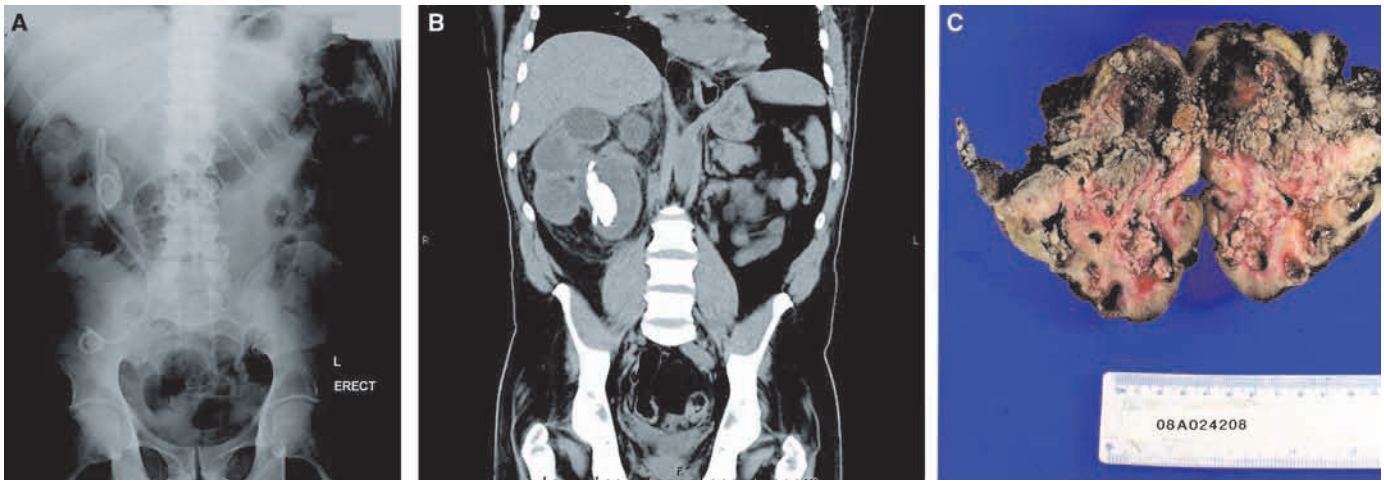
A disastrous sequela of a missed ureteric stent

Peng-Kung Yang, Dinesh Agarwal and Niall Corcoran

Clinical record



In 2008, a 42-year-old man with spina bifida, and an ileal conduit since childhood, presented to our emergency department (ED) with right-sided flank pain. He had experienced episodes of stone formation throughout his adult life, most recently in 2003 when an obstructing right renal pelvic stone was treated at another hospital with a percutaneous nephrostomy and antegrade stent. He failed to attend follow-up appointments, and the stent remained in situ. In the 3 years before he presented to our hospital, he was treated at different EDs for acute pyelonephritis, and on all occasions neither the presence nor significance of the retained stent was recognised.

X-rays of the kidneys, ureters and bladder obtained on the patient's admission to our ED confirmed the presence of the retained stent, as well as showing large encrustations associated with proximal and distal coils (Figure, A). Computed tomography (CT) demonstrated marked hydronephrosis with significant cortical thinning, consistent with longstanding obstruction (Figure, B). Subsequent mercaptoacetyltriglycine renography confirmed minimal residual function of the right kidney. A right nephroureterectomy was planned, but 2 weeks before surgery the patient re-presented with recurrent fevers, anorexia and weight loss. Pyonephrosis was suspected, and a nephrostomy was placed percutaneously, which drained frank pus. Repeated cross-sectional imaging showed marked retroperitoneal lymphadenopathy, which was presumed reactive because of its rapid onset. The sepsis resolved with drainage and broad-spectrum antibiotics, and we performed a difficult right nephrectomy at 6 weeks.

