

## AN UNEXPECTED FINDING IN A PATIENT WITH SUSPECTED UROTHELIAL RECURRENCE DURING SURVEILLANCE POST RADICAL CYSTOPROSTATECTOMY FOR UROTHELIAL BLADDER CARCINOMA

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### Abstract

We report a 79-year-old gentleman with an asymptomatic intra-ureteric encrusted suture thread. He was found to have calcification in the left renal pelvis and thickening of the upper ureteric wall on a follow-up computerised tomography (CT) scan ten years after a radical cystoprostatectomy and ileal conduit formation for bladder and prostate cancer. These incidental CT scan findings raised the possibility of either ureteric stone or tumour. Subsequently, the patient underwent a ureterorenoscopy, which revealed a calcified 6cm length thread thought to be a suture that slipped intraoperative during his initial radical surgery ten years earlier.

**Keywords:** *Radical cystectomy; Urinary diversion; Internal double-J stent; Retained thread*

### INTRODUCTION

Bladder cancer is one of the most common malignancies in the world. It represents the seventh common cancer in men, while this represents the eleventh when both genders are combined.<sup>1</sup> Ten thousand new cases have been reported every year in the UK.<sup>1</sup> Bladder tumours are broadly divided into non-muscle and muscle invasive diseases for management purposes.

Radical cystoprostatectomy in males and anterior pelvic clearance in females is considered the standard care for patients with muscle-invasive tumours or those with high grade (including recurrent) non-muscle invasive diseases. Once the bladder removal is accomplished, the urine will need diverting using either a continent or incontinent mechanism, with an ileal conduit, which involves joining both ureters with a piece of the small bowel,

the most common method of diversion in the United Kingdom.<sup>2</sup>

During the process of urinary diversion, the surgeons often utilise a single straight open tip urinary diversion stent in each ureter to support the ileo-ureteric anastomosis. This practice is a standard of care intra-operatively to protect and minimise the high rate of complications related to uretero-enteric anastomosis such as leakage, stricture, and infection at the early healing phase. The stent is designed with a biocompatible material and high coil strength to help maintain pigtail shape to prevent stent migration (Percuflex™) and is available in (6F, 7F or 8F diameter and 80cm length) that is easily navigated through the cut end of the distal ureter over a guidewire (PTFE) into the collecting system of each kidney then the guidewire is removed. The straight end of the ureter stent is then passed through the small

piece of bowel loop bridging the ureters to the stoma site, and they are left hanging in the urostomy collection bag for later removal in 10–14 days.

This closed system technique of stent insertion in the ureter makes it extremely difficult for a foreign body to find its way into the ureter. Nevertheless, to the best of our knowledge, there are three cases reported so far of ambiguous urinary tract foreign bodies after surgical intervention.<sup>3–8</sup>

### CASE REPORT

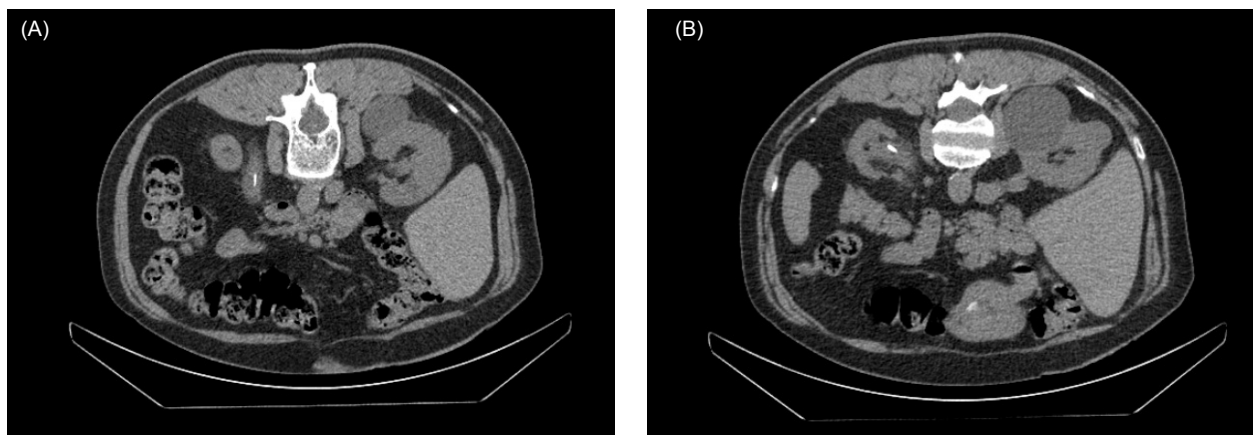
A 72-year-old gentleman with a history of radical cystoprostatectomy and ileal conduit urinary diversion done earlier in 2010 was found to have an abnormal-looking calcification with thickening of the left renal pelvis wall and upper ureter on a follow-up CT scan as part of his last annual surveillance scan for bladder carcinoma (Figure 1A and 1B). He was asymptomatic at presentation and has not experienced any previous renal colic, haematuria, or features of infection.

