

Anastomotic Urethroplasty for Short Segment Bulbar Urethral Stricture; Experience at the Jos University Teaching Hospital, Jos

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Abstract:

Background: Urethral stricture is an acquired permanent narrowing of the urethra impeding the flow of urine during micturition. The aim of surgical reconstruction for urethral stricture is to provide an adequate caliber, compliant and stable urethra. This study provides insight into the aetiology of bulbar urethral stricture, the perioperative and operative management as well as surgical outcome

Patients And Methods: Twenty six patients who had anastomotic urethroplasty from 2010 to 2014 at the Jos University teaching hospital were included in the study. Preoperative evaluation included; history, physical examination, urine analysis, urine culture, serum electrolyte, urea and creatinine, abdominopelvic ultrasonography, micturating cystourethrogram and retrograde Urethrogram and uroflow. Surgical management was via perineal incision with spinal or epidural anaesthesia as the preferred method of analgesia.

Results: A total of twenty six patients who underwent anastomotic urethroplasty were studied.

The mean age of the patients was 38.9 years with age range of 12 years to 76 years.

The aetiology of the bulbar strictures were infection, trauma and iatrogenic. The mean stricture length was 1.6 cm with a range of 0.5 cm to 2.5 cm. Two patients representing 7.7% had recurrence of the bulbar stricture, hence success rate of 92.3%.

Conclusion: Excision and end to end anastomosis (Anastomotic Urethroplasty) for short segment bulbar urethral stricture gives excellent long term results with reduced recurrence rate.

Keywords: Anastomotic urethroplasty, bulbar urethral stricture, outcome.

I. Introduction

The urethra is traditionally divided into anterior and posterior parts. The anterior part is the part which is surrounded by the corpus spongiosum. It includes the bulbar urethra, which is enclosed by the bulbospongiosus muscle and the penile urethra that runs from the distal margin of the bulbospongiosus to the fossa navicularis and external meatus. The posterior urethra is the part between the bladder neck and the bulbar urethra and includes the bladder neck, the prostatic urethra, and the membranous urethra surrounded by the external urethral sphincter mechanism [1].

Urethral stricture is an acquired permanent narrowing of the urethra impeding the flow of urine during micturition. It is one of the oldest urological diseases, and its treatment remains a challenge for urologists [2].

Urethral stricture disease affects about 300 per 100 000 men [3].

Treatment options for short bulbar urethral strictures include dilatation, direct visual internal urethrotomy and anastomotic urethroplasty.

Excision and end to end anastomosis (Anastomotic Urethroplasty) for bulbar urethral strictures 2 cm or less gives excellent long term results with reduced recurrence rate [4], [5].

The aim of surgical reconstruction for urethral stricture is to provide an adequate caliber, compliant and stable urethra [6].

This study provides insight into the aetiology of bulbar urethral stricture, the perioperative and operative management as well as surgical outcome at the Jos University Teaching Hospital Jos.

II. Patients And Methods

Twenty six patients who had anastomotic urethroplasty from 2010 to 2014 at the Jos University teaching hospital were included in the study.

Preoperative evaluation: These involve complete history, physical examination, urine analysis, urine culture, serum electrolyte, urea and creatinine, abdominopelvic ultrasonography, micturating cystourethrogram and retrograde Urethrogram. Chest X-ray and electrocardiography were done in patients above 50 years or at risk of cardiovascular disease.

