Research Article
One-Stage Urethroplasty for Strictures in Maiduguri, North Eastern Nigeria

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Background. Urethral stricture is a frequent cause of lower urinary tract obstruction worldwide. The aim of this study is to present our experience with one-stage urethroplasty.

Methods. All males that underwent one-stage urethroplasty between January 2001 and December 2010 were retrospectively reviewed. Details of their biodata, clinical presentation, diagnostic investigations, operative treatment, postoperative complications, and other outcome of surgery were extracted and analyzed.

Results. Ninety-one patients aged 8–76 years, (mean; 45.6 ± 19.7) with urethral stricture were studied. Postinfective strictures accounted for 58.2% and postprostatectomy strictures for 3.3%. Twenty-six (27.9%) of the strictures were in the posterior urethra of which 18 (59.2%) were posttraumatic. Fifty-seven strictures (61.3%) were in the anterior urethra of which 51 (54.8%) were postinfective. Thirty-nine (42.9%) patients had end to end anastomosis, 29 (31.9%) flap augmentation and 17 (18.7%) tabularized flap substitution, and 6 (6.6%) dorsal onlay grafts (5 with buccal mucosa and 1 with penile skin). There were 18 (19.8%) cases of wound infection, 12 (13.2%) of restricture and 6 (6.6%) cases of urethrocutaneous fistula. Satisfactory urinary stream was found in 77 (84.6%) patients. There was no mortality.

Conclusion. Infection is the commonest cause of urethral stricture followed by trauma, and one-stage urethroplasty give excellent results.

1. Introduction
A urethral stricture is caused by narrowing of the urethral lumen due to spongiosfibrosis, resulting in loss of distensibility and compliance, leading to poor urinary stream which may lead to further complications. It is a common problem worldwide affecting mainly the male urethra [1]. The aetiology of acquired urethral strictures varies from inflammatory causes to traumatic scarring after blunt perineal/pelvic trauma and iatrogenic causes following surgery or urethral catheter use [2, 3].

Most postinfective strictures are located in the anterior urethra (bulbopenile), whereas posttraumatic strictures affect the bulb or cause posterior urethral disruption or distraction the latter is a serious challenge to the urologist, because they are often associated with significant complications including incontinence and erectile dysfunction [4].

Various forms of repair of the urethra have been developed and perfected over the years, ranging from excision and end-to-end anastomosis in short segment strictures to substitution urethroplasty in long segment strictures. The aim is to produce a wider, stable, and more compliant or distensible urethra that will produce a positive impact on voiding [5, 6].

We undertook one-stage approach because, in the interval between the first and second stages, infections of the operating site are common, making the second stage of the operation more difficult; furthermore, most of our patients are of the low socioeconomic status and can afford surgery only once in their life time. We managed 91 patients by one-stage urethroplasty at the UMTH over a 10-year period; this retrospective study details the outcome of our intervention.

2. Patients and Methods
All males that underwent one-stage urethroplasty for urethral stricture at the UMTH between January 2001 and
December 2010 were retrospectively reviewed. Details of their biodata, clinical presentation, diagnostic investigations, operative treatment, postoperative complications, and other outcome of surgery were extracted from their hospital records and analyzed. The diagnosis of urethral stricture was made on clinical assessment, a retrograde urethrogram (RUG) and micturating cystourethrogram (MCUG). The patients had initial urinary diversion by a suprapubic cystostomy (SPC). One-stage urethroplasty was performed on all patients after resuscitation where necessary, ensuring optimal renal function and treating any urinary tract infection with antibiotics based on sensitivity. Penile skin flap, substitution, or augmentation urethroplasty were the main surgical techniques used. With a few buccal mucosal on-lay grafts, short segment strictures, and those from posterior urethral disruption, had end-to-end anastomosis after excision of the stricture, while long segment or beaded postinflammatory strictures were repaired by penile skin flaps. Calculi, bladder diverticuli, abdominal wall hernias were treated at the same surgery or after the urethroplasty have healed. The postoperative outcome was carefully documented. Thirteen patients with incomplete medical records were excluded from the study.

3. Results

A total of 91 patients had one-stage urethroplasty during the study period. Their mean age was 45.6 ± 19.67 years (range 8–76). The 41–50-year-age group was the most affected accounting for 20 (21.9%) patients (Table 1). The causes of urethral stricture are outlined in Table 2 which included post-infective in 53 (58.2%), post-traumatic in 30 (32.9%), iatrogenic, as a complication of urethral catheterization in 5 (5.5%) and as a complications of prostatectomy in 3 (3.3%) patients. Sixty-seven (72%) strictures were in the anterior urethra comprising 26 (38.8%) bulbar, 34 (50.7%) bulbo-penile, and 7 (10.4%) penile. Twenty-six (28.0%) of the strictures were in the posterior urethra (Table 3). Most of the patients presented with progressive poor urinary stream that improved with straining. Eleven (12.1%) presented in acute urinary retention, while 6 (6.6%), presented with multiple perineal urinary fistulae (watering can perineum). The mean duration of symptoms was 24 months for the postinflammatory strictures, and 3–6 months for the posttraumatic strictures.

