



Bangladesh Journal of Urology

VOLUME 9

JULY 2006

NUMBER 2

CONTENTS

Editorial

- Intravesical Therapy for Bladder Cancer

Original Articles

- Treatment of Renal Calculi by Percutaneous Nephrolithotomy Versus Open Surgery 30
- A Comparative Study
Md Shafiqul Azam, Ishteaq Ahmed Shameem, MH Rahman, AKM Anwarul Islam, SAM Golam Kibria
- Laparoscopic Pyeloplasty 37
MJ Kabir, ME Haque, N Rahman, MM Rahman, K Arafuzzaman, A Hossain
- Comparative Study of Stented and non Stented Ureteroneocystostomy in Renal Transplantation 41
ATM Amanullah, MS Islam, M Hossain, S Islam, S Jahan, AKMK Alam, AKMA Islam, SAMG Kibria
- Single Stage Perineal Anastomotic Urethroplasty for Post Traumatic Stricture of Urethra : 50
Outcome of the procedure
ABM Golam Robbani, ABM Abdul Hannan, MH Rahman, M Manzurul Haque, AB Siddique

Review Article

- Management of Priapism: In Regards to Various Aetiologies 55
Options and Outcome
Zahid H Bhuiyan, MF Islam

Case Report

- An Unusual Cause of Vesical Stone: a Migrant Copper-T 60
*ME Haque, AS Jabbar, MSA Chowdhury, A Rasul, MS Hossain, MA Salam
SA Khan, AZM Z Hossain*

- Abstract from Current Literature 62

**BANGLADESH ASSOCIATION
OF
UROLOGICAL SURGEONS**

**EXECUTIVE COMMITTEE
2005 - 2007**

President	:	Prof. MA Salam
Vice Presidents	:	Dr. Ahsan Kabir Prof. AKM Anwarul Islam
Secretary General	:	Prof. AZM Zahid Hossain
Treasurer	:	Dr. Md. Fakhru Islam
Joint Secretary	:	Dr. Kazi Rafiqul Abedin
Organizing Secretary	:	Dr. Md. Abdus Salam
Scientific Secretary	:	Dr. SA Khan
Office Secretary	:	Dr. Saiful Islam Selim
Cultural Secretary	:	Dr. Md. Shohrab Hossain
Press & Publication Secretary	:	Dr. MA Naser Wahid
Members	:	Prof. MA Hadi Dr. CM Delwar Rana Dr. MA Kashem Sarker Dr. SM Mahbub Alam Dr. M Mahbubul Hasan Dr. MA Khalque Dr. Afiquor Rahman Dr. Rafiqul Islam
Ex-officio	:	Prof. MA Wahab

BANGLADESH JOURNAL OF UROLOGY

EDITORIAL BOARD

Chairman	:	MA Wahab
Editor	:	SAM Golam Kibria
Asstt. Editor	:	AKM Anwarul Islam
Members	:	MA Hadi
		MA Salam
		M Ali Akbar
		Md. Fakhru Islam
		MM Hasan
		MH Alamgir
		Feroze Quader

BANGLADESH ASSOCIATION OF UROLOGICAL SURGEONS

EXECUTIVE COMMITTEE 2007 - 2009

President	: Prof. AKM Anwarul Islam
Vice Presidents	: Dr. Promode Ranjan Singh Dr. AKM Zamanul Islam Bhuiyan
Secretary General	: Dr. Md. Habibur Rahman
Treasurer	: Dr. Sabbir Ahmed Khan
Joint Secretary	: Dr. Md. Mizanur Rahman
Organizing Secretary	: Dr. ATM Aman Ullah
Scientific Secretary	: Dr. Isteaq Ahmed Shameem
Office Secretary	: Dr. Taohid Mohammad Saiful Hossain
Cultural Secretary	: Dr. Md. Shawkat Alam
Press & Publication Secretary	: Dr. Md. Shafiqul Alam Chowdhury (Shamim)
Members	: Dr. CM Delwar Rana Dr. Pranashis Saha Dr. ABM Golam Robbani Dr. Kazi Mohammad Monwarul Karim Babor Dr. Mohammed Jahangir Hossain Dr. Golam Mowla Chowdhury Dr. AKM Khurshidul Alam Dr. Waliul Islam Maruf
Ex-officio	: Prof. M A Salam Prof. AZM Zahid Hossain

INFORMATION FOR CONTRIBUTORS

Papers :

Papers submitted must not have been published in whole or in part in any other journal, and are subject to editorial revision. It is a condition of acceptance for publication that copyright becomes vested in the journal and permission to republish must be obtained from the publishers.

Papers based on clinical investigation should conform to ethical standards as set out in the declaration of Helsinki. In the case of animals studies it is the responsibility of the author to satisfy the Board that no unnecessary suffering has been inflicted.

Legal Considerations :

Authors should avoid the use of names, initials, and hospital admission numbers which might lead to recognition of a patient. A patient must not be recognizable in photographs unless written consent of the subject has been obtained. A table or illustration that has been published elsewhere should be accompanied by a statement that permission for reproduction has been obtained from the author and publishers.

Preparation of Manuscript :

Two copies of each manuscript should be submitted and should indicate the title of the paper, the name (s), qualifications and full address of the authors(s), and be double-spaced typing on one side only of the paper, with a wide margin. Contributors should retain a copy in order to check proofs and in case of loss.

Manuscripts should be accompanied by a formal letter of request for publication which should be signed by all of the authors.

Papers generally shall be subdivided into :

Title page
Summary
Introduction (not headed)
Methods
Results
Discussion
Acknowledgements
List of references
Tables
Illustrations

Title Page :

There should be a separate title page, including the name(S), degrees and address (es) of author(s). It should be made clear which address relates to which author. Author's present address differing from those at which the work was carried out, or special instructions concerning the address for correspondence, should be given as a footnote on the title page and reference at the appropriate

place in the author list. If the address to which proofs should be sent is not that of the first-mentioned author, clear instructions should be given in a covering note and not on the title page. The title page should be paginated as page 1 of the paper.

A short running title containing not more than 50 characters and spaces should also be suggested.

Summary :

The summary will be printed at the beginning of the paper. It should be on a separate sheet, in the form of a single paragraph which gives a succinct account of the problem, the methods, results and conclusion and normally should be of 50-150 words. It may be used as it stands by abstracting journals.

Introduction :

The introduction should give a concise account of the background of the problem and the object of the investigation. Previous work should be quoted only if it has a direct bearing on the present problem.

Methods :

Methods must be described in sufficient in detail to allow the experiments to be interpreted and repeated by the reader. Any modification of previously published methods should be described and the reference given. If the methods are commonly used, only a reference to the original source is required.

Drugs :

When a drug is first mentioned it should be given the generic or official name, followed in parentheses by the chemical formula only if the structure is not well known, and by the capitalized proprietary name.

Results :

Description of experimental results, while concise, should permit repetition of the experiments by others. Data should not be repeated unnecessarily in text, tables and figures, and unwarranted numbers of digits should be avoided. Significance should be given as values of probability. The desired position of tables and figures may be indicated by written instruction enclosed within line and brackets, for example :

(Table-1 near here)

Discussion :

The discussion should not merely recapitulate the experimental results, but should present their interpretation against the background of existing knowledge. It should

include a statement of any assumptions on which conclusions are based.

Acknowledgement :

Acknowledgement will be printed in small type. They should be brief, and should include references to sources of drugs not freely available commercially.

References :

References should be limited. Only paper quoted in the text are to be listed in the bibliography. The references should be numbered consecutively as it appear in text and listed at the end of the article as in International Committee of Medical Journal Editors Uniform Requirements for Manuscripts Submitted to Biomedical Journals.

Examples.

I. Papers Published in Journal

Patel R, Mickey MR and Tersaki PL. Leucocyte antigens and disease. Association of HLA A2 and chronic glomerulonephritis. Br Med J. 1969; 2: 424-426.

II. Article in Books :

Meltzer PS, Kallioniemi A, Trent JM. Chromosome alterations in human solid tumors. In: Vogelstein B, Kinzler KW, editors. The genetic basis of human cancer. New York: McGraw-Hill; 2002. p. 93-113.

III. Books :

Grindley MF : Manual of histologic and special staining Nephrologic, Elammarion, Paris, 1965.

It is essential that authors verify the content and details of references which they list, as this responsibility cannot be accepted by either Editors or Publishers.

Table :

All tables should be on separate sheets and be capable, with their captions, of interpretation without reference to the text. They should be numbered consecutively with Roman numerals. Units in which results are expressed should be given in brackets at the top of each column and not repeated on each line of the table ditto signs are not used.

Illustrations :

Photographs should be unmounted glossy prints, and should be protected adequately for mailing. Surfaces should not be marred with clips, pins or by heavy writing on the back. Drawings, charts and graphs should be in black India ink on white paper. Illustrations should be clearly numbered on the back, preferably in soft pencil, with reference to the text, and using Arabic numerals, they should be accompanied on a separate sheet by a suitable legend. Lettering should be professional-looking, uniform, preferably in a common typeface, large enough to read at a reduced size, and in proportion to the illustrated material. Lines in the original must also be thick enough to allow for reduction magnifications especially in photomicrographs, should be indicated by a scale on the photograph itself, in order to remain appropriate after reduction.

The name of the author and title of the paper should also be written in soft pencil on the back of the illustrations.

It is emphasized that care taken in the original preparation of figures will obviate time consuming and expensive necessity of their revision.

LAPAROSCOPIC PYELOPLASTY

M J KABIR¹, M E HAQUE¹, N RAHMAN², MM RAHMAN¹, K ARAFUZZAMAN¹, A HOSSAIN¹

Summary:

Purpose of the study is to assess the efficacy of laparoscopic technique in the treatment of PUJ obstruction. Transperitoneal laparoscopic pyeloplasty was undertaken in 20 patients. 12 were male and 8 were female. The procedure was successful in 18 patients. Dismembered pyeloplasty was done in 16 patients and two had Y-V plasty. All patients were discharged within 2-4 days. The procedure appears to be safe and useful and outcome is excellent.

Introduction:

Pelviureteric junction obstruction is one of the common problems in urological practice. Traditionally open pyeloplasty has been carried out for long time with good success rate¹⁻³. During the last one and half decade advances in endourological techniques have resulted in significant progress in the development of minimally invasive surgical procedures to treat ureteropelvic junction obstruction. These includes retrograde endopyelotomy, antegrade percutaneous endopyelotomy, balloon dilatation used either alone or in combination⁴⁻²¹. These procedures are associated with less postoperative morbidity, improved cosmesis, shorter convalescence and reasonable operative success rate. This encouraged many patients to consider minimum invasive technique instead of gold standard open pyeloplasty. But these endourological techniques could not achieve the same gold standard as open pyeloplasty^{8-11,22-25}. Laparoscopic pyeloplasty was developed to duplicate the high success rates of open pyeloplasty, while offering the advantages of minimally invasive techniques^{26,27,28}. Like open pyeloplasty, laparoscopic pyeloplasty addresses all associated conditions of ureteropelvic junction obstruction, including intrinsic obstruction, high insertion, large redundant renal pelvis and crossing vessels²¹. In this study we analyze our experiences in laparoscopic pyeloplasty at the National Institute of Kidney Diseases and Urology, Sher-e-Bangla Nagar, Dhaka, Bangladesh and in some private centres of Dhaka city.

Patients and Method:

This is a retrospective study of 20 consecutive patients (mean age 25 years, range 12 to 45), underwent laparoscopic pyeloplasty at the National institute of

Kidney Diseases and Urology and in some private centres. The study period is December 2005 to May 2006. 12 of them were male and 8 were female. All patients had flank pain with radiological findings consistent with ureteropelvic junction obstruction and impaired drainage on diuretic renal scan. Both Andersons Hynes pyeloplasty and Y-V pyeloplasty were done depending upon the situation. The procedures were done under general anesthesia with ipsilateral flank position. Four trocars were placed, one umbilical or paraumbilical, two in the midclavicular line above and below the umbilical port and another in the midaxillary line after mobilizing the colon. The peritoneum overlying the kidneys and colon was mobilized medially. The distended pelvis and the ureteropelvic junction were freed from surrounding tissue. If pelvis was not much dilated and there was no crossing vessel, Y-V plasty was carried out at this stage. In dismembered pyeloplasty, the stenotic segment and portion of the dilated pelvis was excised and the ureter was spatulated and anastomosis was performed. Before anastomosis in either case, a 6F D-J stent was passed over a guide wire antegradely. In presence of a crossing vessel, the ureter was transposed anterior to the vessels before anastomosis. The anastomosis was performed with interrupted and running 5-zero round bodied polyglactin sutures. A Foley catheter and 10 mm drain were left indwelling postoperatively for 48-72 hours. The stent was removed 1 month postoperatively.

Patients were assessed at 6 weeks with an ultrasound and assessment of pain, and then an intravenous pyelogram (IVP) and a diuretic renogram were completed at 3 months along with a repeat clinical assessment.

Results:

Out of twenty patients, laparoscopic pyeloplasty was successful in eighteen patients. Two patients converted to open procedure due to difficulties with the anastomosis at the initial stage. Mean operating time was 190 minutes, which decreased with experience. A-H pyeloplasty was done in 16 cases and Y-V pyeloplasty was done in two patients. 4 patients required anterior transposition of the ureter due to the presence of crossing vessel. Only one patient required transfusion. Mean

postoperative hospital stay was 3 days (2-4 days). Follow-up ranges from 4 weeks to 25 weeks. 16 patients had complete relief of their pain and an improvement on ultrasound was demonstrated. So far 12 patients had DTPA renogram and ten patients had shown improvement in function. In one patient with 15% differential renal function preoperatively, the function deteriorated despite complete relief of symptoms.

Discussion:

Since the first reconstructive procedure for ureteropelvic junction (UPJ) obstruction performed by Trendelenburg in 1886, the surgical correction of ureteropelvic junction obstruction has been approached in many ways²⁹. In 1937 Foley described the technique of Y-V plasty for high insertion of the ureter on the renal pelvis³⁰. Subsequently several open techniques had been developed and particularly A-H pyeloplasty became the gold standard, with a success rates varying between 90 and 100%^{1,2,3, 30-34}. Percutaneous antegrade endoscopic incision of PUJ and retrograde endoscopic version of the technique by using the Acucise catheter and an insulated ureteroresectoscope became popular in mid 1980s to 1990s^{4-18,35}. But these new techniques could not achieve the same results as the open procedure and success rate remains between 76 to 82% and even worse in presence of a crossing vessel as this can not be dealt with endoscopic techniques^{4-18,35}.

In an attempt to achieve the gold standard set by the open procedure, Schuessler et al performed the first transperitoneal dismembered laparoscopic pyeloplasty in 1993²⁷. The same year Gaur et al reported the less invasive retroperitoneal approach for a non-dismembered pyeloplasty³⁶. These provided a step by step reproduction of the open technique. With more experience in laparoscopic suturing both transperitoneal and retroperitoneal laparoscopic pyeloplasty are now more widely practiced throughout the world.

Both dismembered and nondismembered pyeloplasty can be done by laparoscopic procedure. This depends upon the size of the pelvis and presence or absence of crossing vessel. The main reason for the preference of the A-H pyeloplasty is that a single procedure is able to cure all variation of the disease. Out of eighteen patients in our series those had successful pyeloplasty, sixteen had A-H pyeloplasty and two had Y-V plasty.

It has been a long debate whether a lower polar crossing vessel cause or aggravate the PUJ obstruction. The crossing vessel is important in determining the success

and type of pyeloplasty. It requires expensive investigation and expertise to diagnose it preoperatively. It is certainly dangerous in case of blind procedures where the vessel can be injured. However in cases of endopyelotomy under vision peroperative injury can be avoided. But several studies have shown that ultimate results are poor when endopyelotomies were done in presence of crossing vessels^{5,17}. But this can easily be dealt with laparoscopic procedure. Here the ureter can be transposed anterior to the lower polar crossing vessel.

All of the cases in our series had laparoscopic transperitoneal pyeloplasty. It has been said that retroperitoneal laparoscopic procedure is less invasive compared to the transperitoneal laparoscopic approach and less morbid from renal vascular and parenchymal point of view compared to percutaneous antegrade endopyelotomy. But intracorporeal suturing in a limited retroperitoneal space is a difficult procedure and particularly in a reconstructive procedure like dismembered pyeloplasty^{26,27}. On the other hand, roomy peritoneal cavity provides a wider space for instrument movement. So, in view of the problems of laparoscopic suturing in a limited retroperitoneal space, a laparoscopic retroperitoneal dismembered pyeloplasty should only be carried out at specialized centers²⁶. As the less complicated Fenger-plasty or Y-V pyeloplasty, does not require any tailoring of the renal pelvis or complicated suturing, it can be considered as the retroperitoneoscopic procedure of choice²⁶.

Another concern in the transperitoneal approach is the urine leakage in the peritoneal cavity. But use of D-J stent in all cases and use of continuous stitches, we have not found any significant urine leak in any of our patient. In fact we found unnecessary to keep drain tube more than 24 hours.

The D-J stent can be placed either antegradely or retrogradely. We put stent retrogradely in initial two cases. But it needs an extra procedure, different position and time. In a comparative study Mandhani et al find it advantageous to place stent antegradely³⁷. We also found easier and advantageous to place a stent antegradely. Moreover it also provides better anatomical delineation and dissection around the ureteropelvic junction since the pelvis remains distended.

