Annals of Medicine and Surgery 80 (2022) 104223

Contents lists available at ScienceDirect

Annals of Medicine and Surgery

journal homepage: www.elsevier.com/locate/amsu

Case Series

Forgotten Double-J ureteral stent: An analysis of 25 cases in a tertiary hospital

Maher Al-Hajjaj [a,*], Oula Abou Alam [b], Bilal Abu-Hussein [c], Hasan AL. Muhammad AL Husein [a]

[a] Department of Urology, Aleppo University Hospital, Aleppo, Syria
[b] Jordan University of Science & Technology, Irbid, Jordan
[c] University of Jordan, School of Medicine, Amman, Jordan

ARTICLE INFO

Keywords:
Forgotten double j stent
Lithotripsy
Ureteroscopy

ABSTRACT

Introduction: Double-J (DJ) ureteral stents are considered basic and common in daily urological practice. We aim to share our experience of managing 25 cases of forgotten double-J (DJ) stents in our tertiary care center.

Methods and materials: We did a retrospective analysis of cases with forgotten DJ stent for a period of one year spanning from February 2021 to February 2022. Detailed information like age, sex, the indication for insertion of the double-J, the period of insertion, presenting symptoms, and the definite procedure performed to remove the double-J.

Results: The total number of cases was 25. We had 60% of patients underwent previous procedure in our hospital and the rest 40% were in other centers. The mean age was 38.44 years. The mean duration of the indwelling stent was 20.36 months, and the duration ranged from 13 months to 33 months.

Most common indications for stenting were URS (64%). Presenting complaints were dysuria (n = 19; 76%), hematuria (n = 13, 52%), flank pain (n = 9; 36%), storage lower urinary tract symptoms (*n* = 8; 32%), and recurrent urinary tract infection (*n* = 5; 20%).

Several complications were noted during or after forgotten stent removal like stent fragmentation (20%), fever (16%), sepsis (8%), and hematuria requiring transfusion (4%).

Conclusion: Forgotten double-J ureteral stents are a source for morbidity. Patients should be educated about the complications of the forgotten double-J. Creating a scheduled program for notifying patients with double-J stent is another good way.

1. Introduction

Double-J (DJ) stents are among the basic and commonly used tools in urology in many procedures since its first introduction in 1967 by Zimskind et al. [1].

They are chiefly used for managing ureteral obstruction due to intrinsic or extrinsic causes (stones, tumors, and fibrosis) and for providing drainage after ureteral surgery or iatrogenic injuries. However, some problems related to their use still occur despite the improvements in materials and design [2].

The DJ stent has been known to have various short-term and long-term complications.

Some of complications of a forgotten double-J (DJ) stent are stent discomfort, encrustation, migration, stone formation, renal failure, and mortality [3].

Encrustations are most frequently noted in forgotten/retained DJ's, which remain indwelling for a long period of time. El-Faqih et al. reported encrustation rate of 9.2% if the DJ was kept for <6 weeks; however, encrustation rate rose to 76.3% if the DJ was left in place for up to 12 weeks [4].

The management of forgotten JJ stent constitutes a dilemma to the urologist and sometimes may be difficult, complicated, risky and expensive. Although open surgery has been reported as a treatment modality, other minimally invasive procedures are followed; of these techniques, extracorporeal shockwave lithotripsy (ESWL), or internal lithotripsy with percutaneous nephrolithotomy (PCNL), cystolithotripsy (CLT), ureteroscopic lithotripsy (URL) have all been used either alone or in combination to tackle this problem [5].

Syrian crisis led to more delay in follow-up after insertion of ureteral stents. In this manuscript, we aim to report our experience in treatment

* Corresponding author.
E-mail address: alhajjaj963@gmail.com (M. Al-Hajjaj).

https://doi.org/10.1016/j.amsu.2022.104223
Received 28 May 2022; Received in revised form 18 July 2022; Accepted 20 July 2022
Available online 31 July 2022

of forgotten and encrusted double j stents in a tertiary hospital.

This work has been reported according to SCARE 2020 criteria [6].

2. Methods and materials

We performed a retrospective study conducted at the Department of Urology, Aleppo University Hospital, Aleppo, Syria, over a period of 12 months (from January 2021 to January 2022). The total number of patients who met the eligibility criteria of forgotten DJ stent (>6 months) and factors like duration of DJ stent indwelling, presenting complaints, and type of previous procedure was 25. The patients included in this study were those previously operated at our center as well as referred from other hospitals.

