

Ureteral Stenting Can Make Ureteroscopic Management of Ureteric Calculus Safe and Effective

Dr. Harshit Patel¹, Dr. Shahaji Deshmukh²

¹PG Resident, Room no. 102, New PG Hostel, Bharti Hospital & Research Centre, Katraj, Pune- 411043, Maharashtra, India

²M.S. General Surgeon, 3rd floor, Surgery Department, Bharati Hospital, Katraj, Pune- 411043, Maharashtra, India

Abstract: *Ureteroscopy is a routinely performed procedure for the management of the ureteric calculus. Since the advent of ureteroscopy and lithotripsy, open surgery for ureteric calculus is less frequently reported as it requires large abdominal incision, more intraoperative and post operative complications and prolonged hospital stay. Routine stenting following ureteroscopy is common, particularly after ureteroscopic lithotripsy. Stones in the ureter can cause significant changes, such as edema or mucosal inflammation, at the location of a stone. If unstented, these changes may cause the patient to have obstructive symptoms and potential ureteral stricture after the procedure. Ureteral stents prevent ureteral stricture formation after ureteroscopy by dilatation of the ureter. To conclude it is advantageous to stent the ureter pre and post operatively for the treatment of ureteral stone disease, specially when associated with morbidity like pyonephrosis or ureteral narrowing or impacted ureteral stone. This study is intended to ascertain the advantages of insertion of ureteral stents after ureteroscopy and to determine the various complications associated with stenting.*

Keywords: Ureteric Calculus, Ureteroscopy, Double J stent

1. Introduction

Urolithiasis is a common problem encountered by the surgeon and its incidence rising day by day. Ureteral stones are formed in the renal collecting system and then progress down the ureter. They then tend to lodge at sites where the ureter narrows. The three most common entrapment sites are at the ureteropelvic junction, over the iliac vessels and at the ureteral meatus.¹

The surgical management of urinary stone disease has evolved from an open surgical approach to various minimally invasive options. Increasing experience with shock wave lithotripsy (SWL), ureteroscopy and percutaneous stone removal have markedly decreased the morbidity of treating urinary calculi in conjunction with maximal clearance of stone.

Since the advent of ureteroscopy and lithotripsy, open surgery for ureteric calculus is less frequently reported as it requires large abdominal incision, more intraoperative and post operative complications and prolonged hospital stay.

Ureteral stents are fundamental to many urological procedures. While stents serve many functions, including relief of renal obstruction, they are most commonly used after diagnostic and therapeutic endoscopic procedures.

Routine stenting following ureteroscopy is common, particularly after ureteroscopic lithotripsy. Stones in the ureter can cause significant changes, such as edema or mucosal inflammation, at the location of a stone. If unstented, these changes may cause the patient to have obstructive symptoms and potential ureteral stricture after the procedure. Ureteral stents prevent ureteral stricture formation after ureteroscopy by dilatation of the ureter.

2. Aim of this Study

To assess the role of Double J stenting in management of ureteric calculus by ureteroscopy; to determine the indications for insertion of Double J stent and to determine the complications following Double J stent insertion.

3. Materials and Methods

This is a retrospective study conducted over a period of two year from august 2012 to august 2014 at Bharati hospital and research centre. Total number of 100 patients of age group 18-70 years with uretic calculus who underwent ureteroscopy were included in the study. Detailed case history and examination findings were recorded. Investigations like ultrasonography, CT scan, X-Ray findings were recorded. Condition of patient in the post operative period, on follow up in the 2nd post operative week and on stent removal recorded based on complaints like pain, fever, hematuria, burning micturition, increased frequency of micturition, urgency, finding on X-Ray etc.

4. Result

Over a period of two years, from august 2012 to august 2014. 100 patients underwent ureteroscopy for ureteric stones at Bharati hospital and research centre, Pune, 100 patients who constituted the study population, 17 were female and 83 were male. All the patients were between 18 and 70 years of age. Majority of the patients were in the age group of 21-30 years.

Out of the 100 case 39 patients had stone in lower ureter, 37 in the middle ureter and 24 in the upper ureter. All the patients underwent ureteroscopy and stented on the side of the procedure.

3 patients with upper ureteric calculus revealed to have a narrow vesical ureteral opening, were stented before the definitive ureteroscopic treatment. Following which ureteroscopy was attempted after a month, when total stone clearance was achieved and restented at the end of the procedure which was removed after 6 weeks.

