

Original Research Article

To analyze the association between the type of pelvic fracture and its prognostic significance in rupture membranous urethra

Dr. Meha Ghodawat¹ (Ex Post Graduate Student), Dr. Ankit Joshi²
(Ex Post Graduate Student), Dr. Manoj Kela³ (HOD and Professor) &
Dr. Tushaar Ghodawat⁴ (Assistant Professor)

Sri Aurobindo Medical College and PG Institute, Indore (M.P.)^{1,2&3}
LNCT Medical College and Sewakunj Hospital, Indore (M.P.)⁴

Corresponding Author: Dr. Tushaar Ghodawat

Abstract

Background & Methods: The aim of the study is to analyze the association between the type of pelvic fracture and its prognostic significance in rupture membranous urethra. Pre-operative evaluation also included routine investigations such as blood, urine examination, pelvic radiographs, as well as specific ones, viz. retrograde urethrogram, urethrosonogram, and uroflowmetry. Patients were accordingly categorized, based on their etiologies, as post traumatic, post infective, iatrogenic, or unknown.

Results: Most of the patients presented to us for definitive reconstructive procedure within 1 year of trauma [75.05%], ranging from a few hours after trauma to up to even 15 years. Road traffic accidents and fall from height were the main modes of trauma. Overall results in the post-operative period were compared at 3, 6, 12 and 24 months.

Conclusion: Urethral strictures have been a reconstructive dilemma for many years due to the high incidence of recurrence as well as less than satisfactory outcomes. A thorough preoperative evaluation, appropriate surgical planning, and adherence to basic surgical principles, even in the hands of the most experienced surgeon, have failed to achieve the desired results. Post traumatic strictures had a short average length of 3.4 cms

Keywords: pelvic, fracture, prognostic, rupture membranous & urethra.

Study Design: Observational Study.

1. Introduction

Urethral stricture disease is as old as mankind. Earliest recorded attempts to deal with strictured Urethra occur in Hindu medicine. In A.D. 1520, occurred the first recorded serious epidemic of gonorrhoea & gradually from the time subject of stricture began to receive more attention. At this period urethral obstruction was regarded as due to formation of obstructive growth & not to a constriction of the urethral lumen In ancient India, Susruta described the use of a reed catheter lubricated with ghee ^{[2],[3]}. He also described the treatment of stricture by means of dilators of metal or wood. Hippocrates & Celsus have also given similar descriptions.

The late Professor John Blandy once stated that gentle urethral dilatation is the best option for a urethral stricture. Better understanding of the pathophysiology of stricture disease, with

recognition of spongiofibrosis, advances in the field of urethral imaging, and principles borrowed from the experience of surgeons, has revolutionized the management of this complex problem. Early enthusiasm about the endoscopic cold knife and later LASER urethrotomy is gradually settling. As Loughnane stated more than half a century ago - 'Internal urethrotomy is an operation of choice, not of necessity, and by itself does not cure^[4]. Urologists now realize that endoscopic urethrotomy is rarely curative and the patient often needs repeated procedures or regular self-calibration. This is not surprising, as a urethral stricture is a scar in the underlying epithelium and adjacent tissues, which needs to be excised and replaced by healthy epithelium to achieve a cure. The telltale signs of urethral injuries are bleeding at the meatus, suprapubic bladder fullness, inability to pass urine, inability to pass a per urethral catheter. Evidence of scarring or bruising due to trauma or induration and perineal fistulae may be seen^[5].

2. Material and Methods

Present Study was conducted at Sri Aurobindo Medical College and PG Institute, Indore from May 2019 to May 2020. A detailed preoperative assessment included careful history-taking and physical examination; with special stress on the urogenital system, followed by routine as well as specific investigations, in order to determine the exact etiology, site and length of the stricture and also the length and degree of spongiofibrosis. Pre-operative evaluation also included routine investigations such as blood, urine examination, pelvic radiographs, as well as specific ones, viz. retrograde urethrogram, urethrosonogram, and uroflowmetry. Patients were accordingly categorized, based on their etiologies, as post traumatic, post infective, iatrogenic, or unknown.

In patients with traumatic urethral strictures, specific history was elicited as regarding the time elapsed since the traumatic event, as well as any intervention, that may have been performed thereafter.

3. Result

Table No. 1: DURATION OF POSTOPERATIVE CATHETERIZATION

S. No.	Nos. of days	Total Number of patients	
		Number	% of cases
1.	< 20	20	8.84%
2.	21-30	156	69.023%
3.	31-40	23	10.17%
4.	> 40	27	11.94%

Table No. 2: TIME LAG BETWEEN INTIAL TRAUMA AND DEFINITIVE SURGERY

S. No.	Nos. of days	Total Number of patients	
		Number	% of cases
1.	Less than 6 months	78	34.5
2.	07-12 months	92	40.7
3.	13-24 months	32	14.2
4.	More than 24 month	24	10.6

Most of the patients presented to us for definitive reconstructive procedure within 1 year of trauma [75.05%], ranging from a few hours after trauma to up to even 15 years. Road traffic accidents and fall from height were the main modes of trauma.

