
ORIGINAL ARTICLE**Early Primary Endoscopic Realignment of Posterior Urethral Injury- Evaluation and Follow-Up**

Prasad Mylarappa¹*, Puvvada Sandeep¹, Prathvi¹, Kailash B Banale¹, Amey¹, Amith¹, D. Ramesh¹
¹Department of Urology, MS Ramaiah Medical College and Hospital, New BEL Road Bangalore - 560054 (Karnataka), India

Abstract:

Background: The management of complete or partial posterior urethral disruption is controversial and much debate continues regarding the immediate, early and delayed definitive therapy. *Objective:* We report our institutional experience and long term result of early endoscopic realignment of traumatic posterior urethral injury. *Method and Materials:* Between September 1996 and March 2012, ninety six men with either complete (84) or partial (12) posterior urethral injury secondary to blunt trauma (11) or pelvic fractures (85), presented to our institution and these patients underwent immediate suprapubic cystostomy followed by early primary endoscopic realignment done 3-8 days after injury. *Result:* Seventy four patients (92.5%) were continent after catheter removal. Urethral stricture was seen in seventy two patients (90%) of which fifty patients (69.4%) had simple urethral stricture who were managed by urethral dilatation on outpatient basis. Fourteen patients (19.4%) developed short strictures which were successfully treated with visual internal urethrotomy. Eight patients (11.1%) required anastomotic urethroplasty for dense stricture. Potency was retained in seventy five patients (93.75%). Urinary flow measurements at follow-up evaluation were satisfactory.

Conclusion: Early primary endoscopic realign-

ment in our experience reduces time to spontaneous voiding, decrease the need for major reconstructive surgery and long term supra public urinary diversion.

Keywords: Endoscopy, Posterior urethral injury, Realignment

Introduction:

The management of complete or partial posterior urethral disruption is controversial and much debate continues regarding the immediate, early and delayed definitive therapy. Advances in endourology have made endoscopic management of most of these injuries feasible without greatly compromising on the final result. We report our institutional experience and long term result of early endoscopic realignment of traumatic posterior urethral injury.

Method and Materials:

Between September 1996 and March 2012, ninety six men with either complete (84) or partial (12) posterior urethral injury secondary to blunt trauma (11) or pelvic fractures (85), presented to our institution. All patients were subjected to X-Ray pelvis, RGU(Retrograde urethrogram)and Ultrasonography. X-Ray pelvis is done to assess the type of fracture (Fig-1) and Retrograde urethrogram to identify the type of urethral injury, whether it is partial or complete (Fig-2). In few cases where there is suspicion of associated bladder injury, mictur-

ating cystourethrogram is done (Fig-3). These patients underwent immediate suprapubic cystostomy followed by early primary endoscopic realignment done 3-8 days after injury. Endourological technique was employed to achieve realignment of the urethra and to establish urethral continuity while attempting to minimize stricture formation. All patients were discharged with indwelling urethral catheter for 4 weeks. At the end of 4th week, the catheter was removed and all patients were followed up at regular interval for quality of urinary flow, incontinence, impotence and stricture formation. All patients underwent urethral calibration after 2 weeks, 6 weeks, 3 months, 6 months and 12 months after catheter removal. The study was approved by Institutional Ethics Committee and written informed consent was taken from all the subjects.

Result:

Urethral realignment was established in all patients (100%) using a variety of endourological techniques. Follow up ranged from 8 months to 12 years and the follow up details were avail-

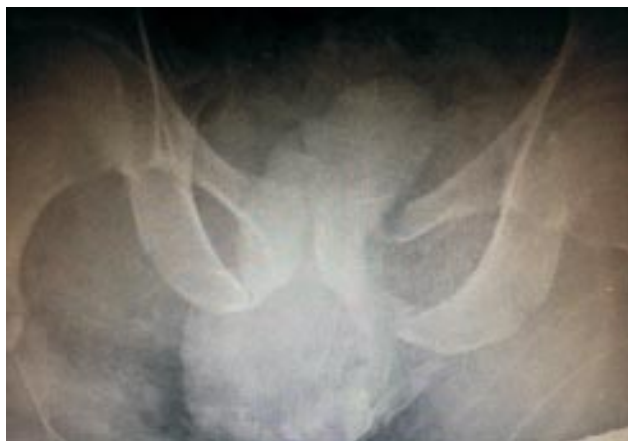


Fig.1: X - Ray pelvis showing fracture of pubis symphysis with ground glass appearance in perineal region. (preoperative X-Ray KUB)



