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## Study of Aetiology, Pathology and Management of Ureteric Strictures

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**Abstract**

**Background:** Management of ureteric strictures is a challenging task. Subtle presentation, silent progression and complex aetiology may delay diagnosis. **Aims:** Evaluate aetiology, pathology and management of ureteric strictures at a tertiary care health centre. **Materials and methods:** This is a prospective study conducted in department for a period of study was 2 years. Total of 26 patients suspected of ureteric strictures were studied. **Results:** In 26 patients Iatrogenic 10 (38.46%) and idiopathic 6 (23%) are common causes. Other causes includes genitourinary TB, calculus. Flank pain 10 (57.7%) was most common symptomatic presentation followed by UTI and non specific symptoms. 15 are upper ureter strictures and 11 are lower ureter strictures. Upper ureter strictures of <2 cm is more common 7 (26.9%) followed by 5–10 cm lower ureter strictures 6 (23%). Altogether 5–10 cm strictures are most common in study 9 (34.6%). Most of patients had Uretero ureterostomy as upper and mid ureteric strictures. Surgery failed in 2 cases, among which one required nephrectomy, and another required redo surgery. Success rate is 92.3% after surgery. **Conclusion:** Significant advances in technique and technology have led to an improved ability to treat ureteral strictures without the need for open surgery in many patients.

**Keywords:** Of ureteric strictures; Iatrogenic; Uretero ureterostomy.

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**Introduction**

Urethral stricture is a medical condition that mainly affects men. The estimated prevalence of urethral stricture disease is 229–627 per 100,000 males, though there are regional variations.<sup>1,2</sup> Urethral stricture involves constriction of the

urethra. This is usually due to tissue inflammation or the presence of scar tissue. Scar tissue can be a result of many factors. Young boys who have hypospadias surgery (a procedure to correct an underdeveloped urethra) and men who have penile implants have a higher chance of developing urethral stricture. A straddle injury

is a common type of trauma that can lead to urethral stricture. Examples of straddle injuries include falling on a bicycle bar or getting hit in the area close to the scrotum. Other possible causes of urethral stricture include pelvic fractures, catheter insertion, radiation, surgery performed on the prostate and benign prostatic hyperplasia. Management of ureteric strictures is a challenging task. Subtle presentation, silent progression and complex aetiology may delay diagnosis. A wide range of available treatment options combined with the lack of adequate randomised trials has led to the introduction of personal bias in the management of this difficult group of patients. Metallic ureteric stents offer an alternative to the conventional treatment modalities. A wide variety of such stents have become available during the past two decades. Their resilience to compression can intuitively lead to long-term patency compared with conventional JJ stents.<sup>3</sup> This may reduce the need for frequent stent changes. It may also offer an improvement in the quality of life for patients with chronic ureteric obstruction caused either by malignancy or recurrent benign conditions.<sup>4,5</sup>

In our study, we have analyzed the aetiology, pathology and management of ureteric strictures at a tertiary care health centre.

## Materials and Methods

This is a prospective study conducted in Department of Urology at Kameneni Academy of Medical Sciences and Research Centre. Period of study was 2 years. Total of 26 patients suspected of ureteric strictures were studied.

### Inclusion Criteria

All the patients presenting to the urology OPD with radiological evidence of stricture were included in the study. We used ultrasound and CT for evidence of stricture for inclusion.

### Exclusion Criteria

1. Patients who underwent some surgical treatment for ureteric stricture elsewhere
2. Patients coming with a recurrence.
3. due to extrinsic compression, uretero-vaginal fistula, retroperitoneal fibrosis, and pelvic malignancies like carcinoma of cervix.
4. Successful stricture management was defined as the absence of clinical symptoms (flank

pain, nausea, vomiting, costovertebral angle tenderness) and resolution of hydronephrosis on, follow-up radiographic imaging at the time of last follow up first at 1.5 month, 15 days after Double J stent removal and then at 6 months.

5. Follow-up imaging was based on an individualized patient basis.
6. Patients, who lost to follow up were considered as a failure.
7. Pelvi-ureteric junction obstruction, being separate entity and malignant strictures are excluded from this study.

Basic investigations, abdominal ultrasound, intravenous pyelogram, abdominal and pelvic CT with CT urogram, MR urogram, and endoscopic procedures like ureteroscopy were done to confirm the diagnosis. A detailed history was taken from all patients including history of previous endourological procedures, surgeries, previous history of tuberculosis and history of stone diseases.

Various surgical treatment modalities are used according to length and location of strictures like *Upper and mid-ureteric stricture*

- Ureteroureterostomy 2–3 cm,
- Uretero calycostomy/pyeloureterostomy for long upper ureteric stricture, 4–5 cm with intrarenal or scarred pelvis,
- Buccal mucosal graft ureteroplasty

### Lower ureter

- Ureteroneocystostomy 4–5 cm,
- Psoas hitch 6–10 cm,
- Boari flap 12–15 cm,
- Ileal ureter replacement for long segment defect > 10–15 cm,

In every patient, we keep closed drainage system. The excised ureteric stricture segments were sent for histopathology. Histopathology slides were studied to arrive at a diagnosis and aetiology. All the cases were followed up for a period of two years.

