ISSN 2219-2816 (online)

World Journal of *Clinical Urology*

World J Clin Urol 2020 September 12; 9(1): 1-15

Published by Baishideng Publishing Group Inc

World Journal of Clinical Urology

Contents

Irregular Volume 9 Number 1 September 12, 2020

ORIGINAL ARTICLE

Retrospective Study

World Journal of Clinical Urology

Irregular Volume 9 Number 1 September 12, 2020

Contents

ABOUT COVER

Editorial Board Member of *World Journal of Clinical Urology*, Dr. YM Fazil Marickar is Dean of Mount Zion Medical College (Kerala, India). He was previously Principal, Azeezia Medical College and Professor and Head of Surgery Government Medical College and SUT College of Medicine. He was the first PhD in the medical faculty (Urology) of Kerala University (1991) and the first and only surgeon awarded FAMS in Surgery (1999) and the prestigious Pandalai Oration award of Association of Surgeons of India (2008), the highest national award. He has served as surgical teacher for the last 47 years and conducted extensive research on urinary stone disease, authoring 395 papers, 9 books and 3 textbooks. He is President of the Association of Genito Urinary Surgeons of India, Secretary of the National Academy of Medical Sciences Kerala Chapter, Chief Editor of the *Kerala Surgical Journal*, and Editorial Board Member of *Urological Research*. (L-Editor: Filipodia)

AIMS AND SCOPE

The primary aim of *World Journal of Clinical Urology* (*WJCU*, *World J Clin Urol*) is to provide scholars and readers from various fields of urology with a platform to publish high-quality basic and clinical research articles and communicate their research findings online.

WJCU mainly publishes articles reporting research results and findings obtained in the field of urology and covering a wide range of topics including andrology, benign prostatic hyperplasia, diagnostic imaging, endoscopy, genital diseases, incontinence, minimally invasive therapy, pharmacology, renal transplantation, urinary reconstruction, urinary tract stones, urodynamics and urinary dysfunction, urogenital abnormalities, urogenital neoplasms, urogenital surgical procedures, and urologic diseases.

INDEXING/ABSTRACTING

World Journal of Clinical Urology is now indexed in China National Knowledge Infrastructure (CNKI), China Science and Technology Journal Database (CSTJ), and Superstar Journals Database.

RESPONSIBLE EDITORS FOR THIS ISSUE

NAME OF JOURNAL
World Journal of Clinical Urology

ISSN
ISSN 2219-2816 (online)

LAUNCH DATE
December 28, 2011

FREQUENCY
Irregular

EDITORS-IN-CHIEF
Olivier Abbo, Jian Lu

EDITORIAL BOARD MEMBERS
https://www.wjgnet.com/2219-2816/editorialboard.htm

PUBLICATION DATE
September 12, 2020

INSTRUCTIONS TO AUTHORS
https://www.wjgnet.com/bpg/gerinfo/204

GUIDELINES FOR ETHICS DOCUMENTS
https://www.wjgnet.com/bpg/GerInfo/287

GUIDELINES FOR NON-NATIVE SPEAKERS OF ENGLISH
https://www.wjgnet.com/bpg/gerinfo/240

PUBLICATION ETHICS
https://www.wjgnet.com/bpg/GerInfo/288

PUBLICATION MISCONDUCT
https://www.wjgnet.com/bpg/gerinfo/208

ARTICLE PROCESSING CHARGE
https://www.wjgnet.com/bpg/gerinfo/242

STEPS FOR SUBMITTING MANUSCRIPTS
https://www.wjgnet.com/bpg/GerInfo/239

ONLINE SUBMISSION
https://www.f6publishing.com

E-mail: bpgoffice@wjgnet.com https://www.wjgnet.com

World Journal of Clinical Urology

Submit a Manuscript: https://www.f6publishing.com

World J Clin Urol 2020 September 12; 9(1): 1-8

DOI: 10.5410/wjcu.v9.i1.1

ISSN 2219-2816 (online)

ORIGINAL ARTICLE

Retrospective Study

Estimation of successful capping with complete aspiration of bladder *via* nephroureterostomy tube

Majid Maybody, Wesley K Shay, Deborah A Fleischer, Meier Hsu, Chaya Moskowitz

ORCID number: Majid Maybody 0000-0003-4650-6640; Wesley K Shay 0000-0003-4076-9693; Deborah A Fleischer 0000-0002-5864-0989; Meier Hsu 0000-0002-9519-8560; Chaya Moskowitz 0000-0002-2850-8450.

Author contributions: Maybody M contributed to study conception and design, acquisition of data, analysis and interpretation of data, drafting of manuscript, and critical revision; Shay WK and Fleischer DA contributed to acquisition of data and critical revision; Hsu M and Moskowitz C contributed to analysis and interpretation of data, critical revision.

Supported by National Institute of Health (United States), No. P30 CA008748.

Institutional review board statement: This study was reviewed and approved by the Institutional Review Board/Privacy Board-B. The IRB determined that the protocol meets the requirements as set forth in the regulatory criteria for research approval and has been granted approval for 12 mo.

Informed consent statement: Your request to waive the requirement to obtain written informed consent and a research authorization has

Majid Maybody, Wesley K Shay, Deborah A Fleischer, Department of Radiology, Interventional Radiology Service, Memorial Sloan Kettering Cancer Center, New York, NY 10065, United States

Meier Hsu, Chaya Moskowitz, Department of Biostatistics and Epidemiology, Memorial Sloan Kettering Cancer Center, New York, NY 10065, United States

Corresponding author: Majid Maybody, MD, Associate Professor, Department of Radiology, Interventional Radiology Service, Memorial Sloan Kettering Cancer Center, No. 1275 York Avenue, M276C, New York, NY 10065, United States. maybodym@mskcc.org

Abstract

BACKGROUND

Ureteral stent and nephroureterostomy tube (NUT) are treatments of ureteral obstruction. Ureteral stent provides better quality of life. Internalization of NUT is desired whenever possible.

AIM

To assess outcomes of capping trial among cancer patients with complete aspiration of retained contrast from bladder *via* NUT.

METHODS

Our Institutional Review Board approved retrospective review of all NUT placement, NUT exchange and conversion of nephrostomy catheter into NUT performed during June 2013 to June 2015 (n = 578). Cases were excluded due to lack of imaging of bladder (n = 37), incomplete aspiration of bladder (n = 324), no attempt at capping NUT (n = 166), and patients with confounding factors interfering with results of capping trial including non-compliant bladder, bladder outlet obstruction and catheter malposition (n = 14). Study group consisted of 37 procedures in 34 patients (male 19, female 15, age 2-83 years, average 58, median 61) most with cancer (prostate 8, endometrial 5, bladder 4, colorectal 4, breast 2, gastric 2, neuroblastoma 2, cervical 1, ovarian 1, renal 1, sarcoma 1, urothelial 1 and testicular 1) and one with Crohn's disease. Medical records were reviewed to assess outcomes of capping trial. Exact 95% confidence intervals (95%CI) were calculated.