Resection of the strictures and primary anastomosis were done in 39 (42.9%) patients while substitution urethroplasty (augmentation and replacement with penile or scrotal skin or buccal mucosa) was performed in 48 (52.7%) patients (Table 4). All the patients had sterile urine on culture before the procedure. General anaesthesia was used in 9 (9.9%) patients 5 of which had buccal mucosal graft. The rest were done with spinal anesthesia. The mean duration of surgery was 98.25 ± 17.8 minutes (range 60–120) for resection and en-to-end anastomosis, while substitution urethroplasty took a little longer, with a mean operation time of 125.4 ± 23.4 minutes.

The postoperative complications (Table 5) included urethral fistula in 6 (6.6%) patients, out of which 4 (66.7%) had flap augmentation and 2 had tabularized pediced penile skin flap. None of the resection and end-to-end anastomosis patients had fistula formation. Wound infection was seen in 18 (19.8%) patients, made up of 15 (83.3%) that had substitution urethroplasty (augmentation 9, and replacement 6) and 3 (16.7%) that had resection and anastomosis. Restricture was seen in 12 (13.2%) patients, of which 7 (58.3%) had resection and anastomosis and 5 (41.7%)
there is now a changing pattern of aetiology with trauma problems. Urethral stricture disease may be because of the social stigma associated with genital. The vast majority of urethral strictures in this part of problem in the West African subregion from time immemo-
Urethral stricture disease has been a common urological

had substitution urethroplasty. Four fistulae healed sponta-
neously on suprapubic cystostomy drainage, while 2 were
repaired. Majority of the patients, 67 (73.6%), did not have
any postoperative complications.

Seventy-seven (84.6%) of the patients had satisfactory
voiding at discharge with a urinary flow rate of at least 10–15 mls/sec, and eleven (12.1%) patients had maximal flow
rate of over 15 mls/sec on discharge. The mean follow-up
duration was 3 months, and majority of the patients were
lost to followup after 6 months.

4. Discussion

Urethral stricture disease has been a common urological
problem in the West African subregion from time immemorial. The vast majority of urethral strictures in this part of
the world present late with many complications, and this
may be because of the social stigma associated with genital
problems. Urethral stricture disease affects all age groups but
is most common in males in their prime of life with mean
age ranging between 30 and 50 years [5–7].

In the past, post-infective urethral strictures especially
following gonococcal urethritis predominated [7]; however,
there is now a changing pattern of aetiology with trauma accounting for most cases [8, 9]. In this study, postinfec
tive strictures were still more common in variance with what is
obtainable in other parts of Nigeria [10]. This may be due
to higher urbanization in those parts of the country leading
to more automobile accidents and other forms of trauma.
Other causes of urethral stricture of particular interest
include posturethral catheterization and postprostatectomy
[11, 12]. In this study there were 3 cases of urethral strictures
following traumatic catheterization and another 3 following
prostatectomy. One of the postprostatectomy strictures in
this series were managed by serial dilatation, anastomotic
urethroplasty and flap augmentation. This is in contrast to
Onuigbo et al’s [11] experience where all their patients were
managed by serial dilatation with good results. The choice of
modality of treatment depends on extent of fibrosis, site, and
length of the stricture.

In the management of anterior urethral strictures, resection with spatulation, followed by mucosa to mucosa
tension-free end to end anastomosis of the urethra, was
the most frequently performed procedure in our series
because most of the strictures were short segment, solitary,
and located in the anterior urethra. Such alignment of the
urethra is responsible for the high success rate of anastomotic
urethroplasty, which is in excess of 90% and sustained
on long-term basis [13, 14]. Patients with complicated
strictures for example, urethro-cutaneous fistulae, extensive
periurethral fibrosis, false passages from previous attempts
dilatation, diverticuli, and others, require more robust
surgical technique which entails maximal excision of scar
tissue with conservation of the ischiocavernous and bul-
bosponious muscles responsible for ejaculation at the same
time dissecting in the mid-line to protect the nervi erigentis
proximally particularly at the bulbomembranous urethra.
This group of patients requires substitution urethroplasty by
way of augmentation or total replacement of the diseased
segment. The success rate of these surgeries is measured by
increase in urine flow rate and patients satisfaction. The
success rate has been variously reported to range between
40 to 80%. In this study 77 (84.6%) had satisfactory voiding
as indicated by urine flow rate of 10–15 mL/s; however, it
was difficult to assess the long-term impact of substitution
urethroplasty on voiding because of poor followup. Most
of the patients were lost to followup by the first 6th
postoperative month.

The postoperative complications are similar to earlier
reports, with wound infection being the most common.
Restricture is common in patients that had resection, and
end-to-end anastomosis and fistulae are mostly seen after
substitution urethroplasty with most closing spontaneously.

5. Conclusion

Urethral stricture disease is a common problem in north-
eastern Nigeria with the infective causes still predominating
in some areas although traumatic causes are on the rise.
One-stage urethroplasty is most appropriate with acceptable
outcome in our environment considering our prevailing
social and economic factors.

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