

CASE REPORT

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Presentation and treatment for reno-duodenal fistula in an acutely ill patient

Imran M Khawaja, Kunj Jain, Aleksandar Popovic,
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ABSTRACT

Introduction: Renal duodenal fistulas are a very rare connection due to chronic inflammation or infection secondary to kidney stones.

Case Report: We present a female with right perinephric abscess and reno-duodenal fistula secondary to a long-standing history of kidney stones. Treatment involved drainage of the abscess, nephrostomy tube placement, intravenous antibiotics, and open nephrectomy and duodenal repair with gastrojejunostomy.

Conclusion: In this report, we discuss management strategies which range from conservative treatment of antibiotics to open nephrectomy. In addition, we will discuss the urologic and gastroenterological post-operative complications in this patient.

Keywords: Fistula, Gastrojejunostomy, Nephrectomy, Reno-duodenal fistula

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INTRODUCTION

A fistula is a canalized tract that can form between two epithelial surfaces [1]. Uroenteric fistulas are rare connections between the urinary system and the digestive tract. The most common are colovesical fistulas. Reno-duodenal fistulas comprise of less than 1% of these connections [2]. Formation is multifactorial with documented causes including renal calculi and infectious processes [2]. A previous report estimated that as of 2020, there had only been approximately 80 reported cases in the literature [3]. Staghorn calculi have been implicated in causing reno-enteric fistulas due to neglected infections or iatrogenic injury during percutaneous nephrolithotomy [4–6]. Early recognition and management can preserve renal function and prevent recurrent infections that can lead to urosepsis.

CASE REPORT

A patient in her late 50s with obesity, gout, hypertension, hyperlipidemia, monoclonal gammopathy of unknown significance (MGUS), and type 2 diabetes mellitus presented to our institution with significant right flank pain.

The patient had a complex history of kidney stones starting in 2018 in which she was found to have a right staghorn calculus within an atrophic kidney. A mercaptoacetyltriglycine renal scan showed 34% split function in the right kidney and she underwent percutaneous nephrolithotomy (PCNL) (Figure 1). Due to the size of the stone, the patient required a staged PCNL one month later and ureteroscopy and laser lithotripsy with complete resolution of her kidney stone. Stone analysis showed 90% struvite and 10% carbonate apatite. The patient had recurrent right kidney stones one year after and additional extracorporeal shockwave lithotripsy (ESWL).

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More recently, the patient presented with acute onset fevers and right flank pain. Computed tomography (CT) abdomen and pelvis showed xanthogranulomatous pyelonephritis as well as a perinephric abscess. The patient underwent percutaneous drainage of the abscess and placement of a nephrostomy. The patient underwent antegrade nephrostogram which demonstrated contrast in the small bowel and reno-duodenal fistula (Figures 2 and 3). Initially, the patient was treated conservatively with intravenous antibiotics. Nuclear scan of the kidney showed it to be a non-functional kidney as a result of the infection.

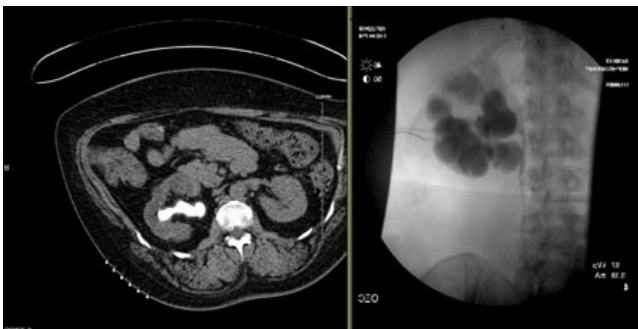


Figure 1: CT during initial stone presentation and IR nephrostomy.

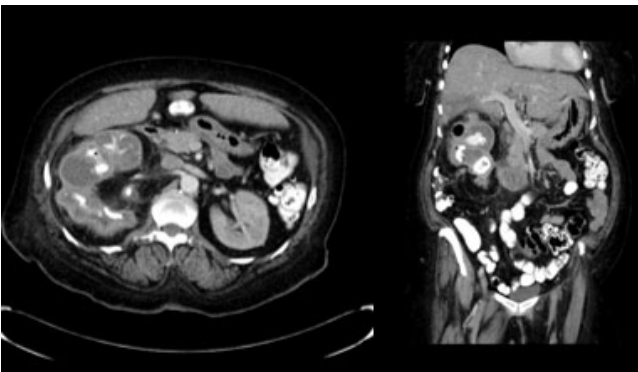


Figure 2: CT scan showing xanthogranulomatous pyelonephritis (XGP) kidney.



