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Original Research Article

Evaluate the optimal stent duration following endourology procedures: 5 days versus 14 days

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ABSTRACT

Background: Most urologists prefer not to place a stent in an uncomplicated URS (ureterorenoscopy) in the post-op period. Even if they do so, they place it with an extraction string that can be removed in post-op day 3-5 based on the patient's compliance. Here we sought to determine the optimal duration of stenting following endo-urology procedures (URSL, RIRS, PCNL) for stone disease (5 days vs 14 days).
Methods: It was a prospective randomised study where 1547 patients were evaluated over a span of 1.5 years, 671 of whom stent was removed on day 5 and 876 of whom stent was removed on day 14.
Results: Of all the patients, 32% experienced post-procedure-related events within 30 days (15% of 5-day stent removal compared to 44.9% of 14-day patients).
Conclusions: Removal of the stent on the 5th day does not warrant re-procedure and is associated with fewer post-procedure-related symptoms.

Keywords: stenting, URSL, RIRS, PCNL, Dysuria, Flank pain, Supra-pubic pain

INTRODUCTION

The American Urology Association recommends that following URS, clinicians can omit stenting in select criteria.[1] But more than 80% of urologists prefer an indwelling stent.[2] It is observed that short-term (1-2 days) stenting prevents urinary stasis due to oedema.[3] Ureteric stents with extraction strings do not increase stent-related urinary symptoms or complications.[4] As all stents are far from ideal, it's a urologist's call on when to deploy stents.[5] Therefore, we aim to determine the difference in postop outcomes for patients with 5 days vs 14 days of stent removal following endourology procedures for stone disease.

METHODS

We did a prospective randomized study at Sri Ramachandra institute of higher education and research (SRIHER), Chennai from January 2021 to June 2022. A total of 1547 patients who underwent endourological procedures for stone diseases were taken considered. The sample was divided into two groups based on simple random sampling, one whose stent was removed at 5 days vs one whose stent was removed after 14 days post-op. These 2 groups were compared based on their demographic information, preoperative variables, and postoperative outcomes (Table 1).

Table 1: Patient details.

Parameters	5th day removal N (%)	14th day removal N (%)	P value
Number of patients	671	876	-
Mean age	45.08	47.18	0.059
Sex			
Male	289 (43.1)	426 (48.6)	0.030
Female	382 (56.9)	450 (51.4)	
ASA status			
1 and 2	476 (70.9)	625 (71.3)	0.861
3 and 4	195 (29.1)	251 (28.7)	
Procedure			
URSL	352(52.5)	456 (52.1)	0.673
RIRS	188 (28)	234 (26.7)	
PCNL	131 (19.5)	186 (21.2)	
Prior stone episode	131 (19.5)	152 (17.4)	0.274
Prior procedure on the same side	73 (10.9)	58 (6.6)	0.003
Stone burden (mean)	65.81	44.33	
Stone location			
Renal	130 (19.4)	153 (17.5)	0.629
Ureter	523 (77.9)	699 (79.8)	
Both	18 (2.7)	24 (2.7)	
Laterality			
Right	312 (46.5)	413 (47.1)	0.800
Left	359 (53.5)	463 (52.9)	

Inclusion criteria

Inclusion criteria for current study were; age ≥18 years, ≤60 years, unilateral procedures and uncomplicated intra-operative course.

Exclusion criteria

Exclusion criteria for current study were; bilateral procedures, intraoperative ureteric injury, features of bulky kidney/peri-nephric/peri-ureteric fat stranding in plain CT KUB, complex anatomy, solitary kidney and renal failure.

Procedure

Ureteroscopy was done by either 6/7.5 Fr semi-rigid scope (Wolff, Knittlingen/Germany) for distal and proximal calculus or 7.5 Fr Flexi-scope flex X-2S (Karl Storz, Tuttlingen, Germany) for intra-renal calculus <1 cm. The patient would be placed in a lithotomy position after spinal anaesthesia. After antiseptic dressing and draping, rigid 6/7.5 Fr URS would be introduced. Using 0.035" hydrophilic coated Terumo guidewire, ureteric entry is done and if possible, the guidewire will be placed by the side of the stone. Pneumatic lithoclast or 100W Holmium: YAG laser will be used to fragment the stone and retrieve the fragments completely using a 3 Fr nitinol stone basket. If a 7.5 Fr flexi-scope is used, the access sheath is placed after guidewire placement. Intra-renal stones of size < 1 cm are removed using a flexible scope with 365µm or 500µm laser fibre and complete clearance is done using Cooks NGAGE nitinol stone extractor. After stone clearance, a 6 Fr/26 cm DJ stent was placed over the TERUMO guidewire. All patients were catheterised with a 16 Fr foley catheter.

Percutaneous nephrolithotomy was done in a prone position after the placement of a 6 Fr ureteric catheter in a patient after general anaesthesia. The fluoroscopic puncture was made by Bull's eye technique and serial metal dilators were used for tract dilatation (24 FR- 26 Fr). 20.8 Fr rigid nephroscope (Wolff, Knittlingen/Germany) was used with or without a sheath. The stones were fragmented using an EMS pneumatic lithoclast and extraction was done using a bi-pronged or a tri-pronged grasper. 6 Fr/26 cm DJ stent was placed in an antegrade manner. A 16 Fr foley was placed after the procedure. All patients were discharged on post-op day 1 after the removal of Foley's catheter. In one group, stent removal was done on post-op day 5 and in the second group, on post-op day 14. The 5-day extraction group were given Tab Amiloride 5 mg for 7 days along with post-op antibiotics.

