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RESEARCH ARTICLE

FORGOTTEN DJ stent– A SOURCE OF MORBIDITY: IS STENT REGISTRY A NEED OF THE HOUR?

Patil S M[1], Magdum P V[1], Shete J S[2], Nerli R B*[1] and Hiremath M B[3]

[1]Department of Urology, KLES Kidney Foundation, KLE University's JN Medical College, KLES Dr Prabhakar Kore Hospital & MRC, Belgaum, India
[2]Community Medicine Department, Rajarshee Chhatrapati Shahu Maharaj Government Medical College, Kolhapur
[3]Department of Biotechnology and Microbiology, Karnatak University, Dharwad, India

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ABSTRACT

Introduction

DJ Stents are placed in the ureter after open/endoscopic surgery or prior to ESWL in order to maintain the patency of the ureter and promote healing. Short term complications of DJ stents include infection, hematuria, pain and stent syndrome. However, long term retention of stents can lead to encrustations, stone formation, fractures and blockades of stents, hydronephrosis and at times loss of renal function. We report our experience in the management of forgotten stents and role of stent registry in preventing DJ stent related morbidity.

Materials and Methods

We retrospectively analysed the records of patients presented to the department of urology with forgotten or long term retention of DJ stents from January 2011 to January 2013. We recorded the duration of DJ stent, presenting complaints, type of previous procedure and procedure performed for removal of DJ stent & associated complication. And we prospectively analysed the feasibility and utility of stent registry from January 2013 to January 2014.

Results

During a two year study period, total 33 patients reported or were referred to our department with history of forgotten DJ stents. 14 patients had severe encrustations with both renal and vesical calculus. 8 others had either only renal or vesical calculus. 9 patients had fracture stents and vanishing portions of stents and 2 had multiple renal, ureteric and vesical calculi. A combination of PCNL, ureteroscopy, ESWL and open surgeries were done to clear the stones and extract the DJ stent. Stent registry showed marked decrease in rates of forgotten DJ stents.

Conclusions

Forgotten or retained stent is a source of severe morbidity and also financial strain. Pre operative and post operative counseling of the patient regarding the DJ stent is necessary. Maintaining stent registry is simple and feasible to avoid the morbidity associated with it.

INTRODUCTION

Zimskind *et al* reported the use of DJ stents in 1967 [1]. Since then, ureteral stents are being used for maintaining ureteral patency during the management of ureteral obstruction. Various complications, including migration, fragmentation and stone formation still occur, especially when stents have been left in situ for long-time [2, 6]. The incidence of encrustation increases with the duration that the stent remains indwelling [7]. Therefore, DJ stent needs to be replaced or removed within 6 weeks to 6 month [2, 3,8,12]. A report by eI-Faqih *et al* indicated that the stent encrustation rate increases from 9.2% for an indwelling time of less than 6 weeks to 47.5% at 6 to 12 weeks to 76.3% at more than 12 weeks [7]. Forgotten ureteral stents with a duration of stenting over 1 year were heavily encrusted and required additional need of some modality of treatment like shock wave lithotripsy (SWL), ureteroscopy (URS) and percutaneous nephrolithotomy (PCNL) for both successful

Corresponding author:* **Nerli R B
Department of Urology, KLES Kidney Foundation, KLE University's JN Medical College, KLES Dr Prabhakar Kore Hospital & MRC, Belgaum, India

removal and treatment. We retrospectively analysed the data from our hospital case records of retained DJ stents and prospectively conducted a study by maintaining the stent registry to analyse the incidence for retained DJ stents.

MATERIALS AND METHODS

This study was conducted at KLES Kidney Foundation, KLES Dr. Prabhakar Kore Hospital and Research Centre Belgaum, India. Institutional ethical committee clearance was taken prior to the study. Case records of the patients with history of retained DJ stents from January 2011 to January 2013 were included. Total 33 patients data was collected and analysed retrospectively for duration of DJ stent, presenting complaints, type of previous procedure and current procedure were recorded.

