

# Role of Double Pigtail Stent in Ureteric Stone

## (Retrieval Following Unsuccessful Ureteroscopy)

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### SUMMARY

*We retrospectively analysed the role of indwelling pigtail stent in successful ureteric stone retrieval by second ureteroscopy when first ureteroscopy failed. Over a period of 44 months initial ureteroscopy failed in 41 patients. 32 patients had pigtail stent inserted and 9 were left without any stent. The group with stent, passed stone spontaneously or had stone retrieval on second ureteroscopy in 27 cases (84%) compared with 2 unstented cases (22%). Ureterolithotomy was done in 5 patients (16%) with stent and 7 cases (78%) without stent. It is concluded that following failed ureteroscopy, insertion of double pigtail stent results in higher subsequent successful ureteroscopic stone removal or spontaneous passage with a lower rate of consequent ureterolithotomy.*

### INTRODUCTION

Double pigtail stent produces ureteric dilatation<sup>1,2</sup> and thus facilitates subsequent ureteric instrumentation<sup>3</sup>. It is also useful in the management of ureteric obstruction<sup>4</sup> and in injury to the ureter<sup>5</sup>. The purpose of this study was to assess the role of indwelling double pigtail stent on subsequent ureteric stone retrieval after failed first ureteroscopy.

### PATIENTS AND METHODS

A retrospective study was done regarding all failed ureteroscopies in patients with ureteric calculi from July, 1987 to March, 1991. There were 41 failures from a total of 131 attempted procedures for ureteric stone. The instrument used was 12 Fr. rigid ureteroscope by Karl Storz. The results were assessed by number of stones retrieved ureteroscopically with radiological evidence of stone clearance. The stents used were 6 Fr. Sof = Flex (R) double pigtail multilength (22-32 cm) by Cook Urological Incorporated.

### RESULTS

Out of 41 patients in which the first ureteroscopy failed, 32 patients were managed with indwelling ureteric stent and 9 without a stent. Male

to female ratio was same for both groups (19 : 12 and 6:3 respectively). The mean age of both groups was 31 and 33 years respectively. The calculus size was similar in both groups (Table 1). Failure was considered if stone could not be removed mostly so because of failure to advance the ureteroscope upto the calculus because of tight distal ureter or poor visualization (Table 2) The results of treatment are shown in (Table 3). There was a significant difference in the success rate on 2nd ureteroscopic stone removal or spontaneous passage of calculus if patients were stented i.e. 84% compared with 22% in the unstented patients (P = 0.015). Ureterolithotomy was required in 5 out of 32 patients with stent compared with 7 out of 9 patients without stent, although the stone size was comparable in both groups.

**Table 1: Mean calculus diameter and location along the ureter.**

	Mean Diameter (mm)	Upper Ureter		Middle Ureter		Lower Ureter	
		No.	%	No.	%	No.	%
Stented (n=32)	7	19	59	8	25	5	16
Unstented (n=9)	6	4	45	2	22	3	33

Five patients with indwelling stent passed calculus spontaneously compared with none in unstented group.

The complication rate is shown in Table 4.

**Table-2: Reason for failure of first ureteroscopy.**

	Failure to Reach the	Poor Vision	Failed Stone Manipulation
Stented (n=32)	20	4	7
Unstented (n=9)	5	2	2

**Table 3: Results.**

	Successful 2nd Ureterscopy		Spontaneous Passage of Calculus		Uretero-lithotomy	
	No.	%	No.	%	No.	%
Stented (n=32)	20	63	7	21	5	16
Unstented (n=9)	2	22	0	00	7	78

**Table 4: Complications**

	Ureteric Perforation	Hung* Basket	Urinary Tract Infection (UTI)
Stented (n=32)	2	2	5
Unstented (n=9)	0	1	3

\*Calculus and Dormia basket engaged at intramural ureter but extraction not possible.

## DISCUSSION

Indwelling ureteric stents are known to produce reversible ureteric dilatation<sup>6</sup> although the exact mechanism is not clear. It is probably physiological relaxation following initial hyperperistalsis or perhaps direct cytotoxic effect<sup>1</sup>.

The results of this study show that insertion of double pigtail stent after initial failure of ureteroscopy has three effects. First it increases the success rate of subsequent ureteroscopic stone extraction. Secondly it relieves obstruction instantly and third it increases the chances of spontaneous passage of calculus.

In this study the ureteric stent was retained from 4 weeks, to 12 weeks until either the calculus was passed spontaneously or adequate dilatation of ureter was achieved for instrumentation. In (78%) of cases it facilitated the passage of ureteroscope at 2nd attempt.

The rate of ureterolithotomy was lower in stented cases, i.e. 16% versus 78% in non-stented case. There is still need of subsequent surgery in smaller number of patients. Data regarding the morbidity especially urinary tract infection and pain in stented cases is not well recorded but these complications can restrict the use of stents to essential situations in order to facilitate subsequent ureteroscopy. Stenting was found very useful to drain obstruction urinary tract in failed ureteroscopy.

This study has shown that an indwelling ureteric stent facilitates subsequent ureteroscopic stone extraction, facilitates spontaneous passage of stone and instantly relieves obstruction. So it is recommended to insert double Pigtail ureteric stent after unsuccessful ureteroscopy.

## REFERENCES

1. Drake WM, Carroll J, Bartone I, et al. Evaluation of materials used as ureteral splints. *Surg Gynaecol Obstet* 1962; 114: 47-57.
2. Weinberg SL. Ureteral function II. The ureter catheter and the ureterometrogram. *Invest Urol* 1985; 12: 255.
3. Perez-castro F, Martinez Perez JA. Ureterorenal endoscopy. *Eur Urol* 1982; 8: 117-120
4. Hepperlen TW, Mardis HK, Kammendel II. Self-retained internal ureteral stents, a new approach. *J Urol* 1978; 119: 731-34.
5. Lang EK. Diagnosis and management of ureteral fistulas by percutaneous nephrostomy and antegrade percutaneous stent catheters. *Radiology* 1981; 138.
6. Weinberg, JI. Observations of the stimulating influence of temporary rubber splinting on regeneration following ureteral resection. *Br J Urol* 1934; 6: 11-16.

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