

Original Research Article

Is Post-Inflammatory Urethral Stricture Commoner Than Post-Traumatic Urethral Stricture? A Study in South-South Nigerian Hospital

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Abstract: Urethral stricture is a narrowing of the urethra due to scarring process. It can be caused by a pre-existing inflammatory process, traumatic condition to the urethral or idiopathic where the cause is unknown. Historically, both in the developed and developing countries post-inflammatory stricture disease dominated over post traumatic causes, however, about few decades ago the trend changed. While the picture remained the same in developing countries it is a reverse in the developed countries where post-traumatic causes topped the list. In our study also, urethral stricture of post-inflammatory origin was seen to be commoner than post-traumatic causes. A retrospective study of all patients seen in our facility with symptoms of bladder outlet obstruction and diagnosed with urethral stricture between January 2014 to December 2014. Eighteen patients were sorted out and used for the study. Biomedical data, clinical features and methods of diagnosis were retrieved and analyzed. Patient's age ranged from 19-93 years with a mean of 50.17 ± 17.618 years. Post-inflammatory group were 10 patients (55.6%) while post-traumatic group were 7 patients (38.9%) and one patient had idiopathic stricture representing 5.6%. Mean age at diagnosis per cause were respectively 55.4 ± 17.61 , 47.14.86 and 19 years for post-inflammatory, post-traumatic and idiopathic causes. Stricture is a major urological condition and frequently leads to bladder outlet obstruction and strong bothersome symptoms to patients. In developing countries such as ours, it is still commonly caused by post-infectious urethritis and other relatively common causes are post-traumatic and idiopathic.

Keywords: Urethral stricture causes, post-inflammatory, post-traumatic, Idiopathic.

INTRODUCTION:

Urethral stricture may be defined as a narrowing of the lumen of the urethra due to scarring process. It results from fibrosis and loss of compliance of the urethra leading to bladder outlet obstruction [1]. Epidemiologically, there are no direct measures to assess the true incidence of urethral stricture disease worldwide; however, the incidence was estimated to be approximately 0.6% in susceptible populations [2]. Historically, infectious urethritis was the leading cause of urethral strictures; with patient's education, better methods of diagnosis and treatment of sexually transmitted diseases (STD), this fact may not be true in some regions of the world. There is significant variation in the aetiology in different parts of the world. In one study in Brazil [3], infection was a cause of the disease in only 15.2% of cases, while in Nigeria it was found to be the cause in 66.5% of the cases [4].

The aetiology can be broadly divided into post-inflammatory, post traumatic and idiopathic. Post

traumatic actually depends on the mechanism of injury which could be pelvic fracture-related, fall astride injury, iatrogenic injury secondary to urethral instrumentation and urethral surgeries. A review of other studies suggest that trauma was a cause of urethral stricture in 9.6-36.1% of cases [5,6], leaving the remainder to post-inflammatory cause. In this study, post-inflammatory urethral stricture formed the majority of cases. Mean age at diagnosis was also higher in this same cohort of patients.

The pathology is that of healing by fibrosis involving the spongiosal tissues called Spongiofibrosis and narrowing of the urethral lumen. Resulting bladder outlet obstruction (BOO) leads to lower urinary tract symptoms characterized by poor urinary stream, straining at micturition, interrupted flow, a feeling of incomplete bladder emptying. These may culminate into urinary retention and other urinary tract complications such as bladder stones, urethral fistulae

and abnormalities of the upper tract including hydronephrosis and renal failure.

The sequelae of urethral stricture have a strong bother on the quality of life of sufferers and so is a major urological disease which needs committed effort in the prevention, diagnosis and dedicated team of urologists to treat the disease and its complications.

PATIENTS AND METHOD

This is a retrospective study of all patients that were seen in our facility with symptoms of BOO between January 2014 to December 2014. One hundred and ten (110) patients were seen out of which seven (7) were excluded from the study because of incomplete data. Of the 103 patients, 18 were diagnosed with urethral stricture disease representing 17.5% of the patients population, 85 patients representing 82.5% presented with prostatic disease namely cancer of the prostate and benign prostatic hyperplasia. Urethral stricture group was used for this study. Data collected from case notes included age, sex, symptoms and their duration, signs, possible causes, methods of diagnosis

including Micturating Cysto-urethrogram and Retrograde Urethrocystogram and treatment modalities. SPSS Version 20.0 was used for the analysis. The aim of this study is to compare the frequency of post-inflammatory and post-traumatic urethral stricture and to answer the question as required by the title of this article.

