CASE REPORT

Colovesical fistula: a rare complication after renal transplantation

Arunkumar Subbiah, Sandeep Mahajan, Raj Kanwar Yadav, Sanjay Kumar Agarwal

Department of Nephrology,
All India Institute of Medical
Sciences, New Delhi, New Delhi,
India

Correspondence to
Dr Sandeep Mahajan,
mahajansn@yahoo.com

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SUMMARY

Colovesical fistula per se is a rare condition and most commonly occurs secondary to diverticular disease in normal patients. Colovesical fistula in the setting of post-renal transplantation is even rarer and very few cases have been reported in literature. Patients with autosomal-dominant polycystic kidney disease (ADPKD) are predisposed to diverticulosis and hence are at a higher risk for fistula formation. Herein, we report a case of colovesical fistula in a renal allograft recipient with ADPKD in the absence of diverticulosis. The patient was successfully operated and is stable with no complications at 1-year follow-up.

BACKGROUND

Colovesical fistula is a rare condition most often secondary to diverticulitis, malignancy and inflammatory bowel disease of which the most common cause is diverticular disease. Though diverticular disease and resulting colovesical fistula are increasingly diagnosed worldwide, only four cases of colovesical fistula following renal transplantation have been reported until now. Our patient is the first case of colovesical fistula being reported in a case of renal allograft recipient with autosomal-dominant polycystic kidney disease (ADPKD) with no preceding history of diverticulitis or recurrent urinary tract infection. This case thus highlights the need for high index of suspicion in certain clinical scenarios and that timely management is both graft saving and lifesaving in a renal allograft recipient.

CASE PRESENTATION

A 45-year-old male patient with end-stage renal disease secondary to ADPKD underwent renal transplantation in 2010 with his wife as the donor. He was started on tacrolimus, mycophenolate mofetil (MMF) and prednisolone, with tacrolimus being withdrawn 3 months post-transplantation and replaced by sirolimus on the account of tacrolimus toxicity (graft dysfunction with biopsy-proven thrombotic microangiopathy (TMA)). The patient was otherwise asymptomatic and had no history of graft dysfunction or other complications till the present admission. He presently was on prednisolone of 5 mg/day, MMF of 1 g/day and sirolimus of 2 mg/day and had a trough sirolimus level of 3.98 ng/mL.

The patient presented 5 years post-transplantation with clinical features of urinary tract

infection (UTI) accompanied by pneumaturia and faecaluria (figure 1). Urine culture revealed mixed growth and the patient was treated with piperacillin-tazobactam and levofloxacin for the same. He did not have any previous history suggestive of UTIs or diverticulitis. With the clinical suspicion of colovesical fistula, colonoscopy was done which revealed fistulous opening 28 cm from anal verge, a biopsy from which was suggestive of chronic inflammation. A CT scan of the abdomen with per-rectal contrast revealed a thickened wall of sigmoid colon in contact with the bladder wall and loss of fat planes between the colon and bladder with gas in the bladder (figure 2), with no evidence of diverticulitis or any other pathology. A fluorodeoxyglucose positron emission tomography scan done to rule out underlying malignancy showed only localised uptake in the region of fistula. As patients on sirolimus therapy may be predisposed to gastrointestinal perforation, we shifted the patient to a cyclosporine-based immunosuppression (in view of history of TMA with tacrolimus). In consultation with our surgical gastroenterology and urology colleagues, the patient was planned for corrective surgery. He was taken up for explorative laprotomy and underwent sigmoidectomy with colorectal anastomosis and diversion ileostomy. Due to involvement of dome of bladder, it was excised (preserving the ureteric orifice) and bladder repair was done. The histopathology revealed non-specific chronic inflammatory changes with no atypical cells. The patient had an uneventful postoperative course and is doing well with no recurrence of UTI and stable graft function.

INVESTIGATIONS

Incorporated in the case presentation above.

DIFFERENTIAL DIAGNOSIS

Incorporated in the case presentation above.

TREATMENT

Incorporated in the case presentation above.

OUTCOME AND FOLLOW-UP

The patient had normal graft function on follow-up with no episodes of UTI or any other gastrointestinal complications. After 1 year, the ileostomy closure was done and the patient is stable on a regular follow-up.

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Figure 1 Urine specimen demonstrating faecaluria.

