

Staghorn Renal Calculus with Xanthogranulomatous Pyelonephritis and Renocolic Fistula

by Risheng Xu, Khawaja Azimuddin

Reno-colic fistula is rare, and even fewer cases were reported in association with staghorn stones and xanthogranulomatous pyelonephritis (XGP). Here we present a case of reno-colic fistula initially presented as recurrent urinary tract infections (UTI) at outside facility and empirically treated with antibiotics without improvement. Patient was admitted to us and found to have staghorn renal calculus with renocolic fistula and pathology features of XGP. Renocolic fistulas complicating staghorn calculus and in association with features of XGP are rare. Although they may present as recurrent UTIs initially, further work up to rule out a fistula should be entertained as imaging modalities are limited in initial diagnosis of fistulas. A high clinical suspicion to rule out fistula should be kept when initial imaging shows staghorn calculus with XGP features. Repeat imaging with contrast is helpful in evaluating renocolic fistulas. Treatment involves nephrectomy with partial colectomy. Post operative prognosis is generally good.

INTRODUCTION

Renocolic fistula is a rare clinical entity. The initial presentation could be abdominal pain, hematuria, pyuria and flank pain which may mimic urinary colic secondary to nephrolithiasis or urinary tract infection. Here we present a case of a female patient initially diagnosed with urinary tract infection who was later found to have obstructive hydronephrosis due to large staghorn calculus, imaging features of

xanthogranulomatous pyelonephritis (XGP) and renocolic fistula. She was subsequently treated with aggressive antibiotic therapy and surgical management with excellent recovery.

Presentation of Case

A 50 year-old female with remote history of nephrolithiasis presented to our hospital with a two-week history of dysuria, hematuria and abdominal pain radiating to the left flank. A few days prior to admission, she was seen at outside facility emergency department and was diagnosed with a urinary tract infection (UTI). She was given nitrofurantoin and discharged home. The patient completed the course of antibiotics but showed no clinical improvement and subsequently presented

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to our hospital for reevaluation. She denied fever and her abdominal exam was normal, except for left costovertebral angle percussive tenderness. On initial check, her white blood cell count was 10,000 with no left shift, and her urinalysis revealed 3+ protein, large blood, large leukocyte esterase, >200 WBC and 177 RBC with few bacteria and many white cell clumps. The patient had a non-contrast computed tomography (CT) of the abdomen and pelvis which showed a large, 4 cm staghorn calculus within left kidney, and an enlarged left kidney with hydronephrosis. Air was noticed within the inferior pole calices with surrounding perinephric fat stranding concerning for emphysematous pyelonephritis and features of XGP. Repeat CT with intravenous contrast revealed extrarenal extension of the infection into posterior perinephric and pararenal spaces and into the quadratus lumborum muscle with an abscess of 5.3 x 2.1 x 5.7cm. A percutaneous nephrostomy tube was placed. Post procedure imaging confirmed appropriate placement of the tube but contrast was noted to be in the descending colon (Figure 1) and in the previous abscess in the posterior abdominal wall, without apparent injury from nephrostomy tube.

Urine culture yielded *Proteus mirabilis*, which was empirically treated with broad-spectrum antibiotics. Given the imaging findings, exploratory laparotomy with left nephrectomy and segmental left colon resection was performed. The resected left kidney eventually showed XGP features on pathology. Cultures obtained during laparotomy subsequently grew *Streptococcus bovis* and *Bacteroides fragilis*. The patient tolerated the surgical procedure well, and no postoperative complications occurred. Eventually, antibiotics were simplified to oral ciprofloxacin and metranidazole and she was discharged from the hospital in ambulatory status. The patient was doing well 6 weeks post operatively.

DISCUSSION

Renocolic fistulas complicating XGP are rare. To our knowledge, less than 10 reports have been published thus far, and there is no large case series in English medical literature. Renocolic fistulas have been described since Hippocrates' time in 460 A.D. Since its initial description, there have been more than 100 cases described.^{1,9} Many cases of renocolic fistulas were suspected to be secondary to chronic tuberculosis (TB) infections in pre-modern time.⁸ Modern cases of fistulas were associated with chronic XGP, nephrolithiasis, iatrogenic cause due to procedures, abdominal trauma

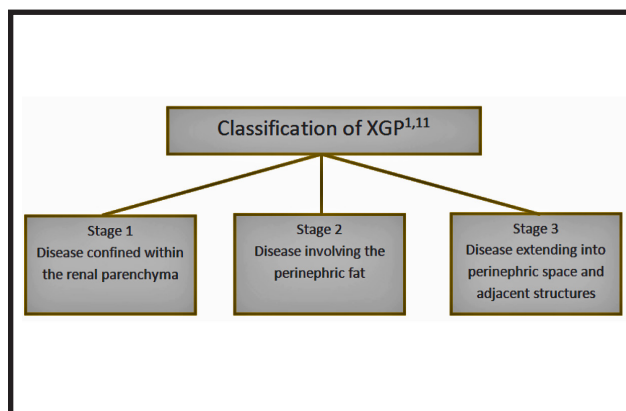


Chart 1.

and renal and colonic malignancy.^{9,10} Of these suspected causes of renocolic fistula, a majority of cases were reported with presence of XGP.

