The Elusive Staghorn Renal Calculus Causing Biliary Obstruction and Duodenal Fistula
A Case Report

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Introduction

This report describes an exceedingly rare complication of renal calculus: staghorn calculus causing biliary obstruction and duodenal fistula.

Literature review provided 8 documented cases of pyeloduoenal fistula since 1973[1-8] while biliary obstruction is described twice since the 1960s[8, 9]. A single case of biliary obstruction with pyeloduodenal fistula from renal calculi was reported in 1976[10]. This case describes a rare pathology and provides a discussion of different modern methods for addressing biliary obstruction and duodenal fistula secondary to renal calculi.

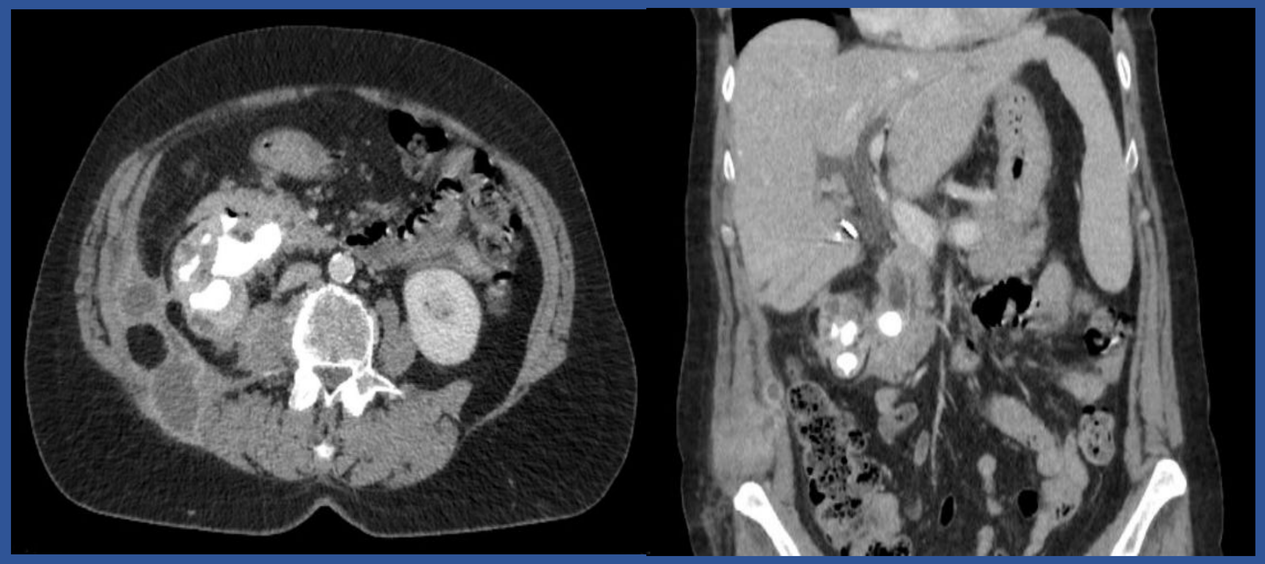
Case Presentation

67 year old female with past medical history of cholecystectomy, presented with several months of worsening right lower quadrant pain.

- No fever, chills, nausea, vomiting, burning or urgency with urination
- Vitals stable, no leukocytosis, alkaline phosphatase 212
- Computed tomography (CT): *biliary ductal dilation with perinephric abscess and associated staghorn calculus in the right kidney* (Fig. 1)

→ Admitted, IV antibiotics, interventional radiology (IR) drainage, discharged. Plan for interval elective nephrectomy.

Figure 1. CTAP at initial presentation



Case Presentation Continued

Re-presented on 6 weeks later with worsening symptoms.

- Repeat CT: persistent biliary dilation with *"distal common duct extrinsically compressed by a large right staghorn calculus which may have eroded into the second portion of the duodenum"* (Fig. 2)

→ Admitted and taken to the operating room (OR) for nephrectomy.

OR: Duodenum fistulized to the renal capsule. Radical nephrectomy with primary repair of duodenal fistula with T-tube placement and pyloric exclusion.

Figure 2. Repeat CTAP



Conclusions

Isolated pyeloduodenal fistula management strategies:

- Conservative management[1]
- Endoscopic ligation[2]
- Nephrectomy with primary closure of fistula[1, 7]

Isolated biliary obstruction from renal calculus previously managed with choledoco-duodenostomy.[9]

The only previously reported combination biliary obstruction and fistula case was managed with primary repair of the fistula with duodeno-jejunostomy diversion.[10]

We present nephrectomy followed by complete biliary exclusion with a T-tube, gastroduodenostomy and temporary pyloric exclusion with primary repair of the duodenotomy as a viable strategy for future dual biliary obstruction and pyeloduodenal fistula secondary to staghorn renal calculus.

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References

1. Kobayashi T, Munoz Casablanca N, Harrington M. Pyeloduodenal fistula diagnosed with technetium-99m scintigraphy and managed with a conservative strategy. *BMJ Case Rep*. 2018;2018:bcr2017223425. Published 2018 Mar 20. doi:10.1136/bcr-2017-223425
2. Lee KN, Hwang IH, Shin MJ, et al. Pyeloduodenal fistula successfully treated by endoscopic ligation without surgical nephrectomy: case report. *J Korean Med Sci*. 2014;29(1):141-144. doi:10.3346/jkms.2014.29.1.141
3. Chung SY, Nadler RB. Spontaneous nephroduodenal fistula in a 27-year-old woman. *Urology*. 2010;75(3):559-560. doi:10.1016/j.urology.2009.06.041
4. Young TH, Lee HS, Tang SS. Urine extravasation into the colon detected by Tc-99m DTPA scintigraphy in a pyeloduodenal fistula resulting from chronic penetrating duodenal ulcer. *Clin Nucl Med*. 2004;29(3):198-200. doi:10.1097/01.rlu.0000114230.75776.68
5. Morris SB, Knight MJ, Shearer RJ. Pyelo-duodenal fistula: a new method of closure. *Br J Urol*. 1994;73(4):464-465. doi:10.1111/j.1464-410x.1994.tb07622.x
6. Shortliffe LM. The role of an indium leukocyte scan in the diagnosis of a pyeloduodenal fistula associated with spontaneous disappearance of a staghorn calculus. *J Urol*. 1985;133(6):1020-1021. doi:10.1016/s0022-5347(17)49359-1
7. Greene JE, Bucy JG, Wise L. Spontaneous pyeloduodenal and renocolic fistulas. *South Med J*. 1975;68(5):641-645. doi:10.1097/00007611-197505000-00029
8. Mering JH, Kaplan GW, McLaughlin AP 3rd. Xanthogranulomatous pyelonephritis. Unusual clinical presentations. *Urology*. 1973;1(4):338-342. doi:10.1016/0090-4295(73)90282-3
9. Uman OH. Mechanical jaundice caused by a large size kidney stone. *Panminerva Med*. 1965;7(11):454-455.
10. Boardman KP. Duodenal and common bile duct obstruction with a pyelo-duodenal fistula caused by renal calculous pyonephrosis. *Br J Urol*. 1976;48(1):6. doi:10.1111/j.1464-410x.1976.tb02730.x