

Iatrogenic Reno-Colo-Cutaneous Fistula in a Case of Horse-shoe Kidney

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Abstract: *Reno-colo cutaneous fistula is a rare entity, commonly resulting from a chronic infective or inflammatory etiology. Newer antibiotics and microbial therapies have led to their decline. However, minimally invasive surgery and percutaneous nephrostomy tube placement has resulted in their increase. We report a case of a 44 years female who underwent a percutaneous nephrolithotomy, resulting in a reno-colo-cutaneous fistula as a complication. Our case was unusual as the patient had an underlying congenital anomaly i.e. a horse-shoe kidney. Intravenous urogram showed leakage of contrast into the left colon. Computerized tomography (CT) done, demonstrated the fistulous connection and extravasation of contrast into the peri-renal space communicating with the skin surface along the tract of the nephrostomy tube. A final diagnosis of a reno-colo-cutaneous fistula was made secondary to percutaneous placement of the nephrostomy catheter. The patient was operated with resection of the fistula with an uneventful postoperative recovery. Imaging plays a pivotal role in diagnosing such anomalies and anatomical variants. It not only helps in deciding the line of treatment but also helps our fellow surgeons to provide utmost care and safe treatment with less post procedural complication.*

Keywords: Fistula, Iatrogenic Disease, Urography, CT Scan.

1. Introduction

A fistula was first described in 460 BC by Hippocrates [1]. It is an abnormal epithelium lined communication between two or more cavities / viscera / vessels, which can develop due to infection, inflammation, trauma or iatrogenic etiology. A fistula can occur almost anywhere in the body, with a fistula in ano being the most common. However, communication between the urinary and gastro-intestinal system is very rare with less than 100 cases reported worldwide [2].

Reno-colo-cutaneous fistula is a condition associated with an abnormal communication between the upper urinary tract, gastrointestinal system and skin surface. In the past this was caused by infections like tuberculosis and xanthogranulomatous pyelonephritis which has significantly decreased with emergence of newer antimicrobial drugs / newer regimes.

Traumatic or iatrogenic fistulas, which were earlier uncommon, now show increased incidence with the advent and increased use of minimally invasive surgery [3]. Imaging plays a crucial role in the diagnosis and management of these patients. We document a rare case of reno-colo-cutaneous fistula as a complication of percutaneous nephrolithotomy in a patient with a horse-shoe kidney.

2. Case Report

A 44-year-old housewife, with no major illness (Non diabetic; Non hypertensive) was diagnosed with bilateral obstructive renal calculi on ultrasound. She underwent a percutaneous nephrolithotomy, in the first week of November 2011. Her post-operative period was uneventful.

A week later she presented with abdominal discomfort and complaints of dysuria, fecealuria and pneumaturia. On examination she had left lumbar tenderness, however no clinically palpable mass was felt. Investigations revealed high leucocyte count and anemia. Urine routine and microscopy showed pus and epithelial cells.

She was referred to our department for an intravenous urogram (IVU). The nephrogram image showed equal and optimal contrast concentration by both kidneys. 15-minute film (Figure 1) showed optimal excretion of contrast by kidneys with opacification of pelvicalyceal system (PC system) and ureters. The right renal pelvis was dilated. Simultaneous opacification of the transverse colon & splenic flexure was noted.



Figure 1: 44 years old female with left reno-colo-cutaneous fistula. *Findings:* Intravenous urogram: 15 Minute prone film shows simultaneous opacification of the left PC system and transverse colon (Arrow). Contrast is also seen in the dilated right renal pelvis and right ureter (Arrowheads). *Technique:*

Intravenous Urogram (IVU) 70 kVp, 40 mAs and 50 ml of iodinated contrast.

Post void 30 minute film showed contrast within the transverse, descending, sigmoid colon & rectum with opacification of the urinary bladder. To evaluate the patient further a CT scan was performed, which showed normal size and position of kidneys with fusion of their lower poles in the midline suggestive of a horseshoe kidney (Figure 2).

