ORIGINAL ARTICLE

Forgotten Double-J Stent – An Extra Burden to both Patient and Urosurgeon: A Single Center Experience

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ABSTRACT

Introduction: Double-J stent is widely used in urological as well in few non urological operations, which must be removed or replace timely. Otherwise unnecessary complications can be encountered. Forgotten Double-J stent is one of them. **Aims:** To find out the cause of forgotten Double-J stent, its complications and prevention. **Methods**: It is a hospital based study done from 2017-2020 in Nepalgunj Medical College. 33 patients fulfilling the inclusion criteria were included and reviewed for the cause, complications and management of forgotten Double-J stent. **Results**: Out of 33 patients, 25 (75.75 %) were operated at Nepalgunj Medical College and 8(24.24%) were in other hospitals. Among them, major causes of forgotten Double- J stent were found due to Poor financial condition and ignorance 10(30.30%) and remote inhabitant 10(30.30%). Major symptoms were flank pain alone in 10(30.30 %) and recurrent fever with flank pain with positive urine culture in 8(24.24%). 21 patients (63.63%) required additional surgical treatment such as percutaneous nephrolithotripsy, ureterorenoscopic lithotripsy, percutaneous cystolithotripsy, perurethtalcystolithotripsy, open cystolithotomy. **Conclusion:** Forgotten Double-J stent is one of the major complications if not removed timely which may increases morbidity, mortality and financial burden. The rate of it may minimize if patients are made aware for the complications of Double-J stent and maintain stent registry properly.

Keywords: Complication, Double- J stent, Forgotten Double- J stent

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INTRODUCTION

DJ (Double J) stent is J shaped curley end ureteric catheter made up of silicon or polyurethane. Zimskind et al described the use of DJ stents in 1967.[1] Since then it is being used routinely in several urological and nonurological procedure.[2] The standard indwelling time of DJ stent is 2-4 weeks.[3] DJ stent must be removed timely or must be replaced.[4] Some short term and long term complications are recorded regarding DJ stent[5-7] which increases with duration of the stent in situ.[8,9] Short term complications include lower urinary tract symptoms, haematuria, abdominal pain and discomfort, urinary tract infection, retention of urine, vesicoureteric reflux. While long term complications include stone formation, stent fragmentation, infection, severe encrustration, renal function impairment with one of them above mentioned symptoms.[10-12] Stent which is not removed for more than three months are considered forgotten DJ stent.[13] The cause of forgotten DJ stent is associated with poor financial condition, ignorance and unaware about the DJ stent placed, forgetting by doctor to tell the time of removal of DJ stent to patient as well forgetting by patient himself to remove DJ stent.[14-16] Additional treatments like Extracorporeal shock wave lithotripsy (ESWL), Ureterorenoscopic lithotripsy (URSL), open surgery may be required to remove it, which increases morbidity, mortality as well as financial burden and decrease work ability and quality of life.[17] The objective of this study is to figure out the complications of forgotten DJ stent, causes behind it and to know preventive measures to decrease the incidence of it.

METHODS

It is a hospital based study done from 2017 – 2020 in Nepalgunj Medical College, Kohalpur. All the patients who presented with symptoms like flank pain, supra pubic pain , haematuria, burning micturition, fever, feature of sepsis were investigated with Ultrasonography (USG), X-ray kidney ureter bladder (KUB), urine examination, complete blood count .

Inclusion criteria- patients who were symptomatic and with a placement of DJ stent for more than three months.

Exclusion criteria- symptomatic patients having stent for less than three months duration.

Patient with inclusion criteria were asked about duration of D J stent placement, types of surgery for which D J stent was placed, reason for not visiting hospital for removal of D J stent had noted. Various combinations of extra surgical treatments such as ESWL, Percutaneous nephrolithotripsy (PCNL), URSL, percutaneous cystolithotripsy (PCCL), perurethralcystolithotripsy (PUCL), open cystolithotomy were performed either alone or in combination to remove the stent or if there was a formation of stone. Before any procedure, patient who had positive urine culture report, underwent treatment with proper antibiotic till its clearance.

