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Original article

Clinical and Epidemiological Profile of Urethral Stricture Disease in Ogbomoso, Nigeria

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Abstract
Urethral stricture disease constitutes a major cause of bladder outlet obstruction in men. The clinical presentation of this pathology is not well understood in our community. Our objective was to discuss the clinical and epidemiological profile of this pathology. This was a hospital-based retrospective review of all cases of urethral stricture and urethral stenosis that were seen in our center between 2015 and 2024. Their case folders were retrieved from the hospital medical record department. Information on the clinical and epidemiological profile extracted was recorded in a designed proforma. Analysis was done by using the chi-square and Kruskal-Wallis test for categorical variables and Spearman's correlation coefficient for continuous variables. A p-value of < 0.05 was considered statistically significant**.** A total number of 46 patients were managed for urethral stricture with a mean age of 37.7+/13.7SD within a range of 16-90 years and hospital period prevalence of 14 per 100,000. Stricture was noted to be common in the bulbar urethral (28, 60.9%), while the most common etiology was observed to be post-inflammatory. (25, 54.3) There was a significant association between location and etiology of the stricture (p-value< 0.001). The association between length and etiology of the stricture was also statistically significant (p-value<0.001). All the patients had a successful voiding trial at discharge. The most common cause of urethral stricture remains post-inflammation, and there was a significant association between location and etiology of stricture, as well as between length and etiology.
Keywords. Urethral Stricture, Epidemiology, Ogbomoso.

Introduction

Urethral stricture disease constitutes a major cause of bladder outlet obstruction, especially in the middle-aged group of any population, with a reported prevalence of 229-627 per 100,000 males[1]. The prevalence of urethral stricture in Nigeria varies according to geographical location[2,3] Patients with urethral stricture commonly present with difficulty in passing urine, with attendant poor quality of life [4]. Some of them may present with urinary retention. The commonly noted attendant history at presentation includes previous history of abnormal urethral discharge, falling astride or manhole injury, pelvic fracture associated trauma, faulty urethral catheterization, and urethral instrumentation[5]. Some of them with delayed presentation may be seen with Fournier's gangrene, watering can perineum, or features of post-renal failure[6]. The etiology of urethral stricture disease has been categorized into congenital, traumatic, post-inflammatory, neoplastic, and idiopathic [1]. The diagnosis of urethral stricture is often made in suspected patients with the help of retrograde urethrogram (RUG) and or micturating cystourethrogram. (MCUG)[7]. This contrast urethral study may reveal the location, length, and number of the stricture, while the etiology can be suspected on clinical evaluation. Other investigation that may be done includes urine culture, pelvic ultrasound, and son urethrography [8].

Ambiguous RUG/MCUG may necessitate urethrocystoscopy. The treatment option for urethral stricture depends on some factors, such as the location of the stricture, the number of strictures, the length of the stricture, etiology, and the patient's clinical status at presentation. (Emergency vs clinic presentation). The options of treatments that have been documented in the medical literature are urethral dilatation, direct vision internal urethrotomy, and urethroplasty. Urethroplasty remains the gold standard[9]. This could be a primary excision of the stricture and end-to-end anastomosis or the use of a flap or graft for the reconstruction. Our objective was to discuss the clinical and epidemiological pattern of this pathology, which includes the age distribution, the etiology, location, length, and definitive treatment of the stricture in our environment.

Methods

This was a hospital-based retrospective review of all cases of urethral stricture and urethral stenosis that were seen in our center between 2015 and 2024. The case folders of the patients who were managed for the

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disease were retrieved from the hospital medical record department following consent from the hospital management. Information on clinical and epidemiological profile, such as the age of the patient, clinical presentation, examination findings, diagnostic findings, etiology, and location, length, and treatment modality, including prevalence of urethral stricture extracted, was recorded in a designed proforma. This proforma contained spaces for the biodata of the potential patients, clinical presentation, examination findings, diagnostic findings, pattern, and management of stricture. The etiology of the stricture was determined based on clinical history and examination. Patients with urethral obstruction at the level of the anterior urethra were defined as urethral stricture, and those noted at the level of the posterior urethral were defined as stenosis. These were subsequently recruited into the study. Patients with incomplete data and of neoplastic etiology were excluded from the study. The research was carried out in accordance with the Helsinki Declaration. The need for ethical clearance was waived by the internal review board (IRB) OF LAUTECH Teaching Hospital, Ogbomoso, due to its retrospective nature. The data obtained were entered into SPSS version 23. Analysis was done by using the chi-square and Kruskal-Wallis test for categorical variables and Spearman's correlation coefficient for continuous variables. (Chi-square test was used in determining an association between location of the stricture and etiology, Kruskal-Wallis test was used to determine an association between age and location, as well as length and etiology of stricture, and Spearman's correlation coefficient was used in the case of age and length of stricture). A p-value of < 0.05 was considered statistically significant