## Results

In our study twenty six cases of ureteric stricture were studied, managed and followed up over a period of two years. The mean age of presentation was 41.67 years (age range: 3 to 57 years).

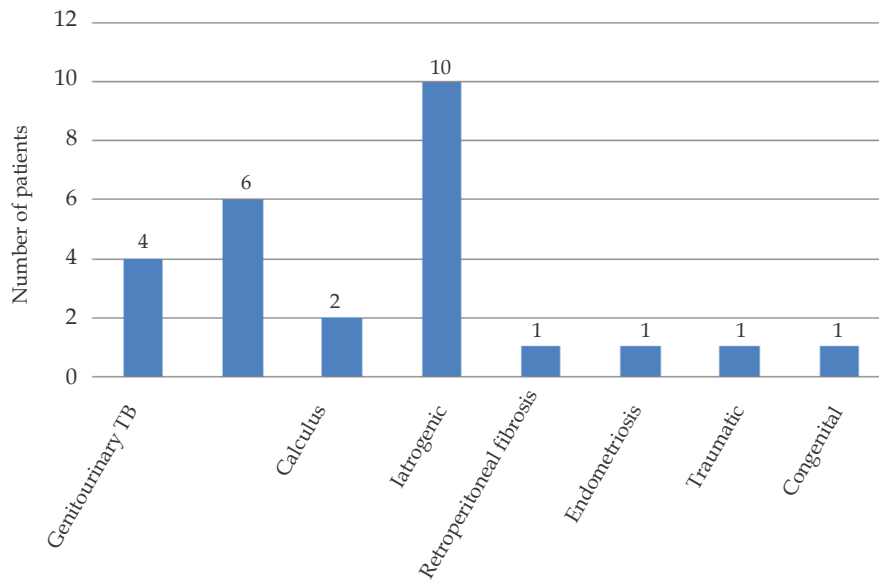


Fig. 1: Etiology in present study.

Iatrogenic 10 (38.46%) and idiopathic 6 (23%) are common causes. Other causes includes genitourinary TB, calculus (Fig. 1).

Table 1: Symptoms and indications of present study

	No. of patients	Percentage
<b>Symptoms</b>		
Pain flank/abdominal	10	38.46
UTI/ pyelonephritis	6	23.1
Fever	3	11.5
Symptoms of azotemia	2	7.7
Non specific symptoms	4	15.4
Palpable mass	1	3.8

	No. of patients	Percentage
<b>Indications of surgery</b>		
Recurrent flank pain	15	57.7
Recurrent urinary tract infection	3	11.5
deterioration of renal function	1	3.84
perinephric-ureteric collection	1	3.84
Pyonephrosis	2	7.6
Failed procedure	4	15.4

UTI: Urinary tract infection

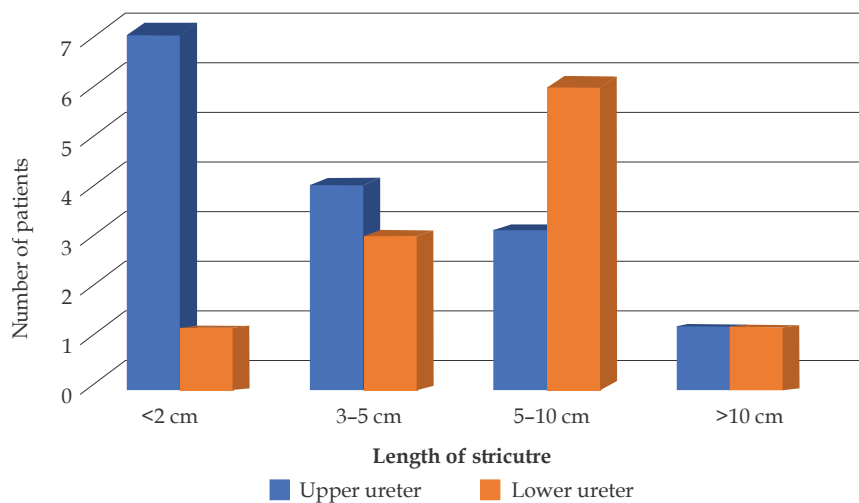


Fig. 2: Length of stricture in patients.

Flank pain 10 (57.7%) was most common symptomatic presentation followed by UTI and non specific symptoms (Table 1).

In total 26 cases 15 are upper ureter strictures and 11 are lower ureter strictures. Upper ureter strictures of <2 cm is more common 7 (26.9%) followed by 5–10 cm lower ureter strictures 6 (23%). Altogether 5–10 cm strictures are most common in study 9 (34.6%) (Fig. 2).

