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PROSPECTIVE OBSERVATIONAL STUDY ON INTOLERANT SYMPTOMS ASSOCIATED WITH DOUBLE-J URETERAL STENTING

Urology

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ABSTRACT

Background: Double J ureteral stenting procedure is commonly done in urological practice and it is associated with wide range of symptoms which include dysuria, irritative storage symptoms like frequency and urgency, flank and suprapubic pain, fever, hematuria, stent migration, stent encrustation, etc. **Methods:** This study is a prospective observational study from August 2022 to September 2023 . 100 patients were taken who underwent double-J ureteral stenting. Patients were evaluated by history and clinical examination and routine investigations and symptoms if any were recorded starting from placement of DJ(double J) stent till its removal. **Results:** In this study period out of 100 patients who underwent double j stenting procedure 95 patients had symptoms which include irritative symptoms like urgency and frequency, flank pain and supra pubic pain , hematuria, dysuria, stent encrustation. Most of the patients with these symptoms are treated conservatively. In upto 20 patients who had severe irritative symptoms were treated with alpha blockers of which 2 patients had stent expulsion. **Conclusions:** Our study demonstrated that patients who underwent double J stenting procedure had post operatively minor symptoms and they can be managed conservatively.

KEYWORDS

Double-J stent(DJ ureteric stent), flank pain, irritative(storage) bladder symptoms, Stent migration(epulsion), Hematuria

BACK GROUND

Stents are hollow tubes work by draining both around and through their structure and used commonly in urological procedures .In19 th century 3 dentists named stent who developed a substance for dental impression (1)

Ureteral stents represent most mature application of indwelling endoluminal splint 1st been described by Zimskind et al (1967) . As originally described, intent of implantation was for treatment of ureteral obstruction or fistula(2). As with advances and application of stenting used in urological procedures like obstructive uropathy cystolithotripsy , ureteroscopic lithotripsy (URSL), percutaneous nephrolithotomy (PCNL) with intracorporal lithotripsy and extracorporeal shock wave lithotripsy (ESWL),open pyelolithotomy etc.

DJ stenting procedure may produce symptoms after the procedure like dysuria, irritative storage symptoms like frequency and urgency, flank and suprapubic pain, fever, hematuria, stent migration, stent encrustation, etc. And some times patient may not have any symptoms. Hence, in this study symptoms associated with ureteral double J stents were analyzed , and methods of treatment of symptoms and its outcomes were noted

METHODS

We conducted an observational study in the Department of urology at VIjayanagara Institute of Medical Sciences, Bellary, Karnataka from August 2022 to September 2023.

Sample Size -

100 patients taken who underwent DJ ureteral stenting from September 2022 to August 2023. The prevalence of suprapubic pain the most common adverse event following double J ureteral stenting was 44%, entering this data in win-pepi software, taking allowable error of 10% at 95% confidence interval, the calculated comes as 95. So sample size of 100 was taken for the study(3).

100 patients were taken who underwent DJ ureteral stenting . Each patient underwent detailed history and physical examination and routine investigations before the procedure. Regular close followup done after the procedure, and if any symptoms occurred recorded and treatment given accordingly.

Inclusion Criteria-

all patients who underwent DJ stenting during study period.

Exclusion Criteria-

1) patients who refused to participate in the study
2) patients with bleeding disorders,
3) pregnant females, children less than 8 years and elder patients more than 70 years.

Patients with mild symptoms were trated conservatively. Patients with severe uncontrollable lower urinary tract symptoms like frequency and urgency were given alpha blockers. Patients with fever and dysuria underwent general examination and routine investigations and treated conservatively.

All the symptoms are evaluated and recorded in every patient who underwent DJ stenting in our study.

RESULTS

This study included total of 100 patients, 37female patients and 63 male patients with age ranging from 8 years to 70 years.

The procedures with dj stenting in our study included are 39 patients who underwent ureteroscopic lithotripsy (URSL), percutaneous nephrolithotomy (PCNL) in 30 patients , DJ stenting in 24 patients, open Pyeloplasty in 5 patients, open pyelolithotomy in 2 patients. DJ stenting done as an emergency in 2 patients for pyonephrosis and in 22 patients to relieve ureteral obstruction with abnormal renal function tests and anuria(table1).

Out of 100 patients 91 patients underwent stent removal after 3 weeks and five patients after 6 weeks and 4 patients underwent stent change at 3 months.

Table 1: Surgical Methods

Surgery method	Number of patients
Emergency DJ Stenting	24
PCNL	30
Open pyelolithotomy	02
Open Pyeloplasty for PUJ obstruction	05
URSL	39
Total	100

Irritative bladder symptoms like frequency and urgency are most common symptom observed after DJ stenting followed by flank and supapubic pain or discomfort, dysuria, hematuria , fever. In 5 patients no symptoms were observed. (Table 2).

