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NEUROGENIC BLADDER DYSFUNCTION

The innervations of the lower urinary tract and control of bladder function is complex. Because of the complex nature of the neural control of the lower urinary tract, complaints about bladder function are common in patients with neurological disease.

The main neural circuits controlling the two functions of the bladder—that is, storage and voiding—are trans-spinal so that intact cord connections between the pons and the sacral segments are necessary to sustain physiological control. Furthermore, input from higher centers is critical in the assessment of appropriate timing of voiding and many types of cortical disease can affect the centers involved with this. In addition to the spinal pathways and input from higher centers, the peripheral innervations to the bladder are through the pelvic plexus, sacral, and pudendal nerves.

However, despite this complexity of neural control, when considered from the point of view of possible dysfunctions, these are limited to those causing a failure of storage or those causing a failure of emptying. Most commonly patients with neurological disease have problems with the former and have incontinence. Some patients, however, may have urinary retention. In addition, there is a large group of patients, particularly those with disruption cord disease, who have a combination of incomplete emptying and bladder overactivity.

Although the patients' symptoms are generally a good guide as to the predominant underlying bladder disorder if it is detrusor overactivity, this is not the case in those with additional incomplete emptying; it is in these cases that investigations determining management are most important.

Investigations

The investigations of patients with neurogenic bladder dysfunction are aimed at both improving symptoms and also preserving renal tract health.

Prevention of upper tract damage

Following spinal cord trauma and in patients with spina bifida, upper urinary tract damage may occur secondary to the neurogenic bladder dysfunction. This is due to high detrusor pressures both throughout the filling phase (so called poor "compliance") as well as superimposed

detrusor contractions occurring against a closed sphincter caused by the disorder known as "detrusor-sphincter dyssnergia". Patients with such conditions should be under the care of a urologist who will arrange annual surveillance of the upper urinary tract, using ultrasound to check there is not any ongoing insidious renal tract damage.

In patients with chronic spinal disorders such as multiple sclerosis, although the extent of neurological disability may be as severe as in the patient who has had a traumatic spinal cord lesion, upper tract involvement is fortunately extremely uncommon. It is only likely to be a problem if the patient has had recurrent urinary tract infections and has an indwelling catheter. In general, therefore, investigations in patients with progressive neurological disease should be aimed primarily at improving bladder management options.

Symptom management

If urinary frequency, urgency, and urge incontinence are major complaints it is highly likely that there is underlying detrusor overactivity. The best method of demonstrating this is to perform cystometry which will show involuntary contractions of the detrusor muscle. The formal International Continence Society definition of detrusor overactivity is that it is "a urodynamic observation characterized by involuntary detrusor contraction during the filling phase which may be spontaneous or provoked"; no limit is specified as to the amplitude of the contraction, but there is a rider that confident interpretation of low pressure waves (that is, $< 5 \text{ cm H}_2\text{O}$) depends on high quality urodynamic technique. The result is a small capacity bladder that develops unwanted contractions which the patient may be unable to suppress. A practical approach to such a patient is to consider treatment with anticholinergics, but only after measurement of the post-micturition residual volume.

Because spinal lesions cause neurogenic detrusor overactivity the predominant symptoms in such patients will be urgency and urge incontinence. However, the spinal disease is also likely to affect the neural pathways involved in bladder emptying so that incomplete bladder emptying may also exist. Although this may be relatively

asymptomatic it can contribute significantly to the overall bladder dysfunction. Typically a patient with multiple sclerosis will present with complaints of urgency, frequency, and urge incontinence but only on direct questioning will admit to a poor stream, possibly difficulty with initiating micturition, and a sense of incomplete bladder emptying. The latter symptom is particularly unreliable because although most patients who complain of incomplete bladder emptying are correct, many of those who claim to be emptying to completion will not be.

Measurement of the residual volume can be carried out using a small portable ultrasound device. The cost of these instruments has now dropped considerably and most nurse-led continence services will have access to one. Continence nurse specialist with the portable ultrasound device for estimating the post-micturition residual volume of urine. Except for the debated value of sphincter electromyography (EMG) in patients with Parkinsonism and bladder symptoms, clinical neurophysiology contributes little to the investigation of patients with established neurological disease.

Medical Treatment

The mainstay of the treatment of the symptoms of urgency, frequency, and urge incontinence is anticholinergic medication. Several alternative drugs are available for treatment of the overactive detrusor but, for most, clinical use is based on the results of preliminary, open studies rather than randomized, controlled clinical trials. Anticholinergics may be efficacious in many patients but they do have side effects, and patients often stop taking them. Their common mode of action is on the muscarinic receptors of the detrusor muscle, and whether they act predominantly on the M2 or M3 receptors seems to have little influence on their clinical efficacy.

Propantheline bromide is non-selective for muscarinic receptor subtypes and has a low bioavailability. It was a first choice agent for detrusor overactivity in the 1980s but has been largely supplanted by newer agents since. Trospium chloride is a quaternary ammonium compound and, although non-selective for the muscarinic receptor subtypes, it is a very efficacious anticholinergic. Tolterodine is a potent and competitive antagonist of the muscarinic receptor. Although no selectivity has been shown for individual receptor subtypes, it appears to show tissue selectivity for the bladder over the salivary glands. Oxybutynin has antimuscarinic, muscle

relaxant, and local anaesthetic actions. It has been demonstrated to have a higher affinity for muscarinic M1 and M3 receptors than M2, but the clinical significance of this is unclear. The therapeutic effect of the immediate release formulation on detrusor overactivity is associated with a high incidence of side effects and its dose should be titrated. Side effects are typically antimuscarinic (dry mouth, constipation, blurred vision, drowsiness). With the recognised problem of central acetylcholine deficiency as a significant neurotransmitter in dementia, it is probably sensible to use anticholinergics that do not cross the blood-brain barrier such as tolterodine or trospium chloride in patients with cognitive impairment.

The most common side effect of the anticholinergic agents is dry mouth; it seems likely that this complaint is worse when blood concentrations are high and preparations which produce less in the way of peaks and troughs (that is, "long acting forms") are preferable. The "XL"/slow release preparations are made so by containing the active constituent in a capsule. This has a minute hole in it through which the medication is released as it passes through the small intestine. Under some circumstances patients may report passing the capsule in their faeces but this does not mean they have failed to absorb the medication.

Most commonly anticholinergic medication is used either alone or, if the patient is failing to empty their bladder adequately, in combination with clean intermittent self catheterization. The latter procedure is most conveniently taught by a nurse continence advisor. There is an extensive network of these specialist nurses in the UK and often they are able to go into the patient's home to teach them the technique in their own environment. The patient is taught to identify the urethral orifice (obviously easier in men than women) and insert a catheter into the bladder to drain it. The catheter is then removed. Over the last 10 years there have been significant developments in the type of catheter available and now those most popularly used are coated with a lipophilic film which upon contact with fluid becomes highly lubricated and easy to pass. Some of the manufacturers now provide the catheter in a sachet containing fluid. These catheters are inevitably more expensive than the multiple use catheters that relied on applying KY jelly as a lubricant.

Patient reaction and acceptance of intermittent catheterization is extremely variable. Some patients take to it well, particularly if they have spoken to another

patient who has benefited from performing the technique. Others always find it difficult and do not persist with it. Since there is very little to be lost by the patient learning the technique of self catheterization, one approach is to teach most patients how to do it if they have a significant post-micturition residual volume (consistently above 100 ml) and are capable of performing the procedure, and see then if it helps them symptomatically.

Recurrent urinary tract infections can undeniably be a problem and its best if the patient learns to recognize the early symptoms of an infection and has available a short course of antibiotics to take as appropriate. Arrangements should be made for a urine specimen to be easily sent off to the laboratory before starting the antibiotics. Long term low dose antibiotics are not usually recommended. Nor is it advisable for asymptomatic patients to send regular specimens to the laboratory since those doing self catheterization are likely to grow organisms from the urine although not actually have a urinary tract infection.

If, despite clean intermittent self catheterization and taking an adequate dose of anticholinergic, incontinence is still a problem, the synthetic antidiuretic hormone Desmopressin taken either at night or during the day (but not both) may be considered. This reduces urinary frequency for a number of hours and patients find it helpful if, for example, they are going on a long journey or out for a social occasion when they want to be free from urinary urgency. It is important, however, to stress to the patient that they must take this only once in 24 hours or be at risk of water intoxication.

Second line treatments

Second line therapies aimed at lessening detrusor overactivity have been largely based on the principle of de-afferenting the bladder. Neurogenic detrusor overactivity can be caused either by loss of inhibition on the pontine micturition centre, as happens with supra-pontine pathologies, or if there has been disconnection of the pontine micturition centre from the sacral part of the cord, the emergence of a new reflex at spinal level. In these circumstances de-afferentation of the bladder using an intravesical vanilloid has been tried. First capsaicin was used but this was pungent and an unlicensed medicine, and was replaced by resiniferatoxin (RTX). Resiniferatoxin is obtained from the plant *Euphorbia resiniferi* and is known to be an ultra-potent capsaicinoid with a thousand times the neurotoxicity for unmyelinated C fibers as capsaicin, for an equal

pungency so that an instillation of RTX is significantly less uncomfortable. Unfortunately multi-centre trials to demonstrate the efficacy of RTX were unsuccessful, probably because its propensity to adsorb to plastic was not recognised. There are, however, some centres in the world that have persevered with this treatment and obtained impressive results in both neurogenic and non-neurogenic detrusor overactivity. It is hoped that this medication will become commercially available in the future.

A highly promising recent development has been the use of intra-detrusor injections of botulinum toxin. First described from Switzerland in the treatment of patients with spinal cord disease, it has been found to be effective in other causes of neurogenic bladder overactivity as well as non-neurogenic cases. The injections are given through a cystoscope at between 20 and 30 different sites in the detrusor muscle wall, avoiding the trigone. The introduction of injections through a flexible cystoscope has meant that the entire process can be achieved as an outpatient procedure, taking less than 20 minutes. The beneficial effect seems to be remarkable, in that it increases bladder capacity and virtually eliminates the sense of urgency, the effect lasting for between 6–9 months. Fortunately the efficacy of second and subsequent injections does not seem to be diminished and reports are now appearing of patients who have had repeat injections on at least four occasions with continuing benefit. As with botulinum toxin injections at other sites, very few adverse events have been reported. The range of patients for whom this treatment will be suitable remains to be defined.

Medicinal cannabinoid extracts

A preliminary open label study looking at the effect of sublingual cannabis spray to treat detrusor overactivity in advanced multiple sclerosis produced some encouraging results. It appears that the medication lessens the sense of urgency and reduces the number of episodes of incontinence, and patients were able to achieve improved bladder control, without unwanted psychotropic effects. The study included only patients with quite advanced multiple sclerosis that were facing the prospect of requiring an indwelling catheter, and many of them found it had a beneficial effect on other aspects of their neurological disability. A multi-centre placebo controlled double blind study in patients with multiple sclerosis is now in progress.

Future pharmacological developments

The emerging understanding of the pharmacology of the neural control of the bladder suggests that there will probably soon be medications available with a central level effect that improve the efficiency of both the phase storage and of emptying. Studies are currently underway looking at the effect of 5-hydroxytryptamine (5-HT) antagonists as well as alpha delta ligands. It seems likely that in the not too distant future there will be a number of oral alternatives to the antimuscarinics to treat overactive bladder symptoms. Unfortunately at the moment there is no medication that improves neurogenic incomplete bladder emptying or retention.

Use of stimulators

In patients with complete spinal cord transection, direct sacral root stimulation through an implanted stimulator may restore a degree of pelvic organ control; however, a dorsal rhizotomy is required to abolish reflex detrusor contractions. Such an implant is not used in patients with incomplete cord lesions. The technique, which stimulates the pelvic plexus through electrodes inserted through a sacral foramen, is known as "neuromodulation" and is mostly reserved for patients with severe idiopathic detrusor overactivity or complete urinary retention. Because of the expense of the stimulator device and the considerable surgical re-operation rate for the implant or the stimulating lead, these are not used for patients with progressive neurological disease in the UK.