PCNL and PCCL were performed by using standard nephroscope 26 fr. URSL was performed by using 4.5/6.5 semi rigid ureteroscope. Open cystolithotomy was done by a standard technique, through a pfanenstial lower abdominal incision. Post opearative x-ray KUB and USG were done to conform for any resisual stone. Patients were considered stone free when no residual stone was found on imaging or the stone size was less than 3mm.

RESULTS

Out of 33 cases of forgotten D J stent ,the major causes of it were found due to poor financial condition and ignorance 10(30.30%) and remote inhabitant 10(30.30%) (Table I). Flank pain alone 10(30.30%) or the flank pain with fever and positive urine culture 8(24.24%) were most common presenting symptoms (Table II). 21(63.63%) patients had to undergo various surgical procedures like PCNL, URSL, PUCL, PCCL and open cystolithotomy to remove the DJ stent but in remaining 12(36.36%) patients the stent was removed by cystoscopy (Table III). The duration of D J in situ ranged from more than 3 months to 16 years. (Table IV)

Variables	Number of patients
Living in remote area	10 (30.30%)
Poor financial condition and ignorance	10 (30.30%)
Unaware about the D J stent in situ	7 (21.21%)
Missed to mention in discharge paper to come remove D J stent	6 (18.18%)

Table I: Reasons for not removing the D J stent timely

Variables	Number of patients
Flank pain alone	10 (30.30%)
Recurrent fever with flank pain and positive E. coli urine culture	8 (24.24%)
Lower urinary tract symptoms	7 (21.21%)
Haematuria with suprapubic pain	5 (15.15%)
Urosepsis with impaired renal function	1 (3.03%)
Pyonephrosis	2 (6.06%)

Table II: Different symptoms and complications with forgotten D J stent

Operative procedure	Procedures performed
Simple cystoscopic removal	12
ESWL	1
PCNL	1
PCNL+URSL	2
URSL	4
PCCL	1
PUCL	4
OPEN CYSTOLITHOTOMY	2
URSL+PUCL	2

Table III: Management of forgotten D J stent

Duration of Forgotten DJ stent	No of patients
3 months to 1 year	26
2 years	2
4 years	2
8 years	1
10 years	1
16 years	1

Table IV: Time of indwelling D J stent

Site of stone formation	Numbers
Stone encrustation	12 (36.36%)
Kidney	4 (12.12%)
Ureter	8 (24.24%)
Bladder	9 (27.27%)

Table V: Sites of stone formation

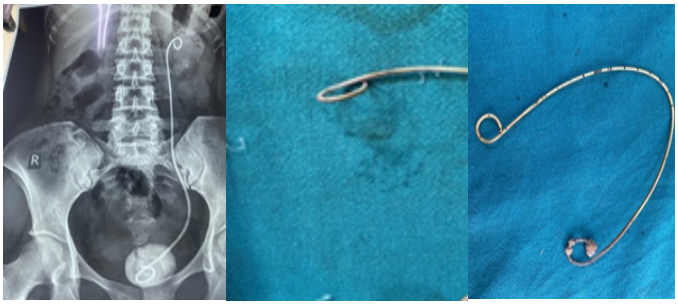

Figure 1: Stone formation in distal end of stent in the urinary bladder

DISCUSSION

The benefit of using D J stent in several operations is appreciable however, forgotten D J stent may create unwanted results. The presentation of forgotten D J stent may vary. The incidence of complication increases with the duration that the D J stent is in vivo.[18,19] Flank pain alone in 30.30% patient and recurrent fever with flank pain and positive urine culture in 24.24 % of patient were most commonly found complications in this study where as in a study conducted by Damiano et al found flank pain (25.3%) and storage lower urinary tract symptoms (18.8%) were most common symptoms.[20]