Conclusions:

With laparoscopic procedure now a day we can perform a wide range of urological procedures. Until recently,

urological laparoscopic surgery primarily focused on ablative procedures, with success. Building on this initial experience, advanced and sophisticated reconstructive procedures of considerable technical complexity are increasingly being performed purely laparoscopically. Laparoscopic pyeloplasty offers excellent symptomatic relief in a minimally invasive fashion with low morbidity for adult patients with ureteropelvic junction obstruction. We hope in future laparoscopic surgery could increasingly evolve into a preferred approach for advanced and sophisticated urological reconstruction.

References:

1. Notley RG, Beaugie JM. The long-term follow-up of Anderson Hynes pyeloplasty for hydronephrosis. *Brit. J Urol.* 1973; 45: 464.
2. Nguyen DH, Aliabadi H, Ercole CJ, Gonzalez R. Nonintubated Anderson-Hynes repair of ureteropelvic junction obstruction in 60 patients. *J Urol.* 1989; 142: 704.
3. Sovion M, Livine PM, Savir A. Long-term follow-up of patients after pyeloplasty for ureteropelvic junction obstruction. *Israel J. Med. Sci.* 1990; 26: 144.
4. Renner C, Fred T, Seemann O, Rassweiler J. Laser endopyelotomy: minimally invasive therapy for ureteropelvic junction stenosis. *J Endourol.* 1998; 12: 537-544.
5. Ramsey JWA, Millar RA, Kellet MJ, Blackford HN, Wickham JEA, Whitfield HM. Percutaneous pyelolysis: indication, complication and results. *Br J Urol.* 1984; 56: 586-590.
6. Meretyk I, Meretyk S, Clayman RV. Endopyelotomy: comparison of ureteroscopic retrograde and antegrade percutaneous techniques. *J Urol.* 1992; 148: 775.
7. Nadler RB, Pearle MS, Nakada SY, Rao GS, Clayman RV. Acucise endopyelotomy: two-year follow up report. *J Endourol. Sup.* 1994; abs P7-192, S100.
8. Nadler BR, Rao GS, Pearle MS, Nakada SY, Clayman RV. Acucise endopyelotomy: assessment of long term durability. *J Urol.* 1996; 156: 1094.
9. Badlani G, Smith AD. Complications of endopyelotomy: analysis in series of 64 patients. *J Urol.* 1988; 140: 473.
10. Van Cangh PJ, Wilmart JF, Opsomer RJ, Abi-Aad A, Wese FX, Lorge F. Long-term results and late recurrence after endoureteropyelotomy: a critical analysis of prognostic factors. *J Urol.* 1994; 151: 934.
11. Gupta M, Smith AD. Factors associated with endopyelotomy failure: a retrospective analysis. *J Endourol.* 1996 (suppl.1); 10: S100, abstract FP2-173.
12. Van Cangh PJ, Nesa S, Galeon M, Tombal B, Wese, FX, Dardenne AN, Opsomer R, Lorge F. Vessels around the ureteropelvic junction: significance and imaging by conventional radiology. *J Endourol.* 1996; 10: 111.
13. Gupta M, Tuncay OL, Smith AD. Outcomes analysis of percutaneous antegrade endopyelotomy. *J Urol.* 1997; part 2, 157: 285, abstract 1110.
14. Nakada SY, Wolf JS, Jr, Brink BA, Quillen SP, Nadler RB, Gaines MV, Clayman RV. Retrospective analysis of the efforts of crossing vessels on successful retrograde endopyelotomy outcomes using spiral computerized tomography angiography. *J Urol.* 1998; 159: 62.
15. Van Cangh PJ. Editorial: Endopyelotomy- a panacea for ureteropelvic junction obstruction? *J Urol.* 1998; 159: 66.
16. Fraerber GJ, Richardson TD, Farah N, Ohi DA. Retrograde treatment of ureteropelvic junction obstruction using the ureteral cutting balloon catheter. *J Urol.* 1997; 157: 454.
17. Motola JA, Badlani GH, Smith AD. Results of 212 consecutive endopyelotomies: an 8-year followup. *J Urol.* 1993;149: 453.
18. Preminger GM, Clayman RV, Nakada SY, Babayan RK, Albala DM, Fuchs GJ, Smith AD. A multicenter clinical trial investigating the use of a fluoroscopically controlled cutting balloon catheter for the management of ureteral and ureteropelvic junction obstruction. *J Urol.* 1997; 157: 1625.
19. Badlani G, Eshghi M, Smith AD. Percutaneous surgery for ureteropelvic junction obstruction (endopyelotomy): techniques and early results. *J Urol.* 1986; 135: 26.

20. Kletacher BA, Segura JW, LeRoy AJ and Patterson DE. Percutaneous antegrade endopyelotomy. *J Urol.* 1995; 153: 701.
21. Brooks JD, Kavoussi LR, Preminger GM, Schuessler WW and Moore RG. Comparison of open and endourological approaches to the obstructed ureteropelvic junction. *Urology.* 1995; 46: 791.
22. Cassis AN, Brannen GE, Bush WH et al. Endopyelotomy: review of results and complications. *J Urol.* 1991; 146:1492.
23. Motola JA, Fried R, Badlani GH, Smith AD. Failed endopyelotomy: implications for future surgery on the ureteropelvic junction. *J Urol.* 1993; 150: 821.
24. Kletschner, Segura JW, LeRoy AJ, Patterson DE. Percutaneous antegrade endopyelotomy: review of 50 consecutive cases. *J Endourol.* 1994 (Sup); abs P7-194, S100.
25. Thomas R. Ureteropelvic junction obstruction: retrograde ureteral approach. In: AD Smith (ed). *Controversies in endourology.* Philadelphia: WB Saunders Company; 1995. pp 268-274.
26. Baurer JJ, Bishop JT, Moore RG, Chen RN, Iverson AJ, Kavoussi LR. Laparoscopic versus open pyeloplasty: assessment of objective and subjective outcome. *J Urol.* 1999; 162: 692-695.
27. Schuessler WW, Grune MT, Tecuanhuey LV, Preminger GM. Laparoscopic dismembered pyeloplasty. *J Urol.* 1993; 150: 1795.
28. Persky L, Krause JR, Boltuch RL. Initial complications and late results in dismembered pyeloplasty. *J Urol.* 1977; 118: 162.
29. Poulakis V, Witzsch U, Schultheiss D, Rathert P, Becht E. History of ureteropelvic junction obstruction repair (pyeloplasty) From Trendelenburg (1886) to the present. (Abstract) *Urologe A.* 2004 Dec;43(12):1544-59.
30. Foley FB. A new plastic operation for the stricture at ureteropelvic junction. *J Urol.* 1937; 38: 643.
31. David DM. Intubated ureterostomy a new operation for ureteral and ureteropelvic stricture. *Surg Gynaecol Obstet.* 1943; 76: 513.
32. Anderson JC, Hynes W. A case diagnosed preoperatively and treated successfully by plastic operation. *Br J Urol.* 1949; 21: 209.
33. Scarding PL, Prince CL. Vertical flap operation ureteropelvioplasty. *South Med J.* 1953; 46:325.
34. Culp OS, DeWeered JH. A pelvic flap operation for certain type of ureteropelvic operation: Observation after 2 years of follow up. *J Urol.* 1954; 71: 523.
35. Wickham JEA, Kellett MJ. Percutaneous pyelolysis. *Eur J Urol.* 1983; 9:122.
36. Gaur DD, Agarwal DK, Purohit KC, Darshane AS. Retroperitoneal laparoscopic pyelolithotomy and pyeloplasty. *J Urol.* 1993; 150: 1795.
37. Mandhani A, Goel S, Bhandari M. Is antegrade stenting superior to retrograde stenting in laparoscopic pyeloplasty? *J Urol.* 2004 Dec;172(6 Pt 1): 2484-5.

Authors

1. Department of Urology, National Institute of Kidney Diseases and Urology, Sher-e-Bangla Nagar, Dhaka
2. Department of Physiology, Dhaka Medical College, Dhaka

SINGLE STAGE PERINEAL ANASTOMOTIC URETHROPLASTY FOR POST TRAUMATIC STRICTURE OF URETHRA: OUTCOME OF THE PROCEDURE

ABM GOLAM ROBBANI¹, ABM ABDUL HANNAN², MH RAHMAN³, M MANZURUL HAQUE⁴, AB SIDDIQUE⁵

Abstract:

60 patients of post-traumatic stricture of posterior urethra with suprapubic cystostomy in-situ were underwent single stage perineal anastomotic urethroplasty during the period of April-2002 to April-2006. Ultimately, 95% of patients have had excellent results with maximum urinary flow rate >15ml/sec. Anastomotic urethroplasty is the treatment of choice for post-traumatic stricture of posterior urethra. Complications are also within acceptable level in this modality of stricture treatment.

Introduction:

Stricture of urethra is a common condition facing the urologists in their day to day practice. The cause and location of urethral strictures vary widely, and treatment must therefore be planned to consider the length and site of the blockage¹. Strictures of posterior urethra continue to represent a real surgical challenge and pose one of the most difficult management problems encountered in urology². This has led to the tendency in the last two decades to manage bulboprostatic stricture of <3 cm preferably by excision of stenosed segment followed by end-to-end anastomosis¹. There are problems involved in repairing these strictures not only because of the awkward location behind the pubic bone, but more importantly because of urosexual problems may result from inappropriate management.

Various endoscopic and surgical methods of repair have been described which range from the extremely simple to the extremely radical, including optical urethrotomy, urethral anastomosis by perineal, elaborated perineal and perinio-abdominal transpubic procedures and substitution urethroplasty^{2,3,4,7}.

Posterior urethral strictures are almost always post-traumatic, usually as a complication of pelvic fracture urethral injury. Rarely, are these in the form of a genuine strictured segment of the urethra with preservation of continuity and such strictures usually result from incomplete urethral rupture². In the absence of dense fibrosis, optical urethrotomy may be the appropriate first line of treatment². Much more commonly, posterior

strictures are in the form of a bulboprostatic urethral gap or defect which results from complete urethral disruption. This gap is occupied by a fibrosed organised haematoma formed between the distracted two ends of the urethra at the time of pelvic fracture injury^{2,8}.

As a group, the latter cases seem to achieve the maximum benefit from excision of the fibrosed segment and restoration of the urethral continuity by end-to-end anastomosis². If performed properly, success rates after a sufficiently long follow-up have been reported to be in excess of 90%^{2,4,6,7}. Surgery in these cases must not over-shorten the urethra, so that a 'ring' is not created, which can lead to ventral curvature of the penis¹. The more proximal the stricture the longer the urethral segment that can be removed without compromise and with a tension-free end-to-end anastomosis¹. Strictures of the posterior urethra are therefore preferably treated by excision of the stenotic segment and primary anastomosis¹.

Herein we review our series of patients treated by this procedure.

Materials and Methods:

This was a prospective, clinical study carried out during the period of April-2002 to April-2006. It was conducted in two private clinic at Narayangonj and Rajshahi, and in Rajshahi Medical College Hospital, Rajshahi. In this study, 60 male patients with the age range of 14 to 57 years (mean- 32.6) were included, who were subjected to single stage perineal anastomotic urethroplasty. 48 (80%) patients have had history of road traffic accident and 12 (20%) patients had straddle type of injury associated with the features of rupture of urethra with acute retention of urine. All patients were presented with suprapubic cystostomy tube in-situ. Rupture of urethra and the resultant acute retention of urine was managed initially by suprapubic cystostomy. Time interval between trauma and attendance for urological consultation were one month to three years (mean- 2months). Surgery was performed at least 3 months following injury. Pre-operatively, none of the patients could pass urine per-urethra. Stricture of urethra of all

patients were evaluated by combined retrograde (RGU) and voiding cysto- urethrography (MCU) (Fig-1&2), and ultrasonography to establish the length of stricture and degree of spongiofibrosis. Pre-operative urethroscopy and cystourethroscopy per pre-existing suprapubic tract were done in some patients. Non-filling of proximal urethra was the indication of antegrade cystourethroscopy. All patients were evaluated for any co-morbidity.

Surgical Technique : After providing written informed consent, all patients underwent single stage perineal anastomotic urethroplasty. With the patient in lithotomy position, perineum and subumbilical regions were prepared and draped as a single operating field. Urethral metallic dilator passed per-urethra and through suprapubic tract to locate the distal and proximal distracted ends of urethra and to estimate the length of gap between them. Through a midline or inverted 'Y' perineal incision, bulbospongiosus muscles were exposed and incised in the midline (Fig-3&4). Bulbar urethra was circumferentially mobilized distally upto but not beyond the penoscrotal junction and proximally upto the strictured segment (Fig-5). The urethra was then transected at the distal end of strictured segment and trimmed back into healthy appearing tissue and spatulated (Fig- 6). The apex of prostate was incised over the tip of metallic dilator passed antegrade through the pre-existing suprapubic tract. Then meticulous retrograde piecemeal resection of the fibrous tissue and prostatic apex were done by the scalpel until a healthy pliable urethral mucosa was reached. End was spatulated and 6 to 8 interrupted 4-0 polyglycolic acid sutures were placed between spatulated proximal and distal ends of urethra (Fig-7). 14 to 18Fr biluminal Foley catheter passed through urethra into the bladder (Fig-8). Stitches were tightened and a tension-free, spatulated, end-to-end, mucosa-to-mucosa bulboprostatic anastomosis was completed (Fig-9). The tension was further relieved off the suture line by fixing the bulbar urethra to the perineal fascia with 3/4 stitches. A soft drain placed in the wound. The bulbospongiosus muscles were repaired over the urethra and the wound closed. The operation was completed by inserting a suprapubic catheter through the tract already present in those patients. In this series, none of the patients required transpubic approach for tension free anastomosis.

Drain removed on 3rd or 4th postoperative day. The urethral catheter was removed on 21st postoperative

day. Peri-catheter urethrography, to detect anastomotic leakage, was not done in any of the patients. If the patient could pass urine per-urethra with good calibre, suprapubic catheter removed on the next day and subjected to retrograde urethrography. Suprapubic catheter kept in-situ for those cases who could not pass urine per-urethra after removal of urethral catheter until the problem was solved by any other way. Post-operatively, all patients were evaluated by direct questioning regarding flow of urine, uroflowmetry and retrograde urethrography (Fig-10) immediately after urethral catheter removal. At follow up visits, patients were evaluated mainly by questionnaires regarding flow of urine and uroflowmetry and by retrograde urethrography in some cases. Follow up were done 3 months to 2.5 years following operation.

Results :

60 patients of post-traumatic stricture of posterior urethra with suprapubic cystostomy tube in-situ were subjected to single stage perineal anastomotic urethroplasty. Mean operating time for the procedures was 3 hours (range 2.5 to 4). 45 (75%) patients required one or more units of blood transfusion. No per-operative complication encountered in any of the patients. 15 (25%) patients developed minor wound infection immediate postoperatively which were managed by regular dressing and antibiotics.

Outcome of these surgery and of the study was qualified on the basis of the quality of flow of urine per-urethra after removal of urethral catheter following surgery, and on follow up visits, as assessed by uroflowmetry. Mean follow up period was 9 months to 2.5 years. Results were categorized on the basis of urinary flow rates as 'Excellent', 'Good' and treatment 'Failure' group as shown in Table-I.

Table-I
Per-urethral flow of urine

Quality of flow of urine (Qmax)	No. of patients (%)
Excellent (Qmax >15ml/sec)	54 (90%)
Good (Qmax 10-15ml/sec)	3 (5%)
Failure (Qmax <10ml/sec)	3 (5%)

54 (90%) patients have had excellent and 3 (5%) had good results with maximum urinary flow rate (Qmax) of more than 15ml/sec and 10-15ml/sec respectively. 3 (5%) patients were in failure group

with Qmax less than 10ml/sec or no flow at all. Patients with good results required urethral dilatation or optical urethrotomy once or twice during the follow-up period and ultimately achieved excellent results. Patients in failure group required re-operation to solve the problem.

No patient developed urinary incontinence as a result of the surgery. All patients were sexually potent before trauma and operation. 20 (33.3%) of them developed impotence among which 3 (5%) had persisted it up to the last follow up visit at 1.5 years. No patient developed chordee, urethral shortening or diverticula during follow up.



Fig-1 : Pre-operative RGU



Fig-2 : Pre-operative MCU



Fig-3 : Position & Incision



Fig-4 : Dissection of urethra



Fig-5 : -cont-



Fig-6 : Transsection of urethra

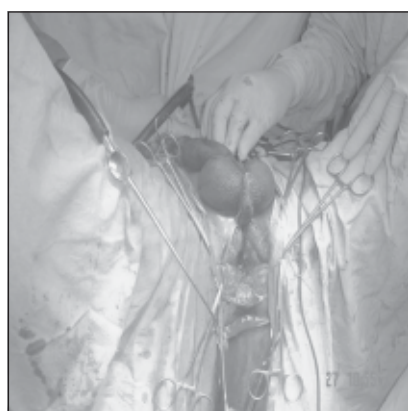


Fig-7 : Placement of stitches



Fig-8 : Urethral catheter passed

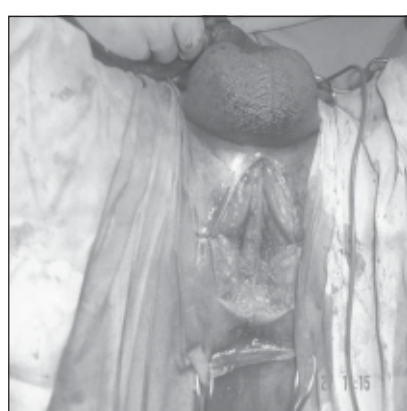


Fig-9 : Anastomosis completed



Fig-10: Post-operative RGU

Discussion:

Stricture of urethra is not an uncommon condition prevailing in the society. Trauma, either accidental or iatrogenic is the commonest cause of stricture of urethra now-a days. Among various treatment modalities available, internal optical urethrotomy is the simplest way of treatment and can be tried as primary modality when urethral luminal continuity still exist². For patients with post-traumatic stricture, where there is a gap between two urethral ends occupied by fibrous tissue, excision of the stenosed segment and primary anastomosis is the best way of treatment⁶. The success of this procedure depends on meticulous surgical technique and careful attention to certain operative details. Of these details, three constitute the 'gold triad' assuring successful outcome, namely; complete excision of scar tissue, mucosa-to-mucosa alignment of two urethral ends, and creation of a tension-free anastomosis².