Long term catheters

Unfortunately in advanced neurological disease, long term indwelling catheters become the mainstay of urinary control. Many factors may complicate or impact on the choice of bladder management including neurological, urological, sexual, psychological, and social. Indeed, sometimes the preservation of quality of life for carers or lack of adequate nursing may dictate the use of indwelling catheters with little regard for the potential longer term consequences. A recent survey estimated that 30% of patients with advanced multiple sclerosis utilised an indwelling catheter (40% urethral, 60% suprapubic).

The convenor or condom catheter is a sheath which is applied to the penis in a similar manner to a condom. It is the least satisfactory means of chronic urinary drainage as it does not drain the bladder per se and significant volumes of residual urine may remain in the

bladder. This type of device is best employed, if at all, in the short term only. The sheath is prone to loose or poor fitting, and skin excoriation and infection are other problems encountered.

Although urethral catheterization does provide effective bladder drainage it is not an ideal long term solution. Erosion of the urethra may occur in both men and women, whereas men are also prone to developing urethral stricture disease, although neither of these problems tends to arise with its short term use.

Most urologists agree that a suprapubic catheter is the preferred route for long term bladder drainage if an indwelling catheter is required. A reduction in maximal detrusor pressure, improvement in bladder morphology, and a resolution of reflux has been reported. Renal function is usually well preserved. A bowel injury or hematoma can occur at catheter insertion, but this is rare and should not happen if ultrasound guidance is utilised.

Complications common to both urethral and suprapubic catheterization include urine bypassing the catheter leading to incontinence, and recurrent infections and catheter blockage. Bypassing is more prevalent with a urethral catheter as the inflated balloon rests on the sensitive trigonal area and may precipitate bladder spasms. Anticholinergics are the treatment of choice for catheter induced bladder spasm.

Recurrent urine infection and its sequelae cause significant difficulties in both forms of catheterization. Initially a biofilm develops on the catheter, usually stemming from a urine infection with a urease-producing organism, and this ultimately may lead to encrustation and catheter blockage. All silicone catheters are less irritant and possess anti-adhesive properties, and their time to encrustation is twice that of the hydrogel-coated latex catheter. A minimum 16 French (minimum size) all silicone catheter is recommended for long term bladder drainage, and it should be changed at least every three months, depending on problems with infections and encrustation. Bearing in mind that the urine in patients with long term catheters is *always* colonised with a variety of microbials, urine should only be sent for microscopy and culture when a symptomatic infection is suspected. Antibiotics should only be used sparingly and prophylaxis in these patients should be resisted.

It has been speculated that chronic bladder catheterization may be a risk factor for developing bladder cancer, but this remains unproven to date. Finally, as a general rule, a surveillance ultrasound of the upper tracts and a serum creatinine should be performed every 1–2 years to ensure stable renal anatomy and function.

Prof. MA Salam

Editor

Bangladesh Journal of Urology

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A STUDY ON THE EFFECT OF TRANSURETHRAL RESECTION OF PROSTATE ON URINARY SYMPTOMS AND QUALITY OF LIFE IN PATIENTS WITH BENIGN PROSTATIC HYPERPLASIA

MW ISLAM¹, MS ISLAM², TMS HOSSAIN³, MA HOSSAIN⁴, AZMZ HOSSAIN⁵

Abstract:

Objectives: To evaluate the effects of TURP on urinary symptoms and quality of life in patients with benign prostatic hyperplasia.

Methods: This prospective study was done between January 2003 to December 2004. A total of 102 consecutive patients with lower urinary tract symptoms due to BPH were selected in the present study. Symptoms were evaluated using IPSS and score on quality of life. Transabdominal ultrasonogram was done to determine post void residual urine volume and uroflowmetry was done to determine peak urinary flow rate (Q_{max}) and voiding time. Each patient was observed and followed up bimonthly after TURP for 6 months. On each follow up visit each patient was evaluated with IPSS, QoL score and uroflowmetry and transabdominal ultrasonogram.

Results: After TURP the IPSS showed significant improvements in urinary symptoms and there was a significant reduction in PVR ($p < 0.001$) after TURP. There was increase in peak urinary flow rate (Q_{max}) ($p < 0.001$) and decrease in voiding time ($p < 0.001$) after TURP. Quality of life was significantly improved ($p < 0.001$) after TURP.

Conclusion: Urinary symptoms and quality of life improves after TURP in patients with BPH.

Key Words: Benign Prostatic Hyperplasia, International Prostate Symptom Score, Post Void Residual Urine Volume, Peak Urinary Flow Rates, Quality of Life.

Introduction:

Benign Prostatic Hyperplasia (BPH) is a common condition in middle-aged and elderly men and its prevalence increases with age.¹ Urinary symptoms are usually related with a subjective decrease in quality of life.

It has been reported that more than 50% of male aged 65 years and over have symptoms consistent with prostatism and that one-third of these (15% of all men aged 65 years and over) would have transurethral resection of prostate (TURP) for prostatic obstruction.² During the last 50 years transurethral resection of prostate has been the reference standard for the surgical treatment of benign prostatic hyperplasia except for patient with large adenomas.³

Symptoms of BPH are caused by mechanical and dynamic obstruction of urine flow. The mechanical obstruction is due to compression or intrusion into the urethra by the enlarging nodule of the prostate or by protrusion of the median lobe of prostate into the bladder neck and leading to higher bladder outlet resistance. Dynamic obstruction is caused by increasing muscle tone of the bladder neck and prostate, which is regulated by α -adrenergic receptor.⁴ A reduction tone might be expected to reduce prostatic urethral pressure and to improve obstructive symptoms. Benign Prostatic Hyperplasia (BPH) is associated with obstructive symptoms (like hesitancy, decrease force and narrow stream, sensation of incomplete bladder emptying, double voiding, straining to urinate, post void dribbling) and irritative symptoms (like urgency, frequency, nocturia) which may be troublesome to an elderly men.

The self-administered questionnaire developed by the American Urological Association (AUA) is both valid and reliable in identifying the need to treat patients and in monitoring their response to therapy.⁶

The International Prostate Symptoms Score (IPSS) initiated the guideline panel for diagnosis and management of benign prostatic hyperplasia. Patients with mild symptoms (having a score of 0 to 7) were assigned to watchful waiting, those with moderate (8 to 19) or severe (20 to 35) symptoms would undergo farther testing and/ or treatment.

Many recent studies have examined the impact of the symptoms of BPH on quality of life. Transurethral resection of prostate (TURP) aimed at reducing the symptoms experienced by patients and their effects on quality of life (QoL). Quality of life (Table-I) measures are important because the same symptoms are not equally bothersome for all patients: getting up three times a night patient may have a significant impact on quality of life, whereas another patient may not find this a problem. Hence patient- reported symptoms must be supplemented by measures of their perception on quality of life.⁷

The assessment of BPH symptoms and their effects can be carried out at three levels (i) Patients- reported symptom questionnaires of which there are many including the commonly used validated IPSS (identical to the AUA index)⁸ (ii) BPH- specific quality of life questionnaires in which patients are asked to directly attribute effects of BPH symptoms to their quality of life examples of this form of measures include the ICS-BPH questionnaire which although lengthy has been validated recently and is comprehensive.⁹ Other example include the AUA Bothersome index or symptom problem index (SPI) which determines how bothersome patients find their symptoms.¹⁰ The BPH impact index (BII) which measures how much urinary symptoms affect the various domains of health, a patient weighted measures comprising 12 questions relating to bladder storage and voiding function.¹¹ (iii) Generic quality life questionnaires: although not specific for BPH and treatment. Generic measures have shown to reflect symptom change after prostatic surgery, result of a large study of over 300 patients undergoing prostatectomy have shown significant sustained improvement in most health dimensions of the Euro quality of life.¹²

Ideally, for a comprehensive assessment of the impact of BPH symptoms all three types of measures should be used but this is often impractical in routine clinical practice.

IPSS are commonly used and validated. One global quality of life question was added "if you were to spend the rest of your life with your urinary condition just the way it is now, how would you feel about that?" and the answering scale ranged from "0" (delighted) to "6" (terrible).

There are many options for treatment of symptomatic BPH like watchful waiting, medical therapy with a α -receptor blocker and 5α -reductase inhibitor, phytotherapy and surgical treatment including minimally invasive

therapy. Symptoms are best assessed by IPSS and peak urine flow (Q_{max}) rate and quality of life Score.¹³ Watchful waiting should be considered when a symptom in mild (0-7). Medical treatment is usually chosen, when there are moderate symptoms and no absolute indication for surgical intervention.¹⁴ Medical treatment is cost effective, time consuming, sometimes patients forget to take medicine regularly, co-morbidity, increased, unwanted adverse effect (like postural hypotension, headache, dizziness etc.), total symptoms free not possible, chance of progression of disease.

Indication for surgical intervention are: failed medical treatment of BPH. and complications of an obstructing prostate- such as acute or chronic urinary retention, recurrent urinary tract infection, haematuria, bladder stone and postrenal azotemia. The most common reasons that intervention is recommended in a patient with symptoms of bladder outlet obstruction and irritability are that symptoms are moderate to severe, bothersome and interfere with the patients quality of life. 90% of patients under going a TURP had symptoms of prostatism, but 70% had another indication as well (eg. acute urinary retention) occurring in 27%.¹⁴

A surgical approach when indicated may reduce urinary symptoms, thus restoring a good quality of life.¹⁵

As life expectancy increases in Bangladesh so, lower urinary tract symptoms due to benign prostatic hyperplasia also increasing. Though the transurethral resection of prostate (TURP) is still considered as a gold standard treatment option for benign prostatic hyperplasia (BPH).

Methods:

The present study was a prospective study. The study was conducted in the out and in patients department of urology, Dhaka Medical College Hospital Dhaka from January 2003 to December 2004. A total 102 cases of selected consecutively according to study designed and selection criteria from the patients attending urology out patient department, Dhaka Medical College Hospital with lower urinary tract symptoms due to benign prostatic hyperplasia. Selection criteria were: Male patient between 60-75 years of age with LUTS suggestive of benign prostatic hyperplasia (volume of prostate >50ml), Refractory urinary retention due to benign prostatic hyperplasia, IPSS: 17-25, Peak Urine Flow Rate (Q_{max}) 7-12.2 ml/sec for voided volume of 200 ml or more, Post voidal residual urine volume >100 ml (by trasabodominial USG), Quality of life (QOL) : Poor quality of life score (4-6).

Patients were excluded from the study if they had- Carcinoma Prostate, Neurogenic bladder, BPH with renal failure (acute and chronic), Patient undergone surgery to the bladder neck of prostate, Stricture urethra, Bladder stone, Stroke with in last six months, Previous history of TURP

Before TURP, base line study of each patient was evaluated by history, physical examination, digital rectal examination (DRE), International Prostate Symptoms Scoring (IPSS), Quality of Life Scoring (QoL) Urinalysis, volume of the prostate and post voidal residual urine (PVR) were determined by ultrasonogram.

Digital rectal examination was done to determine the prostate size and to exclude carcinoma prostate. Perinal sensation, anal tone and bulbocavernosus reflex were observed to detect any neurological lesions.

Urinalysis, if needed culture and sensitivity. Prostate specific antigen, serum creatinine were done in the same laboratory of Dhaka Medical College Hospital and out side reliable pathological laboratories to exclude urinary tract infection, carcinoma prostate and renal failure respective. Transabdominal USG was done by the sonologist (Radiology Department, DMCH and reliable out side Laboratories) to detect any hydronephrotic change, Post voidal residual urine, prostate size, echotexture, any hypoechoic lesion in the prostate. Uroflowmetry was considered reliable when voided volume was >200 ml. Plain x-ray KUB region was done to exclude urinary stone diseases cases, neuropathic bladder was excluded from the study.

All history and examination followed a similar protocol. Informed consent was taken from all patients. A detail data sheet was completed and this included particulars of the patient- history, results of physical examinations and relevant base line investigations. From the supplied sheet IPSS Symptoms Score and QOL score were determined.¹⁶

Each patient was observed and followed up at 8 weeks (1st visit), 16 weeks (2nd visit) 24 weeks (3rd visit) after transurethral resection of prostate (TURP). On each follow up visit, each patient was evaluated by history to find out incontinence, retrograde ejaculation (Dry Coitus). IPSS score, QOL score also recorded and uroflowmetry was done to see the flow of urine and voiding time. USG was done to see post voidal residual urine volume and DRE also done in selected cases. Improvement of lower urinary tract symptoms and quality of life was determined using IPSS score.

