CASE REPORT

Spontaneous extrusion of staghorn renal calculus with nephrocutaneous fistula in a child

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SUMMARY

Renal stone disease may present as nephrocutaneous fistula. Spontaneous extrusion of renal stone with nephrocutaneous fistula is rare. Most of the cases have been reported in adults. We present a case of nephrocutaneous fistula with spontaneous extrusion of staghorn renal calculus in a paediatric patient.

nephrocutaneous fistula,³ as reported here, is even rarer.

Asymptomatic staghorn renal calculus is uncommonly encountered in children and may present with later chronic complications. We report a case of spontaneous staghorn renal stone extrusion with nephrocutaneous fistula in a 10-year-old girl.

BACKGROUND

Nephrocutaneous fistula due to renal stone disease is a rare presentation. Most cases are reported in adults. Spontaneous expulsion of renal stones may be due to renal trauma, renal tumour, previous surgery or chronic infection.^{1 2} Association of spontaneous extrusion of renal stones and spontaneous

CASE PRESENTATION

A 10-year-old girl presented with intermittent pus discharge from the left flank region for the past 6 months. She had no history of abdominal pain, fever or haematuria. She did not have a history of surgery. She had quiescence of the pus discharge intermittently on taking antibiotics. On examination, a small opening, appearing as a

Figure 1 (A1) Fistula opening in skin; (A2) plain X-ray kidney, ureter and bladder showing one large stone and other smaller stones in renal fossa; (A3) intravenous pyelogram showing a poorly excreting left kidney with large staghorn stone; (A4–6) CT scan showing a small atrophic left kidney with bulky left psoas muscle containing a large stone, multiple soft tissue tracts extending from the left kidney to subcutaneous tissue and reaching the skin, where the fistula containing small stone fragments opens.

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small ulcer with puckered skin, was noticed on the left flank (figure 1, A1).

INVESTIGATIONS

The patient's white cell count was $9500/\text{mm}^3$ and serum creatinine was 0.8 mg/dL . Urine culture was sterile. Plain X-ray of the kidney, ureter and bladder (KUB) (figure 1, A2) and ultrasound, showed a normal right kidney and a small atrophic left kidney containing multiple stones in the middle and inferior calices measuring 7–8 mm with a suspected large stone embedded in the left psoas muscle (figure 2). Intravenous pyelogram (IVP) (figure 1, A3) showed poor uptake and excretion of contrast in the left kidney, with large staghorn calculus. On first appearance, the stone seemed to be inside the kidney, but on further investigation with contrast-enhanced CT KUB (figure 1,

A 4–6), it was discovered that the staghorn calculus was embedded in the left psoas muscle. There were multiple soft tissue tracts (arrow, figure 1, A4) extending from the left kidney to subcutaneous tissue and reaching the skin, where a fistula containing small stone fragments opened (arrow head, figure 1, A4). $^{99\text{mTc}}$ diethylenetriaminepentacetate renal scan showed a non-functioning left kidney and normal functioning right kidney.

TREATMENT

An extraperitoneal flank approach was used. There was dense adhesion surrounding the atrophic kidney (figure 3, B3). Fascia planes were not identifiable. Subcapsular nephrectomy had to be performed. A large staghorn stone impacted (figure 3, B 1–2, 5)

Figure 2 Small atrophic left kidney with multiple small calculi; a suspected large calculus is located in the left psoas muscle. The right kidney is of normal size and shape.

Figure 3 (B1) Large staghorn stone embedded within the left the psoas muscle; (B2) bulky left psoas muscle with area of stone impaction; (B3) small atrophic left kidney; (B4) completely excised fistulous tracts; (B5) large staghorn stone after removal.

in the left psoas muscle was removed and the fistulous tract excised completely (figure 3, B4).

OUTCOME AND FOLLOW-UP

The postoperative period was uneventful. At 6 months follow-up, the girl was doing well. Histopathology of the kidney showed chronic pyelonephritis.

DISCUSSION

Association of spontaneous extrusion of renal stones and nephrocutaneous fistula is rare.^{4 5} All the cases in the literature have been reported in adult population.

In the present case, initial plain KUB X-ray and IVP were misleading, giving a false impression that the stone was lying inside the left kidney. The CT scan report confirmed the actual position of the staghorn calculus. In this case, had we only relied on IVP and planned for percutaneous nephrolithotomy, we would have faced difficulty during the surgery.

Nephrocutaneous fistula is usually associated with non-functioning renal moiety. Nephrocutaneous fistula due to renal stone is a chronic disease process that starts in the renal parenchyma and usually manifests late, hence the presentation in adults. The mechanism of renal stone extrusion in our case is not clear. Most likely the patient had renal abscess due to renal stone disease, which gradually burst, extruding the stone outside the pelvicalyceal system.

Management of these cases involves surgery and should be individualised as per renal function.¹ Most of the reported

series mentioned nephrectomy with complete removal of the fistulous tract. Partial nephrectomy may be performed if the involved kidney is functioning.^{6 7} According to a review of the literature, the most common cause of nephrocutaneous fistula is renal stone and chronic infection.⁶ A tubercular aetiology as a cause of nephrocutaneous fistula is common, especially in developing countries. Nowadays, fistula due to renal stone and/or postsurgery fistula have become the leading causes. One report of spontaneous nephrocutaneous fistula in a child does exist in the literature but it was associated with reflux nephropathy and is different from the present case.⁸

Learning points

- ▶ Nephrocutaneous fistula may present in the paediatric age group due to renal stone disease.
- ▶ CT scan appears to be the preferred imaging modality in patients with staghorn stones and nephrocutaneous fistula.

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Competing interests None declared.

Patient consent Obtained.

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