Figure 3: Antegrade nephrostogram showing reno-duodenal fistula.

Treatment

The patient ultimately underwent a right nephrectomy. The procedure started with esophagogastroduodenoscopy (EGD), endoscopic retrograde cholangiopancreatography, and stenting of the common bile duct and pancreatic duct to prevent injury and assist in identification of the fistula location. A chevron incision was made for proper exposure. With the assistance of a surgical oncologist, the duodenum was dissected away from the kidney using sharp and blunt dissection. The kidney was indurated and dissected away from the posterior musculature. The right renal hilum was stapled, and the right kidney was removed. The duodenal fistula was repaired primarily and repeat EGD was performed to ensure no leak. To allow for proper healing, duodenal exclusion with gastrojejunostomy was performed.

Outcome and follow up

Post-operatively, the patient had a nasogastric tube for six days and was able to tolerate a regular diet on postoperative day 7. During the hospitalization, the patient was given piperacillin-tazobactam and was discharged to an acute rehabilitation facility. She followed up one month after discharge without incident.

DISCUSSION

Reno-duodenal fistulas rarely occur to form a pathological connection between the urinary system and digestive tracts. This report highlights the course of presentation and management for an individual with a history of staghorn calculus and perinephric abscess. The patient presented with xanthogranulomatous pyelonephritis and loss of function complicated by abscess and fistula formation and definitive treatment was offered through nephrectomy, duodenal repair, and gastrojejunostomy.

The patient presented with a staghorn calculus and recurrent infections requiring multiple treatments with PCNL, ureteroscopy and laser lithotripsy, and ESWL. Recurrent kidney stones, repeat surgery, and infections are associated with increased inflammation and scarring of the kidney [7–9]. This chronic inflammation most likely led to erosion and fistulation of the kidney to the duodenum.

While reports have previously characterized reno-duodenal fistulas, etiology and management have varied [8–10]. Owen et al. reported a similar patient with a perinephric abscess and fistula secondary to a staghorn calculus that was treated with a gastrojejunostomy with duodenal repair and omental patch along with an open nephrectomy [2]. Lin et al. reported a case of a patient with renal duodenal fistula due to a staghorn calculus in the right kidney complicated by emphysematous pyelonephritis and perinephric abscess that underwent a nephrectomy and primary duodenal repair [11].

Hohenleitner et al. reported a patient who presented with signs of infection three months after surgical repair of a penetrating abdominal trauma. The patient developed a loculated perinephric abscess with concurrent reno-duodenal fistula that was treated with a nephrectomy with suture ligation and subsequent division [10]. While nephrectomy and duodenal repair has demonstrated efficacy, endoscopic ligation has also been successfully utilized for a frail patient pursuing non-surgical treatment [2, 9, 10]. In this patient with pyelonephritis and reno-duodenal fistula, a gastroenterologist placed four clips to obliterate the tract in conjunction with antibiotics. However, previous studies have suggested that non-surgical treatment and kidney conservation may carry a worse prognosis in primary renal pathology [12, 13]. Discretion should be advised when considering operative versus conservative management with consideration given to a patient's presenting renal function [9].

CONCLUSION

Reno-duodenal fistulas are a rare pathological connection between the renal and digestive tracts. Renal stones may serve as a nidus for infection, contributing to abscess and fistula formation in nearby abdominal viscera. Acute management should include nephrostomy and further evaluation. In this case, nephrectomy, duodenal repair with gastrojejunostomy successfully managed the fistula.

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Author Contributions

Imran M Khawaja – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Kunj Jain – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Aleksandar Popovic – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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Conflict of Interest

Authors declare no conflict of interest.

Data Availability

All relevant data are within the paper and its Supporting Information files.

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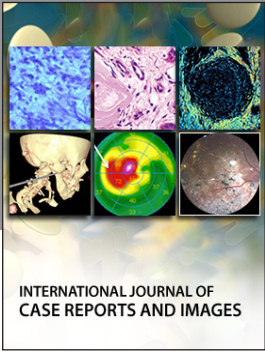
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