In addition, we aimed to report the definite treatment for the removal of double j stent.

All the patients were evaluated with the past medical history, physical examination, radiology study, and laboratory study.

Each patient underwent abdominal and pelvis ultrasonography, X-ray KUB, urine analysis and serum creatinine. In some patients, we performed a non-contrast computed tomography (CT) mainly for radiolucent calculi and in complex cases like fractured or broken stent. The plan of treatment was decided on the basis of investigations. Pre-operative antibiotics were given according to urine culture sensitivity, which were continued postoperatively For removal of encrusted DJ stents, we used ureteroscopy, Cystoscopy and D J removal, mechanical cystolithotripsy, percutaneous nephrolithotomy, and open procedure.

3. Results

A total of 25 patients were enrolled in this study, of which 60% (n = 15) underwent previous procedures (for which DJ stent was inserted) in our hospital and the remaining 40% (n = 10) were from other hospitals.

The mean age of the patients was 38.44 years, and the age ranged from 22 to 58 years. Out of the 25 participants, 12 (48%) were males and 13 (52%) were females.

The mean duration of the indwelling stent in situ was 20.36 months, and the duration ranged from 13 months to 33 months.

Most cases of forgotten DJ stents were because of the Syrian crisis and the bad circumstances to complete the follow-up in our center.

The indications of indwelling stents are shown in Table 1.

Most common indications for stenting were URS (64%). We did not have a fragmented DJ stents.

Presenting complaints (Table 2) were dysuria (n = 19; 76%), hematuria (n = 13, 52%), flank pain (n = 9; 36%), storage lower urinary tract symptoms (n = 8; 32%), and recurrent urinary tract infection (n = 5; 20%).

We had some patients who needed more than one procedure to remove the encrusted DJ stent. Table 3 summarizes the performed procedures. In 17 patients (68%), we performed ureteroscopy. PCNL, mechanical cystolithotripsy (CLT), open procedure for stent removal, and cystoscopy and DJ stent removal were required in 9 (36%), 5 (20%), 5 (20%) and 3 (12%) patients, respectively.

Several complications were noted during or after forgotten stent removal like stent fragmentation (20%), fever (16%), sepsis (8%), and hematuria requiring transfusion (4%).

Table 1
Indications of indwelling stents.

Indications	Number of cases
Ureteroscopic lithotripsy	16
Extracorporeal shock wave lithotripsy	4
Open pyeloplasty	3
Ureteric reimplantation	2

Table 2
Presenting symptoms.

Symptoms	Number of cases
Dysuria	19
Hematuria	13
Flank Pain	9
Storage LUTS	8
Recurrent UTI	5

Table 3
Procedures performed for removal of D J stent.

Procedure	Number of cases
Ureteroscopy	**17**
Percutaneous nephrolithotomy	**9**
Cystoscopy and D J removal	**3**
Mechanical cystolithotripsy	**5**
Open procedure	**5**

4. Discussion

Since its introduction in 1967 by Zimskind et al. DJ stent is commonly used in various urological procedures. DJ stents are like double edged sword, if it is kept for long duration or forgotten causing significant morbidity to patient [1].

In our study, the main cause of forgotten DJ stent was loss of follow-up because of Syrian crisis. Most of our patient did not get the chance to visit the hospital after surgery as scheduled.

We found different reasons for patients who presented with forgotten DJ stent.

The most common presenting symptoms were dysuria (76%) and hematuria (52%).

In a study by Damiano et al. flank pain (25.3%) and storage lower urinary tract symptoms (18.8%) were most common symptoms [7].

The incidence of complications related to stent increases with the duration of the stent; hence, it is important that it should be removed or replaced on time [1].

In our scenario, stent encrustation and recurrent urinary tract infection were the most common complications.

In a study by Nawaz et al. [8], the common complications reported were stent encrustation (10.5%), stent migration (3.5%) and stent breakage (4.5%); similarly, in another study, stent encrustation (24.5%), stent migration (9.5%) and stent breakage (1.3%) were reported as common complications [1].

In a case series by El-Abd et al., the most prominent complication was LUTS followed by fever and UTI [5].

