CASE REPORT

Secondary stone formation over a suture material after partial nephrectomy

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Accepted 9 December 2017

SUMMARY

We hereby present the treatment of renal pelvic and lower pole stones of sizes 2.74×1 cm and 1.38×0.92 cm, respectively, forming over a nidus of non-absorbable suture, in a 50-year-old female patient with a history of open partial nephrectomy done for renal angiomyolipoma around 10 years back. She was successfully treated with percutaneous nephrolithotomy technique under spinal anaesthesia. There was complete stone clearance, and she was discharged in stable condition within 40 hours of surgery without any stent. There is no case report showing the presence of suture material in the renal stone after partial nephrectomy. This case report highlights the fact that the non-absorbable suture material used during the open surgery especially for haemostasis can also act as nidus for future stone formation. This also suggests that percutaneous techniques can be considered to avoid repeat open surgery and the associated morbidity.

BACKGROUND

Following the introduction of percutaneous techniques in urology, percutaneous nephrolithotomy (PCNL) has become more popular and is the gold standard especially for renal stones >2 cm, multiple stones and in those with previous open renal surgeries.

There are case reports of complicated cases, especially having scar and fibrotic tissue, due to previous partial nephrectomy.

We present this case due to its rarity of having a suture material in the renal stone.

Stone formation around a suture is uncommon; however, it is commonly seen following open urological surgery and generally happens when non-absorbable sutures are used.

CASE PRESENTATION

A 50-year-old woman with diabetes presented with left lumbar pain associated with vomiting. She underwent left partial nephrectomy for angiomyolipoma in February 2006 in another institute.

INVESTIGATIONS

Her lab investigations were all within normal limits and viral serology markers were all negative.

X-ray KUB showed a 'Y'-shaped radio-opaque shadow in the left renal area correlating with the lower calyx and the renal pelvis (figure 1).

USG (Ultrasound)KUB showed left renal stone with right renal cyst.

Figure 1 X-ray KUB (Kidney Ureter Bladder) showed a 'Y'-shaped radio-opaque shadow in the left renal area correlating with the lower calyx and the renal pelvis.

CT urography showed left renal pelvic and lower calyceal stone of sizes 2.74×1 cm and 1.38×0.92 cm, respectively, with relatively smaller left kidney with lower pole defect following previous surgery (figure 2).

TREATMENT

Blood sugar monitoring was done perioperatively, with the patient having diabetes and being on diet control.

She was taken up for left PCNL under spinal anaesthesia. Cystoscopy was normal. Both the ureteric orifices were clearly seen with normal efflux of urine. A 5 Fr open-ended ureteric catheter was placed in the left ureter, and retrograde pyelogram was performed by injecting a diluted contrast agent.

Left retrograde pyelography showed an open-ended ureteric catheter with contrast into the system with the presence of stone and filling defect (figure 3).

After placing Foley catheter in the bladder, she was turned to prone position. Under C arm

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To cite: Prem K, Janoria S, Kumar P. *BMJ Case Rep* Published Online First: [please include Day Month Year]. doi:10.1136/bcr-2017-221569

Figure 2 CT urography showed left renal pelvic and lower calyceal stone of sizes 2.74×1 cm and 1.38×0.92 cm, respectively, with relatively smaller left kidney with lower pole defect following previous surgery.

guidance, a left lower calyceal puncture was done and the tract was dilated up to 28 Fr.

On renoscopy, 1.5×1 cm triangular stone in the lower calyx and 2.5×1 cm stone in the renal pelvis were seen (figure 4).

Stone in the lower calyx had a small piece of prolene suture embedded in it. The stone was picked up using alligator forceps and complete clearance was achieved.

Figure 5 shows the gross specimen of the stone delivered, along with the visible part of the non-absorbable suture material (prolene).

A nephrostomy tube of 18 Fr was placed and secured. Post-operative nephrostogram was done before the removal of nephrostomy tube on postoperative day 2. It was normal with no evidence of any stone in the left kidney. Four hours after nephrostomy tube removal, indwelling Foley catheter along with open-ended ureteric catheter was removed as the nephrostomy tube site was dry.

She was later discharged in stable condition with a plan for repeat X-ray after 4 weeks.

The stone was sent for analysis.

OUTCOME AND FOLLOW-UP

The total surgical time was around 25 min and fluoroscopy time was minimal at around 70s; there was no significant bleeding during the procedure and no intraoperative or postoperative complications. After 36 hours, nephrostomy tube was removed after doing nephrostogram. 4 hours after removal of nephrostomy tube the Foley catheter along with the ureteric catheter was

Figure 3 Left retrograde pyelography showing open-ended ureteric catheter with contrast into the system with the presence of stone and filling defect.

Figure 4 Renoscopic image showing the presence of stone along with suture material.

removed. There was no leakage from the puncture site. She was discharged within 40 hours of surgery completely free of stones.