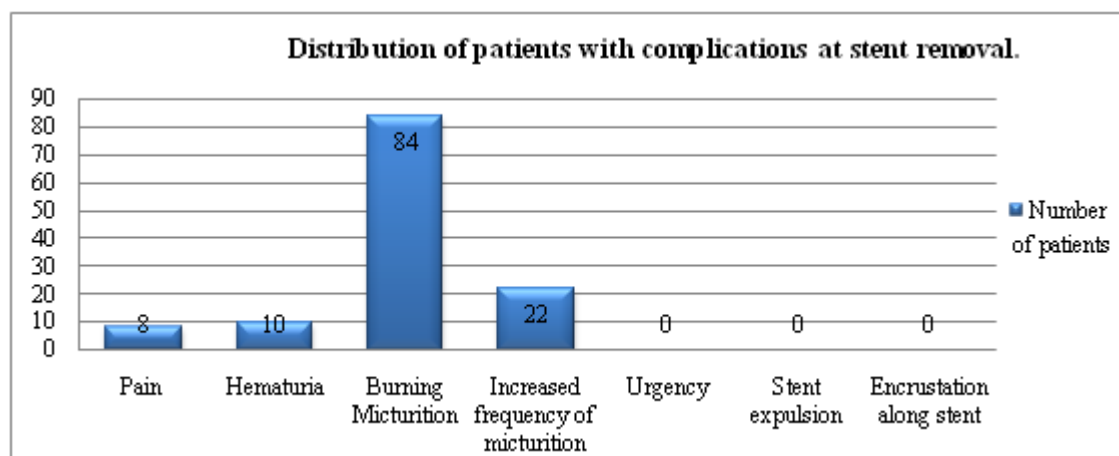
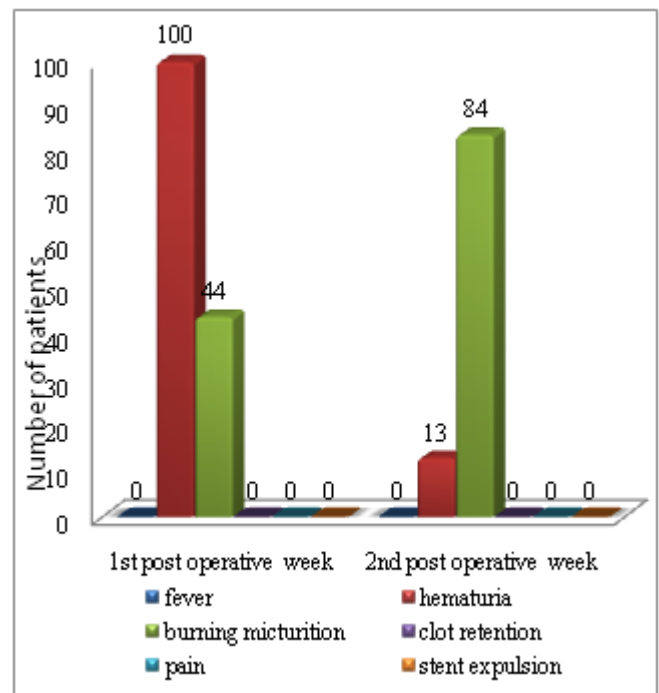
4 patients, 3 with middle ureteric calculus, 1 with lower presented with pyonephrosis. Attempt at placement of the stent with the aim of drainage of pyonephrosis failed compelling us to fragment the stone and stent to drain the pyonephrosis.

In 89 patients stone clearance was attempted with various methods of stone removal and fragmentation. Where in 26 patients only partial clearance could be achieved. They were continued with ureteric stent for variable period of 4-6 weeks. Repeat X-Rays revealed patient have passed these fragments spontaneously except in 3 patients where ESWL was used for complete clearance.

In 11 patients with upper ureteric calculus ureteroscope could not be negotiated because of narrowed portion at middle or lower ureter, the stenting was carried out. All patients underwent ESWL 1-2 sitting for the upper ureteric calculus with removal of the stent after 6 weeks.

During first post operative week all the patients had hematuria, 44 patients complained of burning micturition, otherwise nobody suffered from fever or clot retention. During second week, 84 continued to complaint of burning

micturition, 13 had hematuria. All patients were followed up for variable period of 4-6 weeks for decision of stent removal, depending on the time taken during surgery and ease of instrumentation. 84 had burning micturition, 22 suffered from frequency, 10 had hematuria, and 8 suffered from lumbar pain.