Results

A total number of 46 patients were managed for urethral stricture, including urethral stenosis, with a mean age of 37.7+/13.7SD within a range of 16-90 years and hospital period prevalence of 14 per 100,000. The most common age of occurrence was between 25-34 years (41%) (Table 1). All the patients either present with urinary retention (5, 10.9%) or suprapubic urinary diversion (41, 89%) with antecedent history of either purulent urethral discharge or trauma to the urethral or perineum. All the patients had diagnostic retrograde urethrogram and micturating cystourethrogram, and other routine investigations, such as urine culture. Stricture was noted to be common in the bulbar urethral (28, 60.9%), while the most common etiology was observed to be post-inflammatory. (25, 54%) Others are trauma (15, 32.6%), idiopathic (no history was suggestive of any known etiology) (6, 13%) (Table 2). The majority of the cases had long segment stricture (>2cm) (26, 56.5%). The most common definitive approach was substitution urethroplasty, which included either buccal mucosal graft or penile fasciocutaneous flap substitution (26, 56.5%). Others are anastomotic (17, 37%), direct vision internal urethrotomy (3, 6.5%). There was a significant association between location and etiology of the stricture (p-value< 0.001) using the chi-square test. Kruskal-Wallis test analysis of the association between length and etiology of the stricture was statistically significant (p value <0.001). There was no statistically significant association between age and location (p value $=0.6$), nor between age and length (p value $=0.1$). All the patients had a successful voiding trial at discharge. One month after discharge was uneventful. Five of the patients were seen two years postoperatively with recurrence.

Table 1. Age Distribution of the Investigated group and Relative Frequency

S/N	Age Group	Frequency(n=46)	Percentage (100%)
1	15-24	3	6.5
2	25-34	19	41.3
3	35-44	15	32.6
4	45-54	2	4.3
5	55-64	6	13
6	65-74	0	0
7	75-84	0	0
8	85-94	1	2.2

Table 2. The Location of Urethral Stricture and Relative Frequency

S/N	Location	Frequency (n=46)	Percentage (100%)
1	Bulbar	28	60.9
2	meatal	2	4.3
3	penobulbar	8	17.4
4	penile	6	13.
5	Bulbomemranous	2	4.3

Discussion

This study has been able to illustrate the clinical and epidemiological pattern of urethral stricture disease in our environment. Although urethral stricture can occur in all age groups (6), it has been commonly reported in the middle-aged group, as noted in this study [10]. This is likely due to the vulnerability of people

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in this age group to the common risk factors of urethral stricture diseases, such as sexually transmitted diseases or trauma, among others, compared to the adult population. The incidence and prevalence of urethral stricture disease vary according to geographical locations. The prevalence observed in the study is low compared to other geographical locations. In a study conducted on urethral stricture in Nigeria, Abubakar et al reported a total number of seventy-six cases over a period of five years[11]. This is higher than the number of cases observed in our study conducted over a longer period of time. This may be linked with dissimilarity in the socio-economic factors of the centers of the studies. Also in Nigeria, EshioboIrekpital et al(3) reported 46 cases of urethral stricture over a period of 10 years, as exactly noted in our findings. This may be connected to the similarity in our settings, being a semi-urban environment. It is imperative to state that the global prevalence of urethral stricture disease ranges between 229 to 627 per 100,000 population.