Prospective analysis of 50 patients who underwent endoscopic/open procedures with DJ stenting from January 2013 to January 2014 and stent registry being maintained and incidence of retained DJ stent was noted. Stent Register included details of the patient name, age, sex, and contact number of the patient, diagnosis and type of procedure, date of surgery and due date for removal of DJ stent noted. Patient received two reminder calls, 7 days before and 1 day before the due date of removal of DJ stent. Number of patient turn out for DJ removal was noted. If patient did not turn out even after two reminder call, next reminder call was done after 7 days and 15 days. If there is no turn out of the patient registered letters were mailed to patients address. If the procedure demands prolonging or replacing the stent after due date of removal, accordingly patients detailed were re-entered in to the registry.
Statistical analysis was done with MS Excel and SPSS Version 16.

RESULTS

Total 33 patients record were analysed over the period from January 2011 to January 2013. Out of which 20(60.6%) were male and 13(39.4%) were females. Age ranged from 14 years to 55 years (Mean – 34.48 ± 13.17 years). Duration with stent in situ ranged from 1 year to 4 years (Mean – 2.5 ± 1.06 years). Presenting complaints of recurrent fever 15 (45.4%), dysurea 28 (85%), flank pain 18 (55%), haematuria 21 (65%) amongst patients were noted. Out of 33 patients, 20 patients underwent procedure at outside centre and were referred here for further management. Only 15 (45.4%) were aware of DJ stent being inserted. And 18 (54.6%) patients were not counselled regarding the insertion of DJ stents. Out of 33 patients, 10 (30.3%) were educated less than higher secondary school, 5 (15.15%) were illiterate and remaining 18 (69.7%) were with higher secondary school education.

Out of 33 patients 16 (48.4%) patients underwent ureteros copy, 10 (30.3%) patients had PCNL, 3 (9.09%) underwent open surgery, 3 (9.09%) patients had adjunct DJ procedure and 1 (3.03%) patient with re-implantation of ureter as the initial procedure.

Out of 33 patients, 14 (42.4%) patients had severe encrustations with both renal and vesical calculi, 8 (24.2%) others had either only renal or vesical calculi, 9 (27.2%) had fracture stents and vanishing portions of stents and 2 (6.06%) had multiple renal, ureteric and vesical calculi (Figure 1). During current presentation patients were treated with multimodality of treatments. In some cases more than two procedures were undertaken whenever necessary. 12 (36.3%) patients underwent PCNL, 10 (30.3%) patients received ESWL, in 19 (57.5%) patients URSL was performed, in 15 (45.45%) patients cystolithotripsy was done and in 3 (9.09%) patients cystoscopy and DJ removal were done.

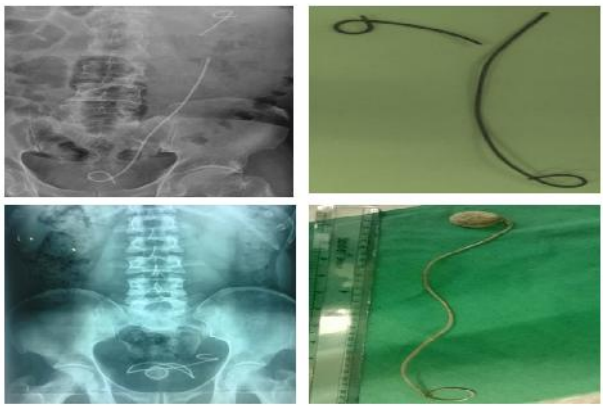

Figure 1 a) X-ray KUB showing retained DJ stent with fracture & migration of upper segment, b) Post operative image of retrieved DJ stent, c) X-ray KUB showing stent migration into bladder with calculus formation, d) Post operative image showing retrieved stent with calculus.

We analysed 50 patients who underwent DJ stenting from January 2013 to January 2014 for various open/endoscopic procedures. 35 were male and 15 were female patients. Age group ranged from 6 years to 65 years (Mean – 35.3 years). Out of 50 patients, 31 (62%) patients had education below higher secondary school, 14 (28%) patients were educated above higher secondary school and 5 (10%) patients were illiterate (Table 1). Total 15 patients underwent PCNL, 25 underwent URSL and 10 underwent open procedures. Out of 50 patients 45 (90%) patients came for stent removal on due date and 3 (6%) turned in after 7 days and 1 (2%) patient after 15 days and 1 (2%) patient lost follow up (Figure 2). Amounting an overall success rate to 98%.