Treatment of forgotten DJ should be planned according to many factors such as extent, severity, and broken DJ stent. In most cases, using multimodal procedures is required.

Several studies describe management of forgotten DJ stent with endourological approach [9,10].

In our hospital, URS and PCNL were the most commonly performed procedures. Three of our patients underwent to open surgery. This is mainly because of the severity of encrustation.

Although encrusted stents can be managed successfully in the majority of cases, the best treatment is prevention.

Patients should be educated about the risks of forgotten DJ stents. Because of the Syrian crisis, we can see an increase in forgotten DJ stents. Most patients were not allowed to visit hospitals because of the Syrian conflict. They were forced to stay in their home.

5. Conclusion

Using double-J stents should be accompanied with a well education of the patient and his relatives to reduce forgotten and encrusted double-

J. Documented follow-up is another good strategy that urologists should use for preventing such complication of the double-J.

Ethical approval

The article is exempted from ethical approval.

Sources of funding

We do not have any financial sources for our research.

Author contributions

Maher Al-Hajjaj: contributed in study concept and design, data collection, and writing the paper.

Oula Abou Alam, Bilal Abu-Hussein, and Hassan AL Muhammad AL Husien: Helped in revising manuscript.

Registration of research studies

1. Name of the registry: OSF Preregistration.
2. Unique Identifying number or registration ID: osf. io/rxfve
3. Hyperlink: https://archive.org/details/osf-registrations-rxfve-v1

Consent

N/A, a retrospective analysis of medical records.

Guarantor

Maher Al-Hajjaj.

Provenance and peer review

Not commissioned, externally peer reviewed.

Declaration of competing interest

All authors disclose any conflicts of interest.

Acknowledgments

The authors have no acknowledgments.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.amsu.2022.104223.

References

[1] S. Patil, K. Raghuvanshi, D.K. Jain, A. Raval, Forgotten ureteral double - J stents and related complications : a real - world experience, Afr. J. Urol. (2020) 4–8, https://doi.org/10.1186/s12301-020-0020-3.

[2] Y. Dakkak, A. Janane, M. Ghadouane, A. Ameur, M. Abbar, Management of encrusted ureteral stents, Afr. J. Urol. 18 (3) (2012) 131–134, https://doi.org/10.1016/j.afju.2012.08.013.

[3] V. Vajpeyi, S. Chipde, F.A. Khan, S. Parashar, Forgotten Double - J Stent : Experience of a Tertiary Care Center, UA, 2020, https://doi.org/10.4103/UA.

[4] R.B. Nerli, P.V. Magdum, V. Sharma, A.K. Guntaka, Forgotten/Retained Double J Ureteric Stents : A Source of Severe Morbidity in Children, 2016, pp. 32–35, https://doi.org/10.4103/0189-6725.181704.

[5] H. El-tatawy, A.S. El-abd, T.A. Gameel, et al., Management of ‘ forgotten ’ encrusted JJ stents using extracorporeal shockwave lithotripsy : a single-centre experience, Arab J Urol 17 (2) (2019) 132–137, https://doi.org/10.1080/2090598X.2019.1595485.

[6] R.A. Agha, C. Sohrabi, G. Mathew, T. Franchi, A. Kerwan O'Neill, N for the PROCESS group. The PROCESS 2020 guideline: updating consensus preferred reporting of CasE series in surgery (PROCESS) guidelines, Int. J. Surg. 84 (2020) 231–235.

[7] R. Damiano, A. Olivia, C. Esposito, M. Desio, R. Autorino, M. D'Armiento, Early and late complications of double pigtail ureteral stent, Urol. Int. 69 (2002) 136–140.

[8] H. Nawaz, M. Hussain, A. Hashmi, Z. Hussain, Experience with indwelling JJ stents, J. Pakistan Med. Assoc. 43 (1993) 147–149.

[9] A. Sohrab, S. Aneesh, S.K. Sureka, M. Varun, P. Nitesh, K. Manoj, et al., Forgotten reminders: an experience with managing 28 forgotten double-J stents and management of related complications, Indian J. Surg. 77 (2015) 1165–1171.

[10] J. Ankur, B. Ankur, P. Gaurav, S. Satyanarayan, Endourological management of forgotten double J ureteral stents: a single centre study, JOJ Uro Nephron 1 (2017), 555566.