Improvement was based on the changes from base line in symptoms, urinary flow rate, amount of post voidal residual urine and quality of life. Urine flow rate was measured by uroflowmetry as peak urinary flow rate (Q_{max}), voiding time and voided volume and was considered valid only if the voided volume was >200 ml.

Symptoms were assessed urinary IPSS & consisting of seven symptoms (frequency, nocturia, urge in continence, urgency, hesitency, terminal dribbling and sense of incomplete evacuation) that were graded from 0-5. An overall symptoms score was calculated. Data was collected in a pre-design and pre-tested data collection sheet. Data was compiled and statistical analysis were done using computer based software, Statistical Package for Social Science (SPSS), using paired 't' test. A P value <0.05 was taken as significance.

Results:

Mean age of patients was 68.92±5.84 years (range 60-75 years).

Before TURP, IPSS range 17-25 and mean 21.61+2.43, after TURP, range 0-7 and mean 4.27+1.71). There was significant correlation between the IPSS obstructive scores and Qmax at base line (P=<0.001), while correlations at the 1st, 2nd and 3rd follow up significant. There was also a significant correlation between IPSS obstructive score and PVR, and quality of life (Table-I).

After TURP, the IPSS Score showed significant improvements in urinary symptoms with the IPSS showing more significant change for obstructive symptoms.

Table-I
Changes in IPSS from base line to end point after TURP (n=102).

IPSS	Baseline (before TURP)	Endpoint (after TURP)	t	df	P value
Mean±SD	21.61+2.43	4.27+1.71	82.508	101	<0.001
Range	17-25	0-7			
Change Mean±SD	-17.33+2.12				

Paired Student 't' test.

Hence a significant improvement of IPSS was found from 2 months to 6 months follow up after TURP. The change was tested using "paired student 't' test".

Before TURP Q_{max} range 7-12.2 and mean was 9.96 ± 1.69 , which became range 18-25 and mean was 22.61 ± 2.28 after TURP and therefore change of mean Q_{max} was 12.64 ± 2.69 .

TURP caused a significant change in Q_{max} the mean Q_{max} being 12.64 ± 2.69 ml/sec and mean PVR range >100 ml. The mean (SD) improvement in Q_{max} was 12.64 ± 2.69 ml/sec and reduction in PVR, 60 patients having no detectable PVR at the 6 months follow up (Table- II).

The change was tested using "paired student 't' test". The change was found significant ($P < 0.001$).

Table-II

Change in peak urine flow (Q_{max}) from base line to end point after TURP.

Q_{max} (ml/sec)	Baseline (before TURP)	Endpoint (after TURP)	t	df	P value
Mean±SD	9.96 ± 1.69	22.61 ± 2.28			
Range	7 12.2	18 25	-47.512	101	<0.001
Change Mean±SD	12.64 ± 2.69				

Paired Student 't' test.

Mean voiding time was 54.65 ± 7.09 sec at base line, which became 21.08 ± 1.86 sec at end point and therefore change of mean voiding time was -33.57 ± 7.53 sec.

Hence a significant improvement of voiding time was found after transurethral resection of prostate (TURP) (Table- III). The changes was tested using 'Paired student 't' test'. The change was found significant ($P < 0.001$).

Table-III

Changes in voiding time from base line to end point after TURP (n=102).

Voiding time (Sec)	Baseline (before TURP)	Endpoint (after TURP)	t	df	P value
Mean±SD	54.65 ± 7.09	21.08 ± 1.86			
Range	40-45	20-25	45.030	101	<0.001
Change Mean±SD	-33.57 ± 7.53				

Paired Student 't' test.

Mean PVR was 205.27 ± 14.76 ml at base line, which became 4.07 ± 8.92 ml at end point and therefore change of mean PVR was -201.21 ± 13.82 ml (Table- IV).

Hence a significant reduction of PVR was found after TURP. The change was test using 'Paired Student 't' test'. The change was found significant ($P < 0.001$).

Table-IV

Change in PVR from base line to end point after TURP (n=102).

PVR (ml))	Baseline (before TURP)	Endpoint (after TURP)	t	df	P value
Mean±SD	205.27 ± 14.76	4.07 ± 8.92	147.075	101	<0.001
Range	180-220	0-5			
Change Mean±SD	-201.21 ± 13.82				

Paired Student 't' test.

Mean quality of life was 5.01 ± 0.64 at base line, which became 0.60 ± 0.91 at end point and therefore change of mean QOL was -4.41 ± 0.93 ml (Table- V).

Hence a significant improvement QOL after transurethral resection of the prostate. The change was test using 'Paired Student 't' test'. The change was found significant ($P < 0.001$).

Table-V

Change in quality of life from base line to end point after TURP (n=102).

QOL	Baseline (before TURP)	Endpoint (after TURP)	t	Df	P value
Mean±SD	5.01 ± 0.64	0.60 ± 0.91	48.089	101	<0.001
Range	4-6	0-3			
Change Mean±SD	-4.41 ± 0.93				

Mean±SD

Paired Student 't' test.

Discussion

This present study was done to determine the improvement of symptoms and quality of life after transurethral resection of prostate. In this study 102 patients of Benign Prostatic Hyperplasia (BPH) from out patient Department of Urology of Dhaka Medical College Hospital were selected for transurethral resection of prostate (TURP) and were followed up 2 monthly for 6

months to determine the improvement of IPSS, peak urinary flow rate (Q_{max}) and quality of life.

International Prostate Symptom Score (IPSS) is a simple tool in the evaluation of BPH. Symptom score permits precise documentation and quantification of symptoms as a mean of expressing the change after treatment of BPH. Uroflowmetry is the most convenient method to examine voiding function and particularly suitable to clinical studies. $Q_{max} < 12$ mL/sec was included in this study as a base line. Elevated PVR is more indicative of detrusor failure than outlet obstruction and patients with PVR > 100 mL was included in this study.

In this prospective study mean IPSS before TURP was 21.61 ± 2.43 (range 17-25). After TURP end point mean IPSS was 4.27 ± 1.71 (range 0-7). So after TURP statistically significant decrease in IPSS was observed in comparison to IPSS before TURP ($p < 0.001$). Gacci et al. observed a significant improvement in urinary symptoms with the IPSS for obstructive and irritative symptoms in their study ($p < 0.001$). Chalise and Agrawal found IPSS 23.4 before TURP and reduced to 7.9 following TURP in their series. The findings of these studies are consistent with the present study.

In this study a significant improvement of Q_{max} was found after TURP. Before TURP mean Q_{max} was 9.96 ± 1.69 mL/sec (range 7-12.2 mL/sec) and after TURP mean Q_{max} was 22.61 ± 2.28 . Gacci et al. found a significant change in Q_{max} after TURP. The improvement in Q_{max} was 17.9 mL/sec at 6 months follow up in their study. Loughlin et al. also found significant improvement in flow rate ($p < 0.001$) after TURP. These results are also similar with the present study.

In the present study mean PVR was 205.27 ± 14.76 mL at base line which became 4.07 ± 8.92 mL at end point and hence a significant reduction of PVR was found after TURP. The change was found significant ($p < 0.001$). A similar reduction of PVR was found after TURP in a study done by Loughlin et al. Gacci et al. found mean PVR before TURP 92 mL and having no PVR at 6 month follow up. These findings are also more or less similar to the present study.

In the present study mean voiding time was 54.65 ± 7.09 sec at baseline which became 21.08 ± 1.86 sec at the end point. Loughlin et al. also found a significant improvement ($p < 0.001$) in voiding time after TURP.

In this study mean quality of life score was 5.01 ± 0.64 at baseline which became 0.60 ± 0.91 at end point. The change was significant ($p < 0.001$). Chalise and Agrawal

also found a significant improvement in quality of life in their series. Before TURP QoL score was 5.2 and after TURP it was 1.5 in their study. These findings are also similar with the present study. Emberton et al. also found a similar improvement of QoL in their study.

Conclusion:

From the present study it can be concluded that transurethral resection of prostate resolves obstructive symptoms, rapid improvement of urinary flow rate and quality of life that is why it is gold standard treatment for moderate to severe symptomatic BPH patients.

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SHORT TERM OUTCOME OF VENTRAL ORAL MUCOSAL GRAFT URETHROPLASTY AND SPONGIOPLASTY FOR BULBAR URETHRAL STRICTURE

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Abstract

Objective: To evaluate the short term result of ventral oral mucosal graft urethroplasty for bulbar urethral stricture.

Patients and methods : From July 2006 to July 2008, 84 patients with a long (>2cm) anterior urethral stricture had the anterior urethra reconstructed, using a onstage urethroplasty with a ventral onlay oral mucosal graft. Mean age 34.9 years, range 21 to 48. RGU done to diagnose and determine the length and location of stricture. Patients were further evaluated by uroflowmetry. The urethra was approached via a midline perineal incision. No urethral dissection was used on laterally or dorsally, so as not to jeopardize the blood supply. A pericatheter urethrogram was taken and the catheter removed at 3 weeks, with subsequent urethrogram at 3 months. Patients were further followed with uroflowmetry at 6-months.

Results : The mean (range) length of the stricture was 3.3 (2-5) cm and mean peak flow rate 7.5ml/sec. Five patients developed stricture at the proximal anastomotic site and required optical internal urethrotomy once. Overall success was 79 of 84 patients (94.05%). Three patients developed leakage managed conservatively and seven patients developed infection treated successfully with antibiotics.

Conclusion: Ventral oral mucosal graft urethroplasty and spongionoplasty is a simple technique with a good surgical outcome; it does not require urethral dissection and mobilization and hence preserves the blood supply.

Keywords: Urethral stricture, buccal mucosal graft, urethroplasty

Introduction

Bulbar urethral strictures, which require urethroplasty but are too long for excision and end-to-end anastomosis, are best treated by a substitution urethroplasty technique in which the stricture is opened throughout its length and a patch of suitable material inserted to restore the calibre of the urethra to normal. This may be achieved by using penile skin flaps or free grafts of full-thickness

skin, bladder or buccal mucosa group (BMG). The BMG is fast emerging as the most versatile urethral substitute as it has ideal graft characteristics and can be harvested with no significant morbidity.^{1,2} There is sufficient evidence to suggest that it is the tissue of choice for reconstructing bulbar urethral strictures.^{3,4} Humby was the first to describe the use of buccal mucosa for urethral substitution as early as 1941, but it was only in the early 1990s that buccal mucosa was rediscovered for this indication.

Various factors have contributed to the acknowledgement of buccal mucosal grafts (BMGs) as an ideal substitute for the urethra, including easy accessibility and manual handling, resistance to infection, compatibility with a wet environment, a thick epithelium and a thin lamina propria, allowing early inosculation and good medium-term results which are at least comparable with full-thickness skin grafts.⁵ However, placing the graft ventrally or dorsally is contentious.^{6,7} The ventrally placed graft is reportedly more prone to fistula formation or sacculation and diverticula formation.⁶ The dorsal onlay graft procedure for anterior penile urethral stricture has obvious advantages over the ventral onlay graft urethroplasty. It provides better mechanical support by the corporal bodies for better take. Recently, dorsal free-graft urethroplasty was described, where the urethra is mobilized to incise it dorsally to place a graft.⁸

Thickness of corpus spongiosum of bulbar urethra is different from rest of the urethra. In this part ventral thickness is greater (5-7mm) than dorsal (2-3mm). This increased ventral thickness give the opportunity to close over the graft without narrowing lumen and didect vascularity to the graft. More over closure of bulbocavernosus over corpus spongiosus adds additional support to the graft. In this study we describe our initial experience with ventral oral mucosal graft (OMG) urethroplasty through a ventral sagittal urethrotomy and spongionoplasty technique for repairing long bulbar urethral strictures.