Fig. 2: RGU (Retrograde Urethra Gram) showing normal anterior urethra with cut off at proximal bulbar urethra (preoperative)



Fig.3: MCU (Micturating Cysto Urethrogram) showing normal bladder outline with faint contrast in the prostatic urethra with evidence of fracture pelvis. (same patient)

able for eighty patients and remaining were lost for follow up. Seventy four patients (92.5%) were continent after catheter removal. Urethral stricture was seen in seventy two patients (90%) of which fifty patients (69.4%) had simple urethral stricture who were managed by urethral dilatation on outpatient basis. Fourteen patients (19.4%) developed short strictures which were successfully treated with visual internal urethrotomy. Eight patients (11.1%) required

anastomotic urethroplasty for dense stricture. Potency was retained in seventy five patients (93.75%). Urinary flow measurements at follow-up evaluation were satisfactory.

Discussion:

Majority of urethral injuries are caused by straddle injuries or blunt trauma from pelvic fractures (Fig-1.) The main goal of treatment of traumatic urethral injuries is the reestablishment of urethral continuity while minimising the risk of complications such as incontinence, impotence and stricture formation [1]. The key to initial management also lies with proper diagnosis, accurate injury staging and proper selection of the intervention. Many authors have discussed the different modality of treatment for posterior urethral distraction injuries but the ideal method of management remains controversial [2, 3]. Once the resuscitation and management of life threatening injuries are over, further step in the management of urethral injury is the bladder drainage. Bladder drainage prevents further extravasation and also helps in the monitoring of urine output. Definitive management options include early primary urethroplasty, early primary endoscopic realignment and immediate suprapubic cystostomy followed by delayed urethroplasty [1].

Early primary urethroplasty procedure is technically challenging as it invariably requires lot of dissection at the site of trauma. The acutely inflamed tissue, hematoma and the distorted anatomy increase the potential for further neurovascular damage and may increase the risk of impotence. Hence this technique is ideal for those patients with simple penetrating partial injury to the anterior urethra [4].

Supra pubic cystostomy and delayed urethro-

plasty has classically been found to be superior to the immediate primary surgical repair, since this procedure is performed after management of local tissue damage and hematoma. However the main drawback of delayed urethroplasty is need for prolonged Suprapubic drainage (3-6 months) as well as inevitable urethral stricture requiring one or more urethroplasties. The other problem encountered is avulsed prostatic urethra which is frequently displaced and frequently misaligned with respect to the distal urethra complicating urethral reconstruction [5].

Few series of primary endoscopic realignment have found the complication rates comparable to the delayed urethroplasty. They have found 26.3% impotence and 2.4% incontinence rate [6, 7, 8, 9, 10, 11]. Dhabawala et al [12] reported that impotency is caused by the original injury itself and it is not due to the urethral repair. Early realignment of acute urethral disruption is not new. Since it was first described in 1934 by Ormond and Cothran, several techniques have been used to pass stent across the urethral injury [13]. The early attempts at early urethral realignment however were performed without the benefit of advanced endoscopic technology and involved the retrograde catheterization of the injured urethra through a cystoscopy and involved varying levels of paravesical dissection. Their early report of primary surgical realignment demonstrates high rates of complications including significant risk of impotence and incontinence [14].