**Table 2:** Surgical procedures followed in study

	No. of patients	Percentages
<b>Upper and mid-ureteric stricture</b>		
Uretero ureterostomy	8	30.8
Pyeloureterostomy	4	15.4
buccal mucosal graft ureteroplasty	3	11.5
<b>Lower ureter</b>		
Ureteroneocystostomy	5	19.23
Psoas hitch	3	11.54
Boari flap	1	3.84
Ileal ureter replacement for long segment defect	2	7.7
<b>Total</b>	<b>26</b>	<b>100</b>

Most of patients had uretero ureterostomy as upper and mid ureteric strictures are mostly observed.

Among 26 patient's surgery failed in 2 cases, among which one required nephrectomy, and another required redo surgery Success rate is 92.3% after surgery (Table 2).

## Discussion

Mean age of presentation is 41.67 years (age range: 3 to 57 years). *Pallav Patel* et al. study shows mean age of presentation is 35.73 years from 3 years to 57 years. Correlates with prevalence of Gutb, iatrogenic, calculus diseases related stricture, usually affect middle age group.

In present study Iatrogenic 10 (38.46%) and idiopathic 6 (23%) are common causes. Other causes includes genitourinary TB, calculus. A review of literature showed considerable overall variation in the frequency distribution of etiological factors. In the developed world, most strictures today are either iatrogenic or idiopathic.<sup>7,8</sup> Major iatrogenic causes include urethral catheterization, cystoscopy, TURP, and hypospadias surgery. Our study also showed a similar result. Iatrogenic strictures occur

at any age, commonly involving the membranous urethra and urethral sphincter mechanism, after transurethral resection of the prostate (TURP).<sup>9</sup>

In younger patients, hypospadias surgery is the most important iatrogenic cause. Urethral stricture incidence after hypospadias surgery varies from 2.5% to 11% of patients.<sup>10,11</sup> Mostly these strictures develop in the distal penile urethra at the site of surgery or at the meatus. Gynaecologic surgery is responsible for up to 75% of iatrogenic ureteral injuries. The widespread use of upper tract endoscopy has led to an increased frequency of iatrogenic ureteral strictures (3–11%).<sup>12,13</sup>

Anthony T. Corcoran (2009), the etiology of stricture were previous endoscopic surgery for calculi 56% (19), rigid ureteroscopy 38% (13), flexible ureteroscopy 18% (6), previous abdominal or pelvic surgery 24% (8), gynecological surgery 9% (3), colon resection. O'Brien reviewed a five year experience and found that 31 patients had been treated for ureteral strictures caused by the following Flank pain 10 (57.7%) was most common symptomatic presentation followed by UTI and non specific symptoms.<sup>14</sup>

Flank pain 15 (57.7%) was most common symptomatic presentation followed by UTI and non specific symptoms. are observed in present study. Similar to study of *Patel P* et al. flank pain 18 (60%), recurrent febrile urinary tract infection 6 (20%),<sup>6</sup> According to *Alwaal* et al.<sup>4</sup> patients experience weak stream, straining to urinate, incomplete emptying, post-void dribbling, urinary retention, and recurrent urinary tract infection.<sup>15</sup>

In total 26 cases 15 are upper ureter strictures and 11 are lower ureter strictures. Upper ureter strictures of <2 cm is more common 7 (26.9%) followed by 5–10 cm lower ureter strictures 6 (23%). Altogether 5–10 cm strictures are most common in study 9 (34.6%).

Various surgical procedures like, Uretero-ureterostomy 8 (30.8%), Pyeloureterostomy 4 (15.4%), Buccal mucosal graft ureteroplasty 3 (11.5%), Ureteroneocystostomy 5 (19.23%), Psoas hitch 3 (11.54%), Boari flap 1 (3.84%), Ileal treter replacement with ileal ureterocalycostomy 2 (7.7%) done with good success rate of 92.3%. Amongst the 26 patients 2 patient's surgery among which one required nephrectomy, and another required redo surgery. one (3.3%) patients with ileal ureter replacement developed complication in form of paralytic ileus requiring prolong ryle's tube aspiration and correction of electrolytes and requirement of total parental nutrition. One patient

develops small leak at vesico ileal anastomosis so he required prolong DJ stenting. For 2 month and percutaneous aspiration and cultures specific antibiotics and prolong hospitalization. The success rate of ureteroneocystostomy with a psoas hitch is greater than 85% in recent reports, Ahn and Loughlin, et al.<sup>16</sup> According to study by Carlton, et al. and Bagley, et al., the success rate for a tension-free, watertight ureteroureterostomy is more than 90%.<sup>17,18</sup> Patients treated with a Boari flap is small, yet the results are good if a well-vascularized flap is used, Motiwala, et al., 1990.<sup>19</sup> Thus this study reconfirm that, even in era of endourology and minimal invasive surgery, open reconstructive surgery have their own place in case of failed endourology procedures and long segment ureteric stricture like genitourinary tuberculosis, endometriosis, idiopathic and or iatrogenic causes with approximately 92.3% success rate with acceptable morbidity.

### Conclusion

Significant advances in technique and technology have led to an improved ability to treat ureteral strictures without the need for open surgery in many patients.

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