Inflammation and infection

Calyceal-venous fistula of the kidney: A rare case report and review of literature

Li Sian Lowa,*, Shiva Madhwan Naira, Linus Wub, Laxmi Lankac, Glen Anthony Devcicha

a Urology Department, Waikato District Health Board, Hamilton, New Zealand
b General Surgery, Waikato District Health Board, Hamilton, New Zealand
c Radiology Department, Waikato District Health Board, Hamilton, New Zealand

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Introduction

Calyceal-venous fistulas are rare complications that have been reported following percutaneous nephrolithotomy, ureteric obstruction or renal transplantation. Our aim is to raise awareness of the possibilities of uncommon postoperative complications as well as the treatment options. We present a case of a 52-year-old European male, with a left upper pole calyceal-venous fistula.

Case presentation

Prior to hospitalization, our patient's chief complaint was of long-standing constipation. Slow transit constipation was suspected. He underwent a flexible sigmoidoscopy with full thickness rectal biopsy, which revealed aganglionic bowel segments, suggestive of Hirschprung's disease. He previously had multiple abdominal surgeries as a child, but no medical records were available, as he migrated to New Zealand. He underwent a laparotomy, extensive adhesiolysis, ultralow anterior resection and covering ileostomy. Intraoperative findings were that of extensive adhesions, and scarring around rectum to suggest previous pelvic dissection.

On post-operative day eight, he developed generalized abdominal pain with associated elevated inflammatory markers. Abdominal CT imaging showed marked left-sided periureteric and perinephric stranding with urothelial thickening. [Fig. 1]. There was associated hydronephrosis and hydronephrosis. On day 14, his condition did not improve despite antibiotic therapy and thus a repeat CT was obtained. A left renal vein thrombus was seen propagating into the inferior vena cava. In addition, a fistula is noted to be arising between the superior pole of the left kidney to the left renal vein with contrast opacification of the fistula tract [Fig. 2].

He deteriorated on day 16 with signs of sepsicaemia with shortness of breath and was diagnosed with a right lower lobe pulmonary embolus on CTPA. He was promptly anticoagulated with heparin and a left sided nephrectomy planned. The need for urgent nephrectomy arose from the embolic risk posed by the fistula, which had resulted in the renal thrombus. JJ stenting or percutaneous nephrostomy drainage was not possible given the significantly increased risk for bleeding by the fistula. A repeat abdominal CT obtained later that day which showed evidence of a new presacral collection around the anastomosis.

Preoperatively, embolization of the left renal artery was performed, and a vena cava filter inserted. The patient underwent a six-hour operation, where a left nephrectomy, vena caval thrombectomy and end colostomy was performed. A right JJ stent was inserted to protect the function of the remaining right kidney. He eventually made an uneventful recovery and was discharged from hospital on day 45, without significant deterioration from baseline renal function.

Discussion

Nemeth and Patel reported a similar case where imaging revealed a large pelvic abscess, associated with a thrombus in the right renal vein extending into the inferior vena cava. Contrast was also seen exiting the right renal collecting system into the renal vein, confirming a fistula. They commented on the renal backflow phenomenon which may cause forniceal rupture in certain cases.7

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In our patient, we hypothesize that the renal backflow pressure, secondary to distal ureteric obstruction was high enough to cause forniceal rupture into the venous circulation and hence, the formation of a fistula. We postulate that the cause of ureteric obstruction may be due to compression by the colonic conduit, which was displaced by the presacral collection and the significant inflammatory changes in the pelvis. Even though both ureters were preserved intraoperatively, iatrogenic injury would be another explanation for the obstruction.

Treatment of calyceal-venous fistula includes selective embolization or surgery. Venyo and Shah reported a successful embolization of a lower pole calyceal-venous fistula, which was identified as part of investigation for macroscopic hematuria. Our patient did not develop macroscopic nor microscopic hematuria, even though it is one of the most common symptoms.

Partial nephrectomy is a suitable option if the fistula can be identified confidently. Total nephrectomy remains the treatment of choice when fistula cannot be identified accurately or if the patient is severely unwell. In our opinion, selective embolization would be an appropriate initial intervention, if the patient was stable and did not have a propagating thrombus into the inferior vena cava. A fatality has been reported from calyceal-venous fistula secondary to urosepsis following percutaneous nephrolithotomy. This could possibly be explained due to systemic circulation of toxins and bacteria via the calyceal-venous fistula as described by Chan et al.

Conclusion

In summary, we believe that this is an exceptionally rare surgical complication. The appropriate approach and expedited treatment following diagnosis led to a non-fatal outcome in this scenario.

Consent

Written informed consent has been obtained by the patient.

Conflict of interest

There are no conflicts of interest among the authors to disclose.

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Declarations of interest

None.

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References

1. Nemeth AJ, Patel SK. Pyelovenous backflow seen on CT urography. Am J Roentgenol. 2004;182:532-533.
2. Venyo AK, Shah S. Lower polar aberrant renal vein – renal pelvis fistula: a rare cause of Haematuria. W Afr J Med. 2008;27(4):267-270.
3. Turki MA, Onuora VC, Koko AH, et al. Pyelovenous fistula: an uncommon cause of ‘Essential Haematuria’. Urol Int. 1998;60:189-190.
4. Weigel JD, Egal M, Bakker J. Fatal calyceal-venous fistula. Intensive Care Med. 2016;42:1805.
5. Chan YH, Wong KM, Kwok PCH, et al. A veno-caliceal fistula related to ureteric stricture in a kidney allograft masquerading as renal failure. Am J Kidney Dis. 2007;49(4):547-551.