RESULTS

Among patients with complete aspiration of retained contrast, 30 (81%, 95%CI:

been granted.

Conflict-of-interest statement: We have no financial relationships to disclose.

Data sharing statement: No additional data are available.

Manuscript source: Unsolicited manuscript

Received: April 9, 2020
Peer-review started: April 9, 2020
First decision: June 7, 2020
Revised: July 16, 2020
Accepted: August 15, 2020
Article in press: August 15, 2020
Published online: September 12, 2020

P-Reviewer: Cantiello F
S-Editor: Zhang L
L-Editor: A
P-Editor: Ma YJ

0.65-0.92) catheters were successfully capped (range 12-94 d, average 40, median 24.5) until planned conversion to internal stent (23), routine exchange (5), removal (1) or death unrelated to catheter (1). Seven capping trials (19%, 95%CI: 0.08-0.35) were unsuccessful (range 2-22 d, average 12, median 10) due to leakage (3), elevated creatinine (2), fever/hematuria (1) and nausea/vomiting (1).

CONCLUSION
Capping trial success among patients with complete aspiration of retained contrast/urine from bladder *via* NUT appears high.

Key Words: Nephroureterostomy tube; Ureteral stent; Capping trial; Internalization; Conversion; Percutaneous nephrostomy

Core Tip: Patients with ureteral obstruction are best treated with cystoscopic placement of ureteral stent because of a better quality of life. When ureteral stent placement is not possible, a nephroureterostomy tube (NUT) is placed. Once the acute clinical problem is resolved, internalization is sought in order to improve patient's quality of life. Currently all patients undergo NUT capping trial which is needed before internalization. This work helps urologists and interventional radiologists to estimate success of capping trial. It helps define the endpoint of NUT placement or exchange interventions with potential benefits to patients and health care systems.

Citation: Maybody M, Shay WK, Fleischer DA, Hsu M, Moskowitz C. Estimation of successful capping with complete aspiration of bladder *via* nephroureterostomy tube. *World J Clin Urol* 2020; 9(1): 1-8
URL: https://www.wjgnet.com/2219-2816/full/v9/i1/1.htm
DOI: https://dx.doi.org/10.5410/wjcu.v9.i1.1

INTRODUCTION

Patients with ureteral obstruction are commonly treated with cystoscopic placement of ureteral stent. Compared to percutaneous approach with externalized catheter, cystoscopic approach is less invasive and the ureteral stent provides a better quality of life to patients. When ureteral stent placement is not possible or when it fails to alleviate hydronephrosis, percutaneous approach is indicated. This is achieved by placing percutaneous nephrostomy (PCN) catheter or nephroureterostomy tube (NUT). Once the acute clinical problem is resolved, internalization is sought in order to improve patient's quality of life. In case of PCN it is converted to NUT first. The NUT is capped for a few days (capping trial) simulating the presence of ureteral stent without the exteriorized catheter. If capping trial is successful, then NUT is converted to ureteral stent (internalization). A successful capping trial is defined when all of the below criteria are met: Lack of fever, lack of rise in serum creatinine level, lack of peri catheter leakage, lack of ipsilateral flank pain and lack of pelvic symptoms such as urgency, incontinence and pain.

After a failed capping trial, patients usually undergo catheter exchange with upsizing and/or change of catheter length in order to improve the outcome of the next trial. In some patients this process is repeated a few times. Currently all patients undergo capping trial(s) as a diagnostic intervention because there is no way of estimating the result. Estimating success of capping trial is helpful. It can help define the endpoint of a catheter exchange intervention with potential benefits to patients and health care systems. Some cancer patients with successful capping trial prefer to carry a capped NUT that can be uncapped if needed over an internal stent. The management algorithm for ureteral obstruction is shown in Figure 1.

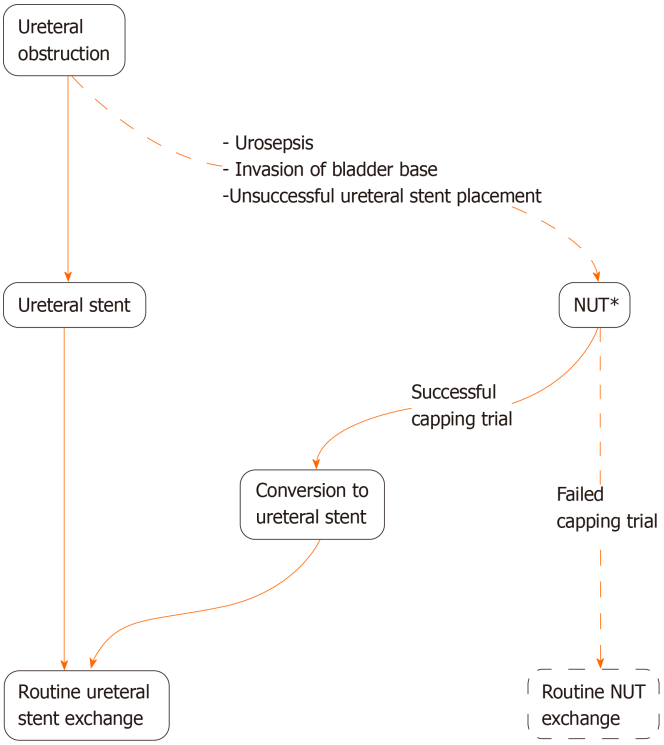

Figure 1 Algorithm of management of ureteral obstruction. The ideal objectives are highlighted with solid lines. Study's observation occurs when a nephroureterostomy tube is in place (asterisk). If originally a percutaneous nephrostomy catheter is placed, it will be converted to a nephroureterostomy tube before capping trial. NUT: Nephroureterostomy tube.

MATERIALS AND METHODS

Our Institutional Review Board approved retrospective review of all patients who underwent NUT placement, NUT exchange and conversion of PCN into NUT performed from June 2013 to June 2015. This included 578 procedures. Patients in whom complete aspiration of retained contrast/urine in bladder was evident followed by a capping trial were selected. The inclusion criteria were presence of NUT at the end of procedure, visualization of bladder on final procedural image, presence of discernible amount of contrast/urine in bladder during procedure, resolution of contrast from bladder on final procedural images, initiation of capping trial at least one d after the procedure and lack of confounding factors that interfere with capping trial (Figure 2).