This study found formation of stent encrustation in 36.36 % at different time of insertion however, rate of formation of encrustation at different particular time interval not observed. Bultitude MF and colligue have also reported that the stent encrustation rates are 9.2%, 47.5% and 76.3% if stent remains indwelling for 6 weeks, 6-12 weeks and more than 12 weeks, respectively.[21] 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.[18] In this study, most of the patient had to undergo various endourological procedure such as ESWL, PCNL, URSL ,PCCL and PUCL to remove the stent. Very few needed open surgery like cystolithotomy. This is also supported by the study of Rana AM, Monga M, Ankur J.[22-24] Living in remote areas, poor financial condition of patient with ignorance, unaware about the stent from patient, missed to mention in discharge paper for the visit to remove D J stent found main causes of forgotten D J stent in this study. Similar causes were also encountered by the study of Goel HK, MohanPillai K, Divakaruni N.[15, 25, 26]

Stent registry,[27] computer trackers which sends message to patients and urologist[28] also have been used globally to minimize the incidence of forgotten D J stent. Study of Lawrentschuk N, Russell JM have reported the decline of incidence of forgotten stent from 12.5% to 1.2% with the use of computer based tracking software.[29]

To minimize the incidence and related complications of forgotten D J stent patient should be counselled to visit in hospital within 2-4 weeks after placing of it and at the same time they must be aware about the complications of the DJ stent. Hospital must also maintain a log book to register the contact number and removal date of D J stent to remind patient to visit hospital in time.

LIMITATIONS

Sample size is small. The rate of stone formation is not compared to time of placement of the stent.

CONCLUSION

D J stent is being widely used in several urological and non-urological operations as a therapeutic and prophylactic purposes. However, sometime forgotten D J stent may increase morbidity, mortality, extra expenses to patient and decrease quality of life. Incidence of forgotten D J stent can be reduced by proper counselling and awareness about forgotten D J stent to patient and maintain stent record in hospital.

REFERENCES

1. Zimskind PD, Fetter TR, Wilkerson JL. Clinical use of long-term indwelling silicone rubber ureteral splints inserted cystoscopically. J Urol. 1967; 97(5):840-4.
2. Kuno K, Menzin A, Kauder HH, Sison C, Gal D. Prophylactic ureteral catheterization in gynecologic surgery. Urology. 1998; 52(6):1004-8.
3. Kumar R, Mandhani A, Kumar A, Ahlawat R. Optimum duration of splinting after endopyelotomy. J Endourol. 1999; 13(2):89-92.DOI: https://doi.org/10.1089/end.1999.13.89
4. Kawahara T, Ito H, Terao H, Yamagishi T, Ogawa T, Uemura H, et al. Ureteral stent retrieval using the crochet hook technique in females. PLoS One. 2012; 7(1):e29292. Doi. org/10.1371/journal.pone.0029292
5. El Khader K. Complications of double J ureteral stents. Journal d'urologie. 1996; 102(4):173.
6. Ringel A, Richter S, Shalev M, Nissenkorn I. Late complications of ureteral stents. Eur Urol. 2000 Jul; 38(1):41-4.
7. Vallejo JH, Burgos FR, Alvarez JA, Sáez JG, Téllez MM, de la Muela Sánchez P. Double J ureteral catheter. Clinical complications. Archivos espanoles de urologia. 1998 May; 51(4):361-73.
8. Kawahara T, Ito H, Terao H, Yoshida M, Matsuzaki J. Ureteral stent encrustation, incrustation, and coloring: morbidity related to indwelling times. J Endourol. 2012; 26(2):178-82.
9. El-Faqih SR, Shamsuddin AB, Chakrabarti A, Atassi R, Kardar AH, Osman MK, et al. Polyurethane internal ureteral stents in treatment of stone patients: morbidity related to indwelling times.J Urol. 1991; 146(6):1487-91.
10. Monga M, Klein E, Castaneda-Zuniga WR, Thomas R .The forgotten indwelling ureteral stent: a urological dilemma. J Urol. 1995;153:1817-19
11. Singh V, Srinivastava A, Kapoor R, Kumar A. Can the complicated forgotten indwelling ureteric stents be lethal? Int Urol Nephrol.2005; 37:541-6.
12. Adanur S, Ozkaya F. Challenges in treatment and diagnosis of forgotten/encrusted double-J ureteral stents: the largest

single-center experience.Ren Fail. 2016;38:920–6

13. Sohrab A, Aneesh S, Sureka SK, Varun M, Nitesh P, Manoj K, et al. Forgotten Reminders: an Experience with Managing 28 Forgotten Double-J Stents and Management of Related Complications. Indian J Surg. 2015 Dec; 77(3):1165-71. DOI: http://10.1007/s12262-015-1229-4