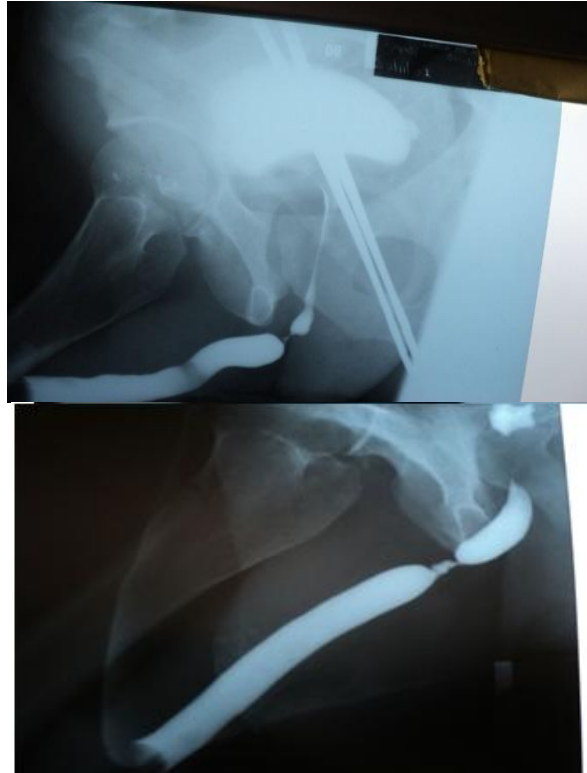


Figure 1: Urethrogram showing bulbar urethral stricture.

Operative management:Standard perineal anastomotic urethroplasty was employed.

Instruments and Suture Material:General surgical set, Haygrove sound, curved metal probes, Electrocautery, Monofilicabsorbable suture material 3–0 to 5–0, Mastoid retractor, Lonestar or Turner Warwick retractor.

Surgical Technique:Spinal or epidural anaesthesia is the preferred method of analgesia.A preoperative antibiotic is given routinely.The patient is placed in the Lithotomy position; The legs are carefully positioned in stirrups. Care is taken to avoid pressure on the lower extremities and calf muscles. The patient is cleaned and draped.

Perineal Approach: Prior to the perineal incision, antegrade and retrograde bougies are passed to determine the site and length of the stricture for patients with suprapubic cystostomy. It also helps the surgeon in the choice of incision.

An inverted Y incision or a median perineal incision extending about 2cm proximal to the anus is made. The subcutaneous tissue and Colle's fascia are cut along the line of the incision, exposing the bulbospongiosus muscle.

The bulbospongiosus muscle is split down the middle.The urethra is mobilized from the corpora. The stricture is localized using Haregroove (antegrade) and a 20-Fr curved metal probe (retrograde). The bulbar urethral is laid open in the area of the stricture.

The stricture is resected into the healthy corpus spongiosum, when blood begins to drip from the urethralstumps. Spongiofibrosis may extend beyondthe actual stricture itself, in which case it must also beresected.

The adequately mobilized urethral stumps are spatulated (1cm)at 6 and 12 o'clock. This ensures a wide anastomosis and sufficient urethral calibre.

The mobilized urethralstump should be without tension. A single-layer suture that catches all layersof the wall is done. We do interrupted anastomosis at 12, 2, 10, 8, 4 and 6 o'clock positions. The dorsal anastomosis is performed first, a 16F two-way silicon catheter is passed, and then the ventral anastomosis is completed taking care not to catch the silicon catheter.

To take some of the tension off the anastomosisuture, the urethral stumps maybe fixed to the corpora cavernosum. The bulbospongiosus muscle is reconstructed over the urethra. The submuscular space is drained and the perineal incision closed in layers. Pressure dressing is applied.

A size 18f suprapubic tube is left in the suprapubic cystostomy for urinary diversion.

Post operative management: Adequate analgesia is invaluable in the post operative period. Intravenous antibiotics is continued for 48hrs, subsequently oral antibiotics is given until the catheter is removed. Patient is mobilized second day post operative and discharged four to seven days after surgery.

Urethral catheter is removed between 14 to 21days postoperative. Pericatheter Urethrogram is done prior to removal of the urethral catheter. Subsequently the suprapubic cystostomy catheter is removed within 48hours. The tract of the suprapubic cystostomy usually closes within a day after removal of the urethral catheter.

III. Results

The study was conducted at the Jos university teaching hospital, Jos. A total of twenty six patients who underwent anastomotic urethroplasty were studied.

The mean age of the patients was 38.9years with age range of 12years to 76years.

The aetiology of the bulbar strictures were infection, trauma and iatrogenic. Infective strictures were Gonococcal in origin; traumatic strictures resulted from fall astride, low velocity gunshot injury and road traffic accidents while iatrogenic strictures were catheter related, following postprostatectomy.