Xanthogranulomatous pyelonephritis was first described in 1916 by Schlagenhauer.⁵ It is a variant of chronic pyelonephritis and is characterized by chronic inflammatory destructions of renal parenchyma and replacement with granulomatous tissue containing histiocytes and foamy cells. The exact etiology is unknown, but XGP is suspected to be caused by UTI, chronic urinary obstruction, hyperlipidemia, altered immune response, vascular occlusion and nephrolithiasis including staghorn calculus.^{1,2,3}

XGP has a female prevalence, and has been reported to occur more in the 5 through 7th decades, but rarely in the pediatric population.^{1,4} Malek and Elder et al. have described a classification system of XGP (Chart 1).

The exact pathogenesis of XGP causing renocolic fistula is unknown. It has been postulated that the chronic inflammatory and destructive process of the renal parenchyma and eventual perforation of the renal capsule with abscess formation and direct contact with colon is the cause of renocolic fistula.⁹

The clinical presentation of XGP is variable, mostly mimicking UTI symptoms, but the presence of gastrointestinal complaints rarely exist. Urinalysis usually shows pyuria and urine culture most commonly show *E. Coli* and *Proteus mirabilis*.^{1,6,7,8} Before the presence of effective tuberculosis treatment, many cases were associated with TB infection.⁹

Multiple imaging modalities have been used in the diagnosis of renocolic fistula, however yields have been limited. Intravenous pyelography (IVP) and contrast CT have been the most commonly utilized and reported imaging studies. Due to rarity and subtlety in clinical

A CASE REPORT

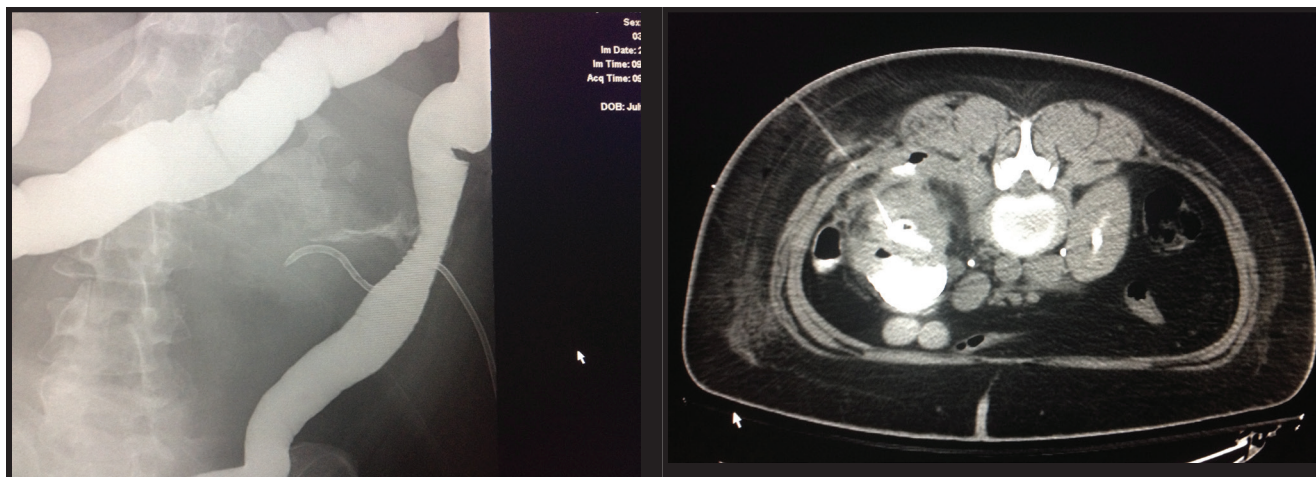


Figure 1.

presentation, majority reported cases presented without initial radiographic evidence of fistula and XGP, and diagnosis was only confirmed on pathological tissues after nephrectomy.^{6,7} Retrograde pyelography has been reported to be helpful in confirming renocolic fistula.¹² In our case, we were fortunate to have seen contrast in the perinephric space and descending colon as well as abscess formation within quadratus lumborum muscle.

The general treatment approach in patients with renocolic fistulas is to perform nephrectomy and partial colectomy simultaneously.¹ Often, as in our case, treatment with broad spectrum of antibiotics may be necessary to stabilize or transition the patient to surgery.

CONCLUSION

Renocolic fistula complicated by XGP is rarely reported. Most cases of XGP were associated with obstructive nephrolithiasis and chronic UTI, especially in the presence of staghorn formation. Renocolic fistula should be considered in patients presenting with imaging evidence of XGP and staghorn calculus with recurrent UTIs. IVP and contrasted CT imaging have been reported in making diagnosis but with limited yields. When additional imaging is needed, retrograde pyelography has been reported to be helpful in confirming renocolic fistula. Nephrectomy and partial colectomy is the treatment of choice and usually with good clinical outcomes. ■

Acknowledgement

We would like to thank Houston Willowbrook Methodist Hospital Department of Radiology in helping with obtaining imaging used in this report.

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