14. MohanPillai K, Keeley FX Jr, Moussa SA, Smith G, Tolley DA. Endourological management of severely encrusted ureteral stents. J Endourol. 1999; 13:377-9.

15. Goel HK, Kundu AK, Maji TK, Pal DK. Retained fragmented double J uret eric stent: A report of four cases with review of the literature. Saudi J Kidney Dis Transpl. 2015; 26:747-50.

16. Divakaruni N, Palmer CJ, Tek P, Bjurlin MA, Gage MK, Robinson J, et al. Forgotten ureteral stents: who's at risk? J Endourol. 2013; 27:1051-4.

17. Sancaktutar AA, Söylemez H, Bozkurt Y, Penbegül N, Atar M. Treatment of forgotten ureteral stents: how much does it really cost? A cost-effectiveness study in 27 patients.Urol Res .2012;40:317–25

18. Kawahara T, Ito H, Terao H, Yoshida M, Matsuzaki J. Ureteral stent encrustation, incrustation, and coloring: morbidity related to indwelling times. J Endourl. 2012; 26(2):178-82.

19. El-Faqih SR, Shamsuddin AB, Chakrabarti A, Atassi R, Kardar AH, Osman MK, et al. Polyurethane internal ureteral stents in treatment of stone patients: morbidity related to indwelling times. J Uro. 1991; 146(6):1487-91.

20. Damiano R, Olivia A, Esposito C, Desio M, Autorino R, D'Armiento M .Early and late complications of double pigtail ureteral stent. Urol Int. 2002;69:136–40

21. Bultitude MF, Tiptaft RC, Glass JM, Dasgupta P. Management of encrusted ureteral stents impacted in upper tract. Urology. 2003 ;62:622–26

22. Rana AM, Sabooh A. Management strategies and results for severely encrusted retained ureteral stents. J Endourol .2007;21:628–32

23. Monga M, Klein E, Castañeda-Zúñiga WR, Thomas R. The forgotten indwelling ureteral stent: a urological dilemma. J Urol.1995; 153:1817–19

24. Ankur J, Ankur B, Gaurav P, Satyanarayan S .Endourological management of forgotten double J ureteral stents: a single centre study. JOJ Uro Nephron .20171;1(4):JOJUN. MS.ID.555566

25. MohanPillai K, Keeley FX Jr, Moussa SA, Smith G, Tolley DA. Endourological management of severely encrusted ureteral stents. J Endourol. 1999; 13:377-9.

26. Divakaruni N, Palmer CJ, Tek P, Bjurlin MA, Gage MK, Robinson J, et al. Forgotten ureteral stents: who's at risk? J Endourol. 2013; 27:1051-4.

27. Patil SM, Magdum PV, Shete JS, Nerli RB, Hiremath M. Forgotten DJ stent– A source of morbidity: Is stent registry a need of the hour? International Journal of Recent Scientific Research Research 2015;6: 2674-76

28. Sancaktutar AA, Tepeler A, Soylemez H, Penbegul N, Atar M, Bozkurt Y, Yıldırım K. A solution for medical and legal problems arising from forgotten ureteral stents: initial results from a reminder short message service (SMS). Urol Res. 2012; 40:253-8.

29. Lawrentschuk N, Russell JM. Ureteric stenting 25 years on: routine or risky? ANZ J Surg. 2004 Apr; 74(4):243-7. DOI: htt p://10.1111/j.1445-2197.2004.02947.