Table 2: Symptoms With DJ Stenting

Most common symptom	Number of patients	Percentage
Dysuria	16	16
Suprapubic or flank pain/discomfort	22	22
Irritative bladder symptoms	44	44
Hematuria	11	11
No complaints	5	5
fever	2	2
Total	100	100

Most of the patients underwent DJ stent removal by the end of 3rd to 4 th week, 5 patients came at the end of 5 th to 6th week of which major symptom was discomfort or flank/suprapubic pain followed by dysuria and 4 patients came at the end of 3 months for DJ stent change for chronic kidney disease with deranged kidney function , and all 4 patients had flank pain. Encrustation seen in 3 patients in whom DJ stent removed at 6 weeks, all 4 patients in whom DJ stent removed at 3 months had stent encrustation. No patients had stent impaction and stent breakage .

20 patients had severe symptoms like frequency and urgency who having normal renal function were treated with alpha blockers like silodosin. These symptoms were improved in these patients but 2 patients had stent expulsion which was confirmed by general examination and with the help of x ray KUB.

2 patients had fever were evaluated with general examination and routine investigation and treated with antibiotics and antipyretics.

Patients with dysuria were examined and evaluated and came to conclusion that dysuria is mainly due to presence of DJ stent itself .

Patients with hematuria evaluated properly and had most of them had flank pain and discomfort who treated conservatively.

In our study, most of the patients had irritative storage symptoms like frequency and urgency are the most common symptom followed by discomfort or flank and suprapubic pain ,dysuria, hematuria and fever. 5 patients had without any problems till their DJ stent removal by 3 weeks. Patients with bothersome irritate lower urinary tract symptoms were treated with alpha blockers and of them 2 patients had stent expulsion. Stent encrustation was seen in 7 patients in whom stent was kept for longer time.

DISCUSSION

Indwelling double J ureteral stenting procedure is doing commonly in most of the open and endourological procedures nowadays in urology practice. Indications for Ureteral Stent Placement are to relief of benign or malignant obstruction ,in adjunct to stone therapy like ureteroscopic lithotripsy (URSL), percutaneous nephrolithotomy (PCNL) with intracorporal lithotripsy and extracorporeal shock wave lithotripsy (ESWL),open ppyelolithotomy and For ureteral instrumentation,in management of urine leak from trauma or surgery or leak due to ureteral fistula etc.

In our study Dj stenting was commonly done in adjunct to stone therapy like ureteroscopic lithotripsy (URSL), percutaneous nephrolithotomy (PCNL) ,open pyelolithotomy followed by emergency DJ stenting in obstructive uropathy and pyonephrosis.

In a study by Nawaz et al in which DJ stenting procedure was done most commonly in adjunct to stone therapy like ureteroscopic lithotripsy (URSL), percutaneous nephrolithotomy (PCNL) ,open pyelolithotomy followed by Dj stenting in obstructive uropathy post vvf repair and Pyeloplasty secondary to pelviureteric junction obstruction(4). But in a study by Saltzman et al, and Memon et al, who reported that DJ stenting was commonly done in obstructive uropathy followed by prophylactic stenting(5,6).

In our study out of 100 patients 63 patients are male and 37 female patients showing high incidence of males compared to females as similarly shown a study by Memon et al and Ghaffar et al (5,7).

Characteristics of an Ideal Ureteral Stent is it should be
- Easily inserted from any access
- Resistant to migration
- Optimal flow characteristics
- Well tolerated by patient
- Biocompatible
- Biodurable
- Resistant to encrustation
- Nonrefluxing
- Radiopaque or visible at Ultrasound
- Easily exchanged and removed
- Versatile
- Affordable

Polyethylene was 1st synthetic polymer used in stent construction, But it was not using commonly nowadays due to its brittleness, tendency to fragment and stiffness, which cause patient discomfort. Polyurethane stents are most commonly using nowadays and it show some resistence to encrustation but it is a stiff material which may cause discomfort to patient . Silicone is most biocompatible stent material and most resistant to biofilm formation, infection & encrustation. But silicone has more flexibility & elasticity so sometimes difficult to advance silicone stents over a guidewire through tight ureters (8).

In this study most of the patients underwent with Polyurethane stent material and in 2 patients used silicone stent which removed after 3 months and size and length of stent inserted according to age of the patient and type of urological procedure.

Consequences & Complications of Ureteral Stent Placement are Irritative voiding symptoms, Incontinence, Suprapubic or flank pain, Vesicorenal reflux, Hematuria, Pyuria, Urinary tract infection, Malposition, Migration, Inadequate relief of obstruction, Encrustation, Ureteral erosion or fistulization, Fracture, Forgotten stent(2)

Prerequisites for reduction of these complications or symptoms proper selection of patient and material and size of stent, proper treatment of comorbidities if any, evaluation and control of infection , using of alpha blockers have shown some good results(9).

In our study Irritative voiding symptoms like frequency and urgency were seen in 44% of patients whereas in a study by Pansota et al 32.5% patients had irritable bladder symptoms which was the commonest complication of DJ stenting. Fever and hematuria in this study was 20% and 27.5% respectively(10) which was higher than our study 2% ,11% respectively.