Stone analysis was done using Fourier transform infrared spectroscopy technique. The stone was found to have 70% magnesium ammonium phosphate hexahydrate and 30% carbonate apatite, which is suggestive of infective origin (struvite stone) (figure 6).

DISCUSSION

Non-absorbable sutures are the most commonly implicated material for stone formation in the urinary tract. Due to prolonged contact time with urine, they act as a nidus around which crystallisation, calcification and finally stone formation occur.¹ Percutaneous techniques such as PCNL can be considered for difficult cases in which repeat open surgery can be very challenging and can increase morbidity.²

Single-case reporting has been done for the presence of prolene material in a ureteric stone, formed following open emergency ureteric repair.³ There is a study on urinary bladder of rat models wherein it was found that the stone formation over

Figure 5 Gross specimen of the stone delivered along with visible part of the non-absorbable suture material (prolene).

Figure 6 Gross specimen of the stone sent for analysis showed presence of magnesium ammonium phosphate hexahydrate and carbonate apatite.

suture can occur following open urological surgery and that it most commonly occurs when non-absorbable sutures are used.⁴

While it has been reported that stone formation can occur within the bladder after using non-absorbable polypropylene suture material,⁵ there is another case where a bladder stone had formed around absorbable suture after a radical prostatectomy.⁶

Learning points

- Use of non-absorbable suture materials during open surgeries can form nidus for stone formation, especially in renal surgeries.
- Use of absorbable materials like polydioxanone suture is currently being advised.
- It is also desirable to take a proper surgical history in patients with renal stones to determine if they underwent some renal surgery in the past (when it was customary to use non-absorbable sutures).
- Percutaneous nephrolithotomy is a safe procedure even after partial nephrectomy despite risk of fibrosis from previous surgery.

Bladder stone formations after extravesical operations (exstrophy repair for pubic bone closure) have been reported.⁷

A study conducted by Ban *et al*⁸ reported that in biliary tract, non-absorbable suture materials, particularly silk sutures, account for majority of stones that form around a foreign body.⁸ There are a couple of reports of stone formation around suture materials occurring inside the upper urinary tract, particularly the renal pelvis: one after undergoing pyeloplasty and the other after subtotal colectomy.^{9 10} There is also a report of stone formation over non-absorbable clip migrating into the collecting system after robot-assisted partial nephrectomy.¹¹

Contributors All authors contributed to the manuscript as follows: KrP, PaK, SJ: conception, design, analysis and interpretation of data. SJ: drafted the article. KrP, PaK revised it critically for important intellectual content. PK: final approval of the version to be published. All authors read and approved the final manuscript.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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REFERENCES

- 1 Dursun M, Danis E, Otunctemur A, *et al*. Foreign body stone of the ureter originated from the suture thread: a case report. *Prague Med Rep* 2014;115:141–4.
- 2 Karatag T, Buldu I, Kaynar M, *et al*. "Treatment of symptomatic lower pole stones of a kidney with partial nephrectomy using micropercutaneous nephrolithotomy technique". *Case Rep Urol* 2015;2015:1–3.
- 3 Sarmah PB, Kelly BD, Devarajan R. "Ureteric suture urolithiasis following open emergency ureteric repair". *Curr Urol* 2016;9:44–6.
- 4 Kusan M, Gonulalan U, Ozturk B, *et al*. Tissue reactions of suture materials (polyglactine 910, chromed catgut and polydioxanone) on rat bladder wall and their role in bladder stone formation. *Urol Res* 2008;36:43–9.
- 5 Akin Y, Basara I. Urolithiasis on non-absorbable suture material: a rare case of bladder stone on polypropylene suture material. *Singapore Med J* 2011;52:851–2.
- 6 Cursio R, Choquet C. Iatrogenic bladder stone formation on absorbable suture 3-years after radical prostatectomy. *Minerva Urol Nefrol* 2002;54:127–8.
- 7 Rub R, Madeb R, Morgenstern S, *et al*. Development of a large bladder calculus on sutures used for pubic bone closure following exstrophy repair. *World J Urol* 2001;19:261–2.
- 8 Ban JL, Hirose FM, Benfield JR. Foreign bodies of the biliary tract: report of two patients and a review of the literature. *Ann Surg* 1972;176:102–7.
- 9 Lock UC, von Pokrzywnitzki W, Weissbach L. [Calculus formation after kidney pyeloplasty due to suture material]. *Urologe A* 1998;37:522–5.
- 10 Lavalley LT, McCarthy JP, Norman RW. Suture urolithiasis in the renal pelvis secondary to prior subtotal colectomy. *Can J Urol* 2008;15:3928–9.
- 11 Lee Z, Reilly CE, Moore BW, *et al*. "Stone formation from nonabsorbable clip migration into the collecting system after robot-assisted partial nephrectomy". *Case Rep Urol* 2014;2014:1–3.

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