Complete excision of scar until healthy appearing tissue is reached, is essential before urethral anastomosis to achieve a successful result^{3,5,6,7}. The widely adopted strategy for performing anastomosis once the lumen of prostatic urethra is seen, after cutting on the tip of a dilator passed transvesically and without excision of scar tissue, should be abandoned². Aside from complete excision of scar tissue, nothing is more important to achieve healthy mucosa-to-mucosa anastomosis. Another important determinant of success after the procedure is to approximate the two urethral ends over the bulboprostatic gap without tension². The length necessary to bridge the urethral gap is offered by the inherited high elasticity of the mobilized bulbar urethra which can provide an extra length of 3-4cm^{5,7}. When the urethral gap is longer than 2.5cm, two other surgical

solutions have been proposed, namely; elaborated perineal and abdomino-perineal approach to solve the problems⁸.

Results of our series are in the line of other published reports. In our series, initial excellent results are in 90% of patients and in other 5% of cases it is excellent after one or two minor procedures resulting ultimate excellent result in 95% of patients. These results correlate with the results of Micheli E et al¹, Koraitim MM², Morey AF et al⁵, Ofer ZS et al⁹.

Urinary incontinence, as a direct result of this procedure has not been encountered in any of the cases of this series which is consistent with the results of others published reports^{2,5,7,8}.

Impotence developed temporarily in 33.3 % of patients of which 5% persisted within follow up time. It is very much consistent with Koraitim² and others series^{7,8,9}.

Conclusion :

From our experience and published reports, urethroplasty with end-to-end anastomosis seems to be a straightforward and simple operation that gives excellent results in patients of post-traumatic stricture of posterior urethra. Excision of the stenotic segment and primary anastomosis is the treatment of choice for stricture of bulbar urethra up to 3cm long; it gives excellent results with cure rate close to 100%. Meticulous and careful attention to surgical technique is needed to achieve spatulated, mucosa-to-mucosa, tension-free, end-to-end anastomosis and to get high success rates.

References :

1. Micheli E, Ranieri A, Peracchia G, and Lembo A. End-to-end urethroplasty: long-term results. *BJU Int.* 2002; 90: 68-71.
2. Koraitim MM. On the art of anastomotic posterior urethroplasty: A 27 years experience. *J Urol.* 2005 Jan; 173: 135-139.
3. Koraitim MM. The lessons of 145 posttraumatic posterior urethral strictures treated in 17 years. *J Urol.* 1995; 153: 63.
4. Andrich DE, Dungalison N, Greenwell TJ, Mundy AR. The long-term results of urethroplasty. *J Urol.* 2003; 170: 90.
5. Morey AF, McAninch JW. Reconstruction of posterior urethral disruption injuries: outcome analysis in 82 patients. *J Urol.* 1997; 157: 506.

6. Jakse G, and Marberger H. Excisional repair of urethral stricture: follow-up of 90 patients. *Urology*. 1986; 27: 233-7.
7. Webster GD, Ramon J. Repair of pelvic fracture posterior urethral defects using an elaborated perineal approach: experience with 74 cases. *J Urol*. 1991; 145:744.
8. Turner-Warwick R. Prevention of complications resulting from pelvic fracture urethral injuries and from their surgical management. *Urol Clin North Am*. 1989; 16: 335.
9. Ofer ZS, Ofer NG, Yehoshua G. Anastomotic urethroplasty for failed previously treated membranous urethral rupture. *Urology*. 2004; 63: 837-840.

Authors

1. Assistant Professor (c.c), Urology, Rajshahi Medical College, Rajshahi.
2. Associate Professor, Surgery, Rajshahi Medical College, Rajshahi
3. Consultant Urologist
4. Associate Professor (c.c), Surgery, Rajshahi Medical College, Rajshahi.
5. Assistant Professor (c.c), Surgery, Rajshahi Medical College, Rajshahi.

MANAGEMENT OF PRIAPISM: IN REGARDS TO VARIOUS AETIOLOGIES, OPTIONS AND OUTCOME

ZAHID H BHUIYAN, MF ISLAM

Introduction

Medically priapism is defined as sustained erection more than 4 hours that is not associated with sexual desire. The pathophysiology of priapism could simply be explained as dysfunctional haemodynamic process of the penis, whereby the genital organ excessively endures blood engorgement¹.

Historical background

The origin of the medical term priapism derives from Greek and Roman mythological figure "Priapus." His phallus was portrayed as disproportionately enlarged size with the respect to whole body to symbolize the male generative power. The priapism has been linked with hang by execution, described even long ago by da Vinci.² Interestingly it was regular practice to observe priapism by the executioner after hanging to ensure the completion of the act.³ Currently it is observed that spinal cord injury is intimately related to priapism and the incidence is higher when the injury is in the proximal level; 14% in case of cervical cord injury gradually diminishing to 3% in case of cauda equina injury (1948. Munro et al)².

The first record of priapism in medical literature was in 1616.² In earlier days there was little awareness of the differences between low-flow ischemic and high-flow nonischemic priapism. High flow priapism was first reported in 1960 and till 2002, 123 case reports, extracted by MEDLINE search⁴. In the past due to lack of understanding of erectile physiology priapism was managed largely on empirical basis.

Pathophysiology :

Frank Hinman, published his extensive research report on priapism on 1914². He had a great contribution for his work to provide a scientific guideline for rational approach in priapism. Frank Hinman Jr. followed his fathers scholarly research and described the pathophysiology of idiopathic priapism⁵.

There is significant advances in the study of erectile physiology during the 1980s to 1990s resulting better

understanding of pathophysiology of priapism and its management⁶. It was described that in low flow priapism there is impaired venous outflow resulting in intracorporeal stasis and ischemia causing a painful erection⁷ and it behaves as compartmental syndrome². After 4 hours of ischemic priapism metabolic waste products tend to accumulate leading to acidosis. After 12 hours trabecular interstitial oedema developed. After 24 hours the sinusoidal epithelium is denuded and thrombocytes adhere to the exposed basement membrane. After 48 hours thrombi form in the sinusoidal spaces and smooth muscle cells undergo necrosis or transform into fibroblast like cells. High flow priapism represents unrestricted arterial inflow to the corpora, resulting in a painless erection⁷. This extent of ultrastructural changes as seen in ischemic priapism is not evident in high-flow nonischemic priapism. So the patho-physiology of priapism in high or low flow is quite different and it requires different treatment strategy⁴.

Priapism, subtypes⁹:

1. Ischemic (veno-occlusive, low -flow) priapism: There is little or no cavernous arterial blood flow and cavernous blood gases are abnormal (hypoxic, hypercarbic, acidotic). Corpora cavernosa are rigid and tender. It is an urological emergency.
2. Nonischemic (arterial, high-flow) priapism : Unregulated arterial flow. Cavernous blood gas value is similar to arterial blood gas. Penis is partially rigid and non-tender. It is not an urological emergency.
3. Stuttering (intermittent) priapism : Recurrent ischemic priapism with intervening period of detumescence. It is an urological emergency.

Aetiology^{4,7,8}:

The aetiology of priapism is broadly classified as:

1. Primary or idiopathic (30% - 50%)
2. Secondary : The secondary causes are mostly related to low-flow priapism.

- a. Thromboembolic diseases : Sickle cell diseases or trait, haemoglobin C disease, thalassaemia, thrombocytopenia, polycythaemia.
- b. Medications and drugs : Drug used in erectile dysfunction (oral sildenafil, intraurethral alprostadil, intracavernosal vasoactive amine like papaverine), Antihypertensive drugs (hydralazine, guanethidine, α -adrenergic antagonists), psychotropic and antidepressant medication, alcohol, marijuana, heparin.
- c. Infiltrative malignancies: Leukemia, lymphoma, bladder and prostatic carcinoma.
- d. Neurogenic : CNS and spinal cord disorders, diabetic neuropathy.
- e. Miscellaneous : Dialysis, total parenteral nutrition.
- f. The aetiology of arterial or high-flow priapism are mostly due to perineal and penile trauma and laceration of the cavernous artery leading to arterial-lacunar fistula.

Diagnosis⁹:

The diagnosis of priapism is self evident in untreated patient. The evaluation should focus on differentiating ischemic from nonischemic priapism, because the protocol of management is different in these two distinct entity. Meticulous history and physical examination in regards to various aetiologies should be carried out. Laboratory and radiological investigations like CBC, haemoglobin electrophoresis should be done in all cases unless there is definite diagnosis⁴. Screening for psychoactive drugs and urine toxicology may needed to be done. Corporal blood gas analysis and color duplex ultrasonography of perineum and the shaft of the penis in lithotomy or frogleg position is most reliable diagnostic tool to differentiate ischemic from non ischemic priapism.

Penile arteriography is reserved if it follows embolization of leaking cavernous artery. The following table is very helpful for the diagnosis⁹:

Table- I
History and clinical examination

Findings	Ischemic priapism	Non- ischemic priapism
Corpora cavernosal rigidity	Fully rigid, not tolerated	Partially rigid, may well tolerated
Penile pain	Usually present	Seldom present
Abnormal cavernous blood gas	Usually present	Seldom present
Thromboembolic diseases and Infiltrative malignancies	Sometime present	Seldom present
Recent use of drugs for ED	Sometime present	Seldom present
Perineal or penile trauma	Seldom present	Sometime present

Table-II
Typical blood gas value

Source (cavernous blood)	Po ₂ (mm Hg)	Pco ₂ (mm Hg)	pH
Ischemic priapism (blackish in colour)	Less than 30	Greater than 60	≤ 7.25
Non ischemic priapism (like arterial blood)	Greater than 90	Less than 40	7.40
In flaccid state (like venous blood)	40	50	7.35

Management:

Priapism of any type is to be considered as urological emergency⁹ in first instance and should be evaluated immediately to differentiate ischemic from non-ischemic variant¹.

Low-flow priapism:

The objective of management of low-flow priapism focus on achieving detumescence and removing the trapped blood as early as possible. Inadequate treatment may lead to permanent erectile dysfunction and in some instances, megalopenis¹⁰. The natural history of low-flow priapism of longer duration reveals spontaneous resolution even without treatment but in expense of permanent loss of potency^{9,2}. Depending upon the etiology and duration of onset, management options are to be applied step-wise pattern starting from conservative approach; gradually to more invasive procedures.

Conservative approaches to low-flow priapism specially in sickle cell disease, include oxygenation, hydration and alkalinization. Priapism of any cause of longer duration is less likely to respond to conservative therapy. The possibility of future erectile dysfunction has to be noticed to all patients and their guardians before taking informed consent for intervention. Minimally invasive procedures are corporal aspiration and intracavernosal irrigation with normal saline or α -adrenergic agents. Priapism of more than 48 hours duration is associated with prolonged ischemic acidosis which impairs the intracavernous smooth muscle response to sympathomimetics. More invasive intervention includes distal and proximal surgical shunt procedure⁷. It has to be done to prevent the complications of persistent ischemia and its related complication. Priapism of more than 72 hours duration requires shunt procedure in most of the cases to re-establish the circulation of the corpora cavernosa. The distal cavernoglandular (corporoglandular) shunts are easier to perform. These procedures are generally successful if the priapism are not associated with significant tissue damage or distal penile oedema. Proximal shunting procedures are time consuming and technically challenging; may be warranted when the distal shunt procedures fail to re-establish the normal corporal circulation. These are very effective, may be associated with serious complication like urethral fistula, purulent cavernositis, pulmonary embolism.

The distal cavernoglandular (corporoglandular) shunts are⁹:

1. Winter shunt : Transglandular puncture with a biopsy needle.
2. Ebbehøj Shunt : Transglandular incision of tunica by scalpel.
3. Al-Ghorab Shunt : Transglandular excision of a piece of corporal tunica albuginea.

Among the distal shunt procedures bilateral Al-Ghorab shunt is most effective.

The proximal shunt procedures are⁹:

1. Quackels procedure : Proximal cavernospongious shunt.
2. Grayhack procedure : cavernosaphenous shunt.

In most cases shunt closes in time⁹. Long-term patency of shunt may lead to erectile dysfunction and patient may need penile implant¹¹. The success rate of different shunt procedures vary from 30% to 100% to achieve detumescence and in around $\geq 50\%$ to achieve potency¹. In presence of appropriate indication the overall success rate in published literature is 66% for winter, 73% for Ebbehøj, 74% for Al-Gorab, 77% for Quackels, 76% for Grayhack procedure⁹.

High-flow priapism :

High-flow priapism may be due to penile or perineal trauma and laceration of cavernous artery, leading to arterial-lacunar fistula¹². It was reported that arterial priapism was evident as long as 31 year without loss of potency¹³. So watchful waiting is the preferred option for nonischemic variant because the incidence of erectile dysfunction is higher following invasive or surgical intervention(50% versus 2%)^{9,14}.

In children the only immediate intervention is the perineal compression. If it fails; an observation period is still mandatory since several cases of spontaneous resolution has been described¹⁵. The conservative approaches in high flow priapism include perineal compression with thumb to prevent spontaneous cavernous filling through arterial-lacunar fistula (also as a diagnostic test) and maintenance of pressure if necessary. The success rate in case of corporal aspiration and intracavernosal irrigation with α -adrenergic agents is a matter of chance and till 2002 only two cases of high-flow priapism was reported to be successfully managed by above mentioned procedure¹⁰. More

invasive approaches include selective internal pudendal arterial embolization or surgical ligation⁷. The incidence of loss of potency in case of selective internal pudendal arterial embolization is low though the incidence of recurrence of priapism is high. Surgical ligation of the artery is reserved only for those who have either no sexual desire or potency is of least consideration⁴.

Stuttering (intermittent) priapism⁹:

The stuttering priapism is seen after recovery from ischemic or low-flow variant. It may often idiopathic in adult but patients with haematological abnormalities may have similar episode specially among the children. All the patients, recovered from ischemic priapism should be warranted for further future episode. To consider the case as stuttering priapism the complete recovery from the initial insult is to be ensured first. Once it recurred it should be considered as an emergency as it was considered initially and has to be dealt as new case. The recurrence should be considered as initial failure in prevention strategy. The prophylactic systemic hormone therapy is to be selected in sexually matured adult only after counseling as it may decrease libido. The common agents used are GnRH agonist, anti-androgen, diethylstilbesterol. If patients do not ready to compromise sexual activities he should be given proper education for self intracavernosal injection of sympathomimetics.

Recently oral beclufen (γ -aminobutyric acid agonist) has been successfully used to prevent idiopathic nocturnal priapism and priapism in patients with sickle cell disease, while preserving normal erectile function.¹⁶

The Erectile Dysfunction Guideline Update Panel of AUA⁹ collected all literature from MEDLINE published in English language in relation to management of priapism between 1966 to 2001, additional relevant articles prior to 1966 were also collected at the recommendation of individual panel member. The panel recommended that:-

1. Physician must determine the difference between the ischemic and nonischemic priapism.
2. When secondary causes are found, the both local and the systemic treatment should be given concurrently.
3. The management of ischemic priapism should progress in stepwise fashion to achieve resolution as promptly as possible.
4. Repeated intracavernous injection of sympathomimetic agents should be performed in

ischemic priapism prior to initiating shunt procedure.

5. Phenylephrine is 1st choice of sympathomimetic agents due to minimum side effect on cardiovascular system.
6. Sympathomimetic agents of optimum dose and duration (1 ml of phenylephrine at a concentration of 100 - 500 μ g / ml normal saline injected intracavernosally in every 3-5 minutes for up to 1 hour) is to be used before deciding the treatment as unsuccessful.
7. There should be keen observation for looking of side effects during the intracavernous injections of sympathomimetic agents.
8. Surgical shunt procedure is not the procedure of first choice.
9. Distal shunt procedures are the first choice than the proximal ones.
10. Oral systemic therapy is not indicated in ischemic priapism.
11. In non-ischemic priapism corporal aspiration has only diagnostic role.
12. Initial management of non-ischemic priapism is observation.
13. Selective arterial embolization is recommended for the management of non-ischemic priapism only on request of the patient.
14. Surgical management of non ischemic priapism is the last procedure of choice.
15. The recurrent priapism is to be managed as ischemic priapism but the goal of management is to prevent future episode.
16. Hormonal agents, oral beclufen may be used in recurrent priapism but hormonal agents is used in sexually matured patient.
17. Self intracavernosal injection of phenylephrine is recommended in recurrent priapism who either fail or reject the systemic treatment.