Patients and Methods:

From July 2006 to July 2008, 84 patients with a long bulbar urethral stricture (>2 cm) as evidenced by RGU had their urethra reconstructed. Mean age 34.9 years, range 21 to 48. Patients were further evaluated by uroflowmetry. A one-stage urethroplasty with a ventral onlay patch OMG through a ventral sagittal urethrotomy technique was used. The BMG was taken from the inner cheek area below the Stensen's duct, and lower lip in cases of long strictures and excess soft tissue removed. Urethra was approached via a midline perineal incision. Through this perineal incision urethra was exposed ventrally 1 cm beyond the proximal and distal limits of the stricture, with no dissection laterally or dorsally, so as not to jeopardize the blood supply. The urethra was opened ventrally in the midline over the stricture and .5 cm proximal and distal to it. This produced a wide elliptical recipient gap for the graft. The graft was placed in the same elliptical area and sutured to the urethral margins with 5-0 polyglactin. The graft was further reinforced by closing the defect of corpus spongiosum by continuous sutures with 5-0 polyglactin over a 16 Foley's catheter. Bulbocavernosus muscle then approximated over corpus spongiosum thus again reinforcing the graft. The dartos fascia was approximated leaving a drain inside. Finally the skin was closed to provide proper anatomical closure. A pericatheter urethrogram was taken and the catheter removed at 3 weeks, with subsequent urethrogram at 3 months. Patients were further followed with uroflowmetry at 6-months.

Results:

The mean (range) length of the stricture was 3.3 (2-5) cm, mean peak flow rate 7.5 (3-12)ml/sec, the operative duration 110 (90-150) min, the blood loss 50 (30-90) mL, no patient required blood transfusion. The criteria of successful reconstruction were a peak flow rate greater than 15 mL/s, no postoperative instrumentation of any kind. Pericatheter urethrogram done at 3 weeks. Three patients had extravasation of contrast medium near the distal anastomotic site and needed extended catheterization for another week; a repeat pericatheter urethrogram showed no leak. Seven patient developed infection and treated successfully with antibiotics. Five patient developed a stricture at the proximal anastomotic site and required optical internal urethrotomy once. The overall success rate was 79 of 84 (94.05%). None of the patients developed any sagging, diverticulum or fistula at the site of the graft. Subsequent urethrogram at 3

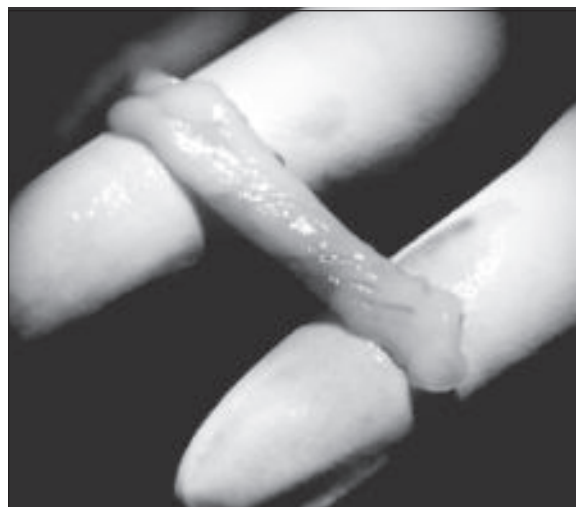
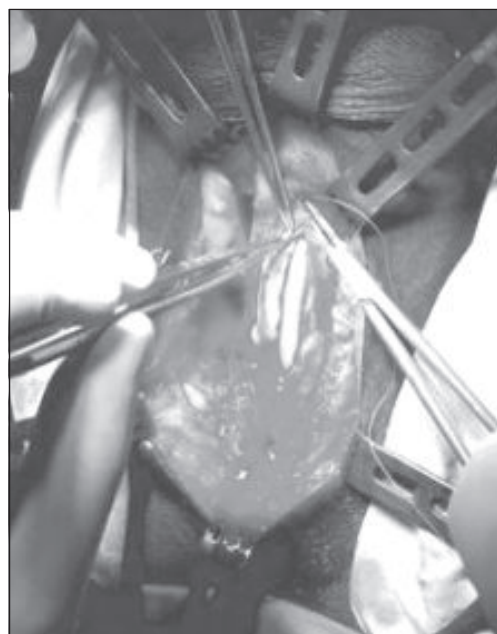
**Fig.1:** *Graft taken from oral mucosa***Fig.-2:** *Oral mucosal defect after closure***Fig.3:** *Placing Graft*



Fig.-4: Pericatheter urethrogram

months showed a normal calibre urethra in all patients. Uroflowmetry at 6 months showed maximum flow rate of 19.5 (15-25)mL/s.

This novel procedure is easy and reliable, as the urethra is exposed through a small perineal incision and no dorsal, lateral mobilization or rotation of the urethra is required.

Discussion:

Ideally, any stricture > 2 cm long should be treated with substitution urethroplasty to avoid postoperative chordee. Substitution urethroplasty may be a patch (free fullthickness skin graft or pedicled) or a tube graft.⁸⁻¹¹ In 1963 Devine and Horton first described the use of a full thickness skin graft and since then there have been many changes.⁹ The disadvantages of vascularized local skin flaps are ballooning and diverticula formation leading to urinary stasis and skin excoriation.¹ Free skin grafts used as ventral patch or tube graft are even worse, as these are more prone to shrinkage, recurrent stricture, urethrocele or diverticula formation and ejaculatory failure.¹²⁻¹⁵

In 1992, Burger *et al*¹⁶ started the recent renaissance of oral mucosa in reconstructive urology. With the advantages of constant availability, easy harvesting, and favorable immunologic properties (resistance to infection

and skin disease)^{17,18} and tissue characteristics (thick epithelium, high content of elastic fiber, thin lamina propria),¹⁹ buccal mucosa has become a widely used, full-thickness graft in substitution urethroplasty for complex hypospadias and urethral stricture repair, with generally favorable outcomes^{13,16,20-25}.

There is some controversy whether to place the patch graft ventrally or dorsally. The rationale for using a dorsal patch graft is the better support of the graft by the underlying corporal bodies. Andrich *et al.*³ reported that dorsal grafts (Barbagli procedure) fare better than ventral grafts, with resticture rates of 5% versus 14%. Our own experiences support the observation by several investigators that reconstruction with oral mucosa has similarly favorable results when used as a ventral patch.^{13,21,23-25} Barbagli *et al.*⁸ described the technique of dorsal free-graft urethroplasty. The procedure involves urethral rotation and longitudinal opening of the urethra to place a free skin graft dorsally under the corpora cavernosa. Excellent results were obtained with no signs of graft weakening. They claimed that the graft is mechanically supported by corpus cavernosa and receives its blood supply from the surrounding corpus spongiosum, and hence giving a better take-up of the graft.

Recently Asopa *et al.*¹⁴ reported good results with dorsal free-graft urethroplasty using a ventral sagittal urethrotomy approach. Here no mobilization of the urethra is required dorsally, which not only preserves the urethral blood supply coming through circumflex and perforating vessels but also simplifies the procedure, as no urethral rotation is required to place the graft dorsally.

In the present series there was five failure through recurrence of the stricture at the proximal anastomotic site at 3 months; after treatment the patient fared well. The overall success rate of 79 of 84 (94.05%) is comparable with those in other series of BMG urethroplasty.^{8,12,13,19,20} Graft harvesting is simple as it requires less expertise than that for raising a penile skin flap, besides avoiding penile deformity through torsion or scarring. This short follow-up may not be sufficient to detect all failures. Hence a longer follow-up with more patients is warranted to satisfactorily evaluate this novel technique.

Conclusion:

Ventral oral mucosal graft urethroplasty with spongioplasty approach is simple and reliable, with good surgical results. It requires no degloving of the penis or

mobilization of the urethra, and hence preserves urethral vascularity. Harvesting the OMG is simple. Long-term studies with more patients should confirm the versatility of this technique for managing bulbar urethral strictures.

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MANAGEMENT OF PRIMARY OBSTRUCTIVE MEGAURETER IN ADULT AND IT'S OUTCOME

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Abstract

Objectives: Primary obstructive megaureter is not very common presentation in adult, it needs aggressive surgical management in contrast to it's presentation in children. We are expressing our experience in this series.

Methods: Clinical presentation, renal function, radiological data, treatment, complications and follow up were studied in 22 patients of primary obstructive megaureter who were treated from January 2004 to June 2008.

Results: Of 22 patients 18 were male and 4 were female (age range 15 to 48 years). All patients were symptomatic. All patients underwent ureteral reimplantation with tailoring in 20 cases. All but 2 patients showed improvement in hydroureter and hydronephrosis during the follow up period of 1 to 4 years. Two patients of bilateral megaureter had renal failure who did not improve after surgery.

Conclusions: Most adult patients are symptomatic and warrant surgical correction. But in delay, patients might present with renal failure those seldom recover after surgery.

Introduction

By convention, megaureter is the ureter greater than 7mm in diameter.¹ However, the extent of dilatation varies considerably and in some cases the ureter may be as wide as 3 cm or more in cross section diameter. In nearly all cases, the dilatation is present along the entire length of the ureter. Primary obstructive megaureter was first described in 1923 by Caulk.² The condition is common in children but as a primary presentation it is uncommon in adults. The disease is characterized by an intrinsic congenital obstruction at the lower 1 to 2 cm of the ureter just before it enters into bladder. The diagnostic criteria are (I) Dilated ureter as demonstrated by different imaging (II) Lower end of the ureter ends in a smooth taper (III) Absence of vesico-ureteral reflux (IV) Absence of intravesical obstruction and (V) Absence of organic obstruction at the lower end of the ureter as confirmed by cystoscopy and ureteral catheterization.^{3,4} Megaureter can be detected in utero by antenatal

ultrasonograph. However 50% of megaureter in children regress with time, presumably owing to maturation of vesicoureteral junction.^{5,6,7} Pain, recurrent infection and deterioration of renal function are the indication of the surgery. However the disease in adults has a variable course and most present in the third decade of life with compromised renal function or other obstructive complication. We would like to present our experience in managing this disease.

Material and Methods:

This series contains 22 patients of symptomatic adult of primary obstructed mega ureter. Period of study was from January 2004 to June 2008. All patient was evaluated with intravenous urography (not in chronic kidney disease), urinalysis, urine culture, serum creatinine, urea and ultrasonograph(USG). Diagnosis is made by intravenous urography (IVU) revealing a dilated lower third or entire ureter with a narrow tapering lower end. Obstruction was also confirmed by diuretic technetium 99 DTPA scan. Those with poor renal function were evaluated by ultrasonography, radio nuclide study and antegrade or retrograde ureteropyelography. A voiding cystourethrogram was obtained to exclude the vascioureteral reflux and intravesical obstruction. Cystoscopy, ureteral catheterization, retrograde pyelography was performed to confirm the diagnosis. Patient were followed up with USG, urine culture, serum creatinine and renal scan, first at three months from the date of surgery and then every six months for the next two years. Voiding cystourethrogram was usually done at six month.

Results:

Total 22 patients, 18 male and 4 were female (age range 15 to 48 years) were managed. 9 patients had bilateral disease, 4 patients had severe renal failure. The most common presentation was flank pain followed by symptoms of urinary tract infection. All patients underwent ureteroneocystostomy with excision of narrow segment by a combined extravesical or intravesical approach. Tailoring of ureter before reimplantation was done in 20 cases. Of those 4 patients of CKD renal failure did not improve in 2 patients.



Discussion:

Primary obstructive megaureter is about one sixth as common as primary pelviureteric junction obstruction. Obstruction appears to result from faulty peristalsis of this segment, and histologic studies have demonstrated increased circular muscle and fibrosis in that segment.⁸ In advent of widespread ultrasound, incidence of neonatal hydronephrosis is detected during antenatal check-up. Most of the cases of asymptomatic megaureter in children regress. But surgery is indicated when complication occurs, the results have been good for ureteroneocystostomy.^{9,10,11} Primary obstructing mega ureter in adult usually present at third or fourth decades of life. Men are commonly more affected than women.^{12,13} Unilateral disease is more common and usually on the left side.

