

The role of stenting in relieving loin pain following ureteroscopic stone therapy for persisting renal colic with hydronephrosis

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Abstract. *Objective* To prospectively define the role of the double J-stent placement following ureteroscopic stone therapy in providing a pain-free postoperative period for patients with persisting loin pain and documented hydronephrosis. *Material and methods* The study cohort consisted of 27 patients (mean age: 38.59 years; range: 22–60 years) who had undergone ureteroscopic intervention due to ureteral stone. All of the patients reported loin pain which did not respond to medical therapy associated with various degrees of hydronephrosis documented by ultrasound and/or an excretory urogram. The patients were randomized to either a stented (18 patients) or stentless (nine patients) group following semirigid ureteroscopy (7.5/12 Fr) for the treatment of ureteral calculi (pneumatic lithotripsy). The mean diameter of the stones was 7.7 mm (range: 3–13 mm). Intra-operative balloon ureter orifice dilatation was routinely performed. All patients were evaluated between 0 and 6 days postoperative for loin pain and lower urinary tract symptoms. *Results* Nine patients had loin pain in the first few days following the operation and were in need of intramuscular and/or intravenous analgesics. Of these, four were stented patients (4/18; 22.2%) and five were stentless patients (5/9; 55.5%). Lower urinary tract symptoms were not clinically significant and did not affect the quality of life in terms of loin pain, with the exception of one patient in whom the stent had dropped into the bladder. *Conclusion* We believe that stenting in patients with documented hydronephrosis manifesting in persisting renal colic is recommended. As ureteroscopic therapy may aggregate the edema of ureter mucosa, double J-stent placement may play an important role in offering patients a postoperative period free of loin discomfort. However, further prospective trials should be designed to evaluate the criteria for stentless ureterorenoscopy.

Key words: Loin pain, Ureter calculi, Ureteroscopy

Introduction

The success rate of ureterorenoscopic stone removal depends on the size and location of the stone, the viability of ureteroscopic instrumentation, and the experience of the ureteroscopist. Despite the high success rate that has been reported for ureterorenoscopy, some parts of this procedure, such as ureter stenting and balloon dilatation, are still ill defined. For example, some clinicians advocate the routine placement of a ureteral stent [1, 2], while others have demonstrated that distal ureter stone [3, 4] and selected patients with an upper stone can be treated without stenting [5, 6]. In the present study, we have

attempted to determine the role of the double J-stent placement in offering the patient with renal colic and documented hydronephrosis a postoperative period free of flank pain following ureteroscopic stone therapy.

Material and methods

From January 2003 to October 2004, 27 patients (mean age: 38.59 years; range: 22–60 years) with renal colic due to ureter stone underwent ureteroscopic stone extraction at our hospital. All patients presented with loin pain which did not respond to oral and/or intramuscular or

intravenous pain killer [non-steroidal anti-inflammatory drug (NSAID)]. All patients manifested varying degrees of hydronephrosis prior to the operation, as indicated by ultrasonography and/or an excretory urogram. The ureter stones were located in the lower ureter in 20 patients, while remaining four and three patients had a ureter stone in the middle and upper third of the ureter, respectively. The mean diameter of the stones was 7.7 mm (range: 3–13 mm). The patients were randomized into stented group (18 patients; 66.7%) and a stentless group (nine patients; 33.3%). The mean diameter of the stone and the number of patients with lower, middle and upper ureter stone in both groups are given Table 1.

Intra-operative orifice balloon dilatation was performed routinely to facilitate the passage of the ureteroscope without causing damage to the orifice. The patients were assessed during the first 6 days following the operation for loin pain, dysuria, frequency, hematuria and urgency. All patients received 1 g of intravenous ceftriaxone preoperatively, and oral quinolone and NSAID were given for 1 week postoperatively. We asked those patients being administered intramuscular or intravenous NSAID if they had persisting loin pain postoperatively despite the oral therapy. At the end of 6 days all patients were evaluated clinically, which included questions on lower urinary tract symptoms and loin pain and whether these affected their quality of life?

Results

Nine patients (9/27; 33.3%) had clinically significant loin pain and were in need of intramuscular or intravenous NSAID therapy despite oral therapy. Four of these were from stented group (4/18; 22.2%), and five were from the stentless group (5/9; 55.5%) (Table 1). The lower urinary tract symptoms were not clinically significant with the

exception of one patient who had a double J-stent dropped into the bladder. Although the diameter of the stones in the stented group (mean: 7.2 mm) was greater than that in the stentless group (mean: 6.9 mm), the percentage of patients with postoperative loin pain was higher in the stentless group (55.5%) than in the stented group (22.2%). The distribution of the locations of the stones in the ureter was almost homogenous in both groups (Table 1).

