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Case Report

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Invisible double-J after kidney transplantation

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ABSTRACT

Ureteral catheterization is widely used in patient after kidney transplantation. The catheters are radiopaque in order to check by radiography. A 52-year-old man underwent kidney transplantation presented a radiolucent ureteral catheter during follow-up. The forgotten double-J catheter complicated with stone encrustation. Further surgical treatment for removal of this catheter was also presented.

1. Introduction

Kidney transplantation is one of the treatments for end-stage renal disease (ESRD). Ureteral double-J catheterization is generally used in patients underwent kidney transplantation. Prophylactic ureteric stenting reduces the incidence of major urological complications significantly in patients underwent kidney transplantation (Mangus and Haag, 2004; Wilson et al., 2005). Complications including stone encrustation, migration, fragmentation and even death may occur with forgotten double-J stent (Singh, 2005). The catheters are usually made radiopaque for further follow-up. There was no cases describing a radiolucent ureteral catheter have been reported. Here we present a radiological invisible double-J catheter in a case of 52-year-old man received kidney transplantation.

2. Case Report

This 52-year-old man received kidney transplantation one year ago in China. After surgery, he turned to visit our out-patient department for post-transplantation care. Elevated serum creatinine level to 2.18 mg/dl was noted in recent check-up. Abdominal ultrasound showed hydronephrosis of graft kidney, ureteral and graft kidney with hyperechoic spots with acoustic shadow. Graft renal stone and ureteral stone were impressed initially. Kidney-ureter-bladder plain film (KUB) was checked but no urolithiasis or retained catheter was found (Fig.1). We speculated these lesions to be radiolucent stones. However the following computed tomography (CT) showed a ureteral stent with stones in graft ureter (Fig.2). Cystoscopy was arranged for removal of the stent but failed due to stone encrustation. Then the operation of endoscopic cystalitholapaxy for encrusted double-J stent was performed. Radiologist was consulted for antegrade removal of double J but failed again. Graft percutaneous nephrostomy drainage (PCND) was done for the hydronephrosis

therefore. The operation of graft ureteroscopic lithotripsy (URSL) for encrusted stone over double-J stent (Fig.3) and double-J stent removal (Fig.4) were smoothly undergone 2 days later. A radiopaque double-J stent was inserted due to swelling and mucosa tear during ureterosopic lithotripsy. Patient serum creatinine level returned to 1.05 mg/dl 3 days after URSL. The double J stent was removed 2 weeks later. The patient is being regularly followed up at our outpatient department with uneventful condition.

3. Discussion

The prevalence rate of ESRD in Taiwan is about 2500 per million populations. The high dialysis prevalence and incidence result in large medical expenditures. More and more patients choose kidney transplantation as a treatment instead of hemodialysis. Placement of ureteral stent in the construction of an ureteroneocystostomy reduces obstruction or urinary leak in the early post-transplant period (Mangus and Haag, 2004; Wilson et al., 2005).

Ureteral stents have become an integral part of urologic practice nowadays. History of the catheters can be traced back to the 19th century. The early catheters were constructed from fabric coated with varnish, and then vulcanized rubber, finally polyvinylchloride (PVC), polyuerethane and polysi loxanes (silicone). Evaluations of the presence and locationare usually performed with fluoroscopy because it is quickly and easy available. The materials of the catheter are always radiopaque. Some stents even contain fillers to enhance ra diopacity. Barium sulfate (BaSO4), bismuth compounds and tungsten (W) are used as common radiopacifiers and are added in polymer formulations contemporary (Mottu et al., 1999). Considerations of the compound depend on various factors. Barium sulfate, the first radiopaque material widely compounded in medical formulations, is the most common filler used with medical-grade polymers. It is inexpensive but might not appear as bright on newer X-ray machines which operate at higher energy levels than older ones. Bismuth compounds are twice as dense, but ten times more expensive than barium. Cheapness, poor quality, lower loading or even lack of radiopacifiers might be the most possible reason why the catheter became invisible in our case.

In spite of the various advantages, loss to follow-up of the catheter, so-called forgotten double-J, may lead to several complications such as migration, stone encrustation, fragmentation, chronic renal failure(Aron et al., 2006), and finally even death(Singh et al., 2005). Forgotten stents is not rare in urologic practice, but relatively rare in kidney transplanted patients. Only 16 cases in 14 reports were in the literature

Table I: Reported forgotten ureteral stents in renal transplant patients (1989-Present).

Case	Year	Author	Patient age	Presenting complaint	Duration of stent	Pre-operative imaging	Operative procedure
1	1989	Gedroyc et al.	3	UTI	17 months	KUB	PCNL, extraction
2	1999	Gustacchini et al.	45	Recurrent UTI	3 years	Ultrasound, KUB	Cystoscopy, PCNL
3		Henderson et al.	52	Not reported	5 months	Unreported	PCNL, URS, Ho:YAG laser
4	2002	Henderson et al.	59	Not reported	6 months	Unreported	PCNL, URS, Ho:YAG laser
5	2004	Yenicesu et al.	34	Hematuria, Dysuria	7 years	Ultrasound, KUB	Cystoscopy, Removal under fluoroscopy
6	2005	Romanowsky et al.	48	Recurrent UTI	4 years	KUB, CT	PCNL, Ultrasonic lithotripsy
7	2005	Singh et al.	Unknown	Hematuria, UTI	1 year	Ultrasound, KUB	Retrograde approach
8	2006	Veltman et al.	47	UTI	5 months	KUB, CT	PCNL, URS, Ho:YAG laser, Cstoscopy, Lithotripsy
9	2009	Bhuva et al.	32	Nocturia, Weak stream	10 years	KUB, CT	Cystoscopy, PCNL
10	2012	Lai et al.	47	Hematuria, UTI	5 years	Ultrasound, KUB, CT	URS
11	2013	Lasaponara et al.	39	Severe UTI	8 years	CT	ureteroureteral anastomosis
12	2014	Bardapure et al.(3 cases)	34-55	Recurrent UTI	3 -5 years	Ultrasound, KUB	ESWL, Cystoscopy
13	2014	Wu et al.	Unknown	Recurrent UTI	19 years	KUB	ESWL, URS, Ho:YAG laser
14	2015	Karabıcak et al.	55	Recurrent UTI	5 years	KUB	Cystoscopy
15	2015	our case	52	Elevated creatinine	7 months	Ultrasound, KUB (invisible), CT	URS, lithoclast lithotripsy

Our case presented with the unique characteristic of invisible stent. The serious morbidity and mortality are associated with increased financial burden for health services (Sancaktutar et al., 2012), and sometimes legal problems. Many approaches for treating encrusted forgotten ureteral stents had been reported including extracorporeal (shock wave lithotripsy), endoscopic (transurethral lithotripsy, percutaneous nephrolithotripsy, or holmium laser) and open procedures (nephrolithotomy or cystolithotomy) (Rabani, 2012). In addition to the polyurethane and silicone stents, a novel biodegradable stent was also documented (Chew et al., 2013). Although the material of the stent in our case is still undetermined, the stent was removed successfully despite its long indwelling time. Advanced ureteral stent register and reminder system are always helpful for avoiding forgotten ureteral stent (Lynch et Al., 2007; Sancaktutar et al., 2012)

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