Table 1: Shows aetiology of strictures:

Aetiology of stricture	Number of patients.	Percentage
Infective	13	50%
Traumatic	11	42.3%
Iatrogenic	2	7.7%
Total	26	100%

The mean stricture length was 1.6cm with a range of 0.5cm to 2.5cm.

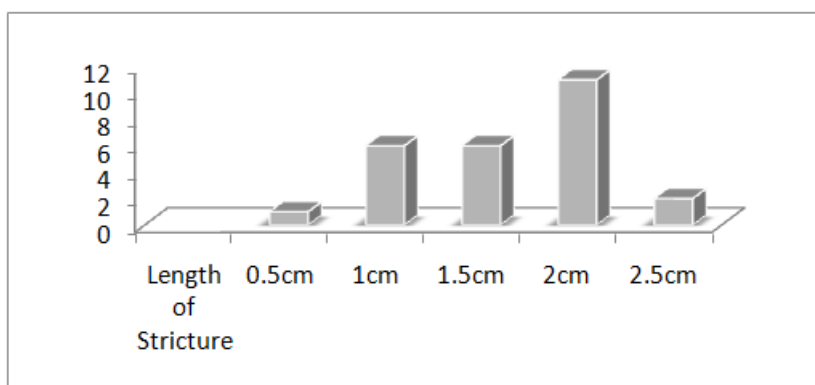


Figure 2: Distribution of length of stricture.

Post operative complications include mild one case each of surgical site infection, scrotal swelling and poor erection.

Mean follow up period was 30.12months, range (10-46 months)

Patients who developed symptoms during the follow up period were re evaluated using history, physical examination and radiological examination (retrograde Urethrogram).

Recurrence was defined as symptomatic patients requiring additional treatment; dilatation, Urethrotomy or urethroplasty.

Two patients representing 7.7% had recurrence of the bulbar stricture, hence success rate of 92.3%.

One of the patients had redo-anastomotic urethroplasty with good outcome while the other patient had filiform dilatation.

IV. Discussion

The aetiology of urethral stricture has evolved over the years. In time past it was mainly associated with longstanding infectious disease (gonococcal urethritis) or trauma [7]. In the developed world, the aetiology of urethral stricture is mainly iatrogenic, such as transurethral resection, urethral catheterization, cystoscopy, prostatectomy, brachytherapy, hypospadias surgery and idiopathic [8],[9]. However in resource poor countries, we still see the pattern of infection and trauma; as documented in the index study, where infection and trauma contributed 50% and 42.3% of the aetiology respectively while only 7.7% were as a result of iatrogenic causes (catheter related/ post prostatectomy). In Lagos, the leading cause as documented by Tijani et al [10] was trauma while Ahmed et al [11] in a review of urethral stricture disease in Zaria, documented infection and trauma as the

only etiological factors with infection as the leading cause. The low incidence of iatrogenic urethral stricture disease in resource poor countries could be attributed to the low volume of endoscopic procedures and the paucity of advanced endoscopic equipment, hence reducing the incidence of iatrogenic urethral strictures.

Urethral stricture disease remains a disease that affects mainly the young. Palminteri et al [Error! Bookmark not defined.] showed that stricture distribution increased until about 45 years and then decreased. In his study, strictures were uncommon in those less than 20 years and above 70 years old [12]. Ahmed et al [Error! Bookmark not defined.] documented a mean age of 40 ± 12.9 years while Tijani et al [Error! Bookmark not defined.] recorded a mean age of 43.1 years. In this study, the mean age was 38.9 years, which is similar to the findings of other investigators. However, there're studies that have showed increased incidence of urethral stricture in the elderly [13],[14].

What constitutes an ideal urethral length for anastomotic urethroplasty is still debatable. Good results have been achieved by different investigators with length that range from 1cm to 5cm [4],[15],[17]. Morey and Kizer concluded that, urethral reconstructability is proportional to the length and elasticity of the distal urethral segment. Defects up to 5 cm may be successfully excised and primarily reconstructed in select young men with proximal bulbar strictures [Error! Bookmark not defined.]. However, Guralnick et al [16] noted that a short bulbar stricture of 1 cm. or less is best managed by stricture excision and primary anastomosis.

