

# Whether post-ureteroscopy stenting is necessary or not?

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## ABSTRACT

**Objectives:** To verify if post-ureteroscopy (URS) stenting is still necessary as a routine strategy, or if some cases can be treated without.

**Methods:** Between August 2004 and April 2005, 85 patients were admitted to the Urology Department at the Nephrology and Urology Center, Al-Thawra Hospital, Yemen with ureteric stones of different size and site. All were scheduled and treated by the ureteroscopy method. According to prospective pure randomization, 45 patients were left non-stented at the end of the operation (non-stented group), while 40 patients were left with stent (stented group).

**Results:** The ages of the non-stented group ranged between 6-70 years (mean  $34.36 \pm 15.53$ ), while the size of the stones ranged between 5-20 mm (mean  $8.4 \pm 3.1$ ). They were 33 males and 12 females. Regarding the site, 26 stones were in the right, and 19 in the left ureter. In

the stented group, the ages ranged between 14-70 years (mean  $39.35 \pm 13.36$ ), while the size of the stones ranged between 6-16 mm (mean  $9.9 \pm 3.2$ ). They were 34 males and 6 females. Twenty-five stones were in the right ureter, and 15 in the left. Success was 100% in the non-stented group, while it was 39 out of 40 in the stented group. The 2 groups were compared statistically for postoperative analgesia, color clearance of urine and hospital stay, and found significantly different. However, for operative time, the difference was insignificant.

**Conclusion:** When treating ureteric stones by ureteroscopy, postoperative stenting should not be used as routine, but should be limited to those with ureteric injury, bigger sizes and prolonged operative time. The non-stenting method decreases the need for postoperative analgesia, time of color clearance and hospital stay.

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More than 95% of ureteric stones are now managed using both ureteroscopy and extracorporeal shockwave lithotripsy (ESWL).<sup>1,2</sup> Prior dilatation of the ureteric orifice and lower third of the ureter for stone extraction through different methods, such as ureteric dilators,<sup>3</sup> balloon dilators,<sup>4</sup> and others, were routine, leaving the stent to the end of the procedure.<sup>5,6</sup> Down sizing of the ureteroscope with development of a flexible type, and the addition of a new generation of lithotriptors has made the procedure safer and

more effective without the need for routine dilatation of the ureter. This has also made the area accessible by ureteroscopy (URS) wider to include the lower, middle as well as upper ureteric stones.<sup>7,8</sup> Stenting following treatment of ureteric and renal stones has more than 3 decades.<sup>9</sup> Nowadays, post URS stenting is questionable, as it was thought before that it decreased postoperative flank pain, especially 24-48 hours postoperative, the time that edema may develop after ureteric manipulation, and decrease ureteric stenosis

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or stricture.<sup>10</sup> Others consider that post URS routine stenting should not be used especially if the procedure is simple and without complications. Stenting should be used for those with a ureteric injury, or if big fragments were left to the end of the procedure.<sup>11,12</sup> In this study, we are presenting our study to verify if post URS stenting is necessary or not.

**Methods.** Between August 2004 and April 2005, 85 patients with ureteric stones were subjected to URS. The procedure was carried out under general anesthesia and by direct entering of the ureter without prior dilatation of the ureter, as we used the semirigid ureteroscope, which is graduated between 8-11Fr. The patients were randomly categorized into 2 groups according to leaving a stent to the end of the procedure or not. Forty-five patients were not stented, while 40 were stented. Data were statistically analyzed using student's t test and chi-squared test with a probability value of  $\leq 0.05$ , which is considered significant.

**Results.** The pre-operative data of the patients are shown in **Table 1**, and the operative and postoperative data are shown in **Table 2**. The age of the patients in both groups was matched as the *p*-value was 0.12. The mean stone size was greater in stented group with significant difference as *p*-value was 0.04. All the stones were reached and extracted without dilatation of the lower ureter in the non-stented group, while in the stented group, 33 did not have dilatation and 7 patients had dilatation. Regarding stone removal, the majority was removed by dormia extracation, followed by pneumatic Swiss lithoclass stone disintegration and forceps in the non-stented group, while in the stented group, the majority was removed by lithoclass, followed by dormia basket, and forceps. No stone was found in one patient from each group. On comparison of the 2 groups for operative time, postoperative pain, the need for analgesia, postoperative hematuria, color clearance, and hospital stay, no significant difference was found for operative time. However, a highly significant difference was found for hematuria and postoperative color clearance. There was also a significant difference between the 2 groups for hospital stay, postoperative pain and need for analgesics. The analgesic was in the form of diclofenac sodium in most of the cases. The success rate or stone free rate was comparable as it was 100% in the non-stented group, while in the stented group the success rate was 39 out of 40 patients, so the success rate was 97.5% as the stone in the failed patient escaped to the kidney and was successfully disintegrated by shock wave after insertion of double J stent. Regarding the stent type, a ureteric catheter