Discussion

The rationale for the routine use of ureteral stent after ureterorenoscopy is currently under debate. Although a number of relatively earlier ureteroscopy series [7, 8, 9, 10] and a few contemporary ones [1, 2] have advocated the routine placement of a ureteral stent following treatment for urinary stone disease, more recent evidence suggests a more limited role for ureteral stenting [3, 4, 5, 6, 11]. There is a belief that ureteral stent placement reduces long-term complication rates (e.g. ureteral stricture formation) [2] and short-term flank discomfort [12]. In addition, there are clinical settings in which ureteral stenting is either mandatory, such as following ureteral perforation or in cases of a solitary kidney, or recommended, including patients with renal calculi and ureteral dilatation [13, 14, 15] and patients with indwelling ureteral catheter preoperatively [14, 15]. Various patient/stone factors and operative parameters, including renal location, history of calculi, history of recent/recurrent urinary tract infection, bilateral procedures, lithotripsy and operative time (in conjunction with other operative interventions), may portend a high risk of developing a postoperative complication and merit further study [16].

However, a number of studies have shown that stented patients have significantly higher pain scores [15, 17], more frequent lower urinary tract

Table 1. Comparison between both the stented and stentless subgroups in terms of number of patients, stone volume, number of patients with postoperative loin pain and number of patients with lower, middle and upper ureter calculi

Group	Patients (n)	Stone diameter (mm)	Loin pain ^a	Lower ureter stone ^a	Middle ureter stone ^a	Upper ureter stone ^a
Stented	18	7.2	4 (22.2)	13 (72.2)	3 (16.6)	2 (11.1)
stentless	9	6.9	5 (55.5)	7 (77.7)	1 (11.1)	1 (11.1)
Total	27	7.1	9 (33.3)	20 (74.4)	4 (14.8)	3 (11.1)

^aValues indicate the number of patients with the percentage of the total patient number given in parenthesis.

symptoms [14, 17] and longer operative times. In addition, their overall treatment is substantially more expensive [13].

Collectively, these studies illustrate that the selective placement of ureteral stents following therapy for urethrolithiasis is warranted. The major difficulty with such a policy of selective placement is that with the exception of patients with small and distal calculi, it is often problematic to discern suitable patients for stentless ureteroscopy preoperatively because factors associated with morbidity have yet to be identified. Moreover, it is unclear whether the findings of all available randomized studies can be applied to a broader population. The objective of our study was to determine the role stenting in providing a postoperative period with high quality of life for patients undergoing ureteroscopic ureter stone therapy. There was only one patient in our study cohort with a solitary kidney and thus who had a mandatory indication of stenting; the remaining patients were randomized homogeneously in terms of recommended indication for stenting, volume of stones, location of stones, ureteral dilatation, urinary tract infection, kind of lithotripsy and preoperative existence of hydronephrosis.

Flank discomfort and lower urinary tract symptoms are the most common factors affecting the quality of life during the postoperative period. While the patients with loin pain were in need of intramuscular or intravenous analgesics to relieve the pain, lower urinary tract symptoms were less intense, with the exception of one patient in whom the stent had dropped into the bladder. Placing the lower end of the double J-stent so that it does not touch the trigon region or the neck of the bladder may minimize the lower urinary symptoms. We also believe that the significant difference between degree of loin discomfort in stented (55.5%) and stentless patients (22.2%) was due edema in the former caused by the calculi and intensified by the ureteroscopic manipulation.

We had two patients with a small lower ureter (3 mm): one was stented and other was not. We found that the stentless patient suffered from loin pain in the postoperative period. Consequently, even in cases of a small lower ureter stone, if hydronephrosis exists and the mucosa is edematous, the placement of a ureteral stent following ureteroscopic therapy may be warranted.



Fig. 1 The late phase of an excretory urogram for a male patient with left hydronephrosis due to radiolucent middle ureter calculi.

Figure 1 depicts a patient from the stentless group with a complete obstruction due to a radiolucent (7 mm) middle ureter stone. This patient suffered from loin pain following ureteroscopic extraction (Figure 1). In such cases, we believe that the complete obstruction of the ureter is due to the presence of calculi and the edema of ureter mucosa caused by irritation, which will be increased during a ureteroscopic intervention.

The sequential relief of hydronephrosis, the bypassing of the obstruction effect of edematous mucosa and the painless passage of ureter stone fragments represents one of the proposed mechanisms that explains the beneficial role of stenting [18].

Conclusion

Stenting is recommended in patients with documented hydronephrosis accompanied with mucosal edema who present with persisting renal colic. Because the ureteroscopic therapy may aggregate the edema of the ureter mucosa, a double J-stent placement may play an important role in providing patients with a postoperative period free of loin discomfort. However, further prospective

trials should be designed to evaluate the criteria for stentless ureterorenoscopy.

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