The disease can present with flank pain, recurrent infection, haematuria, urolithiasis. Four patients having bilateral disease had renal failure. In two patients renal failure progressed despite relief of obstruction. Patients with flank pain and urosepsis may warrant intervention in the form of percutaneous diversion followed by definitive treatment. A number of associated anomalies can be found with primary obstructive megaureter, including pelviureteric junction obstruction, horseshoe kidney, megacalycosis, megalourethra and contralateral renal agenesis. In view of the varied complication of the disease, a multitude of approaches were required. Followup radiological studies showed a definite improvement in anatomy and drainage. The primary obstructive megaureter in adults is different from that encountered in childhood. The growth and maturation of vasicoureteral junction and kidney are complete in adults and therefore little spontaneous improvement can be anticipated, unlike that observed in children. It is evident that the adult megaureter requires a more aggressive

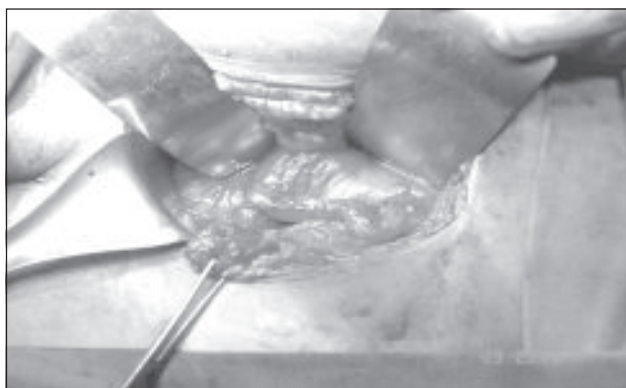


Fig: Primary mega ureter: radiological and per-operative

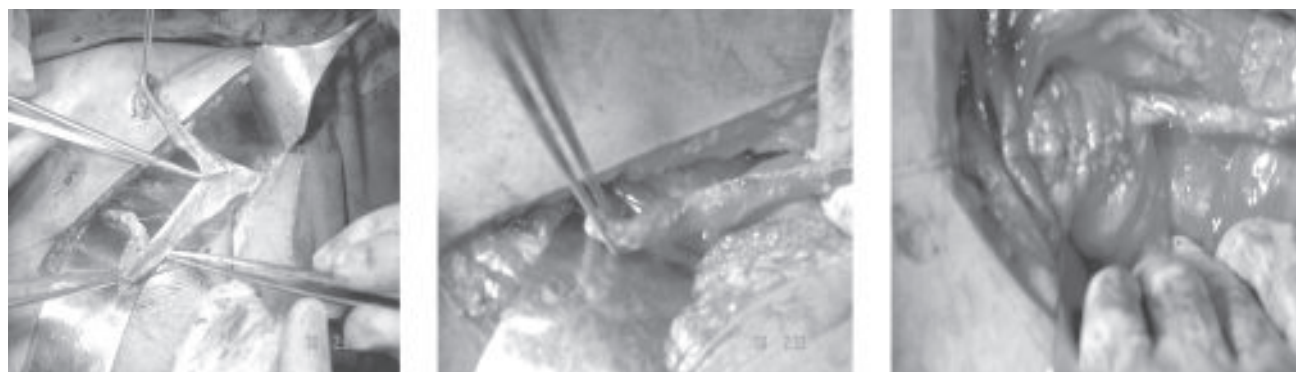


Fig: Ureter: Tailoring (left), reconstruction (middle), ureteroneocystostomy (right)

surgical approach. Surgical correction relieves the obstruction and improves drainage. Although renal functional improvement may not be substantial but further deterioration and complication are prevented.

Conclusions:

Primary obstructive megaureter in adults needs recognition as a separate entity because the treatment approach and outcome appears to be different. In delayed or untreated cases patient may report with complications along with renal failure. In most patients of failure, despite successful reconstruction no substantial improvement is achieved.

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SINGLE STAGE BUCCAL MUCOSAL URETHROPLASTY

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Abstract:

Stricture urethra is a common & chronic urological problem. Several options are there for their management, but all of these techniques are associated with high recurrence rate except buccal mucosal urethroplasty (BMU). We used this technique for management of patient with bulbar and penile urethral stricture.

Aims & Objectives: *To find out the use and efficacy of buccal mucosal graft for urethroplasty.*

Methodology: *This retrospective study was conducted on 42 male patients that underwent BMG at National Institute of Kidney Diseases & Urology (NIKDU), from Jan 2004 - June 2008, with mean age 37 yrs. (range 22-68 yrs). All strictures were located at bulbar and penile urethra with mean stricture length was 3.5cm (range 2.5-5cm). Etiology of stricture was infection in 32 cases, trauma in 8 cases and idiopathic in 2 cases. All patients were evaluated preoperatively & postoperatively with history, clinical examination, uroflowmetry, retrograde & voiding urethrogram. Follow up period was 3-32 months.*

Results: *Overall success rate was 85.71% (36 patients) and only 6 patients (14.28%) had re-stricture, these patients were managed by optical internal urethrotomy (OIU). Out of 42 patients 2 patients had leakage of urine at repair site which was managed conservatively.*

Conclusion: *BMG is a gold standard technique for management of long segment bulbar & penile stricture urethra provided use of loupe, appropriate suture and good quality catheter.*

Key word: *Urethral stricture, Buccal Mucosal graft, Dorsally placed*

Introduction:

Stricture urethra is a common and chronic problem in urological practice and its management poses a big challenge to urologists. The best way to cure urethral stricture is by some form of urethral reconstruction. Turner Warwick remarked that the best substitute for the urethra is the use of urethra as the curative option. However this is only possible, when stricture segment is short i.e. less than 2 cm in length. This is to be excised and re-anastomosis performed with a success rate of more than 95%.¹ When the strictures are long, multiple, associated with urethrocutaneous fistula, false

passages, and BXO, substitution urethroplasty becomes the treatment of choice. Since Devine in 1963 described the use of full thickness skin graft for urethral reconstruction, there have been other innovative materials for urethral substitution¹. Naturally the scrotal and penile skin, being very close to the urethra, has been used for urethral reconstruction. In case of uncircumcised patient prepuce skin can be used. Problem of using scrotal and penile skin is that they become hirsute and more potential to diverticula formation. Bladder mucosa harvested via a suprapubic approach has been utilized for urethral reconstruction, however the process of harvesting the mucosa is cumbersome.

Hamby² was the first person to describe buccal mucosa grafting in 1941, but the procedure become widely used in the 1990s and onwards³. Of late there are reports that are actually advocating buccal mucosa to be the standard treatment for substitution urethroplasty⁴.

Various factors have contributed to the acknowledgement of buccal mucosal graft as an ideal substitute for the urethra, including easy accessibility and mucosal handling, resistance to infection, compatibility with a wet environment, a thick epithelium and a thin lamina propria, allowing inosculation. Now we are using this technique for urethroplasty at our hospital.

Patients and methods:

42 patients underwent urethral reconstruction using a patch of buccal mucosa harvested from the inner side of the cheek at National Institute of Kidney Diseases and Urology, Dhaka, Bangladesh. This procedure was conducted from Jan 2004- June 2008 with mean age 37 years (range 22 -68 yrs). The entire stricture was located at bulbar and penile part of urethra with mean length was 3.5 cm (range 2.5-5cm) and etiology of the stricture were nonspecific infection, trauma and idiopathic.

Preoperative evaluation included history, physical examinations and appropriate investigations, serum creatinine for renal functional status, USG of KUB, Uroflowmetry, RGU with MCU and Urethrocystoscopy to see the severity, location and length of stricture segment. Other investigations were done for anesthetic fitness.

The patients selected to receive substitutions urethroplasty with buccal mucosal patch graft, where

the length was more than 2.5 cm located at bulbar and penile urethra. All operations were done in single stage. BXO and urethrocutaneous fistula were not included in this study. The patients had to consent for the use of buccal mucosal graft.

The urethral stricture was exposed. The urethra was dissected off the corpora and opened at the stricture dorsally. The stricture length was determined in situ at operation before harvesting the mucosa. The donor site was then marked with 1 cm away from the parotid duct and buccal mucosa was then harvested by dissecting the mucosa off the buccinator muscle on the inner side of the cheek. In 23 patients donor site was closed and in rest of the patients donor site kept opened after proper haemostasis.

The graft was washed in saline & defatted and then patched to the corporal bodies and further reinforced with quilting sutures between the graft and tunica. A 16F silicon catheter was used and a drain kept in situ, then wound was closed. Complications developed at donor site were recorded.

Post operatively patients were managed with appropriate antibiotics and analgesics. Drain removed within 48 hours from operation. Urethral catheter kept for 14 days and then pericatheter urethrogram was done. If no extravasation was demonstrated, the urethral catheter was removed. In case of extravasations the catheter was left in for a longer time.

Results:

This retrospective study was conducted on 42 male patients that underwent buccal mucosal urethroplasty at National Institute of Kidney Disease and Urology, Dhaka from January 2004-June 2008, with means age 37 yrs. range 22-68 yrs. The cause of stricture were post infection in 32 patients, trauma in 8 patients and idiopathic in 2 patients. Length of the stricture was 2.5-5cm, mean 3.5 cm. In 36 patients it was present at bulbar part and in 6 patients it was present at penile urethra. Balanitis Xerotica Obliterence and stricture urethra with urethrocutaneous fistula were not included in this study.

All patients underwent single stage buccal mucosal patch urethroplasty. In all patients it was placed dorsally. Overall success rate was 85.71% (36 patients) in the followup period of 3-32 months, mean 2 years. Six patients (14.28%) developed restricture. Restricture patients were managed by OIU. Two patients developed temporary urinary leakage. There was no significant

complication in the donor site, except 1 patient who developed small haematoma in whom the wound was closed, that was improved conservatively.



Fig.-1: Retrograde Urethrogram



Fig.-2: Pericatheter urethrogram

Discussion:

From published reports, there have been no failures to date of urethroplasties using buccal mucosa⁵⁻⁸. This extra ordinary success rate is presumably due to the density of the subdermal plexus of buccal mucosa and thus the case with which it obtains a blood supply from the graft site. The early results in this series with buccal mucosa are very satisfactory and other reports have suggested even better results^{5,6}.

Although substitution urethroplasty can be done with other material like skin and bladder mucosa, early and long term results are not satisfactory like BMG even they are associated more complications than BMG⁹. The early results with the patch graft with a mean follow up at 3 years are at least as good as the results with flaps¹⁰. Indeed, free graft of buccal mucosa after 3 years appear substantially better than scrotal skin flaps at a similar follow up⁹. We used BMG for urethral reconstruction from June 2004 and we now find it as the attractive option when substitution urethral reconstruction is required. Various factors contribute to the acceptance of the buccal mucosal grafts as an ideal substitute for urethra as suggested by others¹¹. They include easy accessibility and manual handling, resistance to infections, a thick epithelium and a thin lamina propria, allowing early inosculation.

Considering the advantages we used buccal mucosal patch graft for urethroplasty involving stricture at bulbar and penile urethra with length 2.5-5 cm. mean 3.5 cm. We always use it in single stage. Graft may placed both dorsally and ventrally. But dorsally placed has more advantage, as it allows better mechanical support for the graft with a rich vascular bed for the graft from the underlying corporeal bodies, less chance of graft failure to take and diverticula formation. In our series we always used dorsal placement of the graft.

Results of our series are impressive and success rate are almost 85% at follow up of 3-32 months. Six patient (14.28%) developed restricture at anastomotic site and managed one session of OIU and CISC. Two patients (4.67%) developed temporary urine leakage at anastomotic site and improved on conservative treatment. Results of our study are little less than S. Bhargava and C. R. Chapple (96%), S.N. Venn and A. R. Mundy (97%). But increase experience, good judgement and other supports, we can improve our results. None of our patients develop significant complications or morbidity at donor site.

Conclusion:

The early results using buccal mucosa for patch urethroplasty are encouraging. So we can consider this technique as gold standard for substitution urethroplasty

using, good quality suture, catheter, minimal tissue handling, and use of loupe.

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LAPAROSCOPIC LIVE DONOR NEPHRECTOMY: IS THIS THE RIGHT CHOICE ?

AU SHAIKH

Abstract

More than a decade after the first laparoscopic live donor nephrectomy (LLDN) at John Hopkin's University in 1995 by Ratner et al.,^[1] the procedure is now accepted in many transplant centres. LLDN is the major source of organ in developing countries. Even in developed countries where the major source of kidney is cadaveric, number of LLDN has increased in the last few years because of shortfall in cadaveric kidneys. LLDN by reducing hospital stay, pain and improving cosmetic outcome, has shown the potential to increase the number of living kidney donations further. In the last 15 years, the technique of LLDN has undergone evolution at various transplant centres and these modifications have improved donor safety and recipient outcome. Operative and post-operative outcome depends on the surgical skill of operative team especially the surgeon and the impact of learning curve has a significant role no doubt.^[2] All donors eligible for open donor nephrectomy, may also undergo LLDN now with increasing experience of the team. Right donor kidney, multiple vessels, anomalous vasculature and obesity are no more considered as contraindication.^[3] A review of the existing literatures for last 12 years revealed many controversies between laparoscopic and open live donor nephrectomy with special attention to the safety of donor and graft especially on earlier literatures. The PubMed literature database was searched from inception to November 2008. Recent articles revealed that LLDN is a viable and up to date option which can be performed safely with increasing experience.^[4]

Keywords: Laparoscopy, Live donor nephrectomy

Introduction

Kidney transplantation is the preferred treatment for patients of end stage renal disease. Kidney can be retrieved for transplantation from either a cadaver or a live donor. In Bangladesh, we are still unable to start cadaveric kidney transplantation despite of legal supports. In this scenario, practice of laparoscopic living donor nephrectomy (LLDN) can significantly increase

the number of kidney transplantation. Because LLDN reduces post-operative pain, shortens convalescence and improves cosmetic outcome^{3,4}.

