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Original Research Article

To Study the Various Clinical and Radiological Presentations of Patients with Anterior Urethral Stricture Disease in Adult Males at a Tertiary Care Center

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Abstract

Introduction: Urethral stricture is narrowing of urethra. The incidence of urethral stricture in India is estimated to comprise about 10% of urological cases. These processes lead to scar tissue formation. Scar tissue contracts and the caliber of the urethral lumen is reduced, resulting in resistance to the normal antegrade flow of urine.

Strictures can be divided into two main types: anterior and posterior, which differ in respect to their pathogenesis. This disease can result in a range of manifestations, from an asymptomatic presentation to severe discomfort secondary to urinary retention. Studies of natural history of stricture disease in untreated patients show high rate of disease complications such as: Thick walled trabeculated bladder (85%), Acute retention (60%), Prostatitis (50%), Hydronephrosis (20%), Periurethral abscess (15%), Bladder or urethral stones (10%) outcomes of various treatment protocols in current practice, complications associated with this disease and the results of the procedures underwent by the patients at our centre.

Methods: This study was conducted on 50 consecutive patients diagnosed with anterior urethral stricture attending the Outpatient department and getting admitted to Department of Surgery, J.A. Group of Hospitals, Gwalior during the period of January 2019 –September 2020

Result: Urethral stricture is very common in urological opd mostly present with thin stream of urination followed by acute retension of urine .most of the patient of stricture urethra having positive urine culture E.Coli 56% followed by klebsiella 18%. First investigation was MCU /RGU done which identify site of stricture which was confirmed by cystoscopy.

Conclusion: Stricture Urethra create variety of problem that was investigated judiciously and managed appropriately. Before any invasive procedure urine culture and renal function should be done.

Keywords: Stricture Urethra, MCU, RGU, Ultrasonography.

Introduction

Stricture urethra results from scarring of the epithelium lining the urethra which can encroach into the deeper spongiosal layer. The stricture is constituted of collagen fibres and fibroblasts. It can circumferentially contract thereby abbreviating the urethral length which results in constriction of the urethral lumen. It has been found over the course of urological practice that the patients suffering from stricture disease become symptomatic only the lumen size exceeds 16 Fr.

One of the proven methods to determine spongiofibrosis is sono-urethrogram but it may not be available in all the institutions where stricture surgery is practiced. Moreover, it is subjective and depends on the experience of sonologist. Presence of urethral induration on palpation and elasticity of the urethral lumen at the time of urethroscopy have been proposed as markers for the underlying fibrosis. But again, these parameters are not always fool proof.

Urinary tract infection has to be ruled out in any patient with urethral stricture. All the patients should undergo a proper urine analysis and urine culture and proper antibiotics should be administered before surgery. A few longstanding patients with stricture may have also developed a medical renal disease. Hence Renal Function Tests should always be done prior to any intervention.

Of the numerous imaging modalities available to image the urethra the most commonly used modalities are retrograde urethrography (RGU) also called as ascending urethrography and the voiding cystourethrography (VCUG). Other modalities which are slowly gaining ground are the Sonourethrography, Magnetic Resonance Imaging (MRI) and Computerised Tomography (CT).

Aims and Objectives

To study the various clinical and radiological presentations of patients with anterior urethral stricture disease in adult males at a tertiary care center.

Material and Methods

Sample Size: A minimum of 50 Patients

Type of study: Observational study (Prospective)

Source of data: Patients diagnosed with anterior urethral stricture attending the Outpatient department and getting admitted to Department of surgery, J.A. Group of hospitals, Gwalior.

Inclusion Criteria:

- All patients of anterior urethral stricture between 15 – 75 years of age.
- Combined anterior and posterior urethral strictures.
- Participant or a family member must be willing to give written and informed consent.

Exclusion Criteria:

- Patient of pure posterior urethral strictures.
- Patients not giving written/informed consent.
- The patients lost to follow up.
- Female patients with disease under study.
- Patients younger than 15 years and patients aged more than 75 years.

Statistical Analysis

All Statistical calculations were done with the help of Chi–Square test with degree of significance <0.5% with SPSS software version 22.0

Results were tabulated and represented by suitable graphs and compared with other similar studies.

Observation & results: Following observations were made

Table 1: Distribution of urological symptoms among the study patients

Symptoms	No. of patients with symptoms (n)	Percentage (%)
Supra pubic pain	4	8
Poor urinary stream	49	98
Fever	0	0
Urinary retention	11	22
Hematuria	5	10
Decreased urine output	0	0

The most common symptom affecting the study population was poor urinary stream (98%) followed by urinary retention (22%), haematuria (10%). Suprapubic pain was experienced by 4 patients (8%). None of the subjects enrolled in the study had fever or decreased urine output.