Conclusion :

Awareness of the physicians should be increased to consider the priapism as an urological emergency till the exclusion of nonischemic variants. Patients prone to develop priapism of secondary causes should be motivated well to know about the priapism and its future consequences. Meticulous history, physical examination and simple observation of colour of corporal aspirate

and its blood gas analysis can easily differentiate the low-flow from high-flow variant. All cases of low-flow priapism has to be investigated for possible secondary causes. Immediate intervention is instituted for low-flow whereas conservative approach suitable for high-flow priapism to reduce the severe complication like erectile dysfunction and so forth. Patients recovered well from low-flow priapism should be well informed regarding the chance of recurrence.

References:

1. Nixon RG, O'Connor JL and Milam DF. Efficacy of shunt surgery for refractory low flow priapism : A report on the incidence of failed detumescence and erectile dysfunction. J Urol. 2003; 170:883-6.
2. Burnet AL. Pathophysiology of priapism : Dysregulatory erection, Physiology. J Urol. 2003; 170:26-34.
3. Gallagher JP. A lesion in neurology from the hangman. JSC Med Assoc. 1995; 91:38.
4. Hatzichristou D, Salpiggidis G, Hatzimouratidis AA, Tzortzis V, Bekos A et al. Management strategy for arterial priapism : Therapeutic dilemmas. J Urol. 2002; 168:2074-77.
5. Hinman F Jr. Priapism; reasons for failure of therapy. J Urol. 1960; 83:420.
6. Spycher MA and Hauri D. The ultrastructure of the erectile tissue in priapism. J Urol. 1986; 135:142.
7. Edney MT, Schned AR, Cendron M, Chaffee S and Ellsworth PI. Priapism in a 15 year old boy with congenital dyserythropoietic anaemia type II (Hereditary erythroblastic multinuclearity with positive acidified serum lysis test). J Urol. 2002; 167:309-10.
8. Razdan S and Krane RJ. "Non traumatic genitourinary emergencies". In: Siroky MB,

Edelstein RA, Krane RJ, editors. *Manual of Urology Diagnosis & Therapy*. Second edition. Philadelphia: Lippincott Williams & Wilkins; 1999. pp-58-60.

9. Montague DK, Jarow J, Broderick GA, Dmochowski RR, Heaton JPW et al. American Urological Association Guideline on the management of priapism. J Urol. 2003; 170:1318-24.
10. Rudick DH. Successful treatment of arterial priapism with α -agonist irrigation : A rural experience. J Urol. 2002; 167:2132.
11. Kulmala RV, Lehtonen TA, Lindholm TS, Tammela TL. Permanent open shunt as a reason for impotence or reduced potency after surgical treatment of priapism in 26 patients. Int J Impot Res. 1995; 7:175.
12. Bastuba MD, Saenz de Tejada I, Dinlenc CZ, Sarazen A, Krane RJ et al. Arterial priapism: Diagnosis, treatment and long-term follow-up. J Urol. 2002; 151:1231.
13. Witt MA, Goldstein I, Saenz de Tejada I, Greenfield A and Krane RJ. Traumatic laceration of intracavernosal arteries : The pathophysiology of nonischemic, high flow, arterial priapism. J Urol. 1990; 143:129.
14. DeWan PA, Tan HL, Auldish A et al. Priapism in childhood. BJU. 1989; 64:54 1.
15. Moscovici J, Barret E, Galinier P, Liard A, Juricic M et al. Post traumatic arterial priapism in the child : A study of four cases. Eur J Pediat. 2000; 10:72.
16. Rourke KF, Fischler AH and Jordan GH. Treatment of recurrent idiopathic priapism with oral beclufen. J Urol. 2002; 168: 2552-53.

Authors

Dept. of Urology, Bangladesh Medical College, Dhaka

TREATMENT OF RENAL CALCULI BY PERCUTANEOUS NEPHROLITHOTOMY VERSUS OPEN SURGERY - A COMPARATIVE STUDY

MD SHAFIQLAZAM¹, ISHTEAQ AHMED SHAMEEM², MH RAHMAN³, AKMANWARUL ISLAM⁴, SAM GOLAM KIBRIA⁴

Abstract:

Purpose: To find out the better operative procedure with minimal morbidity for large renal calculi.

Methods: A total of 77 patients with 80 renal units were prospectively randomized for PCNL (35) or open surgery (45). Intraoperative and postoperative morbidity, operation time, hospital stay, stone clearance and return to work were compared for both methods.

Results: Intraoperative complications in terms of bleeding requiring blood transfusion were recorded in 12 (34.28%) patients in PCNL group and bleeding, pleural and pelvic injury were recorded 26(57.7%) patients in open surgery group, a difference of significant value ($P < .05$). Post operative complications were also recorded and found septicaemia and urinary cutaneous fistula occurred 4(11.42%) cases in PCNL group and wound infection, wound dehiscence, septicaemia and urinary cutaneous fistula occurred in 16(35.5%) cases, with a significant difference ($P < .05$). PCNL was associated with shorter operation time (121.71 ± 28.14 vs. 152 ± 25.11 minutes, $P < .05$), shorter hospital stay (4.58 ± 2.24 vs. 11.22 ± 3.62 days, $P < .001$), and early return to work (3.66 ± 1.55 vs. 5.6 ± 1.49 weeks). On the other hand both treatment groups were comparable in terms of stone free rate.

Conclusion: PCNL is a better treatment options for large renal calculi with a stone free rate approaching that of the open surgery. Moreover it has the advantages of lower morbidity, shorter operation time, shorter hospital stay and early return to work.

Introduction:

Recently the removal of renal stone has undergone changes from open surgery to noninvasive and or minimally invasive procedure. Now four minimally invasive treatment modalities are available for the treatment of kidney stone such as ESWL (Extracorporeal shock wave lithotripsy), PCNL (Percutaneous nephrolithotomy), RIRS (retrograde intrarenal stone surgery) and LSS (Laparoscopic stone surgery)¹.

Stone related factors (size, number, location and composition), renal anatomy and patient clinical factors

should all be considered in conjunction with various surgical modalities and the availability of equipment before this surgical approach is selected. Stone burden (size and number) is perhaps the single most important factor in determining the appropriate treatment modality for a patient with renal calculi. Currently ESWL is the therapy of choice for the most symptomatic renal calculi due to its non-invasive nature, minimal anaesthesia and high level of patient and physician acceptance². Despite the dominant position of ESWL, the procedure is not uniformly successful for all types and size of calculi³.

Percutaneous removal of kidney stones recently has gained the favour over open surgery, since an increasing number of medical centers suggest it with rapid convalescences and diminished pain⁴⁻⁷. Prompt recovery shortens hospital stay and facilitates early return to job activity. In consequence percutaneous stone removal may be the cost effective⁸. Moreover because of low success rate and high retreatment rate of stones more than 2 cm by ESWL, PCNL is the preferred treatment options for such stones⁹.

Many studies have been done in different parts of the world to compare the results of PCNL and open surgery in the management of renal calculi. Recently PCNL has been introduced for the treatment of renal calculi in our country. The present study has been designed to compare the results of treatment of renal calculi more than 2 cm in size by PCNL and open surgery.

Methods:

Between January 2003 and July 2005, the present study was carried out in Bangabandhu Sheikh Mujib Medical University, Dhaka.

Patients over the age of 15 years of either sex suffering from renal stone disease attending in Urology department of BSMMU, Dhaka were included in the study population.

Those with large renal stone more than 2 cm. in size, single or multiple, or partial staghorn calculi, lower and middle calyceal stone and sterile urine were included in the present study.

This group included 77 patients (80 renal units) randomly treated with PCNL (35) or open surgery (45). Random sample technique was applied to collect the sample from study population. Residual stones were treated with ESWL in both treatment groups.

Of the 77 patients 80 renal units were treated since 3 patients had bilateral renal stone disease. Exclusion criteria include children, stone size less than 2 cm. in size, patient with end stage renal disease, infected urine, pregnancy, patients with uncontrolled bleeding disorder, and those with congenital, acquired urinary or skeletal abnormalities. Patients with complete staghorn calculi were not included in this study.

All patients were evaluated by history, physical examination, and investigation having similar protocol. The pertinent investigations are complete blood count, bleeding time, clotting time, blood sugar, blood urea, serum creatinine, serum electrolytes, urine routine and culture sensitivity, Ultrasonography of KUB region, plain X-ray of KUB region, X ray chest, Electrocardiogram, and Intravenous urography. Total 77 patients who fulfilled the criteria selected and divided into PCNL group (34) and open surgery group (43).

Before operation, each patient of two groups were evaluated and compared for age and sex of the patients, size and number of the stones, pelvicalyceal dilatation. Size and number of stone was determined preoperatively by ultrasonogram and excretory urography and was compared between two groups. Urinary tract infection was treated in all patients according to culture and sensitivity.

PCNL: A standard PCNL was performed with the patient under G/A. Access to the kidney was achieved through 1 puncture in 32 units and 2 puncture in 3 units. Pneumatic lithotripsy was used for stone fragmentation in all cases. Rigid nephroscope was used for visualization and extraction of stones. At the end of the procedure an 18 Fr nephrostomy tube was left in each puncture. The procedure was completed in 1 session in 30 kidneys and 2 sessions in 5 kidneys. Radiological evaluation was done postoperatively. Patient who were completely cleared of stones were considered stone free.

Open stone surgery: Open surgery was performed through standard flank incision with or without rib resection. The stones were retrieved via pyelolithotomy in 10 kidneys, extended pyelolithotomy in 12 cases, nephrolithotomy in 8 cases, calicolithotomy in 6 cases or combination of these procedures in 4 cases. An 6 Fr

DJ stent was left in situ in all cases, antibiotics were given routinely. In both groups patients who were discharged home with residual stone were scheduled for ESWL which was performed as an out patient procedure.

Data collection:

The clinical history of the patients, physical examination findings and relevant investigations, operative time, pre-operative event, required adjuvant procedures e.g. ESWL, post operative complication e.g. wound infection, pain, urinary fistula, residual stone, postoperative X-ray, duration of hospital stay were recorded for analysis. All patients in both groups were followed monthly for 3 months. All patients asked about the time required to return to normal activities.

Data analysis:

After collection of data, these were evaluated meticulously. SPSS-WIN 10.0 version analysis program were used. The measure of central tendency (mean), measure of dispersion (standard deviation) were performed. Statistical analysis of the means of continuous variables were performed with the unpaired student 't' test. Analysis of the significance of categorical variables were performed with the Chi-square test. P value obtained. A probable value of less than .05 is considered significant.

Results:

Both groups were comparable regarding age, sex, serum creatinine, incidence of UTI and stone size (Table-I). Loin pain was the most common clinical presentation seen in 32 patients in PCNL group and 41 in open surgery group. Haematuria was the presenting symptom in 4 and 3 in PCNL and open surgery group respectively. Only 1 patients in each group was asymptomatic and was discovered accidentally.

Total intraoperative complications were recorded in 12 (34.28%) cases in PCNL group and in 26(57.7%) cases in open surgery group with a difference of significant value ($P < .05$) (table-II).

Pleural injury was managed by immediate repair and pelvis injury was managed with adequate repair and DJ stenting.

Regarding bleeding requiring blood transfusion, 12 cases (34.28%) required blood transfusion in PCNL group, and among them 1 unit was required in 8(22.85%) cases and 2 units required in 4 (11.42%) cases. 23 cases had no need of blood transfusion. On the other hand in open

surgery group 22(48.8%) required blood transfusion and among them 1 unit of blood was required in 10(22.22%) cases and 2 units of blood was required in 10 (22.22%) cases and 3 units of blood was required in 2 cases (4.44%). P value>.05. So bleeding requiring blood transfusion was comparable in both PCNL group and open surgery group.

Post operative complications including wound infection, wound dehiscence, septicaemia, urinary fistula were observed. Total number of complications (septicaemia and urinary cutaneous fistula) observed in PCNL group were 4(11.42%). On the other hand total number of post operative complications(wound infection, wound dehiscence, septicaemia and ureterocutaneous fistula) in open surgery group were 16(35.5%). On analysis, the overall post operative complications were significantly lower in PCNL group than open surgery group. P<.05 (table-II).

The mean operation time of PCNL group was (121.71 ± 28.14 minutes) significantly lower than that of the open surgery group (152 minutes ± 25.1 1 minutes, P<.05, Table -III).

Post operative pain was compared on both groups to evaluate the amount of analgesia required to relief pain.

Dose of narcotic analgesic was significantly reduced in PCNL group than open surgery group to relief postoperative pain (P<.05) as is shown in table-IV.

Stone clearance including residual stone at discharge home and in follow up[clearance 28 (80%) in PCNL and 35(77.8%) in open surgery] were not significantly different among patients of both treatment groups (P<.05, table-V).

Patients with significant residual stones in the PCNL group (7) and in the open surgery group (10) were subject to ESWL. 1 patient in open surgery group refused ESWL. So in both groups 20% of the patients needed adjuvant procedure ESWL for clearance of the residual stone. In this study no significant difference were observed for clearance of residual stone by adjuvant procedure (P>.05, Table-VI).

Hospital stay involves considerable cost, which is considered in evaluating the procedure. Mean hospital stay was 4.65 ±2.24 days in PCNL group and in open surgery group was 11.22 ± 3.62 days. So, Mean hospital stay was significantly lower in PCNL group than open surgery group (P<.001, Table -VII). Return to work was also faster in PCNL group (3.66 ± 1.55 vs 5.6 ± 1.49 weeks, P<.001 (Table-VII).

Table-I
Preoperative characteristics of PCNL and open surgery group

Characteristics	PCNL	Open surgery
No. of patients	34	43
No. of kidneys	35	45
Mean patient age± SD	41.5±10.23 (26-60)	42.5±10.84 (27-64)
Sex(male/female)	28/6	35/8
Mean S. creatinine (mg/dl)	.98 ±.13	1.13 ±.2 (.6-1.8)
No. of patients with UTI	5(14.7)	8(18.6)
Mean size of the stone	4.01± .98 (2—6.1 cm)	4.1±.88 (2.2—6 cm)

Table-II
Intra operative and post operative complications

	PCNL	Open surgery	P value
No. of intraoperative complications(%)	12(34.28%)	26(57.7%)	
Bleeding	12(34.28%)	22(48.8%)	<.05
Pleural injury	0	2(4.4%)	
Renal pelvis injury	0	2(4.4%)	
Ureteral injury	0	0	
No. of postoperative complications (%)	4(11.42%)	16(35.5%)	
Wound infection	0	8(17.7%)	
Wound dehiscence	0	3(6.6%)	<.05
Septicaemia	2(5.7%)	2(5.7%)	
Ureterocutaneous fistula	2(5.7%)	3(6.6%)	

Table -III
Total operation time

Total time (in minutes)	PCNL (N=35)			Open surgery(N=45)			
	No.	mean	SD	No.	mean	SD	
60	0			0			t=5.006
90	10			0			
120	17	121.71 min	28.14	12	152 min	25.11	P<.05
150	4			20			
180	4			11			
210	0			2			

Table -IV
Amount of analgesia required to relief pain

Amount of narcotics	PCNL (N=35)	Open surgery (N=45)	P value
1 dose	20	0	
2 doses	15	4	<.05
3 doses	0	32	
>3 doses	0	9	

Table -V
Stone clearance and residual stone

No. of kidneys	PCNL	Open surgery	P value
Stone free	28(80%)	35(77.8%)	>.05
Residual stone	7(20%)	10(22.2%)	

Table -VI
Adjuvant procedure

Group of patients	Adjuvant procedure (ESWL)		P value
	No.	%	
PCNL (N = 35)	7	20	.05
Open surgery (N = 45)	9	20	

Table -VII
Mean hospital stay and mean time to return work

	PCNL		Open surgery		t value	P value
	Mean	SD	Mean	SD		
Hospital stay (in days)	4.65	2.24	11.22	3.62	9.805	<.001
Return to work (in weeks)	3.66	1.55	5.6	1.49	5.57	<.001

Discussion:

Present study has been designed to compare the outcome of PCNL and open surgery for the management of renal stone disease more than 2cm in size. Total 77 patients with 80 renal units were divided into PCNL (35) and open surgery (45) groups.

The age of the patients in both groups of the study ranges between 15 to 65 years and the majority between 36 and 45 years. The mean age of the patients in PCNL

groups was 41.5 years ± 10.23 years and in open surgery group was 42.5 ± 10.84 years. The age of the patients of both groups were compared, which was statistically insignificant (P>.05).

The age range of the present study more or less comparable with the study done by Assimosis DG et al, where age of the patients ranges between 31 years and 67 years in nephrolithotomy group and were between 23 years and 79 years in percutaneous nephrolithotomy

groups³. In a comparative study of percutaneous versus open surgery by Brannen GE et al., age range were reported between 15 years and 89 years in percutaneous nephrolithotomy group and between 21 years and 94 years in open surgery group⁸. In another study by Assimos DG et al., to evaluate the role of open stone surgery, age range was between 17 years and 43 years¹⁰.

In these two studies the highest age of the patients were 89 years and 94 years respectively, which is higher than the present study. This is due to long life expectancy of that country and elderly people attending in the clinic for stone treatment.

