Case Report

Pyeloduodenocolic Fistula

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A 75-year-old man presented with epigastric pain and melaena. Multiple right renal stones were seen on abdominal X-ray. Computed tomography of the abdomen and oesophagastroduodenoscopy revealed features of a pyeloduodenal fistula. Elective surgery was planned but the patient developed torrential bleeding with shock. Emergency laparotomy revealed a necrotic right kidney with a pyeloduodenocolic fistula. This report is the first of a pyeloduodenocolic fistula caused by squamous cell carcinoma of the renal pelvis. We review the literature and discuss the aetiologies, clinical presentations, diagnosis, and treatment of pyeloduodenal fistula. [Asian J Surg 2003;26(3):186–8]

Pyeloduodenal fistula is a rare condition and is classified as spontaneous or traumatic according to the aetiology. Spontaneous pyeloduodenal fistula is usually caused by chronic inflammation as a result of nephrolithiasis. We report a patient with a kidney tumour fistulating into the duodenum and colon (pyeloduodenocolic fistula).

Case report

A 75-year-old man complained of epigastric pain and melaena over a period of 2 days. He reported normal bowel habits and no urinary symptoms previously. On presentation, he was pale and cachexic. His abdomen was soft with no palpable mass. His blood pressure was 120/99 mmHg and his pulse was 100 beats/minute. His haemoglobin was 7.4 g/dL. His white blood cell count and renal function were initially normal. An erect abdominal X-ray showed multiple renal stones and air-fluid levels above the right kidney (Figure 1). Abdominal computed tomography (CT) revealed that the right kidney was largely replaced by a mass containing air-fluid levels and the inferior vena cava was thrombosed (Figure 2). The middle part of the mass which contained a staghorn stone had invaded the duodenum (Figure 3). Oesophagastroduodenoscopy (OGD) revealed a fistula in the second part of the duodenum with the stone, but no active bleeding was noted. The clinical diagnosis was pyeloduodenal fistula.

The patient was initially managed with blood transfusion, intravenous antibiotics, and omeprazole. Total parenteral nutrition was administered in preparation for potential surgical treatment. Unfortunately, he developed torrential bleeding and shock 2 days after admission. A visceral angiogram failed to locate the source of bleeding. Emergency laparotomy revealed that the right kidney was grossly destroyed and had been replaced with an infected haematoma. The second part of the duodenum and the hepatic flexure of the colon were both eroded and fistulated. Debridement of the infected haematoma, closure of the duodenal fistula with controlled duodenostomy, feeding jejunostomy and right hemicolecotomy were performed. The colonic stump was closed and terminal ileostomy was performed. Histopathology of the debrided tissue showed squamous cell carcinoma of the kidney. Unfortunately, the patient died 2 days after surgery because of sepsis and multiple organ failure.

Discussion

Pyeloduodenal fistula is a rare but serious condition. It was first reported in 1893 and about 80 cases have been reported so far in the literature. Pyeloduodenal fistulae are classified into spontaneous and traumatic types. About 80% are spontaneous. The majority of spontaneous fistulae result...
from nephrolithiasis. Infection of an obstructed renal pelvis could lead to chronic pyelonephritis, perinephritis, abscess formation and subsequent rupture into adjacent organs.4 On the other hand, a fistula can result from direct erosion of a renal calculus into the duodenum.5 Other possible causes include foreign bodies, tuberculosis, inflammatory bowel diseases and renal or intestinal tumours.6

Renal epidermoid carcinoma7 and adenocarcinoma of the renal pelvis8 have been reported as causes of pyeloduodenal fistulae. Squamous cell carcinoma of the renal pelvis is associated with renal calculi,9 as with our patient. Squamous metaplasia and malignant changes are believed to be the consequences of chronic irritation from renal calculi.9 The tumour is highly infiltrative and the prognosis is poor.10 This is the first report of a pyeloduodenocolic fistula caused by squamous cell carcinoma of the renal pelvis.

Traumatic causes of pyeloduodenal fistulae include falls, crushing injuries, foreign bodies, gunshot wounds, the presence of a gastrostomy tube, and, with increasing incidence in recent decades, the presence of a percutaneous nephrostomy tube.11 Trauma may cause extravasation of blood or urine into the perinephric space, forming a perinephric abscess, with eventual fistulation into the duodenum.4,12

The relative immobility of the second part of the duodenum, its lack of a posterior peritoneal covering, and its close contact with the anterior one-third of the right kidney make it prone to involvement in kidney pathology.11,13 Our patient developed a fistula between the right kidney, the second part of the duodenum and the hepatic flexure of the colon. Although simultaneous pyeloduodenal and renocolic fistulae have been reported,14 pyeloduodenocolic fistulae have not been previously reported.

Patients with pyeloduodenal fistula present with various symptoms as a result of involvement of both the gastrointestinal and urinary systems. Persistent right flank pain is the most common symptom and occurs in 60% of patients; other common symptoms include epigastric pain and dyspepsia in 46%, general malaise and weight loss in 43%,
and lower urinary tract symptoms in 32% of patients. Common physical findings include fever, pyuria and flank tenderness. In 39% of patients, a flank mass is present. Although upper gastrointestinal (UGI) symptoms commonly occur in pyeloduodenal fistula, presentation with UGI bleeding has not been previously reported. Our patient underwent OGD because of melaena, and the fistula was seen endoscopically. The bleeding probably arose from the infected haematoma in the right kidney.

Traditionally, diagnosis of pyeloduodenal fistula requires imaging studies of the urinary system. Retrograde pyelography is the method of choice, and demonstrates the fistula in 64% of cases. The value of intravenous urography (IVU) is limited by the usual involvement of a non-functioning kidney and only 14% of cases are demonstrated by IVU. Other reported imaging modalities include antegrade pyelography and UGI studies. The value of abdominal X-ray and CT for the diagnosis of pyeloduodenal fistulae is well demonstrated in this report. A staghorn stone in the presence of an air-fluid complex in the kidney suggests a communication between the kidney and the gastrointestinal tract. The diagnosis was then confirmed with OGD. The inferior vena cava thrombus was likely a result of both advanced malignancy and chronic inflammation.

We initially planned to build up the nutritional status of this patient before elective surgery. However, he developed torrential bleeding and shock. Under the emergency setting, we could not remove the diseased right kidney. We removed the fistula, closed the duodenal defect, primarily with controlled duodenostomy, and removed the right colon with ileostomy. He had a very poor prognosis.

Nephrectomy and primary closure of the duodenum are the traditional treatments for spontaneous pyeloduodenal fistula. The outcomes of patients so treated are satisfactory. Nephrectomy is generally recommended because the involved kidney is often non-functioning and malignancy is difficult to rule out with conservative treatment. Nevertheless, Desmond et al reported on two patients managed successfully with internal ureteric stenting. One patient underwent subsequent exploration for removal of a renal stone, while the other patient had no renal stone identified on imaging. Management of traumatic pyeloduodenal fistula merits separate consideration as it usually involves a normally functioning kidney. In general, every effort should be made to preserve a normal kidney, and treatment should be tailored to the individual patient.

References