This gentleman's original diagnosis of transitional cell carcinoma (TCC) or often referred to urothelial carcinoma of the bladder (T2N1M0), was made ten years ago. He initially completed neoadjuvant chemotherapy and subsequently underwent radical cystoprostatectomy and ileal conduit urinary

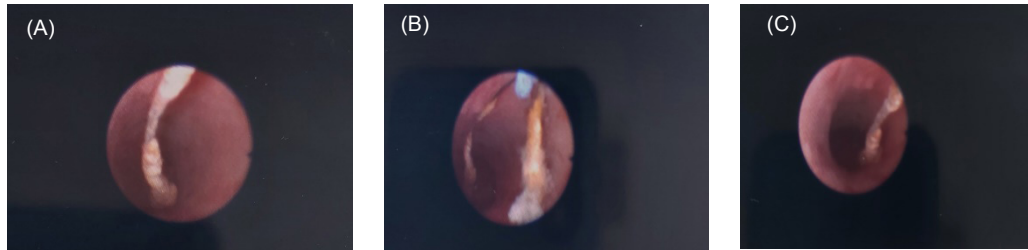
diversion in 2010. As initially described in the introduction and as a standard practice, he had intraoperative ureteric J stents inserted in each ureter. He made an uneventful recovery, and the stents were subsequently removed on the 10<sup>th</sup>-day post-surgery. The histological analysis of the specimen revealed bladder transitional cell carcinoma with a clear resection margin although with an upgraded stage (G2pT2) and an incidental finding of a Gleason 3+3 prostate adenocarcinoma. The patient was followed up regularly as per the national guidelines with six monthly and then annual CT scans and blood investigations.

In 2020, a routine follow-up CT scan demonstrated thickening of the left proximal ureteric wall. This raised suspicion of recurrent left ureteric tumour. In addition, a linear calcification in the left renal pelvis and proximal ureter was also noted. Therefore, a diagnostic ureteroscopy was recommended.

A looposcopy and flexible left ureterorenoscopy were carried out, and a calcified encrusted suture-like material was identified in the left renal pelvis. This was successfully and completely removed in a single piece using a zero tip basket (Zero Tip Nitinol Retrieval Basket™ Boston scientific). This thread measured 6 centimeters in maximal length (Figure 2(A–C)). In addition, there were



**FIGURE 1** (A) Linear calcification at left renal pelvis. (B) Linear calcification extends to left upper ureter.



**FIGURES 2** (A–C) Calcified encrusted suture-like material identified in the left renal pelvis.

non-malignant inflammatory changes on the adjacent ureteric wall. The patient recovered well and was reassured and discharged home.

We strongly believe that this retrieved encrusted suture was originally one of the stay sutures anchored at the lateral edge of the distal ureters in preparation for the Wallace ureterouretero and ureteroenteric anastomosis. It is likely that this suture slipped and was pushed up in a retrograde fashion when the stent was inserted as it is documented to be of the same suture material, and there was no knot on the thread found similar to what is implemented on any stay sutures in the surgical practice.