The first kidney transplantation was performed in 1945 and first live related renal transplantation was done in 1953.⁵ Merrill et al. reported first successful living related kidney transplantation in Boston in 1954.⁶ Thereafter live donor nephrectomy was performed only with open approach. So, many possible donors were reluctant to donate considering the morbidity. Traditional open approach for donor nephrectomy is associated with trauma to thoraco-abdominal wall with long flank incision, more pain, possible pleural injury, pseudo hernia, prolonged hospital stay, wound infection etc.^{3,7,8} Later on some transplant surgeons started mini-incision.^[3,9] Gill et al^[10] demonstrated the feasibility of LLDN in porcine model. To attract more live kidney donation, the technique of laparoscopic live donor nephrectomy (LLDN) was first developed by Ratner et al in 1995.¹ Since then several investigators reported their experience with this procedure to improve donor safety and recipient outcome. Some of the disincentives associated with kidney donations can be overcome with LLDN.^{11,12} In a recent study on "global trends in the rate of living kidney donation" Horvat and coauthors showed that over the last decade, the number of living kidney donor transplants have grown at least 50%.¹³ This is not only because of increased prevalence of end stage renal disease, also for less morbid procedure like LLDN.

LLDN vs Open Surgery

A 2008 meta-analysis evaluated 73 studies that included 3751 and 2843 patients who underwent laparoscopic and open donor nephrectomy respectively.¹⁴ Compared with open nephrectomy, LLDN has less hospital stay, less analgesic use and quicker return to work (1.48 days and 2.58 weeks, respectively). Both groups have almost similar graft function and allograft loss. But in a study from Tehran, confirmed a long operative and warm ischemic time in LLDN.¹⁵ This can be overcome with time and experience of the surgeon. Overall, a consistent

reported observation is that LLDN is associated with less donor morbidity, similar allograft function and overall safety in an experienced hand. Technical aspects need a longer learning curve than open surgery.

Indication and Contraindication of LLDN

Donors eligible for open surgery may also undergo LLDN. Earlier contraindications such as right donor kidney, multiple vessels, anomalous vasculature and obesity can be overcome with increasing experience.¹⁶ Contraindications for kidney donation are similar in both groups. Multiple abdominal surgeries in a donor should be considered a relative contraindication, but retroperitoneal laparoscopic approach can be performed for retrieval of kidney.

Operative Techniques:

LLDN can be performed either transperitoneal or retroperitoneal approach on either side. There are many modifications of the technique. Because of adequate working space, transperitoneal approach is most commonly practiced. This article does not elaborately discuss the operative techniques, but will touch some important points.

Left transperitoneal approach – Patient is well hydrated with 1.5 L I.V fluid overnight. Donor is placed in modified lateral decubitus position after general anaesthesia and catheterization. A veress needle or a 12 mm port at umbilicus by open Hassan technique is used to create pneumoperitoneum. This port is primarily used as camera port. In between this umbilical port and anterior superior iliac spine, another 12 mm port is placed. One 5 mm port is placed in the line of camera port about 3 cm lateral to midline and 3 cm below the costal margin. Sometimes a fourth 5 mm port may be needed about 4 cm below the costal margin in the anterior axillary line. From splenic flexure to pelvic inlet along the line of Toldt lateral peritoneal reflection is incised. Then dissection is carried out in between descending colon and Gerota's fascia. Left gonadal vein is followed up to trace the left renal vein. Adrenal and lumbar veins are clipped and divided. Left renal vein and artery are mobilized. For vasospasm of renal artery, it can be bathed in Papavarine solution (30 gm/ml). Before beginning and after completion of dissection but before ligating the vessels, 25 mg of mannitol is given.^[3] Some transplant centers also use 20 mg of frusemide.^[17] At least 3-4 L fluid should be given during surgery.^[18] Good hydration, mannitol/frusemide and topical papavarine on the renal artery help to minimize

pneumoperitoneum pressure induced oliguria.^{19,20} Dissection is avoided between gonadal vein and ureter. Ureter along with periureteric tissue is dissected up to the level of iliac vessels where it is clipped distally leaving the proximal end open. A 15 mm laparoscopic organ retrieval bag is placed through 6 cm Pfannenstiel incision. Renal artery and vein are sequentially ligated with GI vascular stapler or 13 mm Weck Clips (Hemolock). The kidney is then placed in the retrieval bag and extracted from Pfannenstiel incision. A modification of this incision is a 5 cm incision extending from spinoumbilical port incision in an oblique course directing to symphysis pubis. Underlying muscles are split and peritoneum opened. Kidney is then manually retrieved by holding the fat left intact on the lateral and inferior border of the kidney with 2 fingers.³ Advantage of this incision is 3.8 cm incision extend only from existing port incision, muscles are split, not cut (less painful).

Right transperitoneal approach – Right LLDN is modified for shorter vessels. The iliac vein is completely mobilized in the recipient by dividing all of its posterior branches to facilitate tension free anastomosis.¹⁷ Dissection at interaortocaval space done to allow the division of right renal artery at its origin from aorta.⁸ Another technique to gain extra length of artery involves mobilization of the vena cava by dividing lumbar veins.²¹

Left retroperitoneal approach – Donor is placed in overextended flank position.²² An incision is given just below the tip of 12th rib and underlying muscles are split up to thoracolumbar fascia, which is incised sharply to enter retroperitoneal space. For placement of dilating balloon, blunt finger of dissection of retroperitoneum is helpful. Retroperitoneal space is now created with PBD-1000 balloon device (Tyco, USA) or a balloon can be made with two middle fingers of a glove, pulled one over the other and fixed on a plastic tube (suction tube or rubber catheter) as described by Gaur et al.²³ 450-500 ml saline is infused into fingers of the glove and kept for 10 min. This is cost effective for the patient. A 12 mm port replaces the balloon and used as camera port. Under direct vision 2 more ports are placed (12 mm & 10 mm). About 10-12 mm of Hg pressure is enough to create a retroperitoneal working space.²⁴

Most important landmark during dissection is psoas muscle which should be placed horizontally on video screen for orientation. Gerota's fascia is incised laterally and retroperitoneal space is expanded cranio-caudal direction. Periureteric sheath should be kept intact.

Perirenal faty is identified and renal pedicles are freed. Gonadal and adrenal veins dissected, clipped and divided near renal vein. After separation of adrenal gland from upper pole of kidney, the surrounding fat is removed from kidney except lower pole at Golden triangle. Ureter and renal vessels are clipped with hemolock and cut. One modification is not to cut the gonadal vein near renal vein in order to preserve fatty tissue at golden triangle (area between ureter, gonadal vessels and lower pole of kidney) rather it is traced down till the lower ureteric end.³ Kidney can be retrieved by muscle splitting lumbotomy incision or iliac fossa incision inferior to the anterior port or by pfannensteil incision after creating extraperitoneal space.

Right reteroperitoneal approach: Technical difficulties during right LLDN can be overcome using retroperitoneal approach. It allows direct organ exposure, reduced interferences from abdominal viscera, easier management of right renal vasculature and better exposure of right renal artery for adequate length.²⁵ To prevent the posterior displacement of kidney, antero-medial peritoneal attachments are kept intact. A modified Gibson incision is used to retrieve the kidney. In some centers right LLDN only done through retroperitoneal approach.³

Hand assisted vs pure laparoscopic donor nephrectomy: A non-randomized comparisons have shown that hand assisted LDN is easier to learn, quicker and results in less blood loss than pure LDN and has a shorter warm ischaemic time.²⁶ The disadvantages are longer duration of ileus, longer convalescence time and impaired cosmetic result.

Operative time: An analysis of published reports, the operative time for LLDN was significantly longer (183 to 340 vs 95-260 min, $P < 0.05$) compared with open donor nephrectomy.²⁷ But with increasing experience, it decreases and tends to plateau after 25 cases.²⁸

Complications:

Blood Loss – LLDN and open donor nephrectomy are comparable in terms of blood loss and postoperative transfusion requirement.^{29,30} Blood loss in LLDN is lower in many series compared with open procedure.²⁷ Another study revealed less blood loss in retroperitoneal LLDN compared with transperitoneal LLDN.²⁵

Open conversion – Frequency of open conversion ranges from 0-13% in a reported series.³¹ Most common causes of conversion are intraoperative haemorrhage or vascular injury (65%), difficult kidney exposure or obese

donor(20%), vascular stapler malfunction (12 %), pneumoperitonium loss (3%).²⁷ Sometimes it is difficult to proceed because of dense adhesions.

Ureteric complications – A review of 5 yrs experiences at John Hopkins and the University of Maryland found initial ureteric complications of 9.1%. By performing ureteral dissection medial to gonadal vein, they have reduced their rate to 3% in subsequent 100 cases.³¹ Another large series later on from Baltimore revealed 2% ureteral complication rate.³² This study also reported statistically insignificant ureteral complications between LLDN and open donor nephrectomy (ODN)

Post-operative pain: The amount of analgesia required for LLDN is much lower than that of open donor nephrectomy in several studies ($P < 0.05$).^{31,33,34}

Hospital stay: In LLDN statistically shorter hospital stay was reported (1.2-4.1 vs 2.6-7.5 days, $P < 0.05$).³⁴

Quality of life parameters: Donor quality of life is much better in LLDN than ODN. In case of LLDN, donors can be able to drive, take care of home, return to full activity, work and regular exercise in a shorter time.^{28,31,33}

Graft function and recipient outcome: Data from UNOS (United Network for Organ Sharing) comparing 2734 LLDN and 2576 ODN showed no difference in short term graft survival.³⁵ Major concern in LLDN is slightly longer warm ischaemia time (WIT) compared with ODN due to longer extraction time. WIT during LLDN ranges from 95 to 300 seconds.^{28,29} During a six year period, 738 cases were performed at the University of Maryland, WIT was 169+/- 90.8 seconds.³⁵ The WIT can be reduced with increasing experience, shown by Rawlins et al. in his study (3.3 min in first 25 cases vs 1.8 min in recent 25 LLDNs ($P < 0.001$)).²⁸ Data from Cleveland Clinic^[36] have shown that prolonged pneumoperitonium, warm ischaemia time, renal artery length or use of right kidney did not adversely affect functional outcome. Many clinical trails showed no significant difference in serum creatinine level between LLDN and ODN at 3 days, 30 days, and 3 months after transplantation. Follow up at 6 months, Rawlins et al. found no significant difference in serum creatinine level in LLDN vs ODN.²⁸ A review of LLDN cases found no difference between the rate of acute rejection after LLDN (2 % to 30%) and ODN (0 % to 32%).²⁷

Cost analysis: LLDN has a higher operative cost (73%) compared with ODN.²⁹ But when the total cost including hospital stay, analgesic requirement, loss of days of work and need for supportive care is considered, LLDN

is comparable to ODN. At SGPGI, a renowned urological institute in India, ODN costs about Rs. 15750 while LLDN costs Rs. 22500.³

Conclusions:

Donor nephrectomy is performed on a healthy individual, dedicated to donate his/her one precious organ to near and dear ones. So, we should provide donor a surgery with minimum morbidity, best cosmetic outcome as well as safety. In this concept, laparoscopic donor nephrectomy is the choice for the donors and it should be the choice of the Urologists also. This established standard procedure might increase live related kidney donation in future. Though it has a long learning curve, it is quite safe in experienced hand. Comparing to open donor nephrectomy and hand assisted laparoscopic donor nephrectomy, LLDN has less post-operative pain, less hospital stay, avoids a large scar but has an equal result of graft function in the long run.^{29,37} There are some evidence of slower graft function in some studies.^{20,36} The cause of this unclear and more research is required to investigate the mechanism.

