CASE REPORT

Development of VVF following double J stent placement

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SUMMARY

Double J stent (DJ stent) is commonly used in various urological conditions. Theoretically stent-induced tissue erosion can be a possibility, but fistula formation is rarely reported. The present case was a case of genitourinary tuberculosis diagnosed 4 years ago and had received complete treatment. Two months ago she presented with recurrent urinary tract infection and diagnosed to have vesicoureteric reflux with secondary obstruction for which DJ stent was placed, after 15 days of which the patient reported leakage of urine per vagina. She was diagnosed to have vesicovaginal fistula (VVF) with in situ stent eroding through the bladder wall. Stent was removed and fistula was corrected surgically. This is the first reported case of stent-induced VVF, a rare complication of ureteral stent placement.

BACKGROUND

Genitourinary tuberculosis (GUTB) may have a variety of presentation and involvement of ureter often complicate with a stricture or a refluxing disease. The use of double J stent (DJ stent) to prevent or to treat these complications is a common practice. Although the use of these stents is considered safe, seldom they themselves can lead to complications. Stent-induced tissue erosion is always a theoretical possibility, but a fistula formation is rarely reported. We are reporting a rare case of vesicovaginal fistula (VVF) formation after placement of DJ stent in a patient with GUTB.

CASE PRESENTATION

A 29-year-old woman referred to our hospital with continuous dribbling of urine per vagina for past 15 days. She had a history of genitourinary tuberculosis (GUTB) 4 years ago and was treated with anti-tubercular drugs for 6 months. Two months ago, she developed recurrent right flank pain with dysuria. She had urinary tract infection (UTI) and was diagnosed to have left-sided non-functioning kidney and right-sided vesicoureteric reflux (VUR) with secondary ureteric obstruction (figures 1 and 2). UTI was treated with culture-sensitive antimicrobial therapy and in the right side, DJ stent was placed. After 1 month of placement of the stent, she suddenly started leakage of urine per vagina which was continuous and progressively increasing in volume. Her normal desire to void was lost; still she was able to void a little (30–50 mL) on intervals.

INVESTIGATIONS

Her haematological and biochemical studies were within normal range. Urine analysis suggested few

pus cells but the culture was sterile. Plain kidney, ureter, bladder (KUB) X-ray suggested right DJ stent in situ (figure 1). Hence, cystoscopy was performed with intent to remove the DJ stent but to utter surprise, it was found eroding through the posterior bladder wall forming a supratrigonal fistula, while the rest of the bladder wall was thickened and oedematous and the capacity was reduced (figure 2). DJ stent was removed. Micturating cystourethrogram suggested right side grade 5 reflux with double contour bladder shadow and a distinct posterior pooling of contrast in lateral film (figures 3 and 4). Intravenous urogram suggested left poorly functioning kidney and right hydronephrosis with dilated and tortuous ureter till the double contoured bladder without any associated urteric injury (figure 5). Total glomerular filtration rate (GFR) calculated on DTPA renogram was 73.5 mL/min that was almost totally contributed only by the right kidney which itself had a delayed clearance and a languid response to lasix suggestive of a subclinical intermittent obstruction.

Tuberculosis RNA PCR in urine was negative and the stent was found to be made of polyurethane.

TREATMENT

Active tubercular infection was excluded. Open transvesical VVF repair along with right ureteric non-refluxing reimplantation were performed.

Figure 1 Plain kidney, ureter, bladder (KUB) X-ray showing right side double J stent in situ.

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Figure 2 Cystoscopy showing distal end of double J stent, eroding into the posterior bladder wall.

OUTCOME AND FOLLOW-UP

Postoperative period was uneventful. Ureteric catheter was removed on seventh postoperative day, while urethral catheter removed on the 21st day.

The patient remained dry and symptom free over the past 6 months of follow-up.

DISCUSSION

Ureteral stents (DJ stents) represent the most mature application of an indwelling endoluminal splint and are essential tool in a urologist's armamentarium to prevent and relieve obstruction.¹ DJ stents have proved their efficacy in relieving and preventing upper urinary tract obstruction in various urological conditions. However, their use is not free of complications and problems.

Figure 4 Micturating cystourethrogram lateral view, showing distinct posterior pooling of contrast.

Figure 3 Micturating cystourethrogram anteroposterior view of right side grade 5 reflux and double contour bladder shadow.

Figure 5 Intravenous urography film of the left poorly functioning kidney and right hydronephrosis with dilated and tortuous ureter.

As there is technical advancement, composition and design of the implanted devices have also been evolved. Initial stents were made of silicon, but due to inherent softness and a high coefficient of friction, implantation of silicone stents was often difficult and sometimes impossible. This led to the use of polyethylene in the construction of stents to provide stiffness but the material was proved to be unstable in the urinary environment, and was prone to early fracture. Polyurethane was then came into use, and it continues to be used in stent construction today, either alone or in combination with other materials.² With advancement in endourological techniques and availability of modern stents, indications for ureteral stent placement have expanded significantly,^{3–7} but even with appropriate placement of modern stents, they are not free of complications. Common reported complication of DJ stents include irritative voiding, infection, migration, encrustation, erosion, fracture and forgotten stent.⁸

Fistulisation is one of the rarest and most feared complications of ureteral stent placement. Ureterosigmoid fistula, arterio-ureteral fistula, pulmonary thromboembolism from migration of a stent into the heart and left pulmonary arterial system after pyelolithotomy or intravascular migration of a DJ stent into the inferior vena cava has been reported.^{9–11} However, a stent-induced formation of VVF has not been reported so far. Complications associated with stent placement are basically mechanical and related to stent materials and duration of indwelling period. Exact cause of development of VVF in our case is not known. Erosion of the stent into adjacent vagina, inadvertent trauma during insertion or consequence of tuberculosis on urinary bladder may have a role. So, proper selection of case, meticulous insertion and regular stent monitoring is essential to reduce complications.

Spontaneous closure of obstetric fistulas has been reported in up to 28% of cases where catheterisation has been employed.¹² However, treatment of tubercular fistula includes keeping the patient on antitubercular treatment for 4–6 weeks followed by surgical closure of fistula. In our case, the patient has suffered dreaded complication of tubercular infection leading to knocking out of the left kidney and right-sided ureteric deformity after 4 years of completion of treatment. After few days of placement of DJ stent, the patient developed VVF which was induced by the stent itself. This is a rare and unique complication of DJ stent placement.

Learning points

- ▶ Genitourinary tuberculosis may have a variety of presentations and may often complicate into ureteral stricture or reflux.
- ▶ Ureteral stents (double J stents) are considered safe and effective way to maintain ureteral patency and prevent stricture formation.
- ▶ In situ, DJ stent itself may have many untoward complications.
- ▶ Vesicovaginal fistula formation due to erosion by an in situ DJ stent is rare but possible.
- ▶ Placement of DJ stent must be strictly restricted to selected cases, should be monitored while in place, promptly removed when no longer needed and changed periodically if chronically indwelling.

Competing interests None.

Patient consent Obtained.

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