All the patients could be followed up till the stent removal.

5. Discussion

Ureteroscopy has become a standard urologic technique and is used in a wide variety of situations for diagnosis and treatment. The main use for the technique of supravescical endoscopy is in the treatment of urolithiasis. The advent of smaller semirigid and flexible fiberoptic endoscopes has allowed routine retrograde access to the proximal ureter and kidney, and when combined with modern intracorporeal lithotripsy probes and extraction instruments, provides a safe and highly effective retrograde method of treatment of lithiasis. The current generation of flexible, actively deflectable fiber optic endoscopes makes virtually every part

of the kidney, including the lower pole, accessible for the treatment of calculi.

Placement of a ureteral catheter or stents has been the standard of care following ureteroscopy. The main advantage of a postoperative ureteral stent is to prevent renal colic due to obstruction related to stone fragments or ureteral edema following trauma due to instrumentation and to drain the kidney on operative side. Furthermore, passive dilation due to the presence of stent into the ureter facilitates the passage of stone fragments. Stenting the ureter is also thought to prevent ureteral stricture formation and to facilitate ureteral healing. Disadvantages of ureteral stents include infection, dysuria, flank pain, hematuria, or stent migration.

Ureteral stent placement is an important adjunct to many urologic procedures such as extracorporeal shock wave lithotripsy and ureteroscopy. Ureteral stents may also be useful for managing conditions such as hydronephrosis due to stone disease, pregnancy, malignancy and pyonephrosis. The indications for stent insertion have increased during the last few years and currently ureteric stents are inserted as an almost routinely in patients with ureteric obstruction.

According to our study, placement of the ureteral stent specially was found to be beneficial in the cases where the scope could not be negotiated upto the site of the stone. There was narrowing of the ureter at various levels, following stenting the patients underwent Extracorporeal shock wave lithotripsy. Placement of the stent helped to dilate the narrowing thereby achieving complete clearance of the stone. It was also observed that in patients with partial clearance of the stone following intracorporeal lithotripsy insertion of double J stent helped in spontaneous passage of stone fragments.

Double J stenting was also found to be helpful as a treatment modality for the drainage of pyonephrosis. In a few cases where the ureteroscope could not be negotiated through the narrow vesical ureteral opening, placement of the ureteral stent prior to definitive procedure, allowed easy negotiation of the ureteroscope upto the location of the stone.

Common complications observed in our study were hematuria in the first post operative week. During the second week most of the patients complained of burning micturition and frequency of micturition, which was continued till the stent was removed. None of the patients suffered from major problems like stent migration, encrustation, stent fracture, or stent expulsion or urinary infection.

6. Conclusion

Ureteral stent should be used prophylactically after ureteroscopy. Various indications for stent insertion include prevention of obstruction due to oedema following instrumentation, drainage of pyonephrosis, partial clearance of stone, narrow ureteral passage and/or vesical ureteral opening, and ureteral injury.

Ureteral stent insertion is associated with minor and major complications but if patients are followed up regularly major complications can be avoided and appropriate measures for the minor complications can be taken.

Though few references are indicative of complications following ureteral stenting, we conclude it is more advantageous to stent the ureter pre and post operatively for the treatment of ureteral stone disease, specially when associated with morbidity like pyonephrosis or ureteral narrowing or impacted ureteral stone.

References

- [1] Bailey and Love's: Short Practice of Surgery, 24th Edition; Page 1321-1323.
- [2] Wein: Campbell- Walsh Urology, 9th edition, Page 1432-1433.

- [3] De Historia Lithotomiae by Rainer M. Engel, MD, Curator of the William P. Didusch Museum of the AUA adapted for the Internet by Joop Norrdzij.
- [4] Murphy LJT: The History of Urology, Springfield, III, Charles C Thomas, 1972.
- [5] Ballenger EG, Frontz WA, Hamer HG, et al: History of Urology. Prepared under the auspices of the American Urological Association, Baltimore, Williams & Wilkins, 1933.
- [6] Young HH, McKay RW: Congenital valvular obstruction of the prostatic urethra. Surg Gynecol Obstet 1929.
- [7] Hirschowitz BI, Peters CW, Curtiss LE: Preliminary report on a long fiberscope for examination of stomach and duodenum. Med Bull (Ann Arbor) 1957; 23:178-180.