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CASE REPORT

CYSTIC URETERITIS: A CASE PRESENTATION AND LITERATURE REVIEW

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Abstract:

Cystic ureteritis or pyeloureteritis is a disease entity of unknown etiology and unspecific symptoms, sometimes may present with associated pathology. It is incidentally detected and is difficult to distinguish from other disorders showing filling defects on urographic evaluation.

Methods/Results: *We report a case of cystic Ureteritis that had been diagnosed during ureterorenoscopy in a patient with right-sided Hydronephrosis and recurrent urinary tract infection. The etiopathogenesis, diagnostic and therapeutic aspects described in the literature are briefly reviewed.*

Conclusions: *We found that endoscopic and histopathological studies are important for confirming the diagnosis along with radiographic findings. Conservative management is advocated for uncomplicated cases. Patient follow up should include urinalysis, urine culture and cytology twice yearly and intravenous urography once a year.*

Introduction:

Cystic ureteritis or Cystic Pyeloureteritis (CPU) is an unusual benign disease, consisting of the appearance of suburothelial cysts filled with amorphous gelatinous substances that raise the mucosal layer of the urothelium. Most probably a chronic inflammatory process is involved in its pathogenesis. Histopathological examination of pyeloureteritis cystica and cystitis cystica revealed the mechanisms for the cyst formation of the urothelium. Chronic stimulation with inflammation or physical stimulation with crystals or calculi causes the urothelium to form an inflammatory crypt. The crypt is isolated as a result of an adhesive occlusion of the urothelium at the orifice of the crypt. This crypt is an immature cyst that cannot be clinically detected. A Von Brunn's cell nest represents a cut surface of the immature cyst. The inflammatory cyst isolated from the urinary tract, i.e., the immature cyst, gradually grows into a complete cyst, i.e., a clinically visible mature cyst, because of a hydrodynamic flow between the surrounding tissue and neogenetic capillaries, and inflammation. These findings indicate that Von Brunn's cell nest, and glandular and cystic formation; occur during development from an inflammatory crypt to an immature cyst and then, a mature cyst.

Case Report

A 55-year-old woman from northern zone of Bangladesh, presented with recurrent UTI for long 5 years with occasional right loin to groin pain and fever. She was treated for UTI for several times within this period. Her Urine R/M/E showed numerous pus cells, Urine C/S showed mild growth of E. Coli, Serum creatinine 1.2 mg/dl; USG showed moderate hydronephrosis of right kidney with 0.8 cm thick cortex but left kidney was normal and no other remarkable changes. IVU showed right pelvicaliceal dilatation with dye hold up in PCS without visibility of right ureter but normal upper tract on the left side. DTPA renogram showed 19% split function of the right Kidney with poor excretion. Urethroscopy showed no abnormality in bladder and normal ureteric orifice. URS on the right side showed multiple yellowish bubbles arising from the ureteral wall along its whole length extending from very near to vesicoureteral junction to upper third of ureter partially obstructing the lumen of ureter. However most of these bubbles were teased with the grasping forceps. Then left sided ureterorenoscopy showed no pathology there. Rt. Kidney explored with the aim of dismembered pyeloplasty. There was nothing inside the renal pelvis except dilatation, no kinking, narrowing at the PUJ or aberrant vessel crossing it.

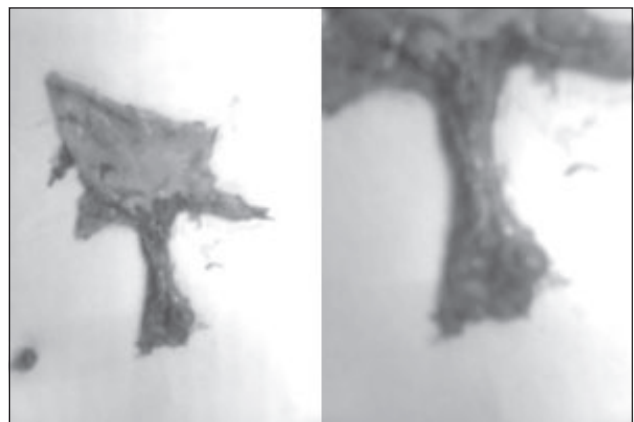


Fig.-1 & 2: *Right renal pelvis with part of ureter (resected). Multiple cysts just below Pelviureteric junction cause of obstruction.*

Opening the PUJ showed multiple bubbles just below the PUJ obstructing ureter lumen completely. After excising the part of renal pelvis and part of the ureter along with it typical A-H pyeloplasty done with D-J stent in situ.

Postoperative period was uneventful, D-J stent removed on 15th postoperative day. Histopathology of the resected Renal pelvis and ureter including multiple cysts at PUJ showed nonspecific chronic inflammatory changes only. Patient was reevaluated for tuberculosis elsewhere, no existing or past history of TB found. Follow up done at 1 month, 3 month, and 9 month and at one year with urine R/M/E, Urine C/S, USG of KUB in every follow up which showed no significant changes except she caught mild UTI at 6 month follow up which have treated accordingly and DTPA renogram at one month and 9 month of operation. Showed 33% and 42% split function of right kidney. Repeat IVU at one year following operative treatment showed well excreting both kidneys with beading in ureter.

Literature review: - The MEDLINE and PUB MED data base searched for all English articles and all translated abstract from other language on cystic ureteritis/pyeloureteritis. An additional search was done using the term "benign lesions of ureter" and causes of Pelvi-ureteric junction obstruction. Recent reviews were checked for additional references.

Ureteritis / Pyeloureteritis cystica characterized by multiple bubbly filling defects in ureter on urography and caused by inflammatory stimuli, are a rare disorder of the ureter. It commonly affects older people. Diagnosis is established by radiological studies. Up to now, no specific treatments except antibiotic therapy are being used to cure this disorder unless one or other complications develop which may require specific treatment. A review of the literature focusing on recently reported cases in the Spanish literature revealed it to be a disease of unknown etiology whose pathogenesis is not well-established, clinical features unspecific, without treatment for the underlying cause, and is a radiologic diagnostic difficulty requiring a differential diagnosis from other filling defects in the urothelium. In one report of a case of pyeloureteritis cystica associated with urinary tract infection and a ureteral stone in a young woman who presented with hematuria and bilateral flank pain. Till now this affection being considered as rare since only about 150 cases have been described in the literature worldwide. It is generally associated with chronic infection and inflammation, and due to its benign

nature, treatment must always be conservative and close follow-up is recommended. There are some other rare pathology that may come as differential diagnosis such as Ureteritis follicularis or granularis, uro-tuberculosis, X-ray-negative calculi, UTI with gas-producing germs, Multifocal Transitional Cell Carcinoma, Vascular ureteral notching, Blood clots, Air bubbles from intervention, Metastases from prostate, stomach, breast (rare), Shistosomiasis, Sloughed papilla. and fibrous ureteral polyps. The knowledge of the X-ray diagnostic criteria of the individual diseases is often of life-important significance for making a certain diagnosis for the patient. Another study showed 34 cases of CPU covering the period 1976 to 1994, analyzing the clinical manifestations, diagnostic procedures, differential diagnosis, and evolution. There are no specific symptoms associated with the presence of cysts. The average age of the patients was 59 years (range 30 to 77). Urinary tract infection was detected in 18 (53%). The pyeloureteritis was unilateral in 27 (79%) and bilateral in 7 (21 %) of the patients. The location of the cysts was as follows: 1 pyelic (3%); 6 pyeloureteral (18%); and 27 (79%) ureteral. In the pyeloureteritis cystica a bead-like appearance on intravenous pyelogram and retrograde pyelogram as well as in magnetic resonance urography whose resolution depends on the resolution of the associated pathology: infections, lithiasis, and obstruction.

Histopathology of lesions showed: numerous small submucosal epithelial-lined cysts representing cystic degeneration of epithelial cell nests within lamina propria (cell nests of von Brunn) formed by downward proliferation of buds of surface epithelium that have become detached from mucosa. In a case report published in a Spanish literature multiple small submucosal cysts were observed mostly in the pelvic ureter by ureteroscopic examination. Ureteroscopic cold punch biopsy proved ureteritis cystica. The ureteral dilatation improved and filling defects disappeared after the treatment with antibiotics.

A report on a series of 7 new cases of cystic ureteropyelitis (C.U.P.) presented historical and pathogenic review of this anatomic-radiologic entity. The conditions for discovery were: renal colic in 4 instances, discovery during surgery in association with a pyelo-ureteral junction syndrome in one instance, and a hematuria in three instances (1 being accompanied by renal colic). In another case of CPU in association with this condition she had a urinary tract infection due to a coagulase-negative staphylococcus. Following a two-week course

of appropriate antibiotic therapy, her urine became sterile and repeat pyelography revealed no abnormality.

Conclusions:

Pyeloureteritis cystica is a benign and uncommon condition whose etiology is not well-known. It is generally associated with chronic infection and inflammation, and may be difficult to distinguish from other filling defects of the urinary tract. Diagnosis is made on the basis of radiologic findings, mainly intravenous urography, endoscopic findings or pathological examination. Due to its benign nature, treatment must always be conservative and close follow-up is recommended.

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ABSTRACT FROM CURRENT LITERATURE

Prospective study of combined treatment with interferon-alpha and active vitamin D3 for Japanese patients with metastatic renal cell carcinoma

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Objectives : To assess the safety and efficacy of combined therapy with interferon-alpha (INF-a) and active vitamin D3 for metastatic renal cell carcinoma (RCC).

Methods: Sixteen patients with metastatic RCC were enrolled in this prospective study. All received oral alfacalcidol (1 mg once daily) and INF-a (Sumiferon; 3million units, three times aweek). The primary endpoint was the response rate (defined as complete + partial remission). Secondary endpoints were cancer-specific survival and toxicity. The median follow-up period was 17 months (range: 5–49 months).

Results: The median age of the patients was 68 years (range: 41–73 years). The sites of metastases were: lung in 13 patients, bone in one, lung and bone in one, and lung, bone, and lymph nodes in one. Four patients (25%) had a partial response (PR), 10 patients (62.5%)

showed no change (NC), and two patients (12.5%) had progressive disease (PD). The median cancer-specific survival time was 45 months. One patient had to discontinue vitamin D3 because of hypercalcemia. Kaplan-Meier survival analysis revealed that metastasis at the time of initial diagnosis and older than average age were significant predictors of poor survival ($P < 0.05$).

Conclusions: Combined treatment with INF-a and active vitamin D3 has shown to be safe and effective for metastatic RCC patients.

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Management and outcome of bilateral testicular germ cell tumors: A 25-year single center experience

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Objectives: To analyze risk factors, management, histology, and outcome of bilateral testicular germ cell tumors (TGCT) based on a 25-year single center experience.

Methods: Out of 612 patients treated for TGCT between 1982 and 2007, 17 (3%) were found to have bilateral disease. Data of these patients were reviewed and analyzed.

Results: Eleven patients (65%) were identified with metachronous and 6 (35%) with synchronous bilateral TGCT. One patient had a cryptorchism in childhood. Patients with metachronous bilateral disease presented at lower stages than those with synchronous bilateral disease (stage I: 82% vs 33%, $P = 0.02$). In metachronous bilateral TGCT, the interval between the tumors ranged from 4 months to 25 years with a median of 47 months. The risk of developing a TGCT in the contralateral testicle was 26-fold higher than the a-priori risk for a healthy individual to develop TGCT. Overall, 74% of the bilateral tumors were seminomas and >50% of the patients had similar histology on both sides. After a median follow up of 121 months for patients with synchronous and 95 months for patients with

metachronous bilateral TGCT, all patients were alive with no evidence of disease.

Conclusions: Most bilateral TGCT develop metachronously and are seminomas. Although patients with synchronous bilateral disease present at higher stages, both synchronous and metachronous bilateral TGCT carry a similar, excellent prognosis. Patients with unilateral TGCT require careful long-term monitoring of the remaining testicle due to a 26-fold increased risk of contralateral disease and a potentially long risk interval of up to 25 years.

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Comparison of transperitoneal and retroperitoneal laparoscopic nephrectomy for renal cell carcinoma: A single-center experience of 100 cases

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Objectives: To report our experience with the retroperitoneal and transperitoneal approaches of laparoscopic nephrectomy for renal cell carcinoma (RCC).

