

Case report

Spontaneous ureterocolic fistula secondary to calculous pyohydronephrosis

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Abstract. We report a case of ureterocolic fistula secondary to urolithiasis in a 70-year-old female imaged with both CT and an antegrade nephrostogram. The ureterocolic fistula was managed with insertion of an antegrade ureteral stent.

Obstructive uropathy and urosepsis commonly complicate urolithiasis. Spontaneous ureterocolic fistula is a rare complication of urolithiasis [1, 2]. To our knowledge, there have been no previous reports describing the changes associated with a ureterocolic fistula on CT, and management of a ureterocolic fistula with an antegrade ureteral stent.

Case report

A 70-year-old female with advanced post-encephalic Parkinson's disease requiring institutionalized care, presented with a 3-week history of fluctuating fevers. A plain abdominal radiograph demonstrated a 1.0 cm × 3.0 cm calculus overlying the left sacral ala, which was confirmed to be a left mid-ureteral calculus on CT. There was marked left hydronephrosis with significant

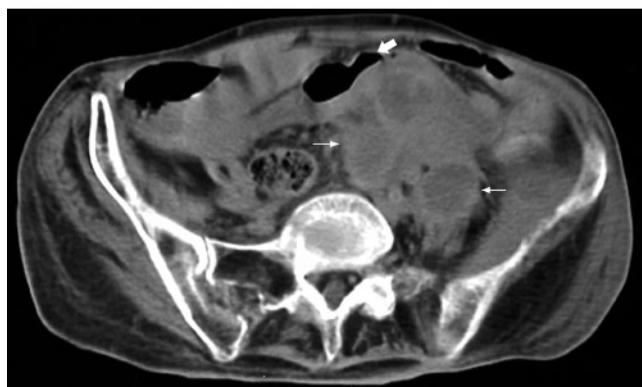
periureteral inflammation (Figure 1). There was no pneumonephrosis, extraluminal bowel gas or extraluminal contrast. She underwent an emergency left nephrostomy, which demonstrated pyonephrosis and fecaluria. *Escherichia coli* was cultured from the urine. An antegrade nephrostogram performed 3 days after insertion of the nephrostomy demonstrated a fistula between the left mid-ureter proximal to the obstructing calculus and the sigmoid colon (Figure 2). The ureteral obstruction was easily crossed with a wire, which facilitated antegrade placement of an 8.5–6 French 26 cm long nephroureterostomy stent (Cook, Bloomington, IN). The patient demonstrated significant clinical improvement following the procedure. However, she died several days later from an unrelated cardiac event.

Discussion

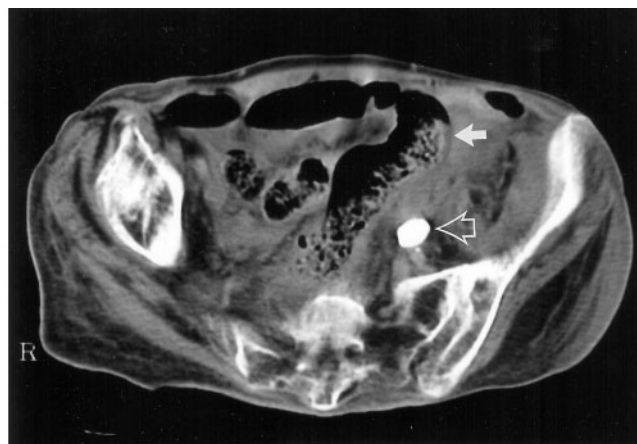
Ureterocolic fistula is a rare and abnormal communication between the ureter and the colon. The most common causes of spontaneous ureterocolic fistulae are diverticulitis and obstructing ureteral calculi [1, 3]. Other less common

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(a)



(b)

Figure 1. (a) Axial CT at the L5-S1 disc level shows a tortuous left hydronephrotic ureter with significant periureteral inflammation (thin arrows). The proximal sigmoid colon (thick arrow) overlies the dilated left ureter. (b) The obstructing left ureteric stone (open arrow) lies just distally.