Table 2: Lab parameters in patients with urethral stricture disease

Blood Picture	Mean	Standard deviation	Min	Max
Haemoglobin (gm%)	10.05	1.39	7.3	14
TLC (/cu.mm)	8345	1800.69	5700	14200
RBS (mg%)	116.18	31.1	73	220
Blood urea (mg%)	43.42	20.6	21	104
S. creatinine (mg%)	1.05	0.4	0.7	2.2

		Count (n)	Percentage (%)
Urine C/S	Negative	34	64
	Positive	16	32

The mean haemoglobin levels out of 50 patients enrolled in the study was 10.05 +/- 1.39, which was lower than the normal reference range for adult males (14-16 mg/dl). The mean total leukocyte count was 8345, the mean random blood sugar was 116.18 mg/dl and mean blood urea and serum creatinine were 43.42 and 1.05 mg % respectively.

Out of 50 patients enrolled in this study, 16 subjects had positive urine cultures.

Table 3: Types of organisms isolated in urine sample

Name of the Organism	Number of Positive Samples	Percentage (%)
E. coli	9	56.25
Pseudomonas	2	12.5
Staphylococcus	1	6.25
Klebsiella	3	18.75
Acinetobacter	1	6.25
Total	16	100

Of 50 patients enrolled in this study 16 (32 %) were found to have positive urine culture, out of which the majority – 9 (18%) patients had E.coli, 3 (6%) had Klebsiella while 2 (4%) had Pseudomonas infection. Staphylococcus and Acinetobacter were identified in the urine samples of 1 patient each.

Table 4: Distribution of site of urethral stricture on Micturating Cysto-Urethrogram (MCU) and RetroGrade Urethrogram (RGU)

Site of stricture	MCU/RGU	Percentage
Penile	2	4%
Mid and distal Bulbar	36	72%
Proximal bulbar	12	24%

Based on the MCU/RGU findings, out of the total 50 patients of this study, 36 were predominantly distal and mid-bulbar urethral strictures, which accounted for 72% of patients. Proximal bulbar strictures were seen in 12 patients (24%) and penile urethral strictures were found to be the least common, accounting for only 2 patients (4%).

Discussion

Presenting Complaints:

Presenting complaints	**Geoffrey R Nuss et al. (2012)**	**Present study**
Weak urinary stream	49 %	98%
Urinary retention / incomplete emptying	27%	22%

The most common symptom experienced by the patients was poor urinary stream (98%), followed by urinary retention or sensation of incomplete bladder emptying, which was seen in 22% of patients.

00This was found to be similar to the study done by Geoffrey R Nuss et al [1] in 2012,where the most common symptom was found to be weak stream of urine (49%), followed by sensation of incomplete emptying in 27% cases.

This was also consistent with the study by Mundy et al [2], where obstructive symptoms were found to be the most common presentation (70%), although the study states that the sensation of incomplete emptying has the strongest association with stricture disease, whereas poor urinary stream was the most commonly seen symptom in patients enrolled in our study.

Associated factors like prostate volume and post-void residual urine volume need to be assessed further. Chronicity of symptoms and age of the patients in the study may also be causative factors.

Laboratory Parameters:

The mean haemoglobin level was 10.05 +/- 1.39 in the present study, while the mean total leukocyte count was 8345 cells / cu.mm. The mean random blood sugar level was 116.18mg% while the blood urea level was 43.42 mg%. The serum creatinine level was 1.05mg% - which were all within the normal reference range for Indian population and laboratory values at our institution.

Out of 50 patients enlisted in the present study, 16 patients had positive urine cultures of which Escherichia coli was the most common organism – found in 56.25% of positive samples, followed by Klebsiella sp. in 18.75% of cases. The 3rd most commonly isolated organism was Pseudomonas sp. (12.5%).

This was found to be in accordance with the study done by Murshidi et al [3], where E.coli was the most commonly isolated organism in urine samples of urethral stricture patients.

Previously gonococcus was identified as a major causative factor of urethral strictures but recent studies have suggested that gonococcal strictures are rare in the developed world – Mundy et al [2].

	Murshidi et al.[3] (2002)	**Present study**
Most common organism	E. coli (66.7%)	E. coli (56.25%)

Radiological Investigations

In our study, we used radiological modalities like micturating cysto-urethrogram (MCU) and retrograde urethrogram (RGU) to aid in diagnosis, which were then confirmed by antegrade and / or retrograde urethro-cystoscopy.

In the study by Conrad Maciejewski and [4] sensitivities between 75% and 100% have been observed, with specificities of

72-97% for the diagnosis of urethral strictures by RGU.

In our study, there was a significant predominance of distal and mid-bulbar urethral strictures (72%) on MCU/RGU studies, followed by proximal bulbar urethral strictures in 24% of patients.

Site of stricture	MCU/RGU (%)	Cystoscopy / Intra-operative finding (%)
Penile	4	-
Distal bulbar		8
Mid bulbar	72	40
Proxima..l bulbar	24	48
Multiple strictures (penile + bulbar)	-	4

Penile urethral strictures were identified only in 4% of patients on MCU/RGU study. This was confirmed by intra-operative /cystoscopy findings where 2 patients had distal penile strictures, although these patients had bulbar strictures in addition to the penile strictures identified on radiographs.

Conclusion

Stricture Urethra create variety of problem that was investigated judiciously and managed appropriately. Before any invasive procedure urine culture and renal function should be done.

There was a predominance of proximal and mid-bulbar strictures in this study as evidenced by radiological investigations and intra-operative findings.

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