Cases with nearly equal size stone burden were included in both groups to compare the effectiveness of the method of treatment. In the present study stone size were between 2 cm. and 6 cm. In PCNL group, the average size of stone was 4.01 cm. \pm 0.98 cm. In open surgery group mean stone size was 4.1 cm. \pm .88 cm. Stone size of both groups were compared and no significant difference were found in size of the stone between two groups ($P > .05$). In a study Lingeman JE³, in the management of lower pole nephrolithiasis by ESWL and PCNL, stone size were recorded between 2 cm. and 7.5 cm. which is almost similar to the size of the stone of the present study. In another study by Stroom SB et al., to see the long term efficacy of combination therapy for struvite staghorn calculi, the size of the stone were recorded between 6 cm. to 11.5 cm¹². In the study of Stroom SB et al., the size of the stone is bigger than the present study as they have studied on staghorn calculi.

In evaluating per operative observation of bleeding requiring blood transfusion in PCNL group 12(34.28%) required blood transfusion and in open renal stone surgery 22(48.8%) required blood transfusion. Both groups were compared and blood transfusion was not significantly reduced in PCNL than open renal stone surgery ($P > .05$) in this observation. In study of Alkohlani et al. reported blood transfusion was required in 33% in open stone surgery and 14% required in PCNL group¹³. Rassweiler JJ et al. shows 37% vs. 10% blood transfusion is required in open surgery and PCNL respectively¹⁴.

In present study the amount of bleeding requiring blood transfusion was relatively higher in PCNL group in comparison of other studies. This may be due to the fact that these were the initial cases of PCNL in this centre.

In present study, the mean operation time was noted 121.71 min. \pm 28.14 min and 152 min. \pm 25.11 min in PCNL and open renal stone surgery respectively. The mean operation time was significantly lower than the open surgery group. $P < .05$. In comparative study of Alkohlani et al. showed mean operation time 127 \pm 30 min in PCNL and 204 \pm 31 min in open stone surgery¹³. Snyder and Smith in 1986, also showed lower time required in PCNL than open operation¹⁵. Mean operation time observed in present study is in accordance with those in literature.

Intra operative complications recorded in PCNL group was 12 cases (34.28%) and 26 cases (57.7%) in open surgery group. Among them bleeding requiring blood transfusion occurred in 12 cases (34.28%) in PCNL group and 22 cases (48.8%) in open surgery group. Pleural injury occurred in 2(4.4%) and renal pelvis injury occurred in 2(4.4%) cases in open surgery group. Neither of these complication occurred in PCNL group. The overall complication was significantly lower in PCNL group than open surgery group; $P < .05$. In a study of Alkohlani et al., intra operative complications like bleeding, pleural injury, renal pelvis injury, ureteral injury occurred in 7(16.3%) patients in PCNL group and 17(37.8%) patients in open surgery group³. The result of the present study was comparable with the above study.

Very few post operative complications were encountered after percutaneous nephrolithotomy in this series. Overall number of complications were 4 (11.42%) cases in PCNL group and 16(35.5%) cases in open surgery group which was significantly lower in PCNL group than in open surgery group. A study on complication of PCNL by Lee WJ et al in 1987 in a series of 542 patients reported 4% overall complications¹⁶. Another study by Al-Kohlani et al. showed overall complication in PCNL group was 8(18.6%) and 14(31.1%) in open surgery group¹³. Post operative complication rate of PCNL and open surgery in present study is almost similar to above study.

Out of 35 cases in PCNL group, only 2(5.7%) patients developed urinary fistula, which were managed by retrograde J-J stenting and 2 patients developed septicaemia. Neither of the patients developed wound infections nor wound dehiscence. Patients who underwent open surgery experienced complications different to those done by PCNL. Out of 45 cases in open surgery group, wound infection was recorded in 8(17.7%) cases and 3(6.6%) cases developed wound dehiscence and 2 cases developed septicaemia. 3(6.6%) cases developed cutaneous urinary fistula which

were managed by J-J stenting. Considering difference of complications between two groups, wound infection was significantly lower in PCNL group than open surgery group. In a comparative study, PCNL vs. open stone surgery by Brannen GE et al., no fistula recorded after PCNL but 2 (2%) patient developed cutaneous fistula after open stone Surgery⁸. In another study of analysis of complications of PCNL by Lee WJ et al., no cutaneous urinary fistula was recorded in PCNL group but 9 (7.96%) cases recorded cutaneous fistula among open surgery group¹⁶. In study by Alkohlani KM, et al., urinary fistula recorded 2 (4.7%) and 6 (13.3%) cases in PCNL and open surgery group respectively¹³. The results of the present study are comparable with the above study. Cutaneous fistula recorded in PCNL group of the present study is due to temporary ureteral obstruction due to oedema which was subsequently relieved by J-J stenting.

In study of PCNL vs. open surgery by Brannen GE found 4 (4%) wound infection rate among open stone surgery group but no wound infection encountered in PCNL group⁸. In another study by Alkohlani KM et al., showed 1(2.2%) case wound infection in open surgery group and 0(0%) case wound infection in PCNL group¹³. Slightly higher rate of infection in open surgery group was observed in the present series 8(17.7%) than the above studies. This may be due to better aseptic hospital environment of those centers than our center.

Post operative pain was compared in both groups of patient. In this series dose of narcotics required to relief pain was significantly reduced in PCNL group (no patient required more than two doses of narcotic analgesics) than open surgery group(41 patients needed 3 or more than 3 doses, $P < .05$). In study of comparison between PCNL and open surgery by Brannen GE reported 16(16%) patients complaining of pain after open surgery but in PCNL group no patient complaining of such pain which requires narcotic analgesics⁸. Snyder & Smith compared PCNL and open surgery group for staghorn calculi and found reduced dose of narcotics in PCNL group¹⁵. The result of the present study was comparable with the mentioned studies.

In present study complete stone clearance rate of PCNL and open surgery group were 28 (80%) and 35 (77.8%) respectively. Stone clearance at discharge home including stone free rate and frequency of residual stone were not significantly different among patients of both treatment groups. Brannen and associates reported 97% and 96% stone free rate for PCNL and open surgery respectively⁸. Alkohlani KM et al., also showed 74%

and 82% stone free rate in PCNL and open stone surgery respectively¹³.

The residual stone are fragments of the targeted stones detected on post operative X- rays of the kidneys, ureter and bladder. In the present study 7 (20%) and 10 (22.2%) patients were found to have residual stone in post operative plain radiograph in PCNL and open surgery group respectively. The rate of residual stone were not significantly different between two groups; $P > .05$. Brannen GE et al. in his study reported 6 (2.4%) and 4 (4%) residual stone following PCNL and open surgery respectively⁸. Segura JW et al. in a review article recorded 3% to 10.4% residual stone in different series following PCNL approach¹⁷. Assimios DG et al. in a comparative study between anatomic nephrolithotomy and PCNL reported 10% residual stone following anatomic nephrolithotomy¹¹. Stone clearance rate and residual stone primarily depend upon the stone size, stone burden and composition. For this reason there is difference in residual stone rate which we have observed in above two studies. In present study the stone free rate and residual stone rate is comparable in both group and also comparable with above studies.

To treat the residual stone, adjuvant procedure was needed and all were treated with ESWL. Out of 35 patients in PCNL group, 7 (17.5%) patients required ESWL for complete clearance of stone. And out 45 patients in open surgery group 10(22.2%) patients had residual stones but 1 of them had refused to do ESWL. So ultimately 9(20%) cases underwent subsequent ESWL for complete clearance of the stone. The total number of adjuvant procedure required for PCNL group were 7(20%) and for open surgery group were 9(20%) for complete clearance of stone. In this series no significant difference was observed for clearance of residual stone by adjuvant procedure ($P > .05$). Brannen GE in his study reported 3% adjuvant procedure in PCNL group and 4% adjuvant procedure needed after open surgery⁸. In a review study of percutaneous removal of kidney stone published in the journal of Urology by Segura J W reported addition of adjuvant procedure in only 2.7% cases¹⁷.

In evaluating method of stone management by PCNL and open surgery mean hospital stay of both groups were compared. The mean hospital stay for PCNL groups (mean 4.65 days) was significantly less than the mean hospital stay for open surgery group(mean 11.22 days); $P < .001$. Preminger GM et al. reported in a comparative study between PCNL and open surgery 4 days mean

hospital stay for PCNL and 10 days mean hospital stay for open surgery¹⁸. In another comparative study by Brannen GE reported similar result of 5.5 ± 0.3 days of hospital stays after PCNL and 8.4 ± 0.5 days after open surgery group⁸. In a comparative study of Alkohani KM et al. also reported of mean hospital stay 6.4 days in PCNL group and mean 10 days of hospital stay in open surgery group¹³. The present study is almost similar to those studies.

In evaluating the time to return work, in PCNL group time required to return work was significantly faster (mean 3.66 weeks) than in open surgery group (mean 5.6 weeks); $P < .001$. In study of Al Kohlani et al., reported mean 2.5 weeks \pm .8 weeks required to return work in PCNL group and mean 4.1 weeks \pm 1 week required to return work in open surgery group¹³. Brannen and associates, and Snyder & Smith also shows rapid return to work in PCNL group than open surgery group^{8,15}. The result of the present study is almost similar to the above studies.

Conclusion:

Percutaneous nephrolithotomy is better treatment option over open surgery in the management of renal calculi more than 2 cm in size. It has a similar stone free rate at discharge home in comparing with the open surgery but the advantages of lower morbidity, shorter operation time and early return to work.

References:

- Lingeman JE, Lifshitz DA, Evan AP. Surgical management of urinary Lithiasis. In: Walsh PC, Retik AB, Vaugan ED (Jr.), Wein AJ, editors. Campbell's Urology. 8th ed. Philadelphia: WB Saunders; 2002: p3361-3451.
- Chaussy CG. ESWL: Past, present and future. J Endo. 1988; 2: 97.
- Lingeman JE, Seigel YI, Steele B, et al. Management of lower pole nephrolithiasis: A critical analysis. J Urol. 1994; 151: 663-667.
- Brannen GE, Bush WH. Ultrasonic destruction of kidney stone. West J. Med. 1984; 140: 227.
- Smith AD. Forward: Symposium on endourology. Urol Clin. N. Amer. 1982; 9: 1.
- Castaneda-Zuniga WR, Clayman R, Smith A, Rusnik B, Herrera M, Amplatz K. Nephrostolithotomy: Percutaneous techniques for urinary calculus removal. Amer. J. Roentgen. 1982; 139: 721.
- Lee berman RP and Uehling DT. Percutaneous fragmentation and extraction of a large renal calculus. Amer. J. Roentgen. 1982; 138: 363.
- Brannen GE, Bush WH, Correa RJ, et al. Kidney stone removal: percutaneous vs. surgical lithotomy. J Urol. 1985; 133: 6-12.
- Agrawal MS. Percutaneous nephrolithotomy. Bombay Hospital Journal. 2002; 44: 45-53.
- Assimos DG, Boyce WH, Harrison LH, et al. The role of open stone surgery since extracorporeal shock wave lithotripsy. J Urol. 1989; 142: 263-267.
- Assimos DG, Wrenn JJ, Harrison LH, et al. A comparison of anatomic nephrolithotomy and percutaneous nephrolithotomy with and without extracorporeal shock wave lithotripsy for the management of patients with staghorn calculi. J Urol. 1991; 145: 710-714.
- Strem SB, Lammert G. Long term efficacy of combination therapy for struvite staghorn calculi. J Urol. 1992; 147: 563-565.
- Alkohani KM, Shoker AA, Mosbah A, et al. Treatment of complete staghorn stones: A prospective randomized comparison of open surgery vs. percutaneous nephrolithotomy. J Urol. 2005; 173: 469-473.
- RassweilerJJ, Renner C and Eiesenberger F. The management of complex renal stones. BJU. Int. 2000; 86: 919.
- Snyder JA, Smith AD. Staghorn calculi: Percutaneous extraction versus Anatomic nephrolithotomy. J Urol. 1986; 136: 351-353.
- Lee WJ, Smith AD, Cubell V, et al. Complications of percutaneous nephrolithotomy. Journal of American Roentgen Ray Society. 1987; 148: 177-180.
- Segura JW, Patterson DE, LeRoy AJ et al. Percutaneous removal of kidney stone: review of 1000 cases. J Urol. 1985; 134: 1077-1081.
- Preminger GM, Clayman RV, Hardeman SW, et al. Percutaneous vs. open surgery for renal calculi. JAMA. 1985; 254: 1054-1058.

Authors

- Assistant Professor, Dept. of Urology, MMCH, Mymensingh
- Associate Professor, Dept. of Urology, BSMMU, Dhaka
- Consultant, Urologist
- Professor of Urology, BSMMU, Dhaka

COMPARATIVE STUDY OF STENTED AND NON STENTED URETERONEOCYSTOSTOMY IN RENAL TRANSPLANTATION

ATM AMANULLAH¹, MS ISLAM¹, M HOSSAIN¹, S ISLAM¹, S JAHAN², AKMK ALAM¹, AKMA ISLAM¹, SAMG KIBRIA¹

Abstract

Objective: The aim of this study was to establish that ureteroneocystostomy over a stent was a better option than without stent in renal transplantation.

Methods: Forty three patients of end stage renal disease were enrolled in this study from nephrology department of Bangabandhu Sheikh Mujib Medical University (BSMMU) hospital, Dhaka for renal transplantation with live related donor. Purposive sampling method was followed as per inclusion and exclusion criteria. Selected 30 renal transplant patient was grouped as Group - I. Included 15 recipients who were subjected to ureteroneocystostomy with double J stent and Group - II. Included 15 recipients who were subjected to ureteroneocystostomy without double J stent. All transplantation was performed at urology department of BSMMU hospital by different surgeons. Extravesical ureteroneocystostomy was done with modified Lich Gregoir technique in all cases. Ureteroneocystostomy with double J stent done in 15 patients and without stent done in 15 patients. Extravesical and renal retroperitoneal drainage was done with drain tube and continuous bladder evacuation done by two-way Foley's urethral catheter in both group of ureteroneocystostomy. Native kidney was not removed in any cases. Drain output measured daily and noted. Intake and output chart maintained strictly. Condition of wound was observed daily for either soaked or not and recorded. Color of urine checked routinely. Drain was removed within 7 days in 28 cases and after 7 days in 2 cases. Urethral catheter was removed within 2 weeks in 27 cases and after 2 weeks in 3 cases. Skin stitches were removed on 10 to 14 days. Hospital stay was more than 30 days in 4 cases. Urine R/M/E, urine culture and sensitivity, blood urea, S. creatinine, S. electrolyte done on 7th day, 6 weeks and 3 months. X-ray KUB done on 4 week to see the position of the stent before removal of the stent at 6 weeks. With aseptic precaution under local anesthesia, stent removed after using one dose of prophylactic antibiotic as an outpatient basis by flexible or rigid cystoscopy. Ultrasound of transplant kidney ureter bladder with post void residue

was done on 6 weeks and 3 months in all cases. MCU and DTPA renogram with indirect vesicoureteric reflux test done on 3 months in a selected case. Postoperative patients were followed up for first 3 months. No one escaped follow up. In the follow up study, history taking, clinical examination and investigations, urine R/M/E, urine C/S, blood urea, serum creatinine and ultrasound of transplant kidney with PVR were done.

Results: In stented group postoperative complication was nil. There was no leakage of urine, no ureteral obstruction and post operative hospital stay was 30 days in all cases. In without stented case there were leakage of urine in 6 patients. In 4 patients there were leakage of urine < 7 days and in two cases it was > 7 days. To overcome prolong leakage of urine retrograde stenting was done in one case and exploration was needed with revision of ureteroneocystostomy one case and in four cases leakage was gradually stop with conservative measures. Conservative measures was ambulation, long time catheterization and anti-spasmodic drugs. In non-stented cases 4 patients developed ureteral obstruction and in 2 (two) cases it were managed by USG guided aspiration, one case with double J stent and one case obstruction relieved by spontaneous passage of blood clot. In non-stented cases postoperative hospital stay was 11(36.7%) for 30 days and more than 30 days in 4 (13.3%) cases. There was no leakage of urine or obstruction in stented group. Hospital stays reduced in stented group. In stent and without stent ureteroneocystostomy there was significant difference in urine leakage ($P < .024$) and ureteral obstruction ($P < .032$) and post operative hospital stay ($P < .032$). Postoperative infection had occurred in 6 cases of stent and 5 cases of without stented ureteroneocystostomy and difference was not significant ($P > 1.000$). There was no vesicoureteric reflux in both group after 3 (three) month follow up.

Conclusion: The use of a double J stent in ureteroneocystostomy in renal transplantation significantly decreases the rate of post operative transplant related complication and hospital stay. So routine use of double J stent is recommended in ureteroneocystostomy in renal transplantation.

Introduction

Renal transplantation is the procedure of choice and most cost effective strategy for the management of patients in end stage renal disease. Although major advances have been made in both dialysis and renal transplantation in the last 15 years, current knowledge firmly supports the notion that successful renal transplant is associated with substantial improvement in quality of life and significant reduction in morbidity and mortality from end-stage renal disease. Today more than 13 thousand renal transplants are performed annually in the United State¹.

In a country like Bangladesh where about more than one million people are suffering from kidney disease and about twenty thousand of them suffer from chronic renal failure and need some sort of replacement therapy either in the form of dialysis or transplantation. Since 1988 department of urology and nephrology of Bangabandhu Sheikh Mujib Medical University (BSMMU) performing renal transplantation regularly usually one case per week.