**Table 1** - Patient's pre-operative data.

Patient's characteristics	Non-stented (n=45)	Stented (n=40)	T test	P value
<b>Gender</b>				
Male	33	36		
Female	12	04		
<b>Age</b>				
Minimum	6	14		
Maximum	70	70		
Mean	34.36±15.53	34.35±13.36	1.6	0.12
<b>Stone size</b>				
Minimum	5	6		
Maximum	20	16		
Mean	8.4 ± 3.1	9.9±3.2	2.1	0.04
<b>Stone size</b>				
<b>Right</b>	26	25		
Upper	1	0		
Mid	3	5		
Lower	22	20		
<b>Left</b>	19	15		
Upper	0	00		
Mid	1	05		
Lower	18	10		
<b>Hydronephrosis</b>				
No	5	1		
Mild	30	31		
Moderate	10	08		
Severe	00	00		

No. 6Fr was left for 1-2 days in 30 patients, and 10 double J stents left for 3-4 weeks.

**Discussion.** Ureteral stents are a mainstay of today's urological armamentarium as they can have both diagnostic and therapeutic value but are used most frequently as adjacent to endoscopic manipulation of ureteric stones. Post URS stenting was routinely used to avoid trauma during the procedure, even minimal, as a result of the pre-procedure dilatation, insertion of the ureteroscope with big diameter and stone extraction or disintegration.<sup>13,14</sup> However, stenting is not without drawbacks, with complications such as irritative symptoms, hematuria, infection, incrustation and even stone formation with migration to the upper tract and the need for another manipulation for their removal with ranging between 10-85%.<sup>15-17</sup> With this controversy, we performed our prospective randomized study. The ages were matched, however, from the results, the stone size was not, as there was a significant difference with the stented group being more sizable. The 2 groups were compared from points of operative time, post-operative pain and need of analgesia, hematuria, and duration of its persistence and hospital stay. Operative time was comparable between the 2 groups without significant difference, as similar to previous studies.<sup>5-18</sup> Postoperative pain with the need for analgesia, was greater in the stented

**Table 2** - Operative data of the patients.

Criteria	Non Stented (n=45)	Stented (n=40)	Type of test	P value
Successful operation (%)	45 (100)	39 (97.5)		
<b>Dilatation</b>				
Without dilatation (direct)	45	33		
With dilatation	0	7		
<b>Stone Retrieval</b>				
Dormia	33	13		
Forceps	2	1		
Lithoclass	9	25		
No stone found	1	1		
<b>Operative time</b>			t test	0.2
Minimum	7	5		
Maximum	40	40		
Mean	18.9 ± 9.2	21.2 ± 7.2		
<b>Postoperative analgesia</b>			1.3 Chi-square	
Not needed (%)	29 (64.4)	5 (12.5)		
Needed (%)	16 (35.6)	35 (87.5)		
<b>Diclofenac</b>			23.8	0.000001
Once daily	12	8		
Twice a day	1	22		
Thrice a day	0	2		
Diclofenac + Tramadol: once daily	1	2		
Diclofenac + Pethidine	0	1		
Tramadol: once daily	2	0		
<b>Hematuria and color clearance (hours)</b>			t test	
Minimum	3 hours	03 hours		
Maximum	48 hours	84 hours		
Mean	10.04 ± 7.9	38.3 ± 40.5		0.001
<b>Hospital stay</b>			t test	
4-6 hours	6	3		0.006
8 hours	3	0		
24 hours	36	32		
48 hours	00	5		
Mean	20.5 ± 7.1	25.5 ± 9.8		

group with significant difference. There is some controversy on this point, as some previous studies found a significant difference,<sup>20</sup> while others did not.<sup>10,18</sup> Postoperative hematuria and hospital stay were higher in the stented group, similar to previous studies.<sup>10,20</sup> Stone retrieval and disintegration were not considered as a determinant factor for leaving a stent, as long as there is no major trauma to the ureter as we used dormia for stone extraction in both groups and also pneumatic lithoclass for fragmentation, and others used laser for stone fragmentation.<sup>19</sup> Non-stenting could be used in any part of the ureter, but most of the studies,<sup>21</sup> included much lower ureteric stones. There was no effect on the success and stone free rate whether there was stenting or not, as the success was 100% in the non-stented group and 97.5% in the stented one. There were no early complications, and late complications such as stricture, require further investigation.

In conclusion, post URS stenting is an excellent weapon if used when indicated, such as major trauma to the ureter, namely, perforation, stricture or presence of big fragments. Otherwise, non-stenting

should be used in cases of smooth URS without any complications or major trauma to the ureter. Non-stenting has the advantages of less postoperative pain, irritative lower urinary tract symptoms, and the need of analgesia, with less hematuria and hospital stay.

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