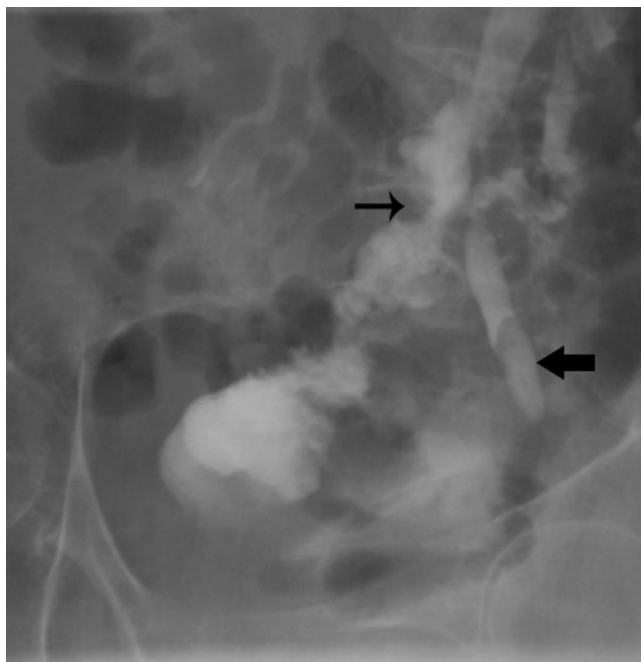


Figure 2. Antegrade ureterogram shows a fistula between the left ureter and sigmoid colon (thin arrow). Obstructing ureteral calculus lies distal to the fistula (thick arrow).

causes include tuberculosis, trauma, tumour and inflammatory bowel disease. A fistulous tract can develop in any area affected by chronic inflammation, necrosis or ischaemia. A large impacted ureteral calculus with urosepsis can cause necrosis of the adjacent ureteral wall. A periureteral abscess can develop which may perforate into an adjacent bowel loop resulting in the formation of a fistula [1]. The majority of patients with renal colic seek acute medical treatment and are thus unlikely to progress to the stage of developing a periureteral abscess. In our case, the inability of the patient to vocalize her symptoms led to a delay in the recognition and treatment of her urosepsis allowing the development of the ureterocolic fistula. Large renal calculi, such as the impacted ureteral calculus in this case, are unlikely to pass through a previously undilated ureter. Prior unrecognized stone passage may have resulted in ureteral dilatation, which facilitated the passage of this larger calculus.

The ureter as it crosses the brim of the lesser pelvis is a common site for ureteral calculus impaction. Although there is no physical luminal narrowing of the ureter at this site, there may be reduced ureteral distensibility due to the extrinsic effect from the adjacent iliac vessels. At this level, the sigmoid colon lies immediately anterior to the left ureter. This close anatomical relationship allows a left ureterocolic fistula to develop most commonly between the mid-ureter and the sigmoid colon.

Reflux of colonic contents through the fistula results in chronic or recurrent urinary tract infection. Pneumaturia and fecaluria are uncommon due to the obstructing ureteral calculus distal to the fistulous tract. Passage of urine per rectum is very uncommon because the higher

colonic pressures lead to predominantly uni-directional flow across the fistula [3].

Plain abdominal radiographs are insensitive for the detection of ureterocolic fistulae. Although pneumonephrosis may be evident, overlying bowel gas often masks small amounts of gas within the urinary tract.

CT is the investigation of choice for urosepsis or renal colic. It is highly sensitive in detecting renal calculi and gas within the urinary tract. The fistulous tract may be evident if it contains gas or contrast. CT with dilute (1–2%) water-soluble rectal contrast may enhance the demonstration of the fistulous tract. We did not use rectal contrast because a ureterocolic fistula was not clinically suspected.

Antegrade or retrograde ureterogram are the most sensitive imaging modalities for the detection and characterization of the fistulous tract [1]. A ureteral catheter can be advanced under fluoroscopy into the region of the suspected fistulous tract. A localized contrast injection provides the best opportunity to demonstrate the fistula. An attempt at crossing the obstruction can be simultaneously performed, which would allow placement of a ureteral stent across the obstruction.

Barium enema may delineate the fistula if the antegrade or retrograde ureterogram is negative despite a high index of clinical suspicion. Double contrast barium enema is more likely to demonstrate the fistulous tract compared with single contrast enema. IVU, renal tract ultrasound, or MRU are less likely to demonstrate the fistulous tract, but may provide corollary evidence of a ureterocolic fistula, such as hydronephrosis or pneumonephrosis.

Quantification of the degree of residual renal function within the affected kidney after relief of the obstruction is important to plan the definitive surgery. If there is poor renal function after relief of the ureteral obstruction, a nephroureterectomy, fistulectomy, segmental colonic resection and primary colonic re-anastomosis are the definitive surgical treatment. If there is significant return of renal function or if there is a single kidney with some residual function, renal sparing surgery is performed. A temporary ureteral stent across the obstruction may be of benefit prior to definitive surgery by reducing the amount of periureteral inflammation. In non-surgical candidates, as in our case, placement of a ureteral stent across the obstruction is the treatment of choice. This may allow the fistulous tract to heal.

In conclusion, spontaneous ureterocolic fistula is a rare complication of urolithiasis. With the increasing number of mentally impaired patients in long term palliative care, this complication of urolithiasis may become more common.

References

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