Ureteral reimplantation is one of the important components of reconstruction of urinary tract in renal transplantation. Various techniques of ureteral reimplantation have been described for different indication. Indication of reimplantation are numerous and varied. Five techniques were studied by Aboutaieb and colleagues like Leduc-Camey, Leadbetter-Politano, Direct, Manchette and Lich-Gregoir as both transvesical and extravesical procedure. They found Lich-Gregoir is the ideal technique for ureteral reimplantation in renal transplantation².

Vesicoureteral leak and obstruction are the commonest post transplant urological problem. The frequency of these complications ranges from 12.5% to 13.5%. Despite avoiding damage to the blood supply of the transplant ureter and adhering to meticulous anastomotic technique, complication still arise. Further measure aimed at preventing these problems, therefore deserve serious consideration. In non transplant patients (specially those with single kidneys), the primary insertion of a double J stent has been shown to prevent or markedly reduce the incidence of anastomotic leakage and stenosis after ureteral repair, pyeloplasty and ureterovesical reconstruction³.

Urologists successfully use ureteral stent to protect ureterovesical or ureterointestinal anastomosis in the native bladder or neobladder after cystectomy. Double J ureteral stent are also used to cure fistula or urinary

stenosis, particularly after kidney transplantation with good results. Therefore, there presently is debate as to whether it is useful to protect the urinary anastomosis during and after kidney transplantation with a DJ stent⁴. The use of indwelling ureteral stent to bypass ureteral obstruction or stenosis is well established in the urological literature. Stent have also been advocated as an effective adjunct for ureteral reconstruction following urological complications in renal transplant recipients. However, potential problems with the use of ureteral stents in the transplant setting and particularly, with their use on a routine basis, have not been defined⁵.

In BSMMU, renal transplantation is going on regular basis. We also observed several urological complications like hemorrhage, urinary leakage, ureteral obstruction, stenosis, infection in some cases. These complications sometime need additional measures like stenting, re-operation, and ultrasound-guided aspiration. These complications may be reduced by anastomosis over a stent, which may cause some complications. In our hospital there is no study about urological complication and use of stent in ureteroneocystostomy as prophylactic value in renal transplantation. Advantage of internal stenting are maintenance of a straight ureter with a constant caliber during early healing, the presence of a conduit for urine during healing, prevention of urinary extravasations, maintenance of urinary diversion and easy removal⁶. The practice of routine stenting of this anastomosis is controversial. Early reports described ureterocystostomy over a pediatric feeding tube with more recent papers describing use of silastic double pigtail or double J stent⁷. Proposed benefits to a stented anastomosis include continuous decompression of the ureter to avoid anastomotic tension, maintenance of the ureter in a more linear alignment to avoid kinking and protection from ureteral narrowing or postoperative luminal obstruction due to edema or external compression⁸. There are some complications of stent like suprapubic pain, dysuria, loin pain, migration of stent, infection, haematuria, stent breakage, stone formation if retained for long time and also spontaneous removal of stent.

Our study is to identify the advantage and possible disadvantage of ureteral stenting in renal transplantations. To see any difference in the ultimate effectiveness of stent and without-stent ureteroneocystostomy in renal transplantation, both early and late follow up of the patient is needed. We have compared the frequency of urological complication like

urinary leakage, obstruction, infection, reflux and hospital stay in two randomized group of ureteroneocystostomy in renal transplantation; one with stent and one without stent for early three months.

Methods

This prospective comparative study was carried out during the period from January 2003 to December 2004 in the department of urology and nephrology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh. Forty three patients of end stage renal disease were enrolled in nephrology department in BSMMU hospital, Dhaka for renal transplantation with live related donor.

Purposive sampling method was followed as per inclusion and exclusion criteria. Selected 30 renal transplant patients were grouped as Group-I: Included 15 recipients who were subjected to ureteroneocystostomy with double J stent; and Group-II: Included 15 recipients who were subjected to ureteroneocystostomy without double J stent.

The inclusion criteria were- Patients presenting with ESRD, Age between 18-65 years of either sex, first and second transplantation. The exclusion criteria were - Patients having features of early graft rejection, Patients died due to concomitant disease other than rejection within first 3 months of transplantation, patient who did not give consent. Detail history was taken and clinical examination and Preoperative evaluation of both donor and recipient were done. Lower urinary tract assessed with history and investigation like PVR by ultrasound and if necessary retrograde urethrogram and micturating cystourethrogram (RGU and MCU).

All transplantation was performed at urology department of BSMMU hospital by different surgeons. Prophylactic antibiotic was used routinely. Incision was from pubic tubercle to tip of twelve rib (right) and kidney placed in right para-psoas gutter except one case in which left side was used for re-transplantation. Vascular anastomosis was done with external iliac vein and internal or external iliac artery. Extravesical ureteroneocystostomy was done with modified Lich Gregoir technique meticulously with all precaution by 5-0 vicryl and it was interrupted watertight suture in all cases. Ureteroneocystostomy with double J stent done in 15 patients and without stent done in 15 patients. Stent was a urologic Double J stent which ranges in size from 4-6 Fr and length was 22 to 26 cm. Extravesical and renal retroperitoneal drainage was done with drain

tube and continuous bladder evacuation done by two-way Foley's urethral catheter in both group of ureteroneocystostomy. Native kidney was not removed in any cases. Drain output measured daily and noted. Intake and output chart maintained strictly. Condition of wound was observed daily for either soaked or not and recorded. Color of urine checked routinely. Drain was removed within 7 days in 28 cases and after 7 days in 2 cases. Urethral catheter was removed within 2 weeks in 27 cases and after 2 weeks in 3 cases. Skin stitches were removed on 10 to 14 days. Hospital stay was more than 30 days in 4 cases. Urine R/M/E, urine culture and sensitivity, blood urea, S. creatinine, S. electrolyte done on 7th day, 6 weeks and 3 months. X-ray KUB done on 4th week to see the position of the stent before removal of the stent at 6 weeks. With aseptic precaution under local anesthesia, stent removed after using one dose of prophylactic antibiotic as an outpatient department by flexible or rigid cystoscopy. Ultrasound of transplant kidney ureter bladder with post void residue was done on 6 weeks and 3 months in all cases. MCU and DTPA renogram with indirect vesicoureteric reflux done on 3 months in a selected case.

Postoperative urological complications like leakage of urine (both internal and external), obstruction, stenosis, infections and haematuria were managed accordingly. Post operative hospital stay was recorded for each patient. Immunosuppression was started on the day before transplantation and continued as maintenance therapy with prednisolone, cyclosporine and azathioprine. Clinically suspicious rejection episodes were treated with bolus dose of steroids.

Postoperative patients were followed up for first 3 months. No one escaped follow up. In the follow up study, history taking, clinical examination and investigations, urine R/M/E, urine C/S, blood urea, serum creatinine and ultrasound of transplant kidney with PVR done. MCU and DTPA renogram with indirect vesicoureteric reflux done on 3 months in selected cases. Color doppler study and serum cyclosporine level and renal biopsy was not needed in any cases in our study.

All patients (recipients) were given an explanation of the study and informed consent was taken. The study did not involve any additional investigation and did not involve any additional risk or cause economic burden to the patients.

This study was prospective comparative study, comparing the immediate postoperative complications after ureteroneocystostomy with stent or without stent.

Comparison of complication between the group were made using paired or unpaired students “t” test and Chi-square (χ^2 test). Both computer (SPSS) and manual technology were used for statistical analysis. Probability (P) value <0.05 was considered as significant.

Result

Thirty cases of renal transplantation were included in this study. Causes of ESRD were chronic glomerulonephritis (27), hypertension (2) and hereditary (1). Twenty-nine patients received first transplantation and single patient second transplantation.

Among 30 transplants, double J ureteral stenting was done in 15 patients (group-I) and without double J ureteral stent in remaining 15 patients (group-II). During the study period, 43 renal transplantation were done in our hospital, out of them 4(four) patient died due to nontransplant related cause and 9 patients had graft failure within 3 (three) month of transplantation and they were not included in this study. Cold ischaemia time was 25 to 50 minutes. Both groups were compared in relation to general characteristics such as sex, age of patient, donor creatinine level.

Mean (\pm SD) age of the recipients was 26.73 (\pm 9.03) years (range 18 to 43 years) and 26.07 (\pm 7.86) years. (range 21-49 years) in group-I and group-II respectively. Recipients were 70% (21) male and 30%(09) female. In group-I, there were 10(33.3%) male and 5(16.7%) female and in group-II, 11(36.7%) male and 4(13.3%) female (Table -I).

Table - I

Characteristics of the patients in the study Group - I (with stent) and group - II (without stent)

Character	Stent group	Without stent group
Number	15(50%)	15(50%)
Male	10(33.3%)	11(36.7%)
Female	05(16.7%)	04(13.3%)
Mean age (years)	26.73 \pm 9.03 years (18-43)	26.07 \pm 7.86 years (21-49)
First/second transplant	14/01	15

Table-II

Relation of donor with recipient - parents 15(50%), sibling 10(33.33%), spouse 2(6.66%), maternal or paternal uncle/aunt 3(9.99%).

Relation	Male	Female	Total
Parents	4	11	15
Sibling	6	4	10
Spouse	0	2	2
Maternal /paternal uncle/aunt	2	1	3
Offspring	0	0	0

Both HLA and cytotoxic cross match were done for the recipients and donor. There was 50% HLA match for 26 patients and 25% match for 4 patients. Cytotoxic cross match was negative for 26 (86.67%) and 20% or more cross match positive for 4 patients. HLA histocompatibility match between two groups was not significantly different.

Stent related mild symptoms like terminal dysuria and suprapubic discomfort was present in few cases but there was no stent-related complication like spontaneous removal of stent, breakage or stone formation. In group-I, 6 patients had urinary tract infection (UTI). After urine culture organism isolated were Escherichia coli (3), Pseudomonas aeruginosa (1), Staphylococcus epidermis (1) and Enterococci (1). Three patients had recurrent UTI, two with same organism and one with different organisms. In group-II patients, 5 patients had urinary tract infection (UTI). After urine culture organism isolated were Escherichia coli (2), Pseudomonas aeruginosa (1), Staphylococcus epidermis (1) and Enterococci (1) (Table-III).

Table –III

Postoperative infection between stented and non-stented ureteroneocystostomy in renal transplantation (X2 value)

Group	Infection	df	χ^2 value	P value
Stent	No. (%) 9(30%)	6(20%)		
Without stent	No. (%) 10 (33.3%)	5 (16.7%)	1	.144 1.000*
Total	No. (%) 19 (63.3%)	11(33.7%)		

• Not significant

During 3 months of study period, 11 patients suffered from UTI, of them 8 patients had single episode and 3 patients had recurrent episodes.

Postoperative leakage of urine between stented and without stented ureteroneocystostomy in renal transplantation was, in group-I none had urinary leakage but in group-II there was leakage in 6 cases. Among them increased drain output was seen in 4 cases and 2 had extravasation through incisional wound. The difference of leakage between two groups was significant (Table-IV).

Ureteral obstruction signified by pelvicalyceal system dilatation was seen in 4 cases in non-stented group but none in case of stented group. In our 3 months study

we did not find any case of stenosis (Table-V).

Table VI shows post operative hospital stay between stented and non-stented ureteroneocystostomy. In group I (n=15), no patient stayed in hospital for more than 30 days and in group II (n=15), 11 patients stayed hospital for 30 days and 4 patients stayed in hospital up to 6 weeks. Hospital stay in two groups was significant due to urological problem.

We did not find any case of vesicoureteric reflux in both groups including patients with recurrent urinary tract infection.

Renal function at 6 weeks and 3 months was found within normal range in two groups by using serum creatinine, blood urea and serum electrolytes.

Table – IV

Postoperative urinary leakage between stented and non-stented ureteroneocystostomy (χ^2 value)

Group		Urinary leakage			df	χ^2 value	P value
		No (-)	<7 days	>7days			
Stent	No. (%)	15(50%)	0(00%)	0(00%)	2	7.500	.024*
Non-stent	No. (%)	9(30%)	4(13.3%)	2(6.7%)			
Total	No. (%)	24(80%)	4(13.3%)	2(6.7%)			

*Significant

Table - V

Postoperative obstruction between stented and non-stented ureteroneocystostomy (χ^2 value)

Group		No obstruction	Obstruction	df	χ^2 value	P Value
Stent	No. (%)	15(50%)	0(00%)	1	4.615	.032*
Non-stent	No.(%)	11(36.7%)	4(13.3%)			
Total	No.(%)	26(86.7%)	4(13.3%)			

*Significant

Table - VI

Postoperative hospital stays between stented and non- stented ureteroneocystostomy (χ^2 value)

Group		Hospital Stay (days)		df	χ^2 value	p value
		<30 days	>30days			
Stent	No.(%)	15(50%)	0(00%)	4	4.615	.032*
Non-stent	No.(%)	11(36.7%)	4(13.3%)			
Total	No.(%)	26(86.7%)	4(13.3%)			

* Significant

Discussion

Renal transplant is the most important treatment option for ESRD as a renal replacement therapy. After completion of renal vascular anastomosis, we revascularised the kidney and ureteroneocystostomy then done. There were different methods of ureteroneocystostomy such as Leduc-Camey, Lich-Gregoir, Leadbetter-Politano, Direct and Manchuate. In renal transplantation, Lich-Gregoir, is the ideal technique².

We use extravesical ureteroneocystostomy for urinary tract reconstruction. When compared with transvesical procedure the extravesical procedure are faster and a separate cystostomy is not needed and less ureteric length is required. These factors reduce the operating time, bladder spasm, hemorrhage and preserve the adequate distal ureteric blood supply. Extravesical technique is based on the procedure described by Lich-Gregoir. A subsequent modification was done by the addition of a stitch to anchor the toe of the spatulated ureter to the bladder. It prevents proximal spillage of the ureter in the submucosal tunnel with loss of anti reflux valve and disruption of the ureteric anastomosis⁹.

This approach is associated with a low complication rate. Thus most center have adopted this technique. Many surgeons have added the step of placing a ureteral stent across this anastomosis. Recent publication shows that rate of urological complications ranges from 0.0 to 4.6% with stent in place¹⁰. The vulnerability of the graft ureter in renal transplantation makes the organ a source of serious complication. However, paying attention to operative techniques of procurement and transplantation can prevent these complications almost totally. The initial potential insult is a harvesting injury, skeletonizing or inadvertently stretching the ureter, resulting in attenuated blood supply and thereby threatening its viability. It is not always possible to ensure consistent and proper organ retrieval by the donor team, or to assess intraoperatively whether a ureter will develop ischaemic necrosis or stricture¹¹.

Many urological complications are technical in nature, although contribution of rejection to ureteral damage has yet to be clarified. This technical problems can occur during retrieval or implantation. Effective retrieval begins with a careful inspection of the donor collecting system and ureter. The importance of maintaining ureteral blood supply by not dissecting the periureteral connective tissue, and avoiding the "golden triangle" of the renal hilum, great vessels and medial lower pole is well

documented and bears constant reinforcement to all those involved with organ procurement surgery. The ureteral anastomosis, regardless of technique, requires the same meticulous care as the vascular component of the transplant¹².

A prophylactic ureteric stent for all kidney transplant ureteroneocystostomies has been shown by Pleass and colleagues in a randomized prospective trial to reduce the incidence of urological complication¹³.

Study conducted on complication following unstented parallel incision extravesical ureteroneocystostomy in 1000 kidney transplant patients showed ureteral complication in 30 patients including 21 anastomosis related problem¹³.

Modified extravesical ureteral implantation and routine stenting in kidney transplantation as study conducted by Khauli R in 2002 for 220 cases, found no urinary leak, 5 patients developed temporary ureterovesical junction obstruction/odema following stent removal, which necessitated re-stenting for 4-6 weeks. Two patients developed delayed stenosis and treated successfully with retrograde balloon dilatation¹¹.

In stenting case, one case of urinary leakage in 97 cases of stented ureteroneocystostomy⁴ and 2 cases in 143 cases of ureteroneocystostomy. But no case in 28 cases of ureteroneocystostomy, in 129 cases of ureteroneocystostomy and in 57 in the renal transplantation^{4,14,15,16,8}.

In case of non-stent ureteroneocystostomy, urinary leakage was seen in 9(nine) out of 1000 cases, 2 (two) of 28 cases, 6 (six) of 97 cases, 2 (two) of 43 cases and 9 (nine) of 137 cases of renal transplantation^{17,15, 14}.

The case series data were reviewed in three subgroups by decade (1973-1982, 1983 -1992 and 1993 - 2002). Data from first two decades fail to show a significant difference but in recent decade stented anastomosis having significant protective effect against urological complication. Obviously, there were many changes in care throughout this 30-year time period including pre- and postoperative care, immunosuppression and transplant volume¹⁰. Despite preserving the vascularity of the ureter during donor nephrectomy and adhering to a meticulous anastomotic technique, complications still occurred. The mechanism as to how a stent can prevent formation of fistula is not clear. A stent enables us to perform ureterovesical anastomosis more easily and

meticulously, avoids ureteral bending or kinking, and ensures a sufficient diameter at the anastomotic site. It also avoids compression and obstruction in a tight submucosal tunnel⁸.

After stenting of ureteroneocystostomy in renal transplantation few postoperative complications were encountered by different authors and they attributed to the routine use of stent.