Patients with urethral stricture diseases may present with complications or may be seen in the clinic. We observed that the majority of our patients were seen in the clinic with suprapubic urinary diversion. This was suggestive of initial presentation at peripheral hospitals with urinary retention and difficult urethral catheterization, which might have necessitated placement of suprapubic catheters. Some similar studies have reported the same clinical scenario at presentation[12]. It is rare for a patient with urethral stricture disease to present with urinary retention without a poor urinary stream that may likely improve with straining[13]. Some of our patients might have ignored this antecedent history, which eventually culminated in urinary retention. it is known that some of our patients have poor health-seeking behavior. This was in contrast to what was reported in the developed countries[14].

The diagnosis of urethral stricture is made following clinical and radiological features of the disease. This was the approach in this series. This is in consonance with some other similar studies.(15) None of our patients had urethrocystoscopy following clinical suspicion of urethral stricture because RUG/MCUG was sufficient for diagnosis in all of them. It has been reported that urethrocstoscopy may be required when RUG/MCUG is ambiguous[16]. Ultrasound of the urethra may be necessary in the management of urethral stricture, especially to determine the density of the stricture before treatment[17]. This was not done in our patients because of a lack of facilities.

Post-inflammatory stricture was discovered to be the most common cause of urethral stricture in this series. This was defined by the presence of an antecedent history of abnormal urethral discharge in the past. Some similar studies have also reported post-inflammatory stricture as the most common etiology[18]. This has been linked to poorly treated abnormal urethral discharge, mainly from sexually transmitted infections. This does not align with the present situation of the etiology of urethral stricture as noted in the medical literature, where trauma remains the leading cause, most especially in the developed world[19]. This shift from post-inflammatory to traumatic cause may be due to the availability of adequate treatment for sexually transmitted infections, with expected decline in the development of post-inflammatory stricture and increase in the incidence of road traffic crashes brought about by the advent of advanced infrastructure development. It has also been established that a higher rate of transurethral procedures has contributed significantly to this development[10]. Studies have revealed that there may not be any known etiology in some individuals with urethral stricture[20]. This is usually termed idiopathic. This study has given credence to this revelation. This explanation of the etiology may also explain the likelihood of long-segment stricture in the developing countries of the world, like ours, as discovered in this study, compared to short-segment stricture seen in the advanced countries with trauma as a predominant cause.

The most common location of stricture disease in the urethra, as observed in this study, is in keeping with the majority of the findings from similar studies in the literature. It has been suggested that the typical orientation of the bulbar urethra makes the stream of urine along its course slower[19]. This may subsequently serve as a nidus for urinary sepsis, which may set up a cascade of events culminating in periurethral spongiofibrosis.

Urethral strictures are often associated with a specific location based on etiology. It is a known fact that pelvic fracture urethral injury, formerly known as pelvic fracture urethral distraction defect, commonly involves bulbar membranous urethral and fall astride injury, as well as post-inflammatory stricture, which are often seen in the bulbar urethral[21]. This study has confirmed a statistically significant association between etiology and location of urethral stricture, thus confirming existing literature. The outcome of this study concerning a statistically significant association between length and etiology of urethral stricture is in agreement with the existing literature. This has been clarified above under the etiological pattern and resultant length of stricture.

The definitive treatment noted to be common based on this study aligns with the most common etiology. Substitution urethroplasty is usually adopted in cases of long-segment urethral stricture for better outcomes, while short-segment stricture that does not fulfill known indications for urethral dilatation/DVIU, such as epithelial stricture, solitary and incomplete stricture, among others, will be treated by excision and primary anastomosis. According to reports from the literature, the preferred treatment modality mainly depends on the length of the stricture [22]. The patients' follow-up was uneventful for two years, after which they were no longer seen in the clinic. It is common knowledge in our environment that once a patient is fine, he disturbs doctors less. We believe that they have done well following uneventful post-management

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care. It is key to emphasize that five of the patients studied later showed up with recurrence after 4 years. They are presently being re-evaluated.

Conclusion

This study has illustrated that the most common cause of urethral stricture remains post-inflammation, and there was a significant association between location and etiology of stricture as well as between length and etiology. There was, however, no statistically significant association between age and length of stricture, as well as age and location of stricture. Post-inflammatory stricture in men may be prevented by prompt and adequate treatment of urethritis that may follow a sexually transmitted infection. Health care professionals and the government should prioritize awareness of sexually transmitted infections.

***Conflict of interest**:* All authors declare no conflict of interest

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