The confounding factors were bladder outlet obstruction, noncompliant bladder, presence of Foley catheter in bladder (may mask pelvic symptoms), undrained obstructed contralateral kidney (interferes with interpretation of serum creatinine level), capping on the same d of procedure (not standard practice, higher risk for failure due to acute inflammation or bleeding from a fresh procedure) and malpositioning of NUT during capping trial that required catheter exchange (mimics capping failure by peri catheter leakage).

Cases were excluded due to lack of imaging of bladder on final procedural images (n = 37), uncertainty about complete aspiration of bladder (n = 324), no attempt at capping NUT (n = 166), confounding factors interfering with interpretation of capping trial (n = 14) (Figure 3).

Because some patients may become uroseptic with forceful injection of contrast antegradely into the renal pelvis, it is our standard practice to avoid forceful injection into NUT and to not pursue contrast flow into the bladder. The study was designed to only capture patients in whom procedural images were conclusive of aspiration of contrast from the bladder through NUT. Study cohort consisted of 37 procedures in 34 patients (male 19, female 15, age 2-83 years, average 58, median 61) (Table 1) mostly with cancer (prostate 8, endometrial 5, bladder 4, colorectal 4, breast 2, gastric 2, neuroblastoma 2, cervical 1, ovarian 1, renal 1, sarcoma 1, urothelial 1 and testicular 1) and one with Crohn's disease. Medical records including imaging studies, lab results, outpatient clinic visits, inpatient progress notes and interventional radiology records were reviewed to assess outcomes of capping trial. Successful capping trial was defined by lack of symptoms of failure until the goal of capping was achieved. The

Table 1 Patient demographics and capping trial outcomes

	Total	Successful capping	Unsuccessful capping
NUT procedures	37	30 (81%), 95%CI: 0.65-0.92	7 (19%), 95%CI: 0.80-0.35
Patients	34		
Gender			
Male	19	17	2
Female	15	10	5
Age (yr)			
Average (range)	58 (2-83)	59 (2-83)	56 (24-73)
Underlying cancer (procedures)			
	Prostate: 9	Prostate: 7	Prostate: 2
	Bladder: 5	Bladder: 5	
	Colorectal: 5	Colorectal: 5	
	Endometrial: 5	Endometrial: 3	Endometrial: 2
	Breast: 2	Breast: 1	Breast: 1
	Cervical: 2	Cervical: 2	
	Gastric: 2	Gastric: 1	Gastric: 1
	Neuroblastoma: 2	Neuroblastoma: 2	
	Ovarian: 1	Ovarian: 1	
	Renal: 1	Renal: 1	
	Sarcoma: 1	Sarcoma: 1	
	Testicular: 1	Testicular: 1	
	Crohn's: 1		Crohn's: 1
Catheter size (French)			
8.5	14	11	3
10	23	19	4
Catheter length (cm)			
22	10	8	2
24	16	13	3
26	8	6	2
28	2	2	0
32	1	1	0
Side			
Right	18	16	2
Left	10	6	4
Bilateral	4	3	1
Capping length (d)			
Average, Median, Range		40, 24.5, 12-94	12, 10, 2-22
Outcomes		Conversion to internal stent (n = 23); Routine exchange (n = 5); Removal (n = 1); Unrelated death (n = 1)	Peri catheter leakage (n = 3); Elevated creatinine (n = 2); Fever/hematuria (n = 1); Nausea/vomiting (n = 1)

NUT: Nephroureterostomy tube.

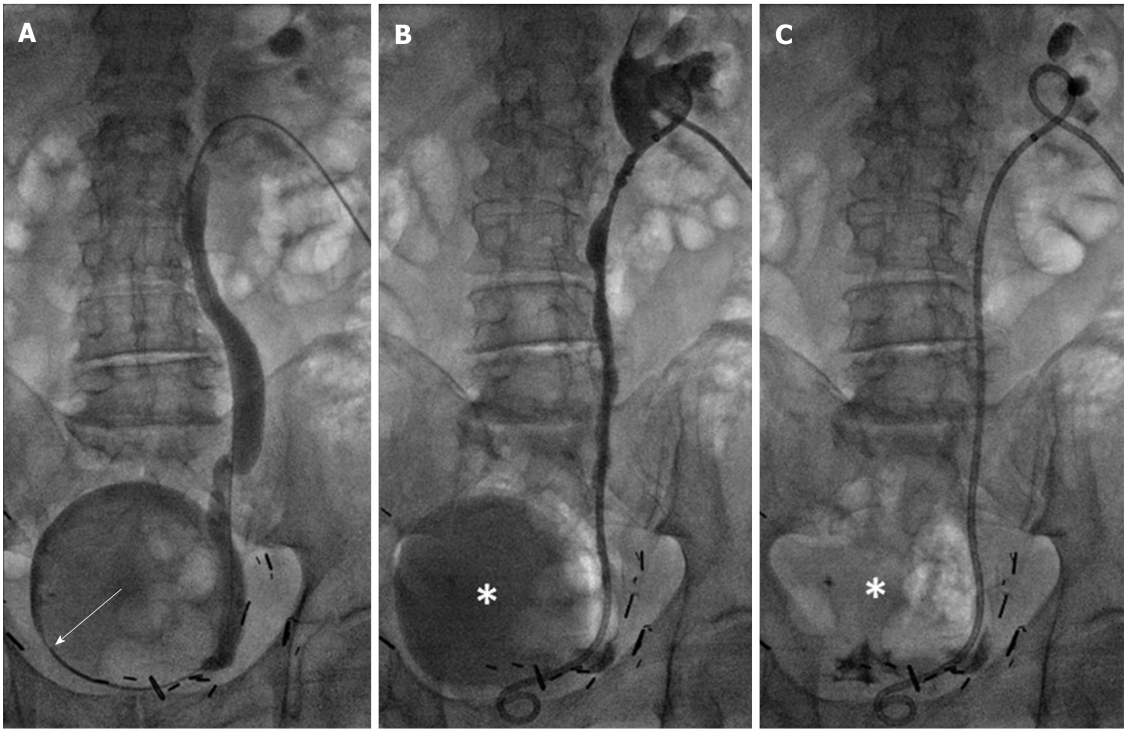

Figure 2 An 83 years old male with prostate cancer presented with right hydroureteronephrosis from a tumor involving the right bladder base. Cystoscopic attempt at placing ureteral stent failed. The indication for drainage of kidney is to preserve renal function for chemotherapy. Prone position. A: Distal right ureteral obstruction is crossed and contrast is injected into the bladder by a 5 French directional catheter (arrow); B: A 10 F × 26 cm nephroureterostomy tube (NUT) is placed, and small amount of contrast is injected through the NUT to confirm proper positioning of the proximal loop. Retained contrast/urine in bladder (asterisk) is evident; and C: Retained contrast in bladder (asterisk) is completely aspirated *via* NUT. B and C are the final images of this intervention. The NUT was capped a few days later. It remained capped with no clinical issues for 42 d before it was converted to a ureteral stent.

goals are conversion of NUT to ureteral stent, removal of NUT and routine exchange of capped NUT.

