported since 1839 and they can be classified as traumatic and spontaneous (6). The most common causes of spontaneous duodenorenal fistula are primary diseases of the kidney, usually chronic perinephrotic inflammation; renal calculi and obstruction (1,5). Resulting perinephritis and possible abscess can lead to erosion of the renal pelvis and duodenum and the fistula occurs. On the other hand, traumatic fistulae result from direct perforation of the renal pelvis by a foreign body (ureteral catheter, nephrostomy tube, swallowed hairpin or toothpick, bullet) or severe blunt trauma (7). Primary gastrointestinal disorders are rare causes of duodenorenal fistulae (4,8). Only one case has been reported after RFA of the renal tumor (3).

Patients with duodenorenal fistula may present with a variety of gastrointestinal and urinary symptoms, including right upper quadrant tenderness, flank pain, nausea, diarrhea and recurrent urinary tract infections (9). In our case, the patient had only non-specific epigastric pain, whereas he had been hospitalized three times for urinary tract infection.

Historically, retrograde or intravenous pyelography had been the radiologic procedure of choice for the diagnosis of reno-alimentary fistula but CT urography which is widely available today is a much more rapid and easier alternative.

Radiofrequency ablation relies on a needle electrode to deliver an alternating current via the tip of an electrode into the surrounding tissue, leading to alternating movement of ions along the direction of the current and the friction results in tissue heating. As the temperature rises above 60 °C, cell death begins, resulting in a region of necrosis surrounding the electrode (10).

Duodenal injury, gastric injury and colon perforation have been reported after RFA for hepatic lesions (2). Our patient had undergone RFA for both recurrent RCC on the remnant kidney and hepatic metastasis of RCC. Both procedures were carried out at the same session and along the same tract. Duodenorenal fistula may develop after chronic perinephrotic inflammation and abscess, however, this process usually takes years (11). What

was critical with our patient was that two RFA procedures were combined and the fistula was diagnosed only three months later. Prolonged exposure to high temperature due to combined procedures could be the underlying mechanism. Using different tracts for subsequent RFA procedures may help lower the incidence of such complications.

Nephrectomy and primary repair of the duodenum are still treatment of choice for patients with a poorly functioning kidney (due to renal infection) or any suspicion of malignancy, however, every attempt to preserve the kidney should be made for traumatic fistulae (7).

In conclusion, duodenorenal fistula is a rare entity, mostly due to chronic renal infection. Less frequently, trauma or malignancy may result in pathologic communication between the duodenum and kidney. RFA, a prevalent technique used for tumor ablation can result in thermal and infectious complications within the adjacent tissues and organs. This is a rare case of a duodenorenal fistula complicating hepatic and renal RFA for metastatic RCC. Surgical intervention is necessary in patients with a history of malignancy.

Ethics

Informed Consent: Consent form was filled out by the participant.

Peer-review: External and internal peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: H.Ö., O.A., A.B.D., O.A., Concept: O.A., A.B.D., O.A., Design: A.B.D., H.Ö., A.E., C.Ö., Data Collection and Processing: A.E., C.Ö., O.A., Analysis or Interpretation: O.A., O.A., A.B.D., H.Ö., Literature Search: A.B.D., A.E., C.Ö., Writing: A.B.D., A.E., C.Ö.

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