DISCUSSION

Colovesical fistula is an infrequently reported complication in patients after renal transplant with only four cases reported in literature, none of them in patients with ADPKD.^{1–4} Among the causes of colovesical fistula, the most common cause is diverticular disease (50%) followed by carcinoma of the colon (20%) and then Crohn's disease (10%). Less common causes include other surgeries, radiotherapy and other carcinomas.⁵ The most common presenting feature of colovesical fistula is pneumaturia which is seen in around 60%–80% of the patients. Other symptoms include dysuria (30%–50%), faecaluria (30%–50%), abdominal pain, diarrhoea and rarely haematuria. Pneumaturia is not specific and can be seen with infection with gas-producing organisms in the urinary tract. Faecaluria, as seen in our patient though a late sign, is pathognomonic. Physical examination is unremarkable. The urinalysis is almost always abnormal and cultures reveal non-specific polymicrobial growth. These findings occurring together are suggestive of a colovesical fistula.⁶

There is no clear cut algorithmic guideline for evaluation of a colovesical fistula. The yield for various diagnostic modalities differs significantly.⁷ Barium enema is useful in resource-limited setting to delineate the fistulous tract and to differentiate malignancy from diverticular disease as aetiology of fistula. Though

sensitivity is low (30%), it can be combined with the Bourne test which involves radiographic examination of centrifuged urine sample obtained immediately after a non-diagnostic barium enema for radiodense particles.⁸ Cystoscopy identifies the fistulous opening in about 40% of the cases and is particularly useful to localise the fistulous opening in relation to ureteric opening more so in patients who had transplant and plan surgery accordingly. Colonoscopy is less useful but is an integral component of fistula workup as nearly 20% of cases are due to malignancies of the colon.⁹

Among imaging techniques, the most commonly used and most useful investigation is the CT scan which not only demonstrates the tract but also its relation to adjacent structures. Either an oral contrast or per rectal contrast can be used. The findings on CT, which are suggestive of colovesical fistula include air in the bladder (in the absence of previous lower urinary tract instrumentation), presence of contrast medium in the bladder and bladder wall thickening adjacent to a loop of thickened intestine with loss of fat planes between the bladder and colon.¹⁰ Recommended surgical treatment is colonic resection and anastomosis and staged repairs are done in case of associated pelvic abscess or malignancy.

Diverticulosis is common in patients with end-stage kidney disease and a prevalence of about 40% is noted irrespective of aetiology. Sigmoid colon is the most common site of diverticulosis in ADPKD and perforation is seen in 2%–4% of patients with ADPKD.^{11 12} Reports on the prevalence of diverticulitis and the severity of complications in patients after transplant is conflicting, with some studies indicating that ADPKD does not increase the prevalence or perforation risk while some studies show an increased prevalence of diverticulitis and mortality in those with ADPKD.^{12 13} The largest case series of colonic perforation in recipients who had renal transplant reported by Catena *et al* comprising 21 patients found that 66% of the cases had active diverticulitis as the predisposing cause. Of these 21 patients, 19 had PKD.¹⁴ However, there has been no mention of renal allograft recipients developing colovesical fistula in the absence of diverticulosis. With regard to immunosuppression, sirolimus use has been linked to gastrointestinal perforation with three reported cases in the literature. Of these, two occurred in the small bowel following islet transplantation and resolved immediately on cessation of sirolimus.¹⁵ The third case was that of colonic perforation post renal transplantation wherein the biopsy was suggestive of leucocytoclastic vasculitis which however was not seen in our patient.¹⁶

This is the first case of colovesical fistula in a renal-allograft recipient with ADPKD with no evidence of diverticulosis or history of recurrent UTIs. Colovesical fistula is an uncommon feature in patients after transplant and due to the relative paucity

Figure 2 CT scan with per-rectal contrast showing air within the bladder (white arrow) and loss of fat planes between bladder and colon (black arrow).

Learning points

- ▶ Colovesical fistula is an uncommon complication in patients after renal transplant.
- ▶ The relative paucity of symptoms necessitates a high degree of suspicion to diagnose the same.
- ▶ Any patient presenting with pneumaturia and/or faecaluria should be thoroughly evaluated for colovesical fistula.
- ▶ A CT scan with an oral/per rectal contrast is diagnostic of colovesical fistula.
- ▶ Timely surgical intervention ensures long-term graft survival and is lifesaving.

of symptoms a high degree of suspicion is needed to diagnose the same, especially in patients presenting with pneumaturia. The risk of fatal sepsis due to infection calls for immediate action and definitive surgery is rewarding as seen in our case.

Contributors All authors: conception, design, acquisition and interpretation of data; final approval of the version to be published; read and approved the final manuscript. AS and SM: drafting the article. SM: revising it critically for important intellectual content.

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