Modern endoscopic instrumentation and minimally invasive techniques have facilitated a progression from early surgical repair to early endoscopic realignment of urethra. This

endourologically performed primary realignment has emerged as an attractive method for early urethral stenting, avoiding the risks associated with complex open urethral reconstruction. This procedure to establish early urethral continuity have been developed and performed with reduced blood loss, shorter hospitalisation and less severe stricture formation [15]. Primary realignment with minimally invasive method has become a common contemporary management option; particularly at high volume centres. Endoscopic urethral realignment employs actual realignment with endoscopic guidance in an ante grade and retro grade fashion (Fig. -4) instead of rail roading technique.

Immediate primary endoscopic realignment is performed in patients with minimal trauma and a stable hemodynamic status. Early primary realignment is typically performed at 3-8 days after the trauma, when pelvic hematoma should have begun to resolve and before significant scar formation. Urethral realignment is delayed

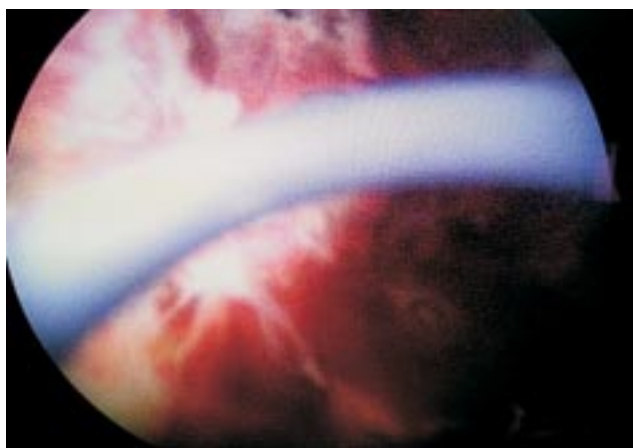


Fig. 4: Cystoscopic picture showing rupture urethra at bulbar region with huge haematoma and guide wire seen which was passed from Suprapubic Catheter/Catheterisation (SPC) site during early primary endoscopic realignment procedure.

in cases of hemodynamic instability or associated injuries that precluded urological manipulations. Most recent series on primary endoscopic realignment has showed favourable outcomes in the rate of impotence (22%), incontinence (6%) and stricture formation (50%) [16].

In a series of twenty nine patients with urethral disruption, Moudouni et al have demonstrated that endoscopic urethral realignment is associated with minimal morbidity and moreover failure of endoscopic realignment has not compromised delayed formal urethral reconstruction [15].

In our study, stricture formation has been found in seventy two patients (90%) who required additional procedure in the form of urethral dilatation, visual internal urethrotomy and anastomotic urethroplasty. The stricture rate has been higher compared to all other series [16], probably because majority of our patients have been severely injured and have completely disrupted urethra [16]. Similar results of a stricture formation (91%) have been observed in a study done by Po Chin Chang et al, where retrospective analysis of twenty two cases of posterior urethral disruption injury has been done [17]. In our study fifty patients who developed stricture (69.4%) have been managed with simple urethral dilatation on out-patient basis without any further voiding problems. Fourteen patients (19.4%) have required visual internal urethrotomy and eight patients (11.1%) who developed dense stricture have undergone anastomotic urethroplasty. Strictures after endoscopic realignment are less severe [18] and more amenable to minimally invasive treatment infrequently requiring formal urethroplasty.

Moudouni et al, in his series of twenty nine patients with urethral disruption, have demonstrated that twenty five (86%) patients to be potent after early primary endoscopic realignment [13]. Therefore careful endoscopic realignment might not interfere with erectile function. In our study, seventy five patients (93.75%) have been potent after early primary endoscopic realignment which is superior to the results of Moudouni et al. It is generally believed that endourological procedures do not adversely affect erectile functions, since there is minimal manipulation of periprostatic tissue and no additional trauma to the cavernous nerve [3, 1].

Conclusion:

Early primary endoscopic realignment offers an effective method for treating traumatic urethral injuries. Our long-term follow up provides additional support for the use of this technique by demonstrating that urethral continuity can be established without an increased incidence of impotence, stricture formation or incontinence. In case of failure, endoscopic realignment does not compromise the result of secondary urethroplasty. Early primary endoscopic realignment in our experience reduces time to spontaneous voiding, decrease the need for major reconstructive surgery and long term supra public urinary diversion.