The proportion of procedures that were successfully capped was estimated among patients with complete aspiration of retained contrast. Exact 95% confidence intervals (95%CI) were calculated.

RESULTS

Among the study cohort, 30 (81%, 95%CI: 0.65-0.92) had successful capping with a median length of capping of 24.5 d (range 12-94 d) until planned goal of conversion to internal stent (n = 23), routine exchange (n = 5) or removal (n = 1) and one patient who expired for reasons unrelated to catheter (n = 1). Substantially fewer patients had unsuccessful capping result (n = 7, 19%, 95%CI: 0.08-0.35) had median length of capping of 10 d (range 2-22 d) due to leakage (n = 3), elevated creatinine (n = 2), fever/hematuria (n = 1) and nausea/vomiting (n = 1).

DISCUSSION

Mechanical obstruction to the flow of urine from kidney to bladder can be due to a variety of etiologies. Among these include primary tumors involving the ureters or bladder, tumors or other space occupying lesions within abdomen and pelvis that compress ureters externally, nephrolithiasis and iatrogenic causes such as surgery. Acute obstruction is symptomatic and may result in urosepsis in some patients. Chronic obstruction mainly interferes with renal function. The first line of

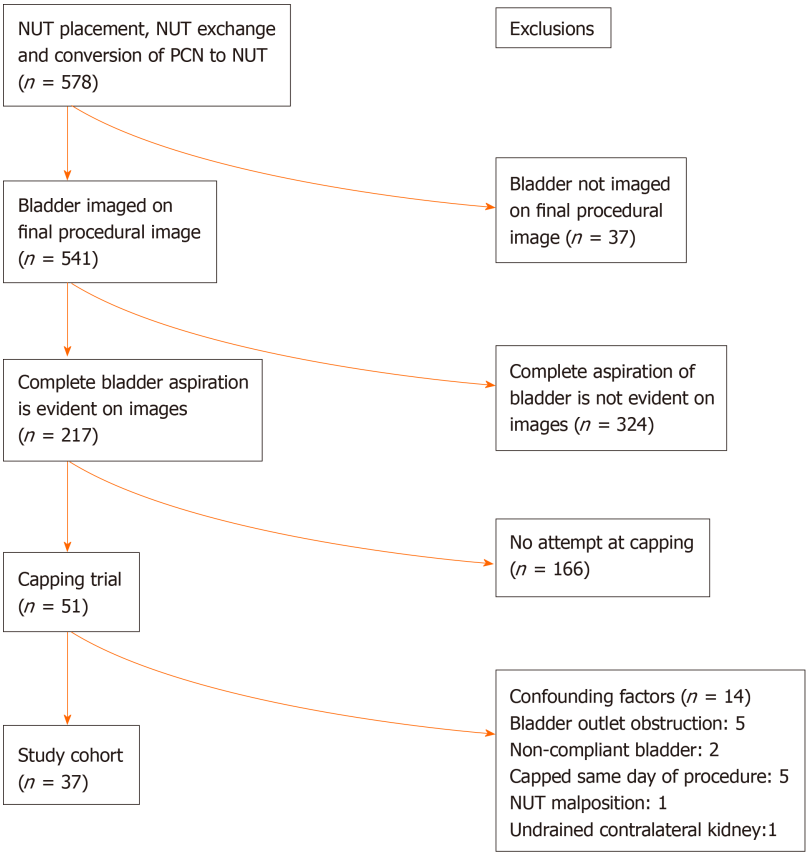

Figure 3 Flowchart of study. NUT: Nephroureterostomy tube; PCN: Percutaneous nephrostomy tube.

management for ureteral obstruction is cystoscopic placement a ureteral stent. This approach provides patients with better quality of life due to lack of external catheter and drainage bag. Cystoscopy may not be possible when tumors involve the base of bladder. If hydronephrosis does not resolve, the stent is considered failed. Patients with hemodynamic instability and urosepsis are not favorable candidates for cystoscopic approach. These scenarios account for 36%-53% of malignant ureteral obstructions and percutaneous approach is advised[1,2]. Once the obstructing etiology is resolved the ureteral stent, PCN or NUT are removed. However, this is not always possible, and many patients remain dependent on these catheters. The external catheter puts limitations on patient's quality of life. For example, they cannot bathe or swim. Maintaining the gravity drainage bag is cumbersome and the catheter may get dislodged by incidental traction. It has been shown that both ureteral stent and external catheters have comparable complication rates[2,3]. Since ureteral stent provides better quality of life, unless there is need for permanent urinary diversion which is achieved only by PCN, the optimal long-term plan is to convert external catheter into ureteral stent whenever possible. In case of PCN and in the absence of need for permanent urinary diversion, it needs to be converted to NUT first. NUT is capped for a few days to simulate lack of external component. If the capping trial is successful, the NUT is converted to ureteral stent. Predictors of ureteral stent outcomes including invasion of bladder base by tumor and degree of hydronephrosis have been published[4-7]. There is no data in the literature about predictors of success for internalization in patients who receive external catheters and the percentage of patients who can ultimately be internalized. Having an indicator of favorable capping trial outcome is helpful in clinical decision-making and defining the endpoint of a catheter exchange intervention. We observed that at the conclusion of an intervention where a NUT is present if the retained contrast/urine in bladder can be aspirated through the NUT there is a high proportion of a successful capping trial. If bladder contrast/urine cannot be aspirated through the newly placed/exchanged NUT, the interventionalist may exchange the catheter with larger caliber or another length at the same sitting. This may save time and resources obviating the results of the next capping trial.

This study has several limitations including its retrospective design, small size of

study cohort and lack of control group. Our results are based on cancer patients with malignant ureteral obstruction and applicability of the results to non-cancer patients is not known. Since aspiration of retained contrast/urine from the bladder through the NUT is not standard practice and this description is not included in official dictations, we could only rely on cases where retained contrast/urine was completely aspirated on final procedural images. This created many exclusions which potentially skew the results.