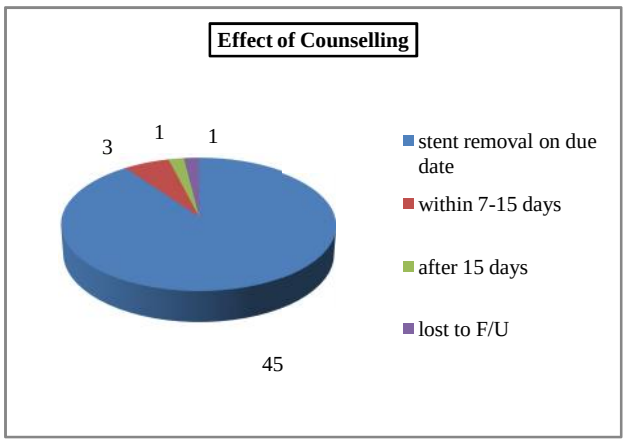

Figure 2 This graph shows effect of counselling. 90% of patients came for stent removal on due date, 6% turned in after 7 days, 2% patient after 15 days and 2% patient were lost for follow up.

DISCUSSION

Zimskind *et al* reported use of ureteral stents in 1967 [1]. Various materials and coatings have been investigated in an effort to avoid ureteral stent complications such as encrustation, incrustation and infections [1]. The incidence of complications increases with the duration that the stent is in-vivo [6,7]. So regular ureteral stent removal or replacement is needed [12].

Table 1

Reported for removal of DJ stent on due date	Educational Status			Total
	Illiterate	≤ Higher Secondary School	> Higher Secondary School	
Yes	2(40%)	29(93.5%)	14(100%)	45(90%)
No	3(60%)	2(6.5%)	0(0%)	5(10%)
Total	5(100%)	31(100%)	14(100%)	50(100%)
Pearson chi square test, value =15.878, df = 2, $p < 0.01$ (statistical Highly Significant)				
Fishers Exact Test, value =9.613, df =2, $p < 0.01$ (statistical Highly Significant)				

Table 1 In above table, 14(100%) patients who were educated more than higher secondary school reported for removal of DJ stent on due date. On other hand, 3(60%) patients who were illiterate did not report for removal of DJ stent on due date. Statistical difference was seen ($p < 0.01$).

Kawahara T *et al* reported that 26.8% of stents were encrusted at less than 6 weeks, 56.9% at 6 to 12 weeks and 75.9% at more than 12 weeks [6]. If an indwelling time exceeds 3 months there will be invariably the need for additional procedure [6]. Bultitude *et al* reported that 42.8% of the stents in their patients became difficult to remove cystoscopically within 4 months, and 14.3% at 2 months [2, 11]. Okuda *et al* reported on 15 irremovable ureteral stents in Japanese patients. The mean indwelling times of these stents was 20 months [13]. In our study we noticed retained DJ stent adds a significant morbidity like haematuria, flank pain, dysurea, recurrent urinary tract infection resulting in to fever. And about 55 % of the patients were not counselled regarding the placement of stent and need for removal of it after due course of time. So proper counselling of the patient can avoid the delay in stent related problems.

In our study it reflects majority of the patients (90%) underwent some invasive procedure like PCNL, URS, ESWL or combination of two or all three procedures, adding to the economic burden to the patient and risking themselves through the complications related to anaesthesia and procedure itself.

Tang VC *et al* studied the stent card system to track the retained DJ stent and proposed the computerised DJ stent registry [14]. Lynch M F *et al* in their study showed the importance of electronic stent register and stent extraction reminder facility to avoid the DJ stent follow up loss and avoid the morbidity associated with it [15].

Further our prospective study reveals that maintaining simple stent registry can achieve almost 98% of DJ stent removal at due date and avoiding the morbidity related to retained DJ stent, procedure to remove them and anaesthesia risk. It also reduces the economic burden on the patient. Newer options like computer based stent registry with patient directed automated information system can also be used. [16]

CONCLUSION

Forgotten or retained DJ stent is a source of severe morbidity and also financial strain to the patient. Factors such as education level of patients and counseling before and after the procedure regarding DJ stent placement and its removal plays a vital role to avoid the retained/forgotten stent and in turn avoiding the morbidity associated with the stent. Maintaining the stent registry is simple and feasible. Computer based stent registry with patient directed automated information system can also be used.

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