In the management of bulbar urethral stricture, many variables, such as length, severity, and location of stricture, can influence surgical outcome. The surgical technique should be selected mainly according to stricture length, but the stricture aetiology and density of the spongiosclerosis tissue should also be taken into account [17].

There have been a plethora of methods in the surgical management of bulbar urethral stricture. These include newer methods such as laser urethral incision, urethral stenting, multiple tissue transfer and older methods such as urethral dilatation and internal urethrotomy [18].

However various investigators have found anastomotic urethroplasty for short segment bulbar urethral stricture quite rewarding, in terms of outcome and long term patient satisfaction. Barbagli et al. [Error! Bookmark not defined.] reviewed 153 patients, who underwent bulbar end to end anastomosis. In his series, stricture length range (1cm – 5cm) and follow up was for a period of 68 months. He reported a success rate of 90.8%. Eltahawy et al [19] in a series involving 260 patients who underwent excision with primary anastomosis with mean follow up of 50.2 months, stricture length range 0.5 to 4.5 cm (mean 1.9), only three patients had recurrent stricture. His success rate was 98.8%. Jun-Gyo Suh et al [20] reviewed 33 patients who underwent bulbar end-to-end anastomosis; the mean excised stricture length was 1.5 cm (range, 0.8 to 2.3 cm). Twenty-nine patients (87.9%) were symptom-free and required no further procedure after a mean follow up 42.6 months.

Tijani et al [21] in a series of 47 patients who had excision and end to end anastomotic urethroplasty. Twenty patients (42.6%) had bulbar stricture and 27 (57.4%) had pelvic fracture urethral distraction stricture involving the posterior urethra. There was a 100% success rate in the 20 patients with bulbar urethral stricture.

In the index study, twenty six patients with bulbar urethral stricture, who had excision and end to end anastomosis, had a success rate of 92.3% with a mean follow up 30.1 months, range 10 to 48 months. This is in keeping with the high success rate recorded by other investigators.

To ensure good success, certain principles must be observed. These include; adequate preoperative assessment and preparation. Urine microscopy, culture and sensitivity is invaluable, as infection is one of the common causes of stricture recurrence apart from the potential danger of post operative sepsis. Intraoperative, gentle tissue handling and adequate haemostasis is important. Ensure adequate mobilization of the urethra and complete excision of the abnormal urethra and spongiosclerosis. The proximal and distal urethra should be spatulated after excision of the abnormal segment and the anastomosis should be tension free using fine suture materials, water tight and stented with silicon catheter (size 14F – 16F). In children smaller sized catheters are used. Drains are used to avoid collection that might disrupt the healing process. Urinary diversion is usually necessary except in few cases of partial bulbar stricture without suprapubic cystostomy.

The improvement in perioperative care and anaesthesia has made anastomotic urethroplasty safer [22], thus it has become the treatment of choice for short segment bulbar urethral stricture.

Heyns et al [23] in his review noted that dilation and internal urethrotomy are useful in a select group of patients. A second dilation or urethrotomy for early stricture recurrence (at three months) is of limited value in the short term (24 months) but of no value in the long term (48 months), whereas a third repeated dilation or urethrotomy is of no value.

Rourke et al [24] evaluated the costs of DVIU and open urethral reconstruction with stricture excision and primary anastomosis for a 2cm bulbous urethral stricture. The model predicted that treatment with DVIU was more costly than immediate open urethral reconstruction.

Postoperative complications were mild and include superficial surgical site infection, scrotal swelling and one case of poor erection. These complications were self limiting. The case of poor erection was treated

with phosphodiesterase inhibitors with satisfactory outcome. Eltahawy et al [19] encountered position related neuropraxia, early urinary tract infection and chest related infection, scrotalgia and wound related complication. . All resolved within the early postoperative period while Tijani et al [21] encountered one case each of perineal wound infection and urethrocutaneous fistula which were managed conservatively.

V. Conclusion

Anastomotic urethroplasty for short segment bulbar urethral stricture has a success rate of 92.3%. It gives excellent long term results with reduced recurrence rate.

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