

Does We Need to Place Double J Stent After Ureteroscopic Guided Distal Ureteral Stone Removal?

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ABSTRACT

Objective: We determine the morbidity associated with no stent placement following uncomplicated ureteroscopy for removal of distal ureteral calculi.

Methods: A total of 93 patients undergoing uncomplicated, complete removal of distal ureteral calculi were contacted 1 to 3 days and 7 to 10 days postoperatively to determine analgesic requirements and time of return to normal activity.

Results: Of 93 patients 40 (43%) had no discomfort postoperatively. Of the 53 patients who had discomfort 45 (85%) had mild discomfort only, controlled with oral analgesics. When discomfort occurred it resolved in 41 patients (77%) in 2 days or less. Of 12 patients who required intravenous narcotics postoperatively 5 required preoperative hospitalization for the narcotics and were still hospitalized at the time of stone removal. None of the 59 patients who had follow-up excretory urogram or renal ultrasound has had a newly identified ureteral stricture to date.

Conclusion: In majority of patients undergoing uncomplicated ureteroscopy for removal of distal ureteral calculi postoperative

discomfort is modest, lasts less than 2 days and is easily controlled with oral analgesics. Stricture formation has not been identified. We do not believe that routine placement of a ureteral stent following uncomplicated ureteroscopy for distal ureteral calculi are necessary.

Keywords: Double J Stent, Ureteroscopy, Ureteral Calculi.

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INTRODUCTION

The routine placement of a ureteral catheter or stent following ureteroscopic stone removal is widely recommended.¹⁻⁶ Although some authors have reported use of a more selective approach.^{7,8} The rationale for stent placement is that it may prevent or reduce the incidence of postoperative ureteral stricture formation and that it will reduce or prevent colic secondary to postoperative ureteral edema.^{3,6,9} The incidence and severity of patient discomfort following ureteroscopy for stone removal without stenting have not been well documented. To address this issue we conducted a prospective study to determine the incidence and severity of renal colic, and analgesic requirements following ureteroscopy for removal of distal ureteral calculi without postoperative stenting. When possible, patients have also undergone follow-up excretory urography (IVP) or renal ultrasound in an attempt to identify the risk of ureteral stricture formation.

METHODS

We have prospectively followed 93 consecutive patients who underwent uncomplicated ureteroscopy for removal of distal (lower third) ureteral calculi without postoperative stenting. Of the patients 49 were women with a mean age of 42 years (range 16 to

83, median 39) and 44 were men with a mean age of 51 years (range 20 to 74, median 52). Patients were excluded from study if stone removal was considered to be incomplete or there was evidence of ureteral perforation at the end of the procedure, under which circumstances ureteral stenting or catheterization would normally be performed. Patients were also excluded from study if there were any concerns of possible urinary tract infection, either on the basis of urine cultures or preoperative symptoms, such as dysuria, fever, or cloudy or malodorous urine. For 1 or more of these reasons 3 patients were excluded during the study period. Of the patients 12 were hospitalized before stone removal for intravenous narcotics and the remaining 81 were treated on an outpatient basis. The procedure was performed with intravenous sedation in 80 patients and with general anesthesia in 13. Balloon dilation of the intramural ureter to 15F was performed in 82 patients before ureteroscopy and stone removal. In 20 patients stone disruption was required before successful stone manipulation. The stone was disrupted with an electrohydraulic probe in 3 patients under intravenous sedation, and with a Swiss Lithoelast pneumatic lithotripsy probe in 7 under general anesthesia and in 10 under intravenous sedation. A Wolf 6F rigid

ureteroscope was used in patients in whom stone disruption was not required and in those in whom an electrohydraulic probe was used. An 8F rigid ureteroscope with an offset eyepiece was used for stone disruption with the pneumatic lithotripsy probe. In 42 patients 30 mg. ketorolac were administered intramuscularly immediately after the procedure to reduce postoperative discomfort. All patients were advised at the end of the procedure that some discomfort might occur. They were provided with a prescription for acetaminophen with 30-mg. Codeine or if there was a history of a codeine allergy an alternative analgesic, such

as ketorolac or meperidine hydrochloride, was prescribed. All patients were contacted by telephone 1 to 3 and 7 to 10 days after the procedure. At each contact patients were asked whether they had experienced any pain or discomfort following the procedure, the duration of such discomfort if any, the amount and type of analgesics taken if any, the need if any for visits to an emergency room or hospitalization as a result of postoperative pain, and recently when the patient returned to normal activities. Patients were asked to return for a follow-up IVP or, in case of contrast allergy, renal ultrasound 8 to 10 weeks postoperatively.