In prospective study shows that there was no leakage of urine in any cases of stented ureteroneocystostomy but in without stented ureteroneocystostomy there was leakage of urine in 6 cases. Of these 6 cases leakage of urine was more than 7 days in 2 cases. Most of this leakage was managed conservatively except 2 cases were managed by placement of DJ stent and reimplantation. Difference of postoperative leakage of urine between stent and without stent ureteroneocystostomy was significant ($P < .024$).

An important aspect in analyzing the outcome of stent and non-stent ureteroneocystostomy was obstruction of ureter. In stenting case, one case of ureteral obstruction was seen in 97 cases of stented ureteroneocystostomy. But no case in 143 cases of ureteroneocystostomy, in 57 cases of ureteroneocystostomy and 75 cases of ureteroneocystostomy in the renal transplantation^{4,14,8,13}.

Non-stent cases, 3 (three) cases of ureteral obstruction were seen in 137, 1 (one) case in 43, 4 (four) cases in 97 and 5 (five) cases in 75 cases of ureteroneocystostomy of renal transplantation^{14,8,4,13}.

In this study ureteric obstruction was found in four cases of without stent ureteroneocystostomy. In 4 cases 2 cases due to urinoma formation, 1 case due to lymphocele and one due to blood clot. They were managed with USG guided aspiration, 1 case treated with double J stenting and one case obstruction relieved by passage of blood clot.

In BSMMU protocol transplant patient was kept in aseptic room (Intensive care unit for transplant patient) for 30 days, then patient was shifted to transplant ward if patient required more than 30 days hospitalization for urological or nephrological ground. Usually most of the transplant patient discharged within 30 days. An important aspect of analyzing the outcome of stent and without stent ureteroneocystostomy is the postoperative hospital stays. This reflects to a postoperative morbidity and it is obviously of considerable importance. In the present study post operative hospital stay is more in

without stented group. Most of the patients of stented group were discharged within 30 days. The difference in hospital stay was significant ($P < .046$).

The success of renal transplant depends on a compromise between achieving sufficient immunosuppression to avoid rejection of the graft and maintaining a sufficient level of immunocompetence to protect the recipient from infection. In the early years of transplantation the incidence of severe and lethal infection was high but with increasing experience, renal transplantation now offer equivalent or better patients survival than haemodialysis. A study carried out in the early 1980's Peterson and colleagues found that 32% of patients suffered a clinically significant infection; 7% patients died and in 87% of these deaths, infection was an important factor.

Patients included for transplant were evaluated for common infection such as UTI, lung infection, dental and sinus infection before transplant and treated with proper antibiotics prior to transplant.

Postoperative UTI was reported in 40-50% of renal transplant recipients. Immunosuppression, intravenous cannula, urethral catheter, drain tube are important risk for infection. With the use of stent we have not observed any increase of urinary infection.

In cases of without stented ureteroneocystostomy, 12 out of 115 patients of renal transplantation had UTI, 119 (34%) patients of 287 case of routine use of stent case had UTI. Of these patients 41(11.5%) had multiple infections. 13 patient of 28 with stent and 14 patients of 28 without stent ureteroneocystostomy case had a positive urine culture. Thirty one patients of 83 case had urinary tract infection in non-stented cases and 28 patients of 84 patients had urinary tract infection in first 3 months. In this study over all infection rate is 33.67%. In this study infection in stented group was 6(six) case and 5(five) in without stent cases. There was no significant difference in between the group. In stented group all urinary tract infection responded to prompt treatment with antibiotics and removal of stent and in non-stented group treated with antibiotics^{17,18,15,3}.

Complication related to DJ stent such as migration, breakage, stone formation or obstruction after removal was not seen in our study. In different study such complication had occurred. Obstruction of ureter occurred due to urothelial reaction to stent after removal of stent. Symptoms due to stent observed in some patients with suprapubic pain, loin pain etc. For such symptom no stent removal was needed.

In our study, there was no reflux in both groups. This was done with MCU and DTPA renogram with indirect voiding cystography. Disadvantage of extravescical implantation is a greater risk of reflux. Recipients having one or more episode of urinary tract infection, Renogram with indirect voiding cystography showed VUR in 16 cases and MCU showed VUR in 14 cases. One case of 1000 renal transplant had symptomatic VUR and 4 cases of another study showed VUR in 1000 cases of non-stent ureteroneocystostomy^{19,20,12,17}.

The limitations of this study were - small sample size with short time follow-up period, different surgeon performed the operation, double J stent that was used in study were of variable length and diameter, bladder capacity and wall thickness were not measured accurately before operation.

Conclusion

The use of a double J stent in ureteroneocystostomy in renal transplantation significantly decreases the rate of urinary leakage, ureteral obstruction and hospital stay. There was no vesicoureteric reflux in early 3 month follow up period in both without stent and with stent group after removal of stent in renal transplantation. Stent placement does not increase the risk of urinary tract infections and other stent related complications if the stent removed early. So routine use of double J stent is recommended in ureteroneocystostomy in renal transplantation.

References

1. Breton PN, Malone MJ. Renal transplantation. Tanagho EA and MC Aninch JW. Smith's General Urology. Sixteenth edition. MacGraw Hill. 2004; 614-625.
2. Aboutaieb R, Rabii R, El Mrini M, Benjelloun S. Ureteral reimplantation. *Ann Urol*. 1996; 30: 240-243.
3. Lin LC Koo Seen, M Bewick and CG Koffman. Primary use of a double J silicone stent in renal transplantation. *Brit J Urol*. 1993; 72: 697-701.
4. Benoit G, Blanchet P, Eschwege P, Alexandre L, Bensadoun H, Charpentier B. Insertion of a double J ureteral stent for the prevention of urological complications in renal transplantation: A prospective randomized study. *J Urol*. 1996; 156: 81-84.
5. Nicol DL, P'Ng K, Hardie DR, Wall DR, Hardie IR. Routine use of indwelling ureteral stents in renal transplantation. *J Urol*. 1993; 150: 375-379.
6. McAninch JW. Injuries to the genitourinary tract. *Smith's General Urology*. 16th edition. McGraw-Hill. 2004; 291-310.
7. Waltke EA, Adams MB, Kauffman HM, Sampson D, Hodgson NB, Lawson RK. Prospective randomized comparison of urologic complications in end-to-side versus Politano-Leadbetter ureteroneocystostomy in 131 human cadaver renal transplants. *J Urol*. 1982; 128: 1170-1172.
8. Kurnar A, Kumar R, Bhandari M. Significance of routine JJ stenting in living related renal transplantation: A prospective, randomized study. *Transplant Proc*. 1998; 30(7): 2995-2997.
9. Bradic I, Pasini M, Vlatkovic G. Antireflux ureteroneocystostomy at the vertex of bladder. *Br. J. Urol*. 1975; 47: 525.
10. Mangus RS, Haag BW. Stented versus nonstented extravescical ureteroneocystostomy in renal transplantation: A Metaanalysis. *Am J Transplant*. 2004; 4: 1-8.
11. Khauli R. Modified extravescical ureteral reimplantation and routine stenting in kidney transplantation. *Transplant*. 2002 Sep; 15(8): 411-4.
12. Shoskes Daniel A, Hanbury Dasmien, Cranston David, Morris Peter J. Urological complications in 1000 consecutive renal transplant recipients. *J Urol*. 1995; 153(1): 18-21.
13. Pleass HCC, Clark KR, Rigg KM et al. Urologic complications after renal transplantation: A prospective randomized trial comparing different techniques of ureteric anastomosis and the use of prophylactic ureteric stents. *Transplant Proc*. 1995; 27: 1091-1092.
14. Dominguez J, Clase CM, Mahalati K, MacDonald AS, McAlister VC, Belisky P, Kiberd B, Lawren JG. Is routine ureteric stenting needed in kidney transplantation? A randomised trial. *Transplantation*. 2000 Aug 27; 70(4): 597-601.
15. Briones MG, Burgos Revilla FJ, fascaul Santos J et al. Comparative study of ureteral anastomosis with or without double-J catheterization in renal transplantation. *Actas Urol Esp*. 2001; 25(7): 499-503.
16. Lasaponara F, Manassero F, Catti M, Rossi R, Ferrando U. The use of small caliber J-J stent with

- anti-reflux valve in double kidney transplant. Personal experience. *Minerva Urol Nefrol.* 2002; 54: 9-13.
17. Gibbons WS, Barry JM, Hefty TR. Complication following unstented parallel incision extravesical ureteroneocystostomy in renal transplantation. *J Urol.* 1992 Jul; 148(1): 38-40.
18. David L, Nicol, Kenny P' Ng, Hardie, Daryl R Wall and Ian R Hardie. Routine use of indwelling ureteral stents in renal transplantation. *J Urol.* 1993; 150: 1375-1379.
19. Yadav RVS, Johnson W, Morris PJ, Sprague P, Yoffa D, Marshall VC. Vesicoureteric reflux following renal transplantation. *Brit J Surg.* 1972; 59: 33.
20. Kmectec Andrej, Bren Andrej F, Aljosa Kandus, Jurij Feyyich and Buturovi-Ponikvar. Contrast enhanced ultrasound voiding cystography as a screening examination for vcsicoureteral reflux in the follow -up of renal transplant recipients: a new approach. *Nephrol Dial Transplant.* 2001; 16:.120-123.

Authors

1. Department of Urology, BSMMU, Dhaka.
2. Department of Paediatrics, BSMMU, Dhaka.

CASE REPORT

AN UNUSUAL CAUSE OF VESICAL STONE: A MIGRANT COPPER-T

ME HAQUE, AS JABBAR, MSA CHOWDHURY, A RASUL, MS HOSSAIN, MA SALAM, SA KHAN, AZM Z HOSSAIN

A 47 years old perimenopausal multipara, attending urology department with complaints of lower urinary tract symptoms, predominantly irritative variety; low back pain and lower abdominal pain with history of insertion of intrauterine contraceptive device (Copper T) about 20 years back. After 6 months of insertion of copper T she had missing thread and regular menstrual period and took oral contraceptive pills for contraception. Her physical examination revealed mild tenderness in the suprapubic area. Ultrasound scan showed stone in urinary bladder and plain X-ray of KUB region showed T shaped stone in the bladder area with Copper T inside the stone (figure 1). Her urinalysis revealed normal findings with no growth of bacteria on culture. Her serum creatinine level was 83 micromole/L.

She underwent cystoscopic evaluation under spinal anaesthesia which revealed vesical stone and retrieved by Mauermayer's stone punch. Fragmented Copper T was found inside the stone. A bi-channel Foleys catheter



Fig.-1 : Pre-operative x-ray

was introduced and kept in situ for one day. Her postoperative period was uneventful and she was discharged on 1st post operative day. Check X-ray of pelvis revealed normal findings (figure 2).



Fig.-2 : Post-operative x-ray

Discussion

Intrauterine contraceptive device (IUD) has been widely used since 1965¹. Although perforation of the uterus by an intrauterine device is not uncommon, intravesical migration with secondary stone formation is a rare complication².

IUD is generally a safe modality for long-term contraception. Associated complications are bleeding, infection, ectopic pregnancy and uterine perforation. Uterine perforation is one of the most serious but uncommon complications associated with an IUD³. The mechanism of perforation is thought to be the insertion procedure or chronic inflammatory reaction with gradual erosion through the uterine wall¹. The incidence is influenced by several factors including the timing of insertion, parity, previous abortions, type of IUD inserted, experience of the operator and position of the uterus⁴. Most of the perforations take place at the time of insertion. Delayed onset of symptoms supports secondary migration¹. The timing of IUD insertion is flexible. Previous studies showed IUD insertion 0-3 months postpartum increased the risk of uterine perforation as did insertions at 3-6 months postpartum⁴.

Patients with IUD should be alerted about the possibility of its migration. Regular self examination for "missing threads" is useful in the early detection of migration of the IUD. A plain radiograph of the abdomen is usually

the initial examination of choice to verify the presence of the IUD in the pelvis. Once found, an ultrasound examination has to be done to determine the location of the IUD relative to the uterus. Withdrawal of the migrated IUD is advisable even if its migration has not given rise to any clinical symptoms⁵ and can avoid further complications like bowel perforation, bladder perforation and secondary stone formation or fistula formation⁶.

In any woman in whom an intrauterine device is fitted and who presents with lower urinary tract symptoms, the possibility of intravesical migration of the device should be included in the differential diagnosis.

References:

1. Zakin D, Stern WZ, Rosenblatt R. Complete and partial uterine perforation and embedding following insertion of intrauterine devices. *Obstet Gynaecol Surg.* 1981; 36: 335-353.
2. Rafique M, Rauf A, Khan NA, Haque TU. An unusual cause of vesical stone: a migrant intrauterine device. *Eur J Contracept Reprod Health Care.* 2003; 8(3):170-2.
3. Key TC, Kreutner AK. Gastrointestinal complications of modern intrauterine contraceptive device. *Obstet Gynecol.* 1980; 55: 239-244.
4. Heartwell S, Schlesselman S. Risk of uterine perforation among users of intrauterine devices. *Obstet Gynecol.* 1983; 61: 31-36.
5. Treisser A, Colau JC. Causes, diagnosis and treatment of uterine perforations by intrauterine devices. *J Gynecol Obstet Biol Reprod.* 1978; 7: 837-847.
6. Berman MC, Cohen HL. *Obstetrics and gynecology: A guide to clinical practice.* Diagnostic Medical Sonography. Lippincott 1997: 569-571.

Authors:

Department of Urology, Dhaka Medical College, Dhaka

ABSTRACT FROM CURRENT LITERATURE

Secondary Hormonal Therapy for Advanced Prostate Cancer

John S. Lam, John T. Leppert, Sreenivas N. Vemulapalli, Oleg Shvarts and Arie S. Belldegrun*,†

From the Department of Urology, David Geffen School of Medicine at University of California-Los Angeles, Los Angeles, California

Purpose: Androgen ablation remains the cornerstone of management for advanced prostate cancer. Therapeutic options in patients with progressive disease following androgen deprivation include antiandrogen withdrawal, secondary hormonal agents and chemotherapy. Multiple secondary hormonal agents have clinical activity and the sequential use of these agents may lead to prolonged periods of clinical response. We provide a state-of-the-art review of the various agents currently used for secondary hormonal manipulation and discusses their role in the systemic treatment of patients with prostate cancer.

Materials and Methods: A comprehensive review of the peer reviewed literature was performed on the topic of secondary hormonal therapies, including oral antiandrogens, adrenal androgen inhibitors, corticosteroids, estrogenic compounds, gonadotropin-releasing hormone antagonists and alternative hormonal therapies for advanced prostate cancer.

Results: Secondary hormonal therapies can provide a safe and effective treatment option in patients with AIPC. The use of steroids and adrenolytics, such as ketoconazole and aminoglutethimide, has resulted in symptomatic improvement and a greater than 50% prostate specific antigen decrease in a substantial percent of patients with AIPC. A similar clinical benefit has been demonstrated with estrogen based therapies. Furthermore, these therapies have demonstrated a decrease in metastatic disease burden. Other novel hormonal therapies are currently under investigation and they may also show promise as secondary hormonal therapies. Finally, guidelines from the United States Food and Drug Administration Prostate Cancer Endpoints Workshop were reviewed in the context of developing new agents.

Conclusions: Secondary hormonal therapy serves as an excellent therapeutic option in patients with AIPC in

whom primary hormonal therapy has failed. Practicing urologists should familiarize themselves with these oral medications, their indications and their potential side effects.

Copyright © 2006 By American Urological Association®

The Journal Of Urology Vol. 175, 27-34, January 2006

Alfuzosin for Symptomatic Benign Prostatic Hyperplasia: Long-Term Experience

Kevin T. McVary*,†

From the Department of Urology, Feinberg School of Medicine, Northwestern University, Chicago, Illinois

Purpose: Evidence of the long-term efficacy and safety of alfuzosin treatment for LUTS indicative of BPH was examined.

Materials and Methods: An English literature search of MEDLINE, PubMed and proceedings from scientific meetings from 1974 to 2004 was done. Search terms included benign prostatic hyperplasia, alfuzosin, treatment, α_1 -adrenergic receptor blocker, long-term, followup, lower urinary tract symptoms, complications or adverse events, sexual, retention and cardiovascular.

Results: Currently α_1 -adrenergic receptor blocking agents are first line treatment for BPH. Although all α_1 -blocking compounds show similar levels of efficacy for LUTS treatment, newer agents such as alfuzosin tend to demonstrate improved selectivity for the prostate and bladder with few vasodilatory effects and they have tolerability advantages over older α_1 -blocking compounds. Immediate, sustained and newer extended release alfuzosin formulations significantly improve LUTS indicative of BPH but extended release alfuzosin may be more convenient to administer and it tends to show better vasodilatory tolerability than the older immediate release formulation.

Conclusions: When used to treat BPH, alfuzosin provides symptom relief, decreased residual post-void urine volume and a decreased risk of acute urinary retention, which are maintained during long-term use. Most vasodilatory side effects occur early in treatment

and they become less frequent thereafter. Patient quality of life also improves with maximal improvements observed after 12 months of treatment. Continued study will further clarify the physiological, clinical and personal benefits produced by alfuzosin when used for the management of LUTS indicative of BPH.

Copyright © 2006 by American Urological Association

Journal of Urology. Vol. 175, 35-42, January 2006

Victor Fray Marshall: Twentieth Century Renaissance Urologist

*Stephen Boorjian, *E. Darracott Vaughan, Jr., W. Reid Pitts, Jr. and Edward C. Muecke*

From the Department of Urology, New York Presbyterian Hospital-Weill-Cornell Medical Center, New York, New York

Purpose: Victor Fray Marshall (1913 to 2001) contributed to advancements in a variety of fields within urology, including incontinence, oncology, stone disease and pediatrics.