ARTICLE HIGHLIGHTS

Research background

Ureteral stent and nephroureterostomy tube (NUT) are treatments of ureteral obstruction. Ureteral stent provides better quality of life. Internalization of NUT is desired whenever possible.

Research motivation

Before internalization of NUT patients should pass a capping trial. Currently there are no indicators of capping trial results.

Research objectives

To help urologists and interventional radiologists estimate successful capping trial during a NUT placement or exchange intervention. By preventing unsuccessful trials, patients and healthcare systems benefit.

Research methods

578 NUT placement, NUT exchange and conversion of nephrostomy catheter into NUT performed between 2013 and 2015 were reviewed. Exclusions were due to lack of imaging of bladder (n = 37), incomplete aspiration of bladder (n = 324), no attempt at capping NUT (n = 166), and patients with confounding factors interfering with results of capping trial (n = 14). Study group consisted of 37 procedures in 34 patients (male 19, female 15, age 2-83 years, average 58, median 61) most with cancer (prostate 8, endometrial 5, bladder 4, colorectal 4, breast 2, gastric 2, neuroblastoma 2, cervical 1, ovarian 1, renal 1, sarcoma 1, urothelial 1 and testicular 1) and one with Crohn's disease. Medical records were reviewed to assess outcomes of capping trial. Exact 95% confidence intervals were calculated.

Research results

In 81% of study group (95% confidence intervals: 0.65-0.92) NUTs were successfully capped (range 12-94 d, average 40, median 24.5) until planned conversion to internal stent (23), routine exchange (5), removal (1) or death unrelated to catheter (1).

Research conclusions

The ability to aspirate retained contrast from bladder through NUT is an indicator for successful capping trial. If contrast cannot be aspirated form bladder through NUT, same session tube exchange (upsize or different length) should be considered.

Research perspectives

Prospective studies are required to further assess the findings of this study.

REFERENCES

1 **Ganatra AM**, Loughlin KR. The management of malignant ureteral obstruction treated with ureteral stents. *J Urol* 2005; **174**: 2125-2128 [PMID: 16280741 DOI: 10.1097/01.ju.0000181807.56114.b7]

2 **Ku JH**, Lee SW, Jeon HG, Kim HH, Oh SJ. Percutaneous nephrostomy versus indwelling ureteral stents in the management of extrinsic ureteral obstruction in advanced malignancies: are there differences? *Urology* 2004; **64**: 895-899 [PMID: 15533473 DOI: 10.1016/j.urology.2004.06.029]

3 **Alawneh A**, Tuqan W, Innabi A, Al-Nimer Y, Azzouqah O, Rimawi D, Taqash A, Elkhatib M, Klepstad P. Clinical Factors Associated With a Short Survival Time After Percutaneous Nephrostomy for Ureteric Obstruction in Cancer Patients: An Updated Model. *J Pain Symptom Manage* 2016; **51**: 255-261 [PMID: 26497918 DOI: 10.1016/j.jpainsymman.2015.09.009]

4 **Yossepowitch O**, Lifshitz DA, Dekel Y, Gross M, Keidar DM, Neuman M, Livne PM, Baniel J. Predicting the success of retrograde stenting for managing ureteral obstruction. *J Urol* 2001; **166**: 1746-1749 [PMID:

11586215 DOI: 10.1016/S0022-5347(05)65666-2]
5 **Matsuura H**, Arase S, Hori Y. Ureteral stents for malignant extrinsic ureteral obstruction: outcomes and factors predicting stent failure. *Int J Clin Oncol* 2019; **24**: 306-312 [PMID: 30298199 DOI: 10.1007/s10147-018-1348-6]
6 **Wang JY**, Zhang HL, Zhu Y, Qin XJ, Dai BO, Ye DW. Predicting the failure of retrograde ureteral stent insertion for managing malignant ureteral obstruction in outpatients. *Oncol Lett* 2016; **11**: 879-883 [PMID: 26870299 DOI: 10.3892/ol.2015.3961]
7 **Fiuk J**, Bao Y, Calleary JG, Schwartz BF, Denstedt JD. The use of internal stents in chronic ureteral obstruction. *J Urol* 2015; **193**: 1092-1100 [PMID: 25463984 DOI: 10.1016/j.juro.2014.10.123]

World Journal of Clinical Urology

Submit a Manuscript: https://www.f6publishing.com

World J Clin Urol 2020 September 12; 9(1): 9-15

DOI: 10.5410/wjcu.v9.i1.9

ISSN 2219-2816 (online)

ORIGINAL ARTICLE

Retrospective Study

Evaluation of patient reported outcome measures post urethroplasty: Piloting a "Trifecta" approach

Michelle Ong, Catriona Duncan, Matthew McGrail, Devang J Desai

ORCID number: Michelle Ong 0000-0003-4955-5835; Catriona Duncan 0000-0002-6231-4618; Matthew McGrail 0000-0002-6901-8845; Devang J Desai 0000-0002-1937-936X.

Author contributions: Ong M and Duncan C were involved in study design, data collection, and manuscript writing; McGrail M was involved in statistical analysis of the data and collation of tables and result graphs; Desai D was involved through the supervision of the study and revision of the subsequent drafts of the manuscript; All authors have read and approve the final manuscript.

Institutional review board statement: The collection of this data was approved by the Human Research Ethics Committee of Darling Downs Health Service.

Informed consent statement: Patients were not required to give informed consent to the study because the analysis used anonymous clinical data that were obtained after each patient agreed to treatment by written consent.

Conflict-of-interest statement: We can declare that there are no conflict of interests

Data sharing statement: No

Michelle Ong, Catriona Duncan, Devang J Desai, Department of Urology, Toowoomba Hospital, Toowoomba 4350, Queensland, Australia

Matthew McGrail, Department of Head Regional Training Hub Research, University of Queensland Rural Clinical School, Rockhampton 4700, Queensland, Australia

Devang J Desai, University of Queensland Rural Clinical School, Toowoomba 4350, Queensland, Australia

Corresponding author: Michelle Ong, MBBS, Doctor, Department of Urology, Toowoomba Hospital, 154 Pechey Street, Toowoomba 4350, Queensland, Australia. mhmong8@hotmail.com

Abstract

BACKGROUND

Buccal mucosal graft urethroplasty is the gold standard treatment for urethral stricture disease. Toowoomba has obtained a fellowship trained urethroplasty surgeon who has been performing urethroplasties for the last two years. Patient reported outcome measure (PROM) questionnaires allow for a detailed and standardized analysis of success and morbidity post urethroplasty and can be used as a reference point against which urethral surgeons can benchmark their performance.

