CASE REPORT

Renal fistulae: different aetiologies, similar management

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SUMMARY

Iatrogenic renocolic fistulae, although have been described in literature, is a rare clinical complication. Recently its incidence is on rise due to advent of minimally invasive surgery and percutaneous surgery of kidney. It has been reported after percutaneous nephrolithotomy but its incidence after percutaneous nephrostomy is quite uncommon and rarely reported. Though spontaneous renocutaneous fistula has been reported, acquired renocutaneous fistula is very uncommon and fistula after gun shot injury has not been reported to the best of our knowledge. Herein, we present two different varieties of renal fistula with completely different history and presentation. But the interesting point is that both were managed conservatively in a similar fashion and both of them responded well

BACKGROUND

Fistulas from kidney are rare. Fistulas can develop between the kidney and the pleura, lungs and bronchia, bowel and skin. However, they are rare, and whenever they occur, they usually involve patients with a history of renal surgery.¹ In the past, incidence of renocolonic fistula was high due to infection, especially tuberculosis and renal stone complications; which reduced gradually with advancements in antimicrobial therapy and better stone management. Spontaneous renal fistula to the skin is rare. Renocutaneous fistulae may occur as a result of chronic infection, especially in the setting of calculus disease. Majority of cases develop in patients with history of previous renal surgery, renal trauma, renal tumours and chronic urinary tract infection with abscess formation.²

CASE PRESENTATION

Case 1

A 20-year-old woman presented at our hospital with percutaneous nephrostomy (PCN) in situ and complaints of pain in right flank since 1 month and generalised body swelling since 2 weeks. She also complained of anorexia, nausea and vomiting for the last 3 days. She had similar history of flank pain and fever 4 months back for which PCN was inserted in a hospital elsewhere. It drained approximately 100 mL of purulent fluid initially but the output decreased gradually. The patient went back to the hospital and informed the doctors regarding absence of output from PCN. PCN was changed twice still there was no drainage. Then the patient

was lost to follow-up due to financial reasons. The condition of the patient deteriorated gradually and she developed fever and pain in right flank and presented to us for further management after 4 months of previous intervention.

Case 2

A 35-year-old man was referred to us from emergency department with complaints of leakage of urine from left flank region following gun shot injury to the abdomen 1 week back. Preoperative X-ray showed presence of bullet in left flank region (figure 1). He underwent exploratory laparotomy in emergency department for haemoperitoneum and bowel injury which was repaired primarily, and the bullet was removed from its site of entry. In the postoperative period, the patient noticed watery discharge from the left flank which happened to be the entry site of the bullet (figure 2).

INVESTIGATIONS

Case 1

Review of old contrast-enhanced CT (CECT) abdomen performed elsewhere 4 months back was suggestive of acute pyelonephritis and pyonephrosis with small right renal pelvic calculus. Most likely

Figure 1 Preoperative X-ray showed presence of bullet in left flank region (patient 2).

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Figure 2 Watery discharge from fistulous tract in left flank which happened to be the entry site of the bullet (patient 2).

that was the reason for PCN placement. Operative documents were not available. Diethylenetriaminepentaacetate (DTPA) scan at 1 month and 3 months after PCN placement revealed poorly functioning right kidney with 9% and 5% differential function, respectively. We requested blood investigations which revealed anaemia, leucocytosis and hypoproteinaemia with normal serum creatinine and markedly raised serum alkaline phosphatase. Ultrasonography showed right small echogenic kidney with PCN in situ with normal left kidney. Nephrostogram showed passage of contrast into the biliary system and opacifying the duodenum and proximal jejunum (figure 3). CECT abdomen and pelvis revealed a small fistulous tract between second part of duodenum and mid calyx of right kidney (figure 4).

Case 2

The leak was confirmed to be urine by laboratory examination. CT urography showed the presence of urinoma in left perirenal region with communication to skin (figures 5 and 6). Left retrograde pyelography was done and pelvicalyceal system was identified. Contrast leak was noted.

Figure 3 Nephrostogram showed passage of contrast into the biliary system and opacifying the duodenum and proximal jejunum (patient 1).

Figure 4 CECT abdomen and pelvis revealed a small fistulous tract between second part of duodenum and midcalyx of right kidney (patient 1).

TREATMENT

Case 1

A diagnosis of renocolic fistula was made. PCN tube was removed after placement of double J stent. Patient improved on conservative management and was discharged. Her DJ stent was removed 3 months later. She presented again with vague abdominal pain around 10 days of stent removal. Surgical gastroenterology consultation was sought and they advised conservative management in view of small calibre fistula and its communication to second part of duodenum. Patient again underwent DJ stent replacement and she did well since then. The patient was kept on 3-monthly DJ stent replacement for a total of 1 year.

figure 5 CT urography showed the presence of urinoma in left perirenal region (patient 2).

figure 6 CT urography showed presence of urinoma in left perirenal region (patient 2).