Macroscopic examination of the specimen revealed an end-stage hydronephrotic kidney with an extensive soft-tissue mass involving the renal pelvis and entire length of the ureter (Figure, C). Microscopic examination showed a moderately differentiated squamous cell carcinoma with widespread invasion through the renal substance and ureteric muscle into fat, extensive vascular invasion and widely positive margins. The patient had a prolonged postoperative stay in hospital because of local infection, but was discharged home in the third week. However, he re-presented within 2 weeks of discharge with recurrent fevers, cachexia and right upper-quadrant pain. Repeat CT imaging showed a rapid increase in the volume of retroperitoneal lymphadenopathy, as well as the appearance of multiple, low-density lesions within the liver. Image-guided biopsy of the largest of these lesions confirmed metastatic squamous cell carcinoma. Following extensive discussion with the medical oncology team, the patient was treated palliatively and died shortly thereafter. ◆

Stent placement is one of the most common procedures performed in urological practice, as a stand-alone procedure to relieve renal obstruction, or as an adjunct to an increasing array of complex endourological procedures.[1] Although urological stents are well tolerated by most patients, stent-related complications are frequent and a common cause of patients re-presenting. The most common side effects are irritative voiding symptoms, suprapubic discomfort and haematuria, usually related to irritation from the bladder coil, or flank pain related to urinary reflux on micturition. Long-term stents, particularly those placed for the management of ureteric strictures or compression not amenable to reconstruction, are prone to encrustation, blocking and subsequent infection.[2]

The prospect of a "missed" stent is a constant source of anxiety to the practising urologist. Stents that have been inadvertently left in situ for many months act as niduses for stone formation, particularly at the proximal and distal coils, which may prevent easy stent removal. Encrustation increases stent fragility and may lead to its fragmentation, even during careful attempts at removal. Multiple procedures may be required to remove the stent completely. Encrustation may also impair urine drainage, resulting in unrecognised renal obstruction and silent kidney damage, necessitating nephrectomy. As in our patient, long-term obstruction may cause persistent infection and recurrent episodes of clinical pyelonephritis and subsequent pyonephrosis. From a biological viewpoint, it is not surprising that the combination of stent irritation and infection would lead eventually to malignant transformation,[3] although to our knowledge this is the first reported case of ureteric carcinoma associated with a retained ureteric stent.

Lessons from practice

- Missed ureteric stents are a frequent source of morbidity, repeated procedures and occasional mortality.
- No stent should be placed without an appropriate removal plan.
- Retained stents can cause recurrent urinary tract infections, which are typically difficult to clear; occasionally, they cause flank pain, fevers and night sweats secondary to suppurative infection.
- Patients with urinary tract infection and a history of urological intervention, particularly for stone disease, need a plain x-ray of the abdomen.
- Identification on x-ray of a stent that has remained in situ for longer than 6 months (unless this was planned) should prompt urgent referral to an appropriate urology service for removal. ◆

Many strategies have been proposed to prevent the occurrence of "missed" stents. In current Australian practice, clinicians rely on a paper-based system that requires manual entry and interrogation to identify overdue stents, and in general this system operates efficiently. However, in a large tertiary hospital where health care is often delivered by a number of different visiting medical officers or junior medical staff, difficulties with a paper-based system may arise. In our experience, the main difficulty is capturing data in unusual circumstances; for example, a stent placed either out-of-hours or at the request of other services in non-urological theatres may not be entered into the system. Recently, a computerised system has been described that addresses this problem.[4] However, it is yet to be seen if this can be successfully introduced into other institutions.

Although computerisation of medical records may circumvent the potential morbidity of many missed stents, it is unlikely to have helped our patient. He was aware he had a stent in situ and was contacted many times to arrange to have it removed, but did not do so. However, all his ED presentations with acute pyelonephritis in the years before the stent's removal were missed opportunities to reconnect him with the appropriate urological services. Expedient stent removal may have relieved him from recurrent infection and prevented the fatal squamous cell carcinoma.

Competing interests

None identified.

Author details

Peng-Kung Yang, MB BCh, AO, Urology Resident[1]
Dinesh Agarwal, FRACS(Urol), Urologist[1]
Niall Corcoran, PhD, AFRCSI, Urology Registrar[1,2]
1 Department of Urology, Royal Melbourne Hospital, Melbourne, VIC.
2 University of Melbourne, Melbourne, VIC.
Correspondence: pky699@yahoo.co.uk

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