Table 1: Duration of pain or discomfort following ureteroscopy, analgesics requirement and need for emergency room visits or hospitalization.

Pain Duration	No analgesics (n)	Oral analgesics (n)	IV analgesics (n)	Emergency visits (n)	Hospitalized (n)
None	35	5	0	0	0
Recovery room	0	0	2	0	0
Evening of procedure	1	13	2	1	1
Next day	0	17	1	2	0
Next 2 days	1	3	6	1	0
> 2 days	0	6	6	1	5

RESULTS

Of the patients 40 (43%) had no discomfort following ureteroscopy, 2 (2%) had pain in the recovery room only, 16 (17%) had discomfort on the evening of the procedure, 18 (19%) had discomfort until the end of the day following ureteroscopy, 5 (55%) had discomfort for 2 days and 12 (13%) had pain or discomfort for longer than 2 days. A total of 53 patients (57%) experienced some pain or discomfort after ureteroscopic stone removal without stent placement, which lasted 2 days or less in 41 (77%) and 1 day or less in 36 (68%). Overall 87% of patients either required no analgesics or symptoms were controlled with oral analgesics only (Table 1).

Twelve patients (13%) required intravenous narcotics postoperatively. Of these patients 2 experienced pain in the recovery room only immediately after the procedure and 3 experienced pain on the evening of the procedure, which initially required intravenous narcotics but was subsequently controlled with oral analgesics. Twelve patients required hospitalization for intravenous narcotics before the procedure and 5 continued to require intravenous narcotics, preventing discharge home after stone removal, 1 of whom only required a single dose the evening following the procedure. In 1 patient who had pain the evening of the procedure and was pain-free for 4 days pain recurred requiring hospital admission. An IVP was normal. In another patient pain developed requiring an emergency visit for intravenous narcotics 1 week after stone removal. Of the 11 patients who did not undergo balloon dilation of the ureter 7 (64%) did not have postoperative discomfort, 1 (9%) had discomfort for 2 days and 3 (27%) had pain for longer than 2 days. Emergency visits for narcotic analgesics were necessary for 1 patient 7 days after the procedure and for another on the evening of the procedure. The latter patient was subsequently hospitalized 4 days postoperatively with flank pain after having been pain-free for 3 days.

Of the 82 patients who did undergo balloon dilation of the ureter 33 (40%) had no postoperative discomfort, and 2 (2%) had discomfort in the recovery room only, 16 (20%) the evening of the procedure, 18 (22%) for 1 day postoperatively, 4 (5%) for 2 days and 9 (11%) for longer than 2 days. Of the 20 patients who required stone disruption before stone removal 10 of 17 treated with the pneumatic lithotripsy probe and 1 of 3 treated with the electrohydraulic probe had no pain following the procedure. One patient (5%) had discomfort the evening of the procedure only, 5 (25%) for 1 day postoperatively, 2 (10%) for 2 days (1 required a single dose of intravenous narcotics on the evening of the procedure) and 1 (5%) for longer than 2 days.

In all but 1 patient who experienced discomfort following stone disruption symptoms were controlled with oral analgesics. None of these patients required hospital admission postoperatively. Of the 42 patients who received 30-mg. ketorolac intramuscularly immediately postoperatively 16 (38%) had no discomfort postoperatively, and 9 (21%) had discomfort the evening of the procedure, 8 (19%) the next day, 1 (2%) for 2 days and 8 (19%) for longer than 2 days. In the latter part of our study we asked patients when they thought they returned to normal physical activity irrespective of whether they still had postoperative discomfort. Of 53 patients 34 (64%) returned to normal activity the following day, 8 (15%) after 2 days, 3 (6%) after 3 days, 3 (6%) after 4 days, 4 (8%) after 7 days and 1 (2%) after 10 days. To date 59 patients (63%) have returned for a follow-up IVP or renal ultrasound. Mean follow-up interval was 9.72 weeks (range 1 to 52, median 8). One patient who had long-standing stone impaction before stone removal had persistent dilatation of the upper ureter and collecting system but prompt excretion of contrast material on the affected side. All of the remaining examinations were normal.