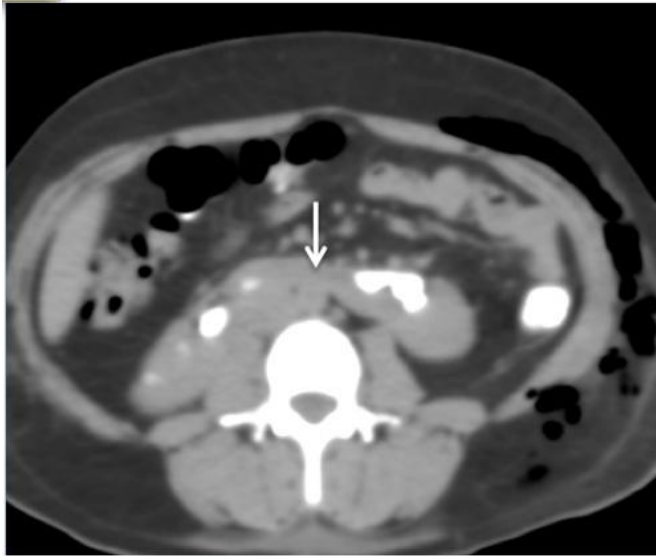


Figure 2: 44 years old female with left reno-colo-cutaneous fistula. Findings: Axial reformatted contrast enhanced CT image in excretory phase shows fusion of the lower pole of kidneys in the midline (Arrow) with contrast in the renal pelvis on both sides. Extensive subcutaneous emphysema is seen along the left lateral abdominal wall. Technique: MDCT 120 kVp, 60mAs, 2 mm slice thickness and 1mm increment.

The contrast opacified renal pelvis and ureters were visualized with abnormal axis of the left renal pelvis. Similar density contrast was also seen in the transverse and descending colon. A contrast opacified fistulous connection (Figure 3) was seen extending from the left upper calyx into the perinephric space and descending colon suggesting a reno-colic fistula.

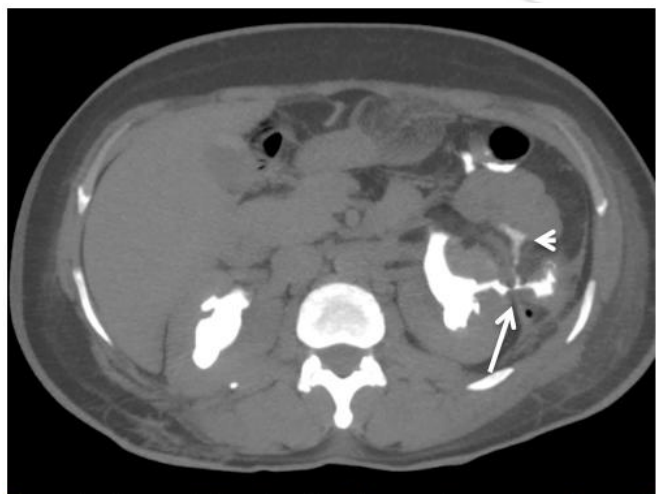


Figure 3: 44 years old female with left reno-colo-cutaneous fistula. Findings: Axial reformatted contrast enhanced CT

MIP (maximum intensity projection) images shows the fistula between the left renal calyx and the descending colon (Arrow). Extravasated contrast is noted in the left perirenal space (Arrowhead). A small foci of air is seen in the left perirenal space. Technique: MDCT 120 kVp, 60mAs, 2 mm slice thickness and 1mm increment

Further evaluation of the CT images showed a non-opacified air filled tract connecting the extravasated perinephric contrast to the skin surface at the site of prior placement of percutaneous nephrostomy catheter (Figure 4).



Figure 4: 44 years old female with left reno-colo-cutaneous fistula. Findings: Axial reformatted contrast enhanced CT images shows air filled tract coursing the left intra muscular plane (arrow). Air is also seen in the left pelvic calyceal system. Extravasated contrast is seen in the left perirenal space (arrowhead). Technique: MDCT 120 kVp, 60mAs, 2 mm slice thickness and 1mm increment.

CT images also revealed focal wall thickening of the descending colon, surrounding fat stranding and air in the urinary bladder and left pelvic calyceal system. The healed right lower pole nephrolithotomy scar was also seen. The rest of the visualized abdominal organs were within normal limits. Subcutaneous emphysema was seen in the left lateral abdominal wall.

The patient underwent surgery 10 days later, resection anastomosis of the bowel and resection of the fistula were performed. The post-operative period was uneventful.