AIM

To assess whether patient compliance rates improved with the use of an abridged PROM questionnaire.

METHODS

Our database of urethroplasty patients was searched to identify patients who had completed the original PROM. This is routinely requested to be completed at the 3-, 6- and 12-mo mark. All patients are asked to complete the questionnaire and to bring it back to their next appointment. Our original PROM consists of the international prostate symptom score, the sexual health index measure and the Global Response Assessment. An abridged version of the questionnaire was derived focusing on urinary flow, sexual function and overall quality of life and consisted of three questions.

RESULTS

Sixty-six patients were included in our study. Fifty-four patients had been invited to complete the original PROM with an overall compliance rate of 30%. Compliance rates improved to 91% with the introduction of the modified PROM. No correlation between non-compliance and patient factors were found. There was also no significant difference in patient reported quality of life when comparing urinary flow and sexual function.

CONCLUSION

We recommend the use of PROMs pre- and post-operatively to accurately determine the level of patient satisfaction. We acknowledge the aversion of patients in completing PROMs due to the length of these questionnaires. We propose a simplistic version aimed at the "Trifecta" of urethroplasty comprising of three questions focusing each on urinary flow, sexual function and quality of life. Our modified PROM demonstrated markedly improved compliance rates and can be used as a screening tool to identify patients who might have had a poor outcome and who require a more in-depth assessment.

Key Words: Urethroplasty; Patient reported outcome measures; Satisfaction; Quality of life

Core Tip: This study demonstrates the use of a modified abridged patient reported outcome measure in patients undergoing buccal mucosal graft urethroplasty for urethral strictures. A significant improvement in compliance rate was observed indicating that this modified version may be a useful screening tool to accurately evaluate patient satisfaction post-operatively.

Citation: Ong M, Duncan C, McGrail M, Desai DJ. Evaluation of patient reported outcome measures post urethroplasty: Piloting a "Trifecta" approach. *World J Clin Urol* 2020; 9(1): 9-15
URL: https://www.wjgnet.com/2219-2816/full/v9/i1/9.htm
DOI: https://dx.doi.org/10.5410/wjcu.v9.i1.9

INTRODUCTION

Buccal mucosal graft urethroplasty has become the gold standard treatment for management of urethral strictures[1]. In evaluating patient outcomes from urethroplasty, patient reported outcome measures (PROMs) are utilized to fully evaluate surgical success and benchmark urethral surgeons' performance[2]. Several stricture PROM questionnaires have been developed by combining pre-existing surveys, such as the Sexual Health Inventory for Men or the International Prostate Symptom Score (IPSS), which were not targeted at patients with urethral stricture disease[3]. These PROMs are notoriously lengthy, confusing and as such, confer poor patient compliance. Our centre observed a 20% compliance rate with the original PROM, comprising 4 validated questionnaires. This led to our development of a modified, abridged PROM focusing on the three main domains of urethroplasty surgery: Urinary flow, sexual function and quality of life. The aim of this study is to evaluate the abridged PROM for compliance.

MATERIALS AND METHODS

With support from a fellowship-trained urethroplasty surgeon who has been continually employed by Toowoomba Hospital over the last 3 years (2017-2020), a prospective database was established. Firstly, a lengthy PROM questionnaire was utilized, with a retrospective analysis of this database performed to identify patients who had complied with its completion. Secondly, a modified PROM questionnaire was developed comprising of three questions. These questions were: Following your procedure, "(1) are you happy with your urinary flow; (2) are you happy with your sexual function; and (3) are you happy with your overall quality of life"? (See

additional data are available.

Manuscript source: Invited manuscript

Received: March 22, 2020
Peer-review started: March 22, 2020
First decision: April 18, 2020
Revised: May 27, 2020
Accepted: September 1, 2020
Article in press: September 1, 2020
Published online: September 12, 2020

P-Reviewer: Cheuk D, Goel A, Kulkarni SB
S-Editor: Liu M
L-Editor: A
P-Editor: Ma YJ

Figure 1). The same patients were re-contacted over the phone and asked these three questions and their results were recorded, with compliance rates compared with the original data set.

The exclusion criteria included: Patients who were deceased; Patients who had subsequently developed a hypocontractile bladder or other urological problem requiring long-term suprapubic catheter/indwelling catheter/clean intermittent self-catheterisation; Patients who had had a urethroplasty in the last 2 mo or still had an indwelling catheter insitu post-operatively; Patients who had another surgery which precluded them from completing the survey.

RESULTS

Eighty-three patients underwent an urethroplasty in the last 3 years. Of these, 2 had deceased by the time the new questionnaire was introduced. Three patients developed hypocontractile bladder and therefore was excluded from the study. One patient proceeded to having a partial penectomy post urethroplasty, and therefore was illegible for the study. Eleven patients had had their urethroplasty within the last 1 mo and therefore still had indwelling catheters insitu and thus were also excluded. This left 66 patients for study inclusion.

Fifty-four patients were invited to participate with the original PROM. Of these, only 16 (30%) patients fully complied with the questionnaire. For the modified PROM, improved compliance rates were observed with 60 patients (out of 66) completing the questionnaire (91%) (Figure 2).

In the original group of 54 patients who were invited to participate in the original PROM, 15 of those complied with both questionnaires. Thirty-two patients did not comply with the original PROM but complied with the modified PROM therefore improving the compliance rate to 87%. Six patients did not comply with either of the PROMs and one patient complied with the original but not the modified PROM (see Table 1).

From the responses of the modified PROM, 49 patients (81%) reported "happiness" with their current flow rate whilst 30 patients (50%) reported "happiness" with their sexual function (Figure 3).

Overall, 91% of patients reported being happy with their quality of life. The positive predictive value (PPV) of sexual function and quality of life did not differ significantly for that of urinary flow and quality of life (PPV 100%, 97%, respectively) (Tables 2 and 3). There was also no significant correlation between urinary flow and sexual function (Table 4).

Objectively, our stricture recurrence rate was 6.4% with the average flow rate pre-operatively improving from 7.67 to 21.02 at 1 mo post-operatively, and remaining stable at 19.04 and 20.36 at 3 and 6 mo post-operatively. Other complications included 5 post-operative infections and 2 wound haematomas. All patients who developed a stricture recurrence has undergone re-do urethroplasty with no new recurrences.