Materials and Methods: We reviewed historical records from the New York Hospital archives as well as the original

publications of Marshall. Personal experiences of former residents and others were recounted.

Results: While Marshall may be most recognized for Marshall-Marchetti-Krantz vesicourethral suspension, designed to correct stress urinary incontinence, he was among the earliest advocates of surgical extirpation for bladder cancer and helped introduce the use of urinary cytology for the diagnosis of urothelial malignancy. At the same time Marshall contributed to the development of ureteroscopy for stone disease. His contributions to pediatric urology include the description of a nonrefluxing ureteral re-implantation technique for the surgical correction of reflux as well as his investigation of the embryology and surgical repair of bladder exstrophy.

Conclusions: The contributions of Victor Marshall to urology are notable in breadth and significance.

Copyright © 2006 by American Urological Association

The Journal Of Urology Vol. 175, 43-45, January 2006

A Clinical Trial With Chimeric Monoclonal Antibody WX-G250 and Low Dose Interleukin-2 Pulsing Scheme for Advanced Renal Cell Carcinoma

*I. Bleumer, E. Oosterwijk, J. C. Oosterwijk-Wakka, M. C. W. Völler, S. Melchior, S. O. Warnaar, C. Mala, J. Beck and P. F. A. Mulders**

From the Department of Urology, Radboud University Nijmegen Medical Centre (IB, EO, JCO-W, MV, PFAM), Nijmegen, The Netherlands, and Johannes Gutenberg University (SM, JB), Mainz and Willex AG (SOW, CM), Munich, Germany

Purpose: WX-G250 is a chimeric monoclonal antibody that binds to carbonic anhydrase IXG250/MN, which is present on greater than 95% of RCCs of the clear cell subtype. The suggested working mechanism of WX-G250 is by ADCC. Because the number of activated ADCC effector cells can be increased by a low dose interleukin-2 pulsing schedule, a multicenter study was initiated to investigate whether WX-G250 combined with LD-IL-2 could lead to an improved clinical outcome in patients with progressive RCC.

Materials and Methods: A total of 35 patients with progressive clear cell RCC received weekly infusions of WX-G250 for 11 weeks combined with a daily LD-IL-2 regimen. Patients were monitored longitudinally for ADCC capacity. Radiological assessment of metastatic lesions was performed at week 16 and regularly until disease progression.

Results: A durable clinical benefit was achieved in 8 of 35 patients (23%), including 3 with a partial response and 5 with stabilization at 24 weeks or greater. Mean survival was 22 months. In general treatment was well tolerated with little toxicity. The number of effector cells increased during treatment but lytic capacity per cell did not increase. ADCC and clinical outcome did not appear to correlate.

Conclusions: WX-G250 combined with LD-IL-2 in patients with metastatic RCC is safe and well tolerated. With a substantial clinical benefit and a median survival of 22 months in patients with metastatic RCC who have progressive disease at study entry combination therapy showed increased overall survival compared to WX-G250 monotherapy. Survival was at least similar to that of currently used cytokine regimens but with a favorable toxicity profile.

Copyright © 2006 by american urological association

The Journal of Urology Vol. 175, 57-62, January 2006

Combining Hand Assisted Laparoscopic Nephroureterectomy With Cystoscopic Circumferential Excision of the Distal Ureter Without Primary Closure of the Bladder Cuff—Is it Safe?

Eliecer Kurzer,* Raymond J. Leveille† and Vincent G. Bird

From the Division of Endourology and Laparoscopy, Department of Urology, University of Miami School of Medicine, Miami, Florida

Purpose: We have previously described our technique of combining HAL-NU using early ureteral ligation with simultaneous cystoscopic circumferential excision of the distal intramural ureter without primary closure of the bladder cuff. We report the oncological sequelae in patients who underwent HAL-NU using our technique of complete ureteral removal.

Materials and Methods: We retrospectively evaluated all patients who underwent HAL-NU from April 1999 through July 2004. Cystograms were performed 1 week postoperatively in all patients. Pathological findings were reviewed. Cystoscopy was performed every 3 months to assess bladder recurrences. Upper tract imaging was performed postoperatively and then annually. The locations of recurrence and need for adjuvant treatment were assessed.

Results: A total of 49 patients with an average age of 67 years underwent HAL-NU. Gravity cystography confirmed that bladder defects had completely sealed at 1 week in all patients. Mean followup was 10.6 months (median 10, range 1 to 52). Of the patients 20 (49%) had bladder tumors postoperatively. Two patients were found to have advanced stage disease, leading to chemotherapy with radiation therapy in 1 and radical cystectomy in the other at 4 and 14 months, respectively. A total of 25 patients had postoperative pelvic imaging. Four patients with pathological stage T2 (1) and T3 (3) had metastatic disease at followup. One patient was known to have pulmonary metastases preoperatively and HAL-NU was performed for refractory hematuria. Two patients were noted to have distant metastases to the liver, lung and bone at 1 and 3 months postoperatively, respectively. One patient was found to have distant metastases to the liver and retroperitoneal lymph nodes 2 years after surgery. No patients were found to have local pelvic or peritoneal metastases.

Conclusions: HAL-NU with cystoscopic excision of the distal ureter is feasible, safe and effective for upper tract transitional cell carcinoma. Oncological sequelae are comparable to results after open surgery. There is no evidence to suggest pelvic or peritoneal tumor seeding since no cases of pelvic or abdominal recurrence were discovered after surgery, while allowing the bladder defect to close spontaneously with catheter drainage. Our technique of ureterectomy ensures complete removal of the entire ureter, eliminating the possibility of ureteral stump recurrences. Early ligation of the ureter prevents tumor migration during renal manipulation, minimizing the risk of local tumor recurrences postoperatively.

Copyright © 2006 by American Urological Association

The Journal of Urology Vol. 175, 63-68, January 2006

Bilateral Metachronous Ureteral and Renal Pelvic Carcinomas: Incidence, Clinical Presentation, Histopathology, Treatment and Outcome

Sten Holmäng* and Sonny L. Johansson

From the Department of Urology, Sahlgrenska University Hospital, Göteborg, Sweden (SH), and the Departments of Pathology and Microbiology and Eppley Cancer Center, Nebraska Medical Center, Omaha, Nebraska (SLJ)

Purpose: Metachronous bilateral UUTTs are rare. The authors reported baseline and long-term followup data for all patients diagnosed in Western Sweden during a 28-year period.

Materials and Methods: We performed a clinical and histopathological analysis of all patients in Western Sweden surgically treated for ureteral and renal pelvic tumors from 1971 to 1998.

Results: Of 768 patients a contralateral UUTT developed in 24 (3.1%) after a median of 46 months (range 2 to 232). The projected incidence after initial UUTT diagnosis was 2.7%, 5.8% and 6.5% at 5, 10 and 15 years, respectively. Median age of the 24 patients at initial UUTT diagnosis was 67 years and the median age at death was 77 years. Bladder cancer was significantly more common among patients with bilateral UUTT compared to those with unilateral UUTT (83% vs 31%, $p < 0.0001$). Routine followup urography was normal in 9 patients 2 to 11 months before the diagnosis of the contralateral UUTT. Nine patients died of UUTT and 5 patients died of bladder cancer.

Conclusions: Bilateral subsequent upper tract tumors are rare, in general diagnosed at an older age and associated with

short survival. Many patients die of bladder cancer and it may be possible to improve survival if the bladder cancer is treated early and aggressively. Routine followup urography is not indicated among patients with a tumor-free bladder and a history of UUTT.

Copyright © 2006 by American Urological Association
The Journal Of Urology Vol. 175, 69-73, January 2006

Risk Factors for Upper Tract Recurrence in Patients Undergoing Long-Term Surveillance for Stage Ta Bladder Cancer

*Benjamin K. Canales, James K. Anderson, Juan Premoli and Joel W. Slaton**

From the Department of Urology, Veterans Administration Medical Center (JWS) and Department of Urologic Surgery, University of Minnesota (BKC, JKA, JP), Minneapolis, Minnesota

Purpose: While the evidence is clear that patients with carcinoma in situ or high grade T1 TCC of the bladder are at higher risk for developing UUT tumors, the role of imaging the UUT in patients with Ta tumors remains controversial. We hypothesized that the number and frequency of recurrences in patients with Ta disease would allow us to identify a population who should undergo routine UUT surveillance.

Materials and Methods: We reviewed our database of 375 patients who underwent resection of a stage Ta TCC between 1975 and 1995. Median followup was 6 years. Patients were stratified according to the presence of an UUT occurrence, rate and timing of superficial recurrences, and grade of the initial bladder tumor.

Results: Among the 375 patients 50% had no bladder recurrence, 25% had 1 tumor, 15% had 2 tumors, and 10% had 3 or more tumors. Average time between tumors was 17 months. UUT tumor developed in 13 patients (3.4%) at an average of 22 months after their initial bladder tumor. A high risk group consisting of patients who had 2 or more bladder recurrences recurring within 12 months of each other were at 4.5-fold the risk of UUT tumor.

Conclusions: Stage Ta bladder cancer patients with 2 or more recurrences of bladder tumors with a median of less than 12 months between recurrences are at higher

risk for developing an UUT tumor and should be considered for more frequent UUT surveillance.

Copyright © 2006 by American Urological Association
The Journal Of Urology. Vol. 175, 74-77, January 2006

Effect of Preoperative Delay on Survival in Patients With Bladder Cancer Undergoing Cystectomy in Quebec: A Population Based Study

Salaheddin M. Mahmud, Brian Fong, Nader Fahmy, Simon Tanguay and Armen G. Aprikian,†*

From the Departments of Oncology (SMM), Surgery (Urology) (SMM, BF, NF, ST, AGA) and Epidemiology and Biostatistics (SMM), McGill University, Montreal, Quebec, Canada

Purpose: In Canada there is growing concern that waiting time for cancer surgery has been increasing. We used population based data to estimate the average PD for RC in Quebec and assess whether delayed surgery has a negative impact on long-term survival.

Materials and Methods: We used the provincial billing database of the maladie du Quebec to identify all patients with bladder cancer 18 years or older who underwent RAMQ from 1990 to 2002. PD was calculated as the time elapsed between the most recent transurethral resection and the date of RC. Patients were categorized according to PD tertiles into 3 groups, namely 1) 20 or less, 2) 21 to 47 and (C) 48 days or greater. Cox proportional hazards models were used to assess the effect of PD on overall survival, while adjusting for patient and provider factors.

Results: During the study period 1,592 radical cystectomies were performed. Overall median PD was 33 days (95% CI 30 to 35). Median PD increased from 23 days in 1990 to 50 in 2002. After adjusting for calendar year, and patient and provider variables there were no significant differences in survival among the 3 delay categories. However, patients subject to greater than 12 weeks of delay were at 20% greater risk for dying (95% CI 1.0 to 1.5, p = 0.051).

Conclusions: In line with previous reports PD greater than 12 weeks seems to be associated with a worse long-term prognosis.

Copyright © 2006 by american urological association
The Journal Of Urology Vol. 175, 78-83, January 2006

References vs Bibliography

What are they?

References usually come at the end of a text (essay or research report) and should contain only those works cited within the text. So, use the term '**References**' to cover works cited, and '**Additional Bibliography**' to refer to works read as general background.

A **Bibliography** is any list of references at the end of a text, whether cited or not. It includes texts you made use of, not only texts you referred to in your paper, but your own additional background reading, and any other articles you think the reader might need as background reading.

Both Refs. & Bibliog. must be in alphabetical order; and each entry must be laid out in a strictly ordered sequence. Examples:

Cuba, L. (1988) *A Short Guide to Writing in the Social Sciences*. London: Scott Foresman. Chs. 2, 4 & 6.

Friedman, S. & S. Steinberg (1989) *Writing and thinking in the Social Sciences*. Englewood Cliffs, NJ: Prentice Hall.

Hamp-Lyons, L. & K. Courter (1984) *Research matters*. Rowley, Mass.: Newbury House.

Ivanic, R. & J. Simpson (1992) Who's who in academic writing? In N. Fairclough (Ed) *Critical Language Awareness*. London: Longman. 141-173.

How do you compile a bibliographic entry? A bibliographic entry is a 'reference' which offers readers a standard set of information that will enable them to either

- find the cited source in a library, or
- order it through a library or bookshop.

The information varies according to the type of source. We look at the 3 main sources:

- books
- journal articles
- book chapters or articles in a book

Note: There are many variations of format, even within the same discipline. Browse through the back pages of different journals to get an idea. Our advice is to choose a system you like - or your teachers prefer - and use it consistently.

In **Academic Grammar**, we use a simplified version of the 'house style' most common to the Social Sciences: the American Psychological Association, or **APA**, for all of our formats, as illustrated previously.

A typical book entry would be as follows:

Hamp-Lyons, L. & K. Courter (1984) *Research matters*. Rowley, Mass.: Newbury House.

INTRAVESICAL THERAPY FOR BLADDER CANCER

The initial tumor evaluation sets the foundation upon which management decisions are based. Approximately 75% of the patients with transitional cell carcinoma of the bladder present with superficial transitional cell carcinoma¹. Less than 5% of the patients with grade I stage Ta (noninvasive) tumors have progression in stage². Thus, we should avoid overtreating this group. Alternatively patients with high grade, stage Ta or T1, or carcinoma in situ require particularly careful evaluation and close monitoring. The latter should include endoscopy as well as voided and/or bladder wash cytology studies. At diagnosis of a high grade resection biopsy of the prostatic urethra should be performed, since prostatic transitional cell carcinoma may alter management³. Histological material obtained at transurethral resection should be reviewed with the pathologist, which is most helpful in correlating the endoscopy and prior treatment, such as intravesical chemotherapy or radiation, with the biopsy and cytology material. Prognostic factors for transitional cell carcinoma have been established and based upon these the clinician must determine the risk of a subsequent tumor (new occurrence or recurrence) and progression⁴.

The rationale for the use of intravesical therapy has not changed. The patient who presents with a solitary stage Ta, grade 1 tumor does not need intravesical therapy following transurethral resection. If there are multiple stage Ta, grade 1 tumors intravesical therapy is required. Approximately 50% of patients will have recurrence. If one elects to use intravesical therapy the primary goal is to decrease the frequency of subsequent tumors, and avoid the cost and morbidity of further surgery.

Following transurethral resection patients with high grade Ta or T1 transitional cell carcinoma, or carcinoma in situ should receive intravesical therapy in an attempt to prevent recurrence and, thus, influence the risk of progression. A small subgroup of these patients might even be considered for cystectomy at presentation, for example multifocal stage T1, grade 3. For patients in whom intravesical therapy is deemed appropriate, the

clinician must decide whether to use chemotherapy, for example thiotepa, doxorubicin or mitomycin C, or immunotherapy, for example bacillus Calmette-Guerin (BCG).

It has been 30 years since intravesical BCG was first proposed by Morales.⁵ BCG requires interaction with the host. Although the antitumor activity of BCG may be partly nonspecific, there is ample evidence that at least part of its effectiveness requires a specific immunological host response. The response rate is higher in high grade compared to low grade tumors. Thus, the response in patients with carcinoma in situ is better than for papillary tumors.

Unfortunately, there are few dose response studies relating the total dose, concentration and efficacy of the commonly used chemotherapeutic agents. The dose of thiotepa is usually 30 mg., the dose of doxorubicin ranges from 20 to 60 mg. and that of mitomycin C from 20 to 40 mg. The endoscopic evaluation is critical, the clinician should resect all tumors, if possible. If necessary, one should feel comfortable to take the patient back to the operating room to complete a difficult resection. Selected mucosal biopsies from normal-appearing urothelium need not be routinely performed. Patients with high grade Ta or T1 disease or carcinoma in situ should receive 6 weeks of BCG following endoscopic tumor resection. If they are not tumor-free at 3 months the clinician has several choices. He may elect 6 more weeks of BCG, switch to intravesical chemotherapy or proceed to cystectomy.

Many tumors are grade 2 to 3, stage Ta or T1. Treatment must be individualized and will depend on the pattern and type of recurrences. Most importantly, the urologist should not wait too long before considering cystectomy.

There may be better ways to optimize the efficacy of intravesical chemotherapy. We need markers to predict which tumor and which host are likely to respond favorably to chemotherapy or BCG, and which individuals require early cystectomy before waiting for tumor progression.

References

1. Herr, H. W., Laudone, V.P. and Whitmore, W. F., Jr.:An overview of intravesical therapy for superficial bladder tumors. J. Urol., 138: 1363, 1987.
2. Prout, G. R., Jr., Barton, B. A., Griffin, P. P. and Friedell, G. H.: Treated history of noninvasive grade 1 transitional cell carcinoma. J. Urol., 148: 1413, 1992.
3. Matzkin, H., Soloway, M. S. and Hardeman, S.: Transitional cell carcinoma of the prostate. J. Urol., 146: 1207, 1991.
4. Soloway, M. S. and Perito, P.E.: Superficial bladder cancer: diagnosis, surveillance and treatment. J. Cell. Biochem., suppl., 161: 120, 1992.
5. Morales, A., Eidingen, D. and Bruce, A. W.: Intracavitary bacillus Calmette-Guerin in the treatment of superficial bladder tumors. J. Urol., 116: 180, 1976.