Irritate voiding symptoms followed by discomfort or pain in flank or suprapubic region, dysuria, Hematuria, fever are most common presenting symptoms in our study. ,5 patients had no any complaints. All patients with any complaints were treated conservatively.

20 Patients with severe lower urinary tract symptoms were treated with alpha blockers till DJ stent removal, of these 2 patients had stent expulsion which was confirmed by general examination and x ray KUB. Single J stent is more prone stent migration than double J stent and other reasons of stent migration are incorrect selection of stent size, ureteric peristalsis(11). Stent migration is less in our study compared to a study by Arshad et al16.3%(12).

Longer period of stent placement is associated with stent encrustation and most commonly after stone related surgeries. Poly urethane is more prone to encrustation than silicone stent. One of the reason for stent encrustation is deposition of crystal , bacteria and proteins over stent. Various attempts have been made to reduce deposition of crystals, bacteria & protein on stent surfaces including:
- Using low surface energy biomaterials
- Heparin coating
- Antimicrobial eluting biomaterials
- Diamond-like carbon coatings
- Polyethylene glycol &Marine mussel adhesive proteins(13,14)

Initial treatment for removal of encrusted stents were Extracorporeal shock wave lithotripsy (ESWL), ina study by Mathew et al, for removal of encrusted stents ,29.1% patients underwent ESWL and 20.8% by URSL(15). In our study 7 patients had stent Encrustation and in all these patients stent removed cystoscpically without ESWL and URSL.

CONCLUSION

In modern urological practice, DJ stenting procedure is commonly

performed to relieve any obstruction in obstructive uropathy and in adjunct to stone related surgeries. As there is no ideal stent it may produce symptoms which may be tolerated by most of the patients and intolerable in some. As most of the patients did not have major problems without any major morbidity and morality till it is needed to propore evaluation and regular follow up is needed to monitor patients regularly and to treat accordingly. Most of the patients were treated conservatively in our study. In our study majority of patients underwent stent removal by 3 weeks.

Further larger group studies are required to establish symptoms and complications of DJ stenting in long standing placement of stent.

REFERENCES

(1) Lawrentschuk N, John M. Russel, Murray Valley, Corner Pearce St, Nordsvan Drive ,Woodanga et al. Ureteric stenting 25 years on: routine or risky. ANZ J. Surg. 2004; 74: 243–247.
(2) Raymond B. Dyer , Michael Y. Chen ,Ronald J. Zagoria, John D. Regan, Charles G. Hood, Peter V. Kavanagh, Complications of Ureteral Stent Placement. RadioGraphics 2002; 22:1005–1022.
(3) Noopur Bansal, Gurpreet Singh Bhangu, Darpan Bansal-"Post operative complications of double-J ureteral stenting:a prospective study" International Surgery Journal Bansal N et al. Int Surg J. 2020 May;7(5):1397-1403)
(4) Nawaz H, Hussain M, Hashmi A, Hussain Z, Zafar N, Naqvi A, et al. Experience with indwelling JJ ureteral stents. JPMA. 1993;43(8):147-9.
(5) Memon NA, Talpur AA, Memon JM. Indications and complications of indwelling ureteral stenting at NMCH, Nawabshah. Pak J Surg. 2007;23(3):187- 91.
(6) Saltzman B. Ureteral stents. Indications, variations, and complications. Urol Clin N Am. 1988;15(3):481-91.
(7) Ghaffar A. DJ-Stenting; Efficacy in the management of obstructive uropathy. Professional Med J. 2007;14:56-9.
(8) Chew BH, Denstedt JD: Technology insight: Novel ureteral stent materials and designs . Nat Clin Pract Urol. 2004, 1:44-8. 10.1038/ncpuro0014.
(9) Deliveliotis C, Chrisofos M, Gougousis E, Papatsoris A, Dellis A, Varkarakis IM. Is there a role for alpha1- blockers in treating double-J stentrelated symptoms?. Urol. 2006;67:35-9.
(10) Pansota MS, Rasool M, Saleem MS, Tabassum SA, Hussain A. Indications and complications of double J ureteral stenting: our experience. Gomal J Med Sci. 2013;11(1):8-12.
(11) Singh I. Indwelling JJ ureteral stents - a current perspective and review of literature. Indian J Surg. 2003;65:405-12.
(12) Arshad M, Shah SS, Abbasi MH. Applications and complications of polyurethane stenting in urology. J Ayub Med Coll Abbottabad. 2006;18(2):69-72.
(13) Gorman SP, Tunney MM, Keane PF, Van Bladel K, Bley B. Characterization and assessment of a novel poly (ethylene oxide)/polyurethane composite hydrogel (Aquavene®) as a ureteral stent biomaterial. J Biomed Materials Res. 1998;39(4):642-9.
(14) Riedl CR, Witkowski M, Plas E, Pflueger H. Heparin coating reduces encrustation of ureteral stents: a preliminary report. Int J Antimicrobial Agents. 2002;19(6):507-10.
(15) Bultitude MF, Tiptaft RC, Glass JM, Dasgupta P. Management of encrusted ureteral stents impacted in upper tract. Urol. 2003;62(4):622-6.