DISCUSSION

Buccal mucosal graft urethroplasty (BMGU) is a lifestyle operation and therefore patient reported questionnaires are widely used in the evaluation of urethroplasty success[4]. We advocate that PROMs should be utilized as an integral part of the pre- and post- operative process to determine the level of patient satisfaction. Soave *et al*[4] found that urethroplasty offered excellent outcomes in their patient cohort but found that the success rate of 78% was lower than the stricture recurrence-free survival. They emphasised the importance of a more patient-oriented evaluation to define the success of the surgery[4]. They also found that whilst the PROM does not provide evidence of surgical complications, it does provide crucial information about patient's subjective morbidity and quality of life following BMGU[4].

Spencer *et al*[5] utilized patient-reported urinary and sexual outcome measures across four institutions over a minimum of 12 mo follow up however found that the main limitation of the study was the poor patient compliance which was observed in completing the questionnaires. Chung *et al*[6] advocated for the development of a PROM with relevant questions aimed at directly assessing the effects from the disease as well as limiting questionnaire fatigue.

A lot of the criticism against the use of PROMs post urethroplasty surgery is that the existing questionnaires are not aimed specifically at urethral stricture disease, but are

Table 1 Comparison of compliance between original and modified patient reported outcome measure

	Original – complied	Original – not complied
Modified – complied	15	32
Modified – not complied	1	6

Table 2 Relationship between sexual function and quality of life

	Quality of life – happy	Quality of life – unhappy
Sexual function – happy	30	0
Sexual function – unhappy	11	3
Positive predictive value = 100%		
Negative predictive value = 78%		

Table 3 Relationship between urinary flow and quality of life

	Quality of life – happy	Quality of life – unhappy
Urinary flow – happy	48	1
Urinary flow – unhappy	7	4
Positive predictive value = 97%		
Negative predictive value = 63%		

Table 4 Relationship between urinary flow and sexual function

	Sexual function – happy	Sexual function – unhappy
Urinary flow – happy	29	10
Urinary flow – unhappy	1	4
Positive predictive value = 59%		
Negative predictive value = 9%		

mainly intended for measuring outflow obstruction secondary to prostatomegaly (*i.e.*, IPSS)[7]. Jackson *et al*[8] measured the effects of the Urethral Stricture Surgery PROM: A questionnaire aimed at standardising patient-centred evaluations for urethral stricture in particular. However, poor compliance rates were again noticed with approximately 50% of patients declining to complete the PROM or were lost to follow up[8].

Our modified PROM has been aimed at highlighting capturing simple measures of the subjective morbidity "Trifecta" of urethroplasty surgery: Urinary flow, sexual function and quality of life. Whilst not in-depth questions, we advocate that it can act as a simple screening tool, easily used in the outpatient setting pre- and post-operatively in order to quickly gauge patient satisfaction in these three areas.

Our centre observed an 18% compliance rate with our original PROM comprising four validated questionnaires, which improved to 91% with our abridged version. We feel that this is because the modified PROM limits questionnaire fatigue, and identifies the key issues in relation to urethroplasty. With improved compliance rates, we may be able to obtain crucial information about patients' perceived surgical success and quality of life.

As demonstrated by our results, patient "happiness" does not always align with perceived surgical success. Bertrand *et al*[9] also found that a proportion of men were dissatisfied with their procedure independent of cystoscopic appearance, as such emphasising the use of the PROM as a useful tool in measuring success after urethral reconstruction.

Our study also found that there was minimal difference in the impact of sexual function *vs* urinary flow on quality of life. This is likely because, as seen in previous

TOOWOOMBA UROLOGY	PROM questionnaire

Date-
Patient name-
Time since surgery

Following your procedure,

Are you happy with your overall urinary flow?
Yes No

Are you happy with your overall sexual function?
Yes No

Are you happy with your overall quality of life?
Yes No

Figure 1 Modified form. PROM: Patient reported outcome measure.

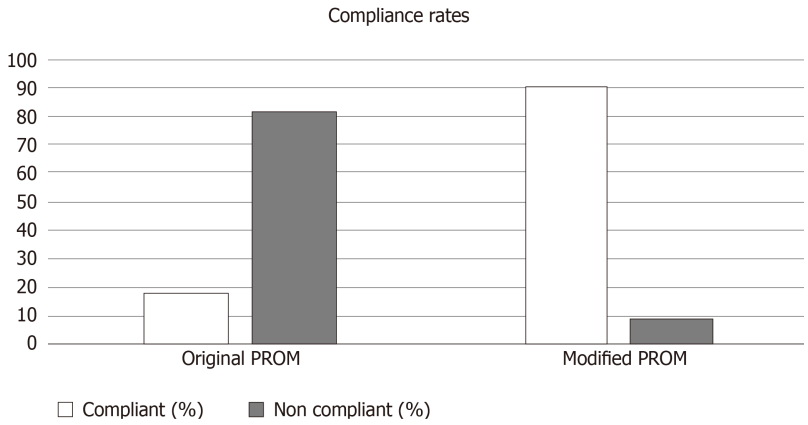

Figure 2 Comparison of compliance rates between original and modified patient reported outcome measures. PROM: Patient reported outcome measure.

studies on patients with benign prostatic hypertrophy, sexual dysfunction is often related to a higher symptom severity score, and with improvement in lower urinary tract symptoms, comes improvement in overall sexual satisfaction[10].

The limitations of this study include: A small patient cohort, and the inability to compare true compliance rates between the original and modified PROM, given that the modified PROM was collected at a different time point. More work needs to be done to validate our modified questionnaire and a prospective study should be performed to fully ascertain its usefulness in clinical practice. We also recognise that a briefer, abridged PROM may not necessarily be efficacious in reflecting detailed patient experiences, however we feel that this could be used as more of a screening tool to highlight patients who will require a more in-depth assessment, especially patients who have not had a good outcome. By using a screening tool with good compliance, we ensure that patient satisfaction is addressed.

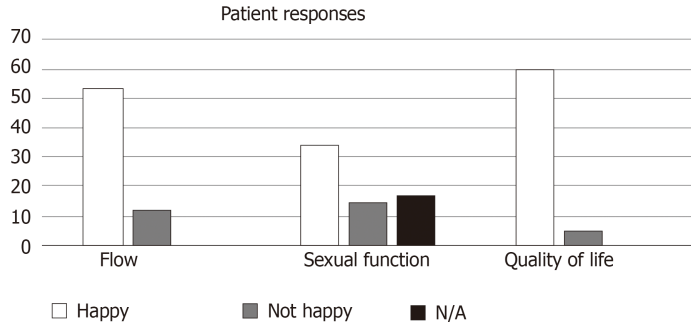

Figure 3 Patient responses to the three questions.