## DISCUSSION

Radical cystectomy is the standard treatment option for patients with locally advanced or high-grade organ-confined disease or those with high-grade, recurrent disease who failed endoscopic or intravesical adjuvant treatment. Although controversial, the utilisation of intra-operative urinary diversion stents has been widely popular over recent decades. First introduced in the early 1980s to control and overcome the complications related to anastomosis by providing better alignments, which would help prevent obstruction and leakage while reconstructing the diversion (Figure 3). However, more recent studies have shown minimal benefits in intraoperative stenting in preventing reducing complications such as ureteric stricture and urine leak from the anastomosis.<sup>9,10</sup> Conversely, Donat et al. report from their randomised controlled trial of 283 uretero-ileal anastomoses, concluded that



**FIGURE 3** Calcified thread after removal.

intraoperative stenting was associated with significantly increased odds (OR 3.55) of urinary complications 30 days postoperatively.<sup>11</sup>

Despite the paucity of evidence suggesting the benefit of using intraoperative stents, most surgeons, including at our centre, still prefer using ureteric stents during the anastomosis of urinary diversion to reduce the pressure around the anastomosis and allow time for healing.

Although there is no clear standard practice for the time of removal, the majority of surgeons have instructed to remove the stent 7 to 14 days after surgery.<sup>9,12</sup> Stent-related complications vary from simple stent-related infection and pain to other less commonly observed risks such as encrustation, formation of mucus plug, and being a nidus for future stone formation if left in situ for a more extended

period.<sup>4,5</sup> In our case report, it was documented that the initial uretero-ileal anastomosis was fashioned over an 8 Fr ureteric J stent using 4/0 biosyn suture material.<sup>3</sup> Therefore, we believe that the calcification on the CT scan was a suture material used during the original procedure in 2010 that slipped up during the insertion of the ureteric stent at the time of uretero-ileal anastomosis.

Our literature review found three similar case reports to date. Critchlow et al. describe a case of a retained nephrostomy string following radiological guided insertion of a nephrostomy tube to urgently decompress an obstructed and infected renal system due to a distal ureteric stone. Their patient subsequently passed this stone spontaneously but continued to have intermittent haematuria and right loin pain. Further investigations with two CT scans and cystoscopy were unremarkable, but due to persisting pain, he underwent a diagnostic ureteroscopy that revealed a retained thread from the tip of the nephrostomy tube. This was also successfully removed with an endoscopic grasper.<sup>6</sup> Contrary to our case, we feel that the retained thread did not show up as a calcification on the CT scan due to the relatively short time elapsed between the iatrogenic insertion of the nephrostomy tube and subsequent ureteroscopy and thread removal.

The second case reported by Melloni et al. was a retained nine centimetre monofilament surgical thread 2 years following a robot-assisted pyeloplasty for a pelvi-ureteric junction obstruction. The patient developed a urinoma 3 days postoperatively, which was subsequently treated with percutaneous nephrostomy tube drainage. This tube was removed 10 days later, but the patient experienced intermittent renal colic for the next 2 years. After several CT scans, a ribbon-like calcification was found in the lower renal pole of the operated kidney. This was successfully removed via an endoscopic approach, and examination with electron microscopy and X-ray spectroscopy confirmed a calcified 9 mm non-absorbable thread (likely Prolene) from the inserted nephrostomy.<sup>7</sup> The extended persistence of the suture thread found in our study is supported

by this case reports finding to be a non-absorbable suture as these sutures inherently have a greater affinity to act as a nidus for calcification. However, we did not take steps to determine the composition or type of the non-absorbable thread in our specimen.

Ahn et al. have reported a gentleman presenting with recurrent haematuria. He was initially diagnosed with bladder cancer, for which partial cystectomy and re-implantation of the left ureter was performed. Two years following the surgery, he underwent successful extracorporeal shockwave lithotripsy (ESWL) for an obstructed renal stone, and at the same admission, he required a temporary left nephrostomy (PCN). Three years later, after admittance with recurrent haematuria, a plain film abdomen and intravenous urography confirmed a renal pelvis calcification similar to what was found in our case report. The patient underwent left percutaneous nephrolithotomy (PCNL), and the retrieved calcified specimen was a long calcium encrusted synthetic suture. This is thought to be a slipped suture from the PCN tube inserted a few years earlier.<sup>8</sup>

## CONCLUSION

If feasible, abnormal calcification within the urinary systems should always be directly visualized. The differential diagnosis includes retained foreign bodies, including suture material in patients who have undergone previous surgical or radiological intervention. Discussion within a multidisciplinary team is recommended, and a duty of candor remains an obligation if any harm is caused to the patient. The authors recommend robust safety checks before, during, and after any invasive intervention in guidance with the current best practice to ensure patients' safety.

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