Methods: Between July 2001 and December 2007, 100 patients with RCC underwent laparoscopic radical nephrectomy at our institution for clinically localized RCC. Fifty-three patients received a retroperitoneal procedure and 47 received a transperitoneal procedure. The perioperative and oncological outcomes of these groups were reviewed retrospectively.

Results: Mean follow up was 34 months. No statistically significant difference was found between the two approaches in terms of pathological stage, operative time, need for additional procedures such as adrenalectomy and/or lymph node sampling, estimated blood loss, need for blood transfusions, analgesic requirement, length of hospital stay, or the incidence of minor or major complications. The 5-year disease-free survival rate was 90% for both the retroperitoneal and transperitoneal procedures. The 5-year overall survival rates were 98% and 96%, respectively. Therefore, no significant difference was observed in the long-term oncological outcome between the two groups.

Conclusions: Tumor control and surgical morbidity in laparoscopic radical nephrectomy seem not to be significantly influenced by the approach.

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Modified anatomic partial nephrectomy with selective renal segmental artery clamping to preserve renal function: A preliminary report

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Objectives: Partial nephrectomy is effective for preserving renal function, but temporary clamping of the renal artery for hemorrhagic control may impair renal function due to ischemia/reperfusion injury. Anatomic partial nephrectomy (APNx) has been proposed to minimize renal ischemia/reperfusion injury by clamping only the feeding artery. We aimed to evaluate whether anatomic partial nephrectomy (APNx) is useful in preserving renal function and to assess variations in renal artery anatomy to determine the feasibility of selective segmental artery clamping.

Methods: We performed preoperative renal angiography to evaluate the utility of APNx. Perioperative changes in renal function were compared between the APNx group and a standard partial nephrectomy group.

Results: APNx was successful in 18 patients. The mean lengths of the feeding artery on preoperative angiography were 20.5 and 6 mm for successful and unsuccessful cases, respectively. It was not difficult to clamp the feeding artery in 16 patients with lengths >10 mm or with multiple renal arteries. Evaluation of renovascular variations on 116 renal angiograms indicated that APNx was feasible for 60% and 40% on the right and left sides, respectively. The short-term increase in the serum creatinine level was significantly smaller after APNx than it was after standard partial nephrectomy.

Conclusions: APNx minimizes ischemic/reperfusion injury and preserves renal function while achieving hemorrhage control. As it can be performed safely in about 50% of cases, it may be the option for patients with renal impairment or a solitary kidney.

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Neoadjuvant targeted therapy and advanced kidney cancer: observations and implications for a new treatment paradigm

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Objective: To evaluate our early experience with neoadjuvant therapy (sunitinib or sorafenib) in advanced renal cell carcinoma (RCC), to explore the effect on both tumour biology and potential for downstaging advanced tumours, as systemic therapy for RCC has historically resulted in little if any primary tumour response, but recent experience with targeted therapy suggests otherwise.

Patients and Methods: The preliminary experience with neoadjuvant therapy for the surgical management of RCC was reviewed at two large referral centres. Several unique patients were identified who had a novel response to systemic therapy that altered the surgical strategy.

Results: Four patients who had targeted therapy before surgery are described and in whom there were effects on tumour biology not seen previously with chemotherapy and cytokine therapy. The selected patients who had neoadjuvant targeted therapy had shrinkage of a tumour thrombus in the inferior vena cava, nodal involvement, renal fossa recurrence and tumour within a solitary kidney.

Conclusions: The introduction of new molecular agents has revolutionized the treatment of patients with metastatic RCC. Responses to targeted therapy within the primary tumour, tumour thrombus, renal fossa recurrence, and lymph node metastases are novel findings not seen during treatment with immunotherapeutic based strategies. This might be a signal for urological surgeons to re-evaluate the paradigm for the surgical management of advanced RCC. Potential applications are presented to encourage further investigations with targeted therapy in the neoadjuvant setting.

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The role of lymph-node dissection in the treatment of upper urinary tract cancer: a multi-institutional study

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Objectives: To determine the role of lymph-node (LN) dissection in patients undergoing surgery for upper urinary tract (UUT) cancer.

Patients and Methods: We reviewed the clinicopathological data from 312 patients with UUT cancer treated predominantly by nephroureterectomy. The relationship between clinical characteristics and cancer-specific survival (CSS) was analysed, focusing on node-related information.

Results: In all, 166 patients had LN dissection while 146 did not (pNx). Multivariate analysis showed that T stage, grade and pN status were significant variables for CSS. The difference in survival between the pN0 and pNx groups remained significant in a multivariate analysis. The median (range) number of LNs removed was 6 (1–65). There was no significant difference in CSS between the 72 patients with fewer than six LNs removed and the 78 with six or more removed.

Conclusions: LN dissection is important for postoperative stratification of patients with UUT cancer because node-positive disease was one of the variables with a significant adverse effect on survival. In addition, the significant difference in survival between the pN0 and pNx groups might indicate a therapeutic benefit of LN dissection, although removing more LNs did not uniformly increase the probability of CSS.

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Is there a relationship between prostate volume and Gleason score?

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Objectives: To review the relationship between the Gleason grade and prostate volume in biopsy and radical prostatectomy (RP) specimens, and thus assess the hypothesis that smaller prostates have a greater incidence of high grade tumours.

Patients and Methods: We selected 390 patients who had RP at our institution, with a prostate-specific antigen (PSA) level of < 10 ng/mL and who had not had hormonal therapy. We retrospectively reviewed the data for transrectal ultrasonography (TRUS)-guided prostate biopsies from these patients and the RP specimens. Indications for biopsy included a PSA level of e” 4 ng/mL or an abnormal digital rectal examination. High-grade tumours were defined as having a Gleason score of e”7.

Results: The TRUS volume was statistically related to the rate of high-grade tumours at biopsy and RP. On multivariate analyses, TRUS volume was a significant predictor of high grade tumour for biopsy and RP specimens, with an inverse relationship between high grade tumours and prostate volume for biopsy and RP specimens.

Conclusions: Our data suggest that there is a relationship between the rate of high-grade tumours and prostate volume even in biopsy and RP specimens and it is not an artefact related to the biopsy.

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Bladder botulinum toxin A injection can benefit patients with radiation and chemical cystitis

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Objective: To investigate the potential utility of botulinum toxin A (BoNT-A) bladder injections in patients with

radiation cystitis and bacillus Calmette-Guérin (BCG)-induced chemical cystitis.

Patients and Methods: In all, six patients with refractory radiation cystitis were treated with 200 U bladder BoNT-A injections and two patients with refractory cystitis after intravesical BCG therapy were treated with 100 U bladder BoNT-A injections. All the patients were refractory to anticholinergic agents. Under sedation or local anaesthesia, BoNT-A was injected through a cystoscope into 20 sites submucosally in the trigone and floor of the bladder.

Results: There were no side-effects or retention after BoNT-A injection. In five of the six patients with radiation cystitis there was a moderate to significant improvement; the mean (SD) bladder capacity increased from 105 (25) mL to 250 (35) mL and the urinary frequency decreased from 14 (2) to 11 (1) episodes per day. In the two patients with BCG cystitis both reported significant symptomatic improvement; the mean (SD) bladder capacity increased from 110 (23) to 230 (23) mL, the urinary frequency decreased from 16 (1) to 12 (1) episodes per day, and using a 10-point visual analogue pain scoring system, the perceived pain score decreased from 8 to 2. Microscopically, the bladder tissue at 1 month after BCG injection showed marked acute and chronic inflammation with eosinophilic infiltration and focal granulomatous formation. At 2 months after BoNT-A injection, there was only a mild degree of chronic inflammation with few eosinophils.

Conclusion: These preliminary results suggest that BoNTA injected into the bladder is a promising treatment for patients with refractory radiation and BCG cystitis.

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Extracorporeal shock-wave therapy for treating chronic pelvic pain syndrome: a feasibility study and the first clinical results

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Objective: To investigate the feasibility and clinical outcome of extracorporeal shock-wave therapy (ESWT) for patients suffering from chronic pelvic pain syndrome (CPPS).

Patients and Methods : The study included 34 patients who had had CPPS for e" 3 months, who were investigated in two subsequent studies. ESWT was administered using a perineal approach with two different standard ESWT devices with and without an ultrasonographic positioning system. The follow-up was at 1, 4 and 12 weeks after ESWT, to evaluate the effects on pain, quality of life and voiding. Imaging studies and changes in prostate-specific antigen (PSA) were used to investigate the safety and side-effects of ESWT.

Results: All patients completed the treatments and follow-up; there were statistically significant improvements in pain and quality of life after ESWT. Voiding conditions were temporarily improved but with no statistical significance. Perineal ESWT was easy and safe to administer with no anaesthesia on an outpatient basis. Side-effects could be excluded clinically, by imaging studies and by changes in PSA level.

Conclusion: Perineal ESWT must be considered as a promising new therapy for CPPS, in particular as it is easy to apply and causes no side-effects.

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The long-term outcome of prenatally detected posterior urethral valves: a 10 to 23-year follow-up study

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Objective : To document the functional outcome of patients with prenatally detected posterior urethral valves (PUV) in the second decade of life, and to evaluate the possible impact of prenatal diagnosis on the long-term outcome of this condition

Patients and Methods : We analysed the functional outcome of 25 patients with prenatally detected PUV born between 1984 and 1996, whose mean (range) age at follow-up was 17.7 (10–23) years. The findings were compared with those in 17 patients (mean age 16.1 years) who had presented clinically to our unit during the same period. The duration of follow-up in both groups was <10 years. Late outcomes were also compared

with published data for PUV. Outcome measures included; death, incidence of end-stage renal failure (ESRF), age at transplantation and the most the recently available plasma creatinine level in untransplanted patients. We also examined any possible association between functional outcome and early predictors, including nadir plasma Creatinine level at <1 year and vesico-ureteric reflux (VUR).

Results : Three patients died (12%), two as neonates and one aged 3 years. Of five patients who had been shunted *in utero*, four died or developed early-onset renal failure. In the 23 prenatally detected patients who survived the neonatal period, four (17%) had a renal transplant at a mean (range) age of 6.5 (3.0–12.0) years. Of 19 patients with prenatally detected PUV who had not been transplanted in the first 12 years of life, only one (5%) developed new-onset ESRF at 10.0–23.4 years whilst 11 (58%) of these patients had normal creatinine values. In the untransplanted patients there was a statistically significant correlation between age and plasma creatinine level, but no correlation between late functional outcome and nadir creatinine in the first year of life, or bilateral VUR.

Conclusions: Prenatal diagnosis had little impact on mortality or ESRF in the first decade of life. This appears to be largely predetermined by renal dysplasia and the severity of intrauterine obstruction. However, the functional outcome of patients with prenatally detected PUV aged 10–23 years was considerably better than published long-term data and the outcome of clinically presenting patients in our study. These findings suggest that the long-term prognosis of PUV of intermediate severity might be improved by prenatal diagnosis.

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A randomized clinical trial of suspension technique for improving early recovery of urinary continence after radical retropubic prostatectomy

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Objective: To evaluate, in a prospective, single-blind, randomized trial, the safety and efficacy of a suspension technique for improving early recovery of continence after radical retropubic prostatectomy (RRP).

Patients and Methods : We randomly assigned 60 men with clinically localized prostate cancer to RRP; 30 were treated with the suspension technique and the remaining 30 were not. All patients had RRP by the same surgeon followed by early catheter removal on the third day after RRP. The primary outcome measures were the interval to recovery of continence, and the positive margin rates. The continence status was evaluated by a third party using validated questionnaires at baseline before RRP and at 4 and 7 days, and 2 weeks, 1, 3, 6 and 12 months after RRP.

Results : The suspension technique resulted in significantly greater continence rates at 1, 3 and 6 months after RRP of 53% vs 20%, 73% vs 47% and

100% vs 83%. Kaplan-Meier curves also showed that patients in the suspension group had a significantly earlier recovery of continence than in the no-suspension group; the median (95% confidence interval) interval for recovery was 31 (12–74) days in the suspension group and 90 (65–150) days in the nosuspension group (log rank test, $P=0.002$). The groups had no significant differences in their histological status.

Conclusions : The suspension technique had a significant effect on the earlier recovery of urinary continence within 6 months after RRP, without compromising the oncological outcome of RRP.

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