RESULTS

18 patients diagnosed with urethral stricture aged between 19-93 years had a mean age of 50.17 ± 17.618 years. 10 patients representing (55.6%) had post-inflammatory urethral stricture while 7 patients and 1 patient representing 38.9% and 5.6% respectively had post-traumatic and idiopathic urethral stricture (Table 1). Mean age at diagnosis were 55.4 ± 17.61 , 47.14 ± 14.86 and 19 years respectively of post-inflammatory, post-traumatic and idiopathic diseases (Table 3). Median age was 51, 52 and 19 years with a range of 61, 41, 0 respectively. Association between age and frequency of causes showed that there were more patients in the post inflammatory group who were above 50 years of age than the other groups (Table 2).

Table-1: Frequency of causes of Urethral Stricture:

Causes	Frequency	Percent (%)
Post-inflammatory	10	55.6
Post-traumatic	7	38.9
Idiopathic (Congenital)	1	5.6

Table-2: Age of Respondents and causes of Urethral Stricture:

Age (years)	Post-traumatic	Post-inflammatory	Idiopathic	Total
< 50	3 (33.3%)	5 (55.6%)	1 (11.1%)	9 (100%)
> 50	4 (44.4%)	5 (55.6%)	0 (0.0%)	9 (100%)
	7 (38.9%)	10 (55.6%)	1 (5.5%)	18 (100%)

Table-3: Mean and Median age at diagnosis/Causes of Urethral Stricture:

Causes	Mean age (n)	Median age	Range
Post-inflammatory	55.40 ± 17.618 (10)	51	61
Post-traumatic	47.14 ± 14.860 (7)	52	41
Congenital	19.0 (1)	19	0
Total	50.17 ± 17.860 (18)	51	70

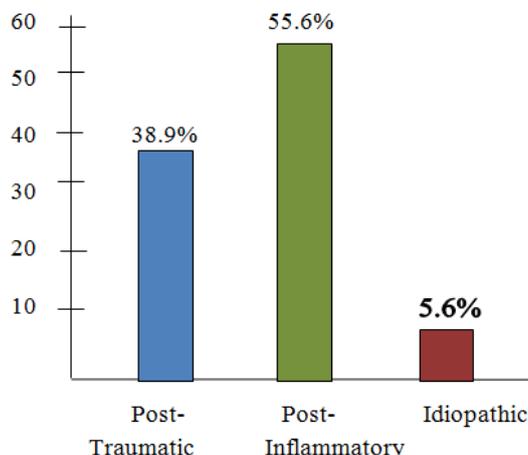


Fig-1: Frequency of causes of Urethral Stricture:

DISCUSSION

Urethral stricture is defined as a narrowing of the lumen of the urethral due to scarring process. The causes can be categorized as follows [7]; Infective or inflammatory: Urethritis due to STD, lichen sclerosus (balanitis xerotica obliterans), tuberculosis. Traumatic: Internal (iatrogenic): urethral catheterization, cystoscopy, transurethral resection, prostatectomy, brachytherapy, hypospadias repair. External: Perineal or straddle injury, pelvic fracture, gunshot and stab wounds, penile fracture: Congenital or idiopathic (unknown). The pathogenesis of urethral stricture following any insult to the urethra for e.g biological, chemical and physical agents results in induction of squamous metaplasia from the normal pseudo-stratified columnar epithelium. The earlier lacks the waterproof nature of the columnar epithelium and causes extravasation of urine into the underlying corpus spongiosum aggravated by fissures formed in the epithelium when distended during voiding. The importance of urinary extravasation into the corpus spongiosum has been stressed by all and the worse the extravasation, the worse the fibrosis [8]. This spongiobfibrosis especially if circumferential may constrict the urethra and lead to symptoms of BOO.

The anterior urethra has abundance of paraurethral glands where bacterial infection is said to occur. The location of the urethral glands coincides well with the site of the incidence of infection related stricture implicating these as a cause⁸. In this study and in line with its objectives; post inflammatory urethral stricture was found to be commoner than other causes studied with a frequency of 55.6% as against 38.9% and 5.6% for post-traumatic and idiopathic causes respectively. In the developing countries, post-inflammatory stricture is still relatively commoner than other causes of urethral stricture. A review by Essiet *et al.* [9], urethral stricture of inflammatory origin was seen in 53.3% and 42.2% for traumatic aetiology. Another study by Hagos *et al.* [10] still in the sub-Saharan Africa had 82.4% represented by the post-inflammatory group. Reports from other parts in the Sub-Saharan Africa indicate that stricture of post inflammatory origin still predominates in the sub region [11]. The menace of this disease has continued although with some improvements due to patient's education, and various improved methods of preventing STD, better methods of diagnosis and adequate treatments.