CONCLUSION

In conclusion, urethroplasty is a lifestyle procedure focused on patient satisfaction with symptoms rather than objective measures of surgical success. Only by widespread implementation of such PROMs, can we objectively compare different surgical outcomes and ultimately refine techniques towards improved patient outcomes[11]. Our study demonstrated that an abridged PROM conferred a higher compliance rate and increased patient participation. Our three question PROM allows for a quick and easy screening process to identify patients who may require further investigation on the basis of their perceived dissatisfaction of urinary flow, sexual function and quality of life. We propose that this "Trifecta of Urethroplasty" can help pinpoint patient concerns easily in the outpatient setting.

ARTICLE HIGHLIGHTS

Research background

Patient reported outcome measures (PROMs) are an important measure of patient satisfaction pre- and post-urethroplasty There are very few urethroplasty-specific PROMs and those that exist are usually very length and tedious to complete. It has also been shown that patients' perceived outcomes often do not align with the conventional measures by which urethroplasty surgeons determine success and as such, lack of surgical complications does not necessarily indicate patient satisfaction.

Research motivation

PROMs are notoriously lengthy and tedious to complete. This results in poor patient compliance with PROMs. Given urethroplasty is predominantly a lifestyle procedure, it is important to gain an accurate sense of patient's perceived outcomes from surgery as this will determine patient satisfaction with their quality of life. This sparked our motivation to develop an abridged PROM which focused on the Trifecta of Urethroplasty (flow, sexual function and quality of life), so as to improve patient compliance rates and thus, increase the accuracy of our PROMs.

Research objectives

Our aim was to apply our abridged PROM to our patient cohort and compare compliance rates with the conventional PROM which was previously used.

Research methods

We performed a retrospective analysis on patients who had previously completed a conventional PROM. We then invited all patients to participate in the abridged PROM. We recorded their responses and compared compliance rates.

Research results

We found an improved patient compliance rate with the use of our abridged PROM.

Research conclusions

We advocate the use of this abridged PROM as a screening tool to easily identify patients who may not have perceived satisfaction with their urethroplasty surgery and

can therefore, be investigated further.

Research perspectives

Abridged PROMs can be utilized pre- and post- urethroplasty to help obtain a more accurate sense of patient satisfaction and to also easily identify patients who may require further investigation, counselling or revision based on their level of satisfaction with their surgery. Future research should be performed to validate abridged, urethroplasty-specific PROMs which can also be widely used.

REFERENCES

1 **Bhargava S**, Chapple CR. Buccal mucosal urethroplasty: is it the new gold standard? *BJU Int* 2004; **93**: 1191-1193 [PMID: 15180603 DOI: 10.1111/j.1464-410X.2003.04860.x]

2 **Lucas ET**, Koff WJ, Rosito TE, Berger M, Bortolini T, Neto BS. Assessment of satisfaction and Quality of Life using self -reported questionnaires after urethroplasty: a prospective analysis. *Int Braz J Urol* 2017; **43**: 304-310 [PMID: 28128915 DOI: 10.1590/S1677-5538.IBJU.2016.0207]

3 **Verla W**, Waterloos M, Lumen N. Urethroplasty and Quality of Life: Psychometric Validation of a Dutch Version of the Urethral Stricture Surgery Patient Reported Outcome Measures. *Urol Int* 2017; **99**: 460-466 [PMID: 28850951 DOI: 10.1159/000479189]

4 **Soave A**, Kluth L, Dahlem R, Rohwer A, Rink M, Reiss P, Fisch M, Engel O. Outcome of buccal mucosa graft urethroplasty: a detailed analysis of success, morbidity and quality of life in a contemporary patient cohort at a referral center. *BMC Urol* 2019; **19**: 18 [PMID: 30885184 DOI: 10.1186/s12894-019-0449-5]

5 **Spencer J**, Blakely S, Daugherty M, Angulo JC, Martins F, Venkatesan K, Nikolavsky D. Clinical and Patient-reported Outcomes of 1-sided Anterior Urethroplasty for Long-segment or Panurethral Strictures. *Urology* 2018; **111**: 208-213 [PMID: 28864340 DOI: 10.1016/j.urology.2017.08.029]

6 **Chung PH**, Vanni AJ, Breyer BN, Erickson BA, Myers JB, Alsikafi N, Buckley J, Elliott SP, Zhao LC, Voelzke BB; Trauma and Urologic Reconstructive Network of Surgeons (TURNS). Evaluation of Generic Versus Condition-Specific Quality of Life Indicators for Successful Urethral Stricture Surgery. *Urology* 2019; **126**: 222-226 [PMID: 30580004 DOI: 10.1016/j.urology.2018.12.009]

7 **Tam CA**, Elliott SP, Voelzke BB, Myers JB, Vanni AJ, Breyer BN, Smith TG 3rd, McClung CD, Erickson BA; Trauma and Urologic Reconstruction Network of Surgeons (TURNS). The International Prostate Symptom Score (IPSS) Is an Inadequate Tool to Screen for Urethral Stricture Recurrence After Anterior Urethroplasty. *Urology* 2016; **95**: 197-201 [PMID: 27109599 DOI: 10.1016/j.urology.2016.04.006]

8 **Jackson MJ**, Chaudhury I, Mangera A, Brett A, Watkin N, Chapple CR, Andrich DE, Pickard RS, Mundy AR. A prospective patient-centred evaluation of urethroplasty for anterior urethral stricture using a validated patient-reported outcome measure. *Eur Urol* 2013; **64**: 777-782 [PMID: 23664422 DOI: 10.1016/j.eururo.2013.04.037]

9 **Bertrand LA**, Voelzke BB, Elliott SP, Myers JB, Breyer BN, Vanni AJ, McClung CD, Tam CA, Warren GJ, Erickson BA; Trauma and Urologic Reconstruction Network of Surgeons. Measuring and Predicting Patient Dissatisfaction after Anterior Urethroplasty Using Patient Reported Outcomes Measures. *J Urol* 2016; **196**: 453-461 [PMID: 26907509 DOI: 10.1016/j.juro.2016.01.117]

10 **Bruskewitz RC**. Quality of life and sexual function in patients with benign prostatic hyperplasia. *Rev Urol* 2003; **5**: 72-80 [PMID: 16985624]

11 **Baradaran N**, Hampson LA, Edwards TC, Voelzke BB, Breyer BN. Patient-Reported Outcome Measures in Urethral Reconstruction. *Curr Urol Rep* 2018; **19**: 48 [PMID: 29774434 DOI: 10.1007/s11934-018-0797-9]

Published by **Baishideng Publishing Group Inc**
7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA
Telephone: +1-925-3991568
E-mail: bpgoffice@wjgnet.com
Help Desk: https://www.f6publishing.com/helpdesk
https://www.wjgnet.com