References:

1. Koraitam MM. Pelvic fracture urethral injuries - the unresolved controversies. *J Urol* 1999; 161(5):1433-41.
2. Koraitam MM. Pelvic fracture urethral injuries: evaluation of various methods of management. *J Urol* 1996; 156(4):1288-91.
3. Mouraviev VB, Coburn M, Santucci RA. The treatment of posterior urethral disruption associated with pelvic fracture: comparative experience of early realignment versus delayed urethroplasty. *J Urol* 2005; 173(3):873-6.
4. Chapple C, Barbagli G, Jordan G, Mundy AR, Rodrigues-Netto N, Pansadoro V, McAninch JW. Consensus statement on urethral trauma. *BJU Int* 2004; 93(9):1195-1202.
5. Koch M.O. Primary realignment of prostatomembranous urethral disruptions. *Semin Urol* 1995; 13(1):38-44.
6. Herschorn S, Thijssen A, Radomski SB. The value of immediate or early catheterization of the traumatized posterior urethra. *J Urol* 1992; 148(5):1428-31.
7. Follis HW, Koch MO, McDougal WS. Immediate management of prostatomembranous urethral disruptions. *J Urol* 1992; 147(5): 1259-62.
8. Cohen JK, Berg G, Carl GH and Diamond AD. Primary endoscopic realignment following posterior urethral disruption. *J Urol* 1991; 146 (6):1548-1550.
9. Gelbard MK, Heyman AM, Weintraub P. A technique for immediate realignment and catheterization of the disrupted prostatomembranous urethra. *J Urol* 1989; 142 (1): 52-55.
10. Patterson DE, Barrett DM, Myers RP, DeWeerd JH, Hall BB, Benson RC Jr. Primary realignment of posterior urethral injuries. *J Urol* 1983; 129 (3):513-516.
11. Crassweller PO, Farrow GA, Robson CJ, Russell JL, Colapinto V. Traumatic rupture of the supramembranous urethra. *J Urol* 1977; 118(5):770-71.

-
12. Dhabuwala CB, Hamid S, Katsikas DM, Pierce JM Jr. Impotence following delayed repair of prostatomembranous urethral disruption. *J Urol* 1990; 144(3):677-8.
 13. Wilkinson FO. Rupture of the posterior urethra with a review of twelve cases. *Lancet* 1961; 1(7187):1125-9.
 14. Webster GD, Mathes GL, Selli C. Prostatomembranous urethral injuries: a review of the literature and a rational approach to their management. *J Urol* 1983; 130(5):898-902.
 15. Moudouni SM, Patard JJ, Manunta A, Guiraud P, Lobel B, Guillé F. Early endoscopic realignment of post-traumatic posterior urethral distraction. *Urology* 2001; 57(4):628-. 32.
 16. Jepson BR, Boullier JA, Moore RG, Parra RO. Traumatic posterior urethral injury and early primary endoscopic realignment: evaluation of long-term follow-up. *Urology* 1999; 53(6):1205-10.
 17. Chang PC, Hsu YC, Shee JJ, Huang ST, Huang HC, Chen Y, Hsieh ML. Early endoscopic primary realignment decreases stricture formation and reduces medical costs in traumatic complete posterior urethral disruption in a 2-year follow-up. *Chang Gung Med J* 2011; 34(2):179-85.
 18. Ku Ja, Kim ME, Jeon YS, Lee NK, Park YH. Management of bulbous urethral disruption by blunt external trauma: the sooner, the better? *Urology* 2002; 60(4):579-583.
-

***Author for Correspondence:** Dr. Prasad Mylarappa, Associate Professor, Department of Urology, MS Ramaiah Medical College and Hospital, New BEL Road Bangalore- 560054 Karnataka, India, Cell: +9109845305742 Email ID: prasadmyl@rediffmail.com