DISCUSSION

Although stenting after ureteroscopy has been recommended to prevent the development of ureteral strictures.⁹ There have been no controlled trials in humans to our knowledge, which have shown that it prevents strictures. Boddy et al⁹ suggested on the basis of studies on mini-pigs that ureteral dilatation might be responsible for ureteral damage. The duration of dilatation in their study was not provided, and they did not assess the effect of stenting in minipigs undergoing balloon dilation of the ureter. They also did not demonstrate ureteral stricture formation or necrosis but did show evidence of ureteral obstruction secondary to edema, which persisted for as long as 96 hours. We cannot satisfactorily address the issue of postoperative ureteral stricture development with our data. Although it is our practice to perform an IVP routinely 8 weeks postoperatively, for reasons such as patient noncompliance, residence in remote areas, allergy to contrast agents and pregnancy, IVP or renal ultrasound was performed in only 59 of our patients (63%). Based on these limited data, the risk of stricture formation would appear to be low. While renal colic or flank pain secondary to ureteral edema might be expected following balloon dilation of the ureter and ureteroscopy for stone removal, to our knowledge there have been no studies documenting the frequency and severity of patient discomfort following ureteroscopic removal of distal ureteral calculi using small caliber (6 to 8F) rigid ureteroscopes with or without balloon dilation of the intramural ureter.

There are several reports suggesting that stent placement may be associated with significant symptoms and that the symptoms persist until the stent is removed.¹⁰⁻¹² Stoller et al reported that for many of their patients removal of the stent using local anesthesia was more traumatic than the initial ureteroscopy procedure using general or major regional anesthetic.¹ Pryor et al noted that all 73 patients in their study reported untoward symptoms related to ureteral stents.¹⁰ Pollard and Macfarlane reported that 90% of their patients (18 of 20) experienced troublesome symptoms related to internal stents.¹¹ Bregg and Riehle found that 44% of their patients (22 of 50) experienced moderate to intolerable discomfort that was relieved by removal of the stent.¹² We are not aware of any reports comparing symptoms in patients with versus those without a stent following ureteroscopy, or any reports suggesting any symptomatic advantage gained by placing a stent.

There are disadvantages to stent placement following ureteroscopy. Stent placement prolongs the ureteroscopy procedure, and when the procedure is performed with intravenous sedation, it adds significantly to potential patient discomfort. Our observation is that stent placement with the patient under intravenous sedation is often associated with more discomfort than the ureteroscopic stone removal procedure. Many patients require additional cystoscopy for stent removal, adding not only to the overall discomfort, but also to the cost of the stone removal procedure. Stent placement also introduces the additional cost of the stent itself. Additional potential concerns are those of cephalad stent migration requiring ureteroscopic retrieval and failure of patient compliance with follow-up with resultant stent fragmentation or encrustation. Of the 6 patients requiring hospitalization following stone removal 5 were already hospitalized for intravenous narcotics to relieve pain. Although they were less symptomatic following stone removal, they still required narcotics to the extent that immediate hospital discharge

was not possible. It is possible that patients with prolonged, severe persistent pain requiring frequent administration of intravenous narcotics may represent a subgroup who might benefit from postoperative stent placement. However, an alternative possibility is that they may represent a subgroup with an above average analgesic requirement. It should be noted that most of our patient's experienced significant discomfort before stone removal and that in many instances, while postoperative discomfort was documented, it represented symptomatic improvement.

Of our patients 12 (13%) required intravenous narcotics postoperatively, 2 of who required analgesics in the recovery room only. Although it has not been our experience that stent placement in patients with renal colic invariably eliminates the need for parenteral narcotics, it is possible that stent placement could have reduced or potentially eliminated the need for postoperative narcotics, supporting the argument for stent placement in all patients. We do not believe that routine stent placement following ureteroscopy for distal stone removal is necessary but acknowledge that based on our data there is room for the contrary opinion that routine stent placement following uncomplicated ureteroscopy for stone removal could be justified.

We have not been able to identify any specific factors that might predict post-ureteroscopy discomfort. Balloon dilation, need for stone disruption and postoperative administration of ketorolac do not appear to affect the postoperative symptoms. We prefer to perform balloon dilation of the ureter in most patients. It is well tolerated with intravenous sedation,¹³ and we believe that it is less traumatic to the ureter than attempting to manipulate a stone out of an undilated intramural ureter. In conclusion, this study does not resolve the question as to whether stenting after ureteroscopy for stone removal confers any benefits in reduction of postoperative pain or ureteral stricture development. However, it is our observation that in the majority of patients discomfort following ureteroscopic removal of distal ureteral calculi with 6F and 8F ureteroscopes, with or without balloon dilation and stone disruption, is usually modest, lasts less than 48 hours (77% of our patients) and is usually satisfactorily controlled with oral analgesics. A new ureteral stricture has not been identified in any of our patients postoperatively to date. Based on our experience, we do not believe that routine placement of a ureteral stent following uncomplicated ureteroscopic removal of a distal ureteral calculus is necessary.

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