Table 3: PERIOD OF FOLLOW UP

S. No.	Duration of follow up (in months)	No. of cases	% of cases
1.	0-6	38	16.81%
2.	7-12	61	26.99%
3.	13-18	55	24.33%
4.	19-24	35	15.48%
5.	25-48	18	07.96%
6.	49-96	19	08.40%

Table No. 4: POST OPERATIVE RESULTS

Results	3 months	6 months	12 months	24 months
Good	188 [83.62%]	185 [82.95%]	156 [81.25%]	138 [82.14%]
Fair	26 [11.5%]	26 [11.66%]	24 [12.5%]	19 [10.31%]
Poor	12 [4.86%]	12 [5.38%]	12 [6.25%]	11 [6.55%]
Total	226	223	192	168

Overall results in the post-operative period were compared at 3, 6, 12 and 24 months.

4. Discussion

Urethral stricture remains a complex and perplexing problem as regards the management and morbidity despite vast improvements in radiological imaging as well as surgical expertise. Over past several years, urethral stricture disease has, constantly and continuously, been a thorn in the flesh of urologists worldwide, to their honest and zealous efforts of obtaining a permanent cure for the same. Failure to obtain satisfactory results, even with the use of the most advanced techniques, by the most experienced surgeons, has laid the entire brunt of the burden on the etiology and other co-morbid conditions^[6].

Various studies have been performed to identify the major etiologies for stricture formation, notwithstanding their actual impact on the ultimate long term outcome, post-surgical intervention. Moreover, there has also been a major shift in the etiologies leading to stricture formation. In 1981, a review of 20 articles between 1961 and 1981, regarding the etiology of strictures, was published, with urethritis being the most common cause at that time, in 40% of the cases. Even in this study, there was a shift towards iatrogenic causes of urethral strictures, especially in the second decade of study. Jordan and Schlossberg, in 2002, suggested that most strictures in the recent era are a result of external trauma^[7].

Traumatic strictures most frequently involve the posterior urethra. Pelvic fracture causing disruption at the bulbo-membranous junction is by far the main etiology. Motorcyclists and bicyclists or pedestrians struck by a car, are at the highest risk of pelvic fracture with concomitant urethral disruption.^[8] Studies have reported an incidence of such strictures of up to 31%, in countries with poor vehicular and road conditions as well as inadequate traffic regulations^[9]. Casselman and Schillinger hypothesized that the mechanism of injury to the

urethra in major trauma causing pelvic fracture involves compression of the pelvic ring laterally, resulting in an increase in the antero-posterior diameter, leading to superior bladder displacement and consequent urethral stretching and avulsion. In our study, we had a group of 226 patients all of whom had radiological evidence of pelvic fracture. Various types of pelvic fractures were seen by us, majority of these falling into grades A and B of the TILE classification system. Out of a total of 226 subjects, 114 of them had TILE type A pelvic fractures whereas TILE B fractures were seen in only 70 cases. TILE C fractures were present only in about 42 patients. Hence the bulk of our study group was made up of patients presenting with TILE A and TILE B fractures (81.4%).

5. Conclusion

Urethral strictures have been a reconstructive dilemma for many years due to the high incidence of recurrence as well as less than satisfactory outcomes. A thorough preoperative evaluation, appropriate surgical planning, and adherence to basic surgical principles, even in the hands of the most experienced surgeon, have failed to achieve the desired results. Post traumatic strictures had a short average length of 3.4 cms

6. References

1. Raya-Rivera A, Esquiliano DR, Yoo JJ, Lopez-Bayghen E, Soker S, Atala A. Tissue-engineered autologous urethras for patients who need reconstruction: An observational study. *Lancet* 2011;377:1175-82.
2. Ingram MD, Watson GS et al. Urethral Injuries after Pelvic Trauma: Evaluation with Urethrography. *J. RadioGraphics* 2008;28:1631-1643.
3. Raj Kumar Mathur, Aggarwal Himanshu and Odiya Sudarshan Technique of anterior urethra urethroplasty using tunica albuginea of corpora cavernosa *International Journal of Urology* (2007) 14, 209–213
4. Jordan GH, Scholssberg SM: Surgery of the penis and urethra, in Walsh PC, Retik AB, Vaughan ED Jr, et al (EDS) :Campbell's Urology, 8th ed. WB Saunders, Philadelphia, 2002;pp 3886-3952.
5. Markogiannakis H, Sanidas E, Messaris E et al: Motor vehicle trauma: analysis of injury profiles by road-user category. *Emerg Med J* 2006; 23: 27.
6. Mouraviev VB, Santucci RA. Cadaveric anatomy of pelvic fracture urethral distraction injury: most injuries are distal to the external urinary sphincter. *J Urol* 2005; 173:869–72.
7. Basta AM, Blackmore CC, Wessells H. Predicting urethral injury from pelvic fracture patterns in male patients with blunt trauma. *J Urol* 2007;177:571–5
8. Fenton AS, Morey AF, Aviles R et al: Anterior urethral strictures: etiology and characteristics. *Urology* 2005; 65; 1055.
9. Chapple C, Barbagli G, Jordan G et al. *BJU International* 2004; 93:1195-1202.