3. Discussion

A fistula was first described in 460 BC by Hippocrates [1]. It is an abnormal epithelium lined communication between two or more cavities / viscera / vessels, which can develop due to infection, inflammation, trauma or iatrogenic etiology. A fistula can occur almost anywhere in the body, with a fistula in ano being the most common. However, communication between the urinary and gastro-intestinal system is very rare with less than 100 cases reported worldwide [2-3].

Reno-colic fistula is rare condition affecting the upper urinary tract and gastrointestinal system. The first renocolic fistula was first described in 1960's [4].

Fistulas are classified as: -

1. Spontaneous - due to chronic infectious or inflammatory process and neoplasia.
2. Traumatic – due to staghorn calculus, GI (Gastrointestinal) trauma and iatrogenic.

In the past fistulas were commonly spontaneous caused by renal infections like tuberculosis with pyonephrosis. This has significantly decreased with emergence of newer antimicrobial drugs / newer regimes. The other rare renal causes include stag horn calculus, xanthogranulomatous pyelonephritis [5] and tumors like adenocarcinoma [1]. A GI cause like inflammatory bowel disease resulting in reno-colic fistula is rare.

The increase in minimally invasive procedures like laparoscopy, radiofrequency ablation [6] and percutaneous nephrostomy tube placements has increased the occurrence of fistulas. In our case the fistula was iatrogenic resulting from percutaneous nephrostomy tube placement.

The kidneys are retroperitoneal organs lined by Gerota's fascia anteriorly and fascia of Zuckerkandl posteriorly. They are separated from the peritoneal cavity by fat and parietal peritoneum. The colon is also retroperitoneal in location, separated from the peritoneal cavity by parietal peritoneum. The colon is situated anteriorly or anterolateral to the kidneys on both sides.

Renocolic fistulas are more common on the left [2,8,9] as was our case. This is attributed to the anomalous location of the colon more posteriorly in relation to the left kidney [9], thus rendering it more prone for perforation during nephrostomy tube placement. An associated renal anomaly like horseshoe kidney further increases the chances of complication due to abnormal axis of the kidneys.

Symptoms of the reno-colic fistula maybe those of the primary pathology, which in case of infections, like tuberculosis and tumors, may manifest as weight loss, asthenia, and dehydration. The symptoms may be due to the fistula in which case they would manifest as acute abdomen, pneumaturia and fecaluria. Ignored, under or untreated fistula can result in complete loss of kidney function resulting in increased morbidity and mortality.

Diagnosis of the reno colic fistula can be made with conventional renal or GI imaging with the help of IVU (intravenous urogram), barium enema. However with the availability of cross sectional imaging i.e. computed tomography and MRI (Magnetic Resonance Imaging) high resolution, cross sectional images are obtained which not only diagnose the fistula but also help in identifying the cause.

An IVU identifies the fistula, however it is two-dimensional and would be limited in case of non-functioning kidneys. A CT scan performed during the IVU, serves as a valuable adjunct, providing information about the fistula (location, extent and cause) and other associated conditions like underlying congenital renal anomalies, as was seen in our case. This helps in planning appropriate management, reducing the morbidity. MR urography has of late, emerged as an alternative to CT scan, providing better soft tissue

contrast. Its main advantage is it involves no radiation and hence is especially useful in patients who need repeated scans over a long period.

Reno colic fistula can be managed either conservatively or surgically. The choice of treatment depends upon the cause, location of fistula and renal function. Surgical treatment varies from nephrectomy in a non-functioning kidney with resection of the fistula with/without resection anastomosis of the affected bowel segment. Emergency laparotomy needs to be done if patient shows signs of peritonitis [2]. In our case, the patient underwent surgical resection of the fistula preceded by antibiotic therapy. She had an uneventful recovery.

4. Conclusions

Reno-colic fistula is a rare condition with female predominance and occurs more on the left as was also seen in our case. Our case was unusual as the patient had an underlying congenital anomaly i.e. a horse-shoe kidney with fusion of the lower poles. Increase demand for minimally invasive surgery has caused increase in the incidence of iatrogenic fistulas.

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Author Profile

Dr. Priscilla Joshi received the M.B.B.S. from Armed Forces Medical College, Pune and M.D. degrees in radio diagnosis from BJ Medical College, Pune in 1981 and 1985, respectively. She currently heads the department of radio diagnosis at Bharati Hospital and Research Center, Pune. She has immense experience in teaching and also has many publications to her name.