Now the patient's wound has healed completely and she has no complaints even after 1 month of stent removal (**figure 7**).

Case 2

A 6F double J stent was inserted for draining the kidney. The leak soon decreased and finally stopped. The entry wound which was also the external site of fistula healed within a few days (**figure 8**). The stent was kept in situ for 1 year with regular replacement every 3 months. Poststent removal patient is doing well (**figure 9**).

DISCUSSION

The development of fistulous communication between the kidney and the alimentary tract is rare. It began to be recognised in the mid-1800s due to renal tuberculosis; but the incidence decreased with advancements in antitubercular and antimicrobial therapy.³ With the advent of minimally invasive surgeries for stone disease, PCN tube placement and radio frequency ablation for renal tumours,⁴ the incidence of renocolic fistulae, especially the iatrogenic variety has increased. As of now, most common cause for fistula formation is iatrogenic, as in our case followed by less common reasons such as long-standing calculi leading to obstruction and abscess formation, xanthogranulomatous pyelonephritis, traumatic injury to the kidney and the gut and malignancies.

The kidneys are retroperitoneal structures separated from the enteric system by the peritoneum, Gerota fascia and perirenal fat. Renocolic fistulae occur more commonly when these structures are absent or attenuated. The retroperitoneal colonic segments usually lie anterior to the kidneys, rendering this bowel segment more susceptible to fistula formation. In about 1.0% of cases, even the colon is more posteriorly displaced and may contain a retrorenal component.⁵ Hadar *et al* reported an incidence of retrorenal colon in 0.6% of the cases, after studying the anatomic relation of the colon to the kidneys.⁶ This anatomy

Figure 7 Site of fistula 1 month post DJ stent removal (patient 1).

Figure 8 The entry wound which was also the external site of fistula healed within a few days.

is more common on the left side and is seen more frequently in females.

The ascending and the descending colon are most common segments to be affected. Other locations include fistulous tracts to the duodenum, stomach or small bowel.⁷ Patients may present with pneumaturia or pyuria. Diagnosis is made radiologically by retrograde pyelogram or barium enema. CT is used to locate the precise anatomical site of involvement while fistulogram can be performed to delineate the tract in case of cutaneous extension.

Treatment of renocolic fistula largely depends on the cause of fistula and the segment of bowel involved. If renocolic fistula is caused by iatrogenic injury during percutaneous nephrostomy placement, if it is recognised at an early stage and the patient does not display signs of peritonitis, the simplest treatment is to pull back the percutaneous tube so that it drains the renal pelvis without maintaining the fistulous connection with the colon. If peritonitis sets in, immediate surgical exploration may be required. If the patient is stable and diagnosed at a later date, elective resection of the fistula following mechanical and antibiotic bowel preparation is preferred.⁵

Conservative management can be adopted to treat small renocolic fistula by means of control of infection, ureteral stenting and treating the underlying cause.⁸ Surgical intervention by means of fistulectomy, partial nephrectomy, nephrectomy and bowel resection with primary anastomosis may be required in large fistulas and failed conservative management. Nephrectomy

Figure 9 Site of fistula post-DJ stent removal (patient 2).

is required in most cases as the kidney involved is usually destroyed and non-functional. In our first case, the patient was young and the fistula was small so a trial of conservative management was given by double J stent and the fistula healed gradually.

Most renocutaneous fistulas present as spontaneous drainage through the lumbar region following path of least resistance, most commonly the lumbar triangle (Petit) and the lumbar quadrilateral (Grynfeld), forming a fistulous pathway that acts as a communication between the perirenal tissues and collecting system to the external environment. Frequently, they are associated with infectious renal stones and has been described in all cases reported in literature.^{1 9 10} Therapeutic approaches must be based on the renal function and on the patient's ability to tolerate the surgical procedure, and can include total nephrectomy, partial nephrectomy or isolated antibiotic therapy.¹⁰ Our second case was different as it was not a spontaneous nephrocutaneous

fistula, rather it was acquired after a gun shot injury. Also, the patient was young and his kidney function was well preserved. So we managed the patient conservatively using a double J stent and the fistula healed.

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Learning points

- ▶ Minimally invasive percutaneous procedures have caused resurgence in the incidence of fistulous disease of the kidney.
- ▶ Acquired renocutaneous fistula is rare and fistula after bullet injury through the same trajectory has not been reported.
- ▶ Although most cases in literature required extensive surgeries including nephrectomy, selected fistulas may be managed conservatively.
- ▶ A simple procedure like placement of a double J stent may be sufficient to close the fistulas of different aetiologies and preserve the kidney.

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