A global review of urethral stricture disease before the 21st century also supported the fact that majority of the causes stemmed from STD [12]. Approximately 40% of all strictures in the 1960's and 1980's were a direct result of urethritis [7]. Historically and although less frequent, infection by Neisseria Gonorrhoea is still blamed as the main cause of stricture in developing countries [13]. The incidence of post-inflammatory urethral stricture may still be on the high

side in some localities in developing countries despite awareness campaign and better treatment offered because of the lag time between infection and development of the disease. Some studies have suggested periods of 10-18 years between infection and clinical features [6]. Others suggest > 20 years for symptoms to occur after a single episode of untreated gonorrhoea infection [12]. With these facts on ground, patients as it were, who had this infection within this window period may still present in their numbers in the near future before the effects of the awareness campaign for prevention arrest the trend.

Lichen Sclerosus (LS) as a cause of inflammatory urethral stricture was not encountered in our study. It is a chronic inflammatory condition of unknown aetiology. It commonly affects Caucasian patients with female to male ratio of 6:1. Palminteri *et al.* [5] demonstrated that LS is a cause of stricture in 13.5% of cases and is the most common cause of Pan-urethral stricture.

The aetiological factors for urethral stricture in developed countries are a reverse of what is discussed above. Recent studies from Europe and the USA have suggested that the aetiology of stricture disease has changed over the past decades with a decrease in urethritis and an increase in iatrogenic and idiopathic causes [7]. In Belgium (2009), post-inflammatory strictures occurred in 3.7% of the cases studied [7], iatrogenic and external trauma being the majority. However, post-traumatic causes including iatrogenic and external trauma are also on the increase in developing countries. Tijani *et al.* [14] in their study in Nigeria had 57.9% as post-traumatic in origin and only 26.5% in the post-inflammatory group. This is actually a reflection of increased urethral instrumentations in the developing countries which had began to gain popularity. These are in the areas of cystoscopy, transurethral resection of the prostate (TURP), urethroscopy, aside from the traditional urethral catheterization for prostatic pathologies. External trauma has also been on the increase because of good road networks that follow rural development. Good roads encourage over-speeding by drivers which can lead to severe road traffic accident (RTA) with pelvic injuries [15]. The vehicle drivers in this setting also ignore traffic rules and regulations which may result in fatal RTA with injuries that may involve the urethra. These heal with fibrosis in the anterior urethra and stenosis in the posterior urethra. Urethral injuries heal within a shorter period and compromise urethral lumen faster than post-inflammatory causes. In a study by Heyns *et al.* [16], the external trauma group took 6.4 years while the post-inflammatory group took 13.1 years to present with urethral stricture disease. This however, may be affected by patient's poor recall of events and so may not be altogether true.

One case of idiopathic urethral stricture was encountered in our study. Idiopathic strictures include those occurring at any age and at any site where the cause is not known, and those short sharp strictures that occur in adolescents and young adults at the junction of the proximal and middle thirds of the bulbar urethral, which some think are congenital possibly due to incomplete rupture of the urogenital membrane and related to what is called Cobb's collar [17] by some and Moorman's ring [18] by others. This was seen in a 19 year old boy with no possible aetiological factor ascribed to. Fenton *et al.* [6] thought it could be a possible manifestation of unrecognized paediatric trauma.

The mean age at diagnosis in this study was 50.17 ± 17.860 years higher than what was reported by Palminteri (45.1 years) [5] and much higher than what was reported in US/Italy (42.7 years) and India (38.2 years) [19]. To sub-classify the causes and age at presentation; patients in the post-inflammatory group were older than those in the post-traumatic group (55.4 ± 17.61 versus 47.14 ± 14.860). Although there were more patients in the post-inflammatory group than other groups who were older 50 years, the association between age and the causes of urethral stricture was not statistically significant (P Value > 0.05).

Urethral stricture is a major urological disease and can adversely affect the quality of life of patients such as sexual function. A number of other complications include acute or chronic urinary retention, urinary tract infection, urethral fistulae, sepsis, bladder calculi and ultimately chronic renal failure. These complications may take a great toll on the patients, the work force and economy of any nation. In developing countries, Gonorrhoea still remains an important cause of pan-urethral stricture although less frequent [20]. This type of stricture presents challenges in its treatment than short segment strictures which may demand rising of flaps and grafts. The trend to prevent spread of STD should be intensified and proper diagnosis and treatment instituted. More benefits will also accrue if this disease is picked up early and appropriate referrals made to urological centres for expert management.

CONCLUSION

Aetiology of urethral stricture disease has had several influences ranging from geographical region, ethnic groups and level of awareness of health information. In the developing countries, post-inflammatory cause had been of less frequency compared with the developed countries.

However, and of recent, the frequency of strictures of inflammatory aetiology has come down relative to what it was decades ago in the developing countries although still higher than episodes of post-

traumatic causes. In our study and in some studies in sub-Saharan Africa, post-inflammatory urethral strictures are still commoner than post-traumatic stricture disease with the latter being seen more than before as a result of increased use of endoscopic treatments for prostate diseases and alarming RTA with pelvic injuries and associated posterior urethral distraction defects occasioned by good rural road networks and over-speeding.

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