Presence of PREs (post-procedure related events), defined as either a phone call to the clinic, unscheduled clinic visit, or emergency department visits for a stent-related complaint. Additional outcome variables included gross hematuria, lower urinary tract symptoms (LUTS), dysuria, suprapubic pain, fever, additional serum or urine studies, early imaging, clinically insignificant residual fragments (CIRFs), and post-operative hydronephrosis. Statistical analysis was done using SPSS software (ver. 17 for windows).

RESULTS

The patient details of the two groups which were similar are depicted in (Table 1). The mean age of the 5th-day removal group was 45.08 years and that of the 14th-day removal group was 47.18 years. Most of the patients were women (56.9% in the 5th-day removal group, and 51.4% in the 14th-day removal group). Most patients were of ASA 1 or 2. URSL was the most commonly performed procedure in both groups accounting for more than 50%. Only 17% to 19% of patients had a prior stone episode. The stone location was mostly in the ureter and on the left side. It was seen that post-procedure-related events were more in the 14th-day stent removal group (44.9%) vs. the 5th-day stent removal group (15%) (Figure 1). The incidence of the flank plain was mostly reported among the 5-day stent removal group (51.5% of 101 PREs) but the 14th-day stent removal group had more dysuria (20.8%) and suprapubic pain and presented as a constellation of multiple symptoms (Figure 2). In our study, we found that post-procedure-related events were more in the 14th-day

stent removal group (44.9%) as compared to 15% of the 5th-day stent removal group (p<0.05).

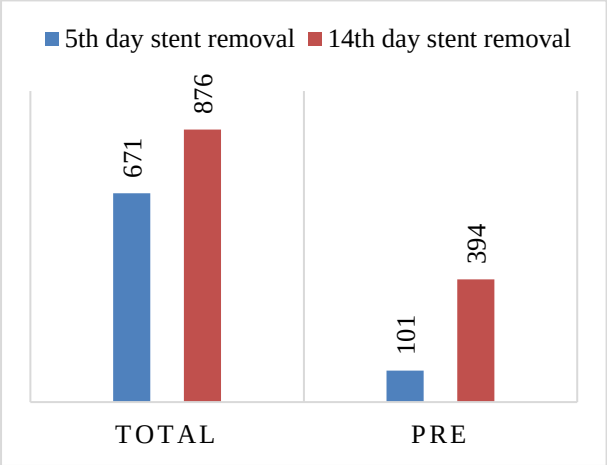

Figure 1: Post-procedure-related events.

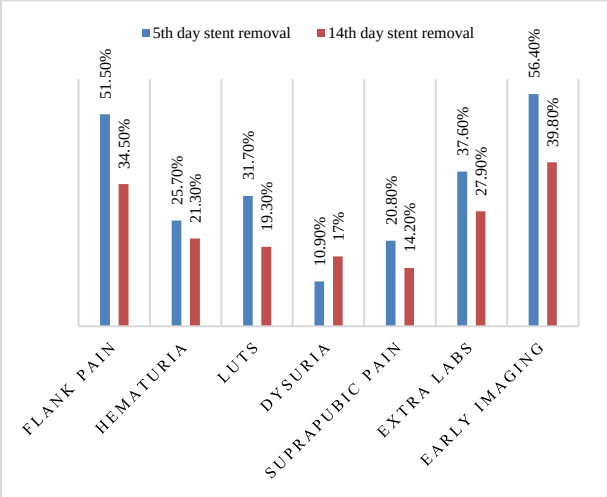

Figure 2: Post-operative symptomatic complaints and diagnostics in 5-day and 14-day stent extraction groups.

DISCUSSION

Ureteric stenting is done in more than 80% URSLs.[6] The majority of urologists do not leave an extraction string while placing an indwelling stent.[7] It is well-known that ureteric stents cause morbidity in the post-op period.[8] Incontinence, hematuria, storage symptoms and dysuria lead the list of unwarranted symptoms associated with stenting. Apart from these aforementioned symptoms, sexual health and work performance is also affected by indwelling stents leading to loss of work hours.[9] The longer intra-vesical portion of the DJ stent (loop of distal end crossing midline) causes more morbidity and requires more analgesics.[10] Patients with no stent following a URS procedure have a better post-op quality of life with fewer complaints. But this is applicable for stones less than 10mm.[11] A study of 3 days vs 7 days stent removal in URS procedures found that the latter group had less morbidity and thus suggested that a one-week indwelling stent post-procedure may have some benefit when compared to a 3-day one.[12] Routine use of a stent following URS with access sheath leads to lesser pain and thus less requirement of seeking medical advice in the immediate post-op period.[13]

In our study, we found that post-procedure-related events were more in the 14-day stent removal group (44.9%) as compared to 15% of the 5-day stent removal group (p<0.05). Though in the 5-day stent removal group, the symptoms were more among the 15% of the group who required early imaging. The most common being flank pain (51.5%) among the early stent removal group. We found that retaining the stent for 5 days gives time for the ureter oedema to settle and as the patient is on antibiotics and diuretics during this time, the symptoms are much lesser.

Limitations

The limitation of our study was that this was a single institution study, and the procedures were done by experienced urologists (>15 years of experience). The study needs a higher variety of demographics, a larger study sample and a multi-centre approach.

CONCLUSION

The current recommendation of stenting following a ureteroscopic procedure for a stone disease is limited and can be avoided in uncomplicated procedures. Removing the stent on the 5th day does not warrant any re-procedure. We found that the constellation of post-procedure-related symptoms in the 5th-day stent removal was less and the patients could join work earlier, thus decreasing loss of working hours, less psychological stress and thus better quality of life.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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