Research Article

THE EFFECTIVENESS OF PRIMARY REALIGNMENT IN TRAUMATIC POSTERIOR URETHRAL DISTRACTION INJURIES ASSOCIATED WITH FRACTURE PELVIS

N. Rama Murthy¹*, T.Jagadeeswar,² Ravi Jahagirdar³, Bhaghavan.A⁴, N.Srinivas⁵, K.V.Narendra⁶.

¹. Asst. prof, Dept of Urology, Gandhi hospital, Secundrabad.

² Prof & Hod, Dept of Urology, Gandhi hospital , Secundrabad.

³. Associate .prof ,Dept of Urology, Gandhi hospital ,Secundrabad.

⁴. Associate .prof, Dept of Urology, Gandhi hospital, Secundrabad.

⁵ Senior consultant' Dept of Urology, Care hospital, Secundrbad.

^{6.} Post graduate, Dept of Urology, Gandhi hospital, Secundrabad.

Corresponding Author: Dr. G. Ravi Chander, Asst.prof, Dept of Urology, Gandhi hospital, Secundrabad. 9493243567.

Abstract :

AIM: To study the effectiveness of primary realignment on the incidence of stricture urethra and its impact on the incidence of complications. METHODS : From 2005 to 2008, a total of 27 patients of posterior Urethral distraction injuries were studied, out of which 15 patients were treated with the aim of reestablishing Urethral continuity immediately or early after injury and 12 patients were treated with SPC alone followed by definitive management after 6 months. Follow up ranged from 6 months to 2 years. Of the 15 patients who were treated with the Urethral Catheteric alignment, 6 patients underwent open procedure as there was an indication for emergency Laparotomy. Rest 9 patients were treated with endoscopic alignment with in 1 - 2 weeks. Out of 9 Patients, Endoscopic alignment was successful in 8 patients. Rest 12 patients managed with SPC alone as these patients required a major Urethroplasty later. RESULTS: Of the 15 patients managed with primary realignment, 7 patients developed stricture at the site of injury of which 3 patients required major Urethroplasty and 4 patients could be managed by endoscopic procedures. All 12 patients in SPC group required a major Urethroplasty later. The incidence of Incontinence and impotence were comparable in both the groups. CONCLUSION: We conclude that careful Urethral Catheteric realignment after acute trauma is safe and useful as it obviates total Urethral closure in majority of cases.

KEY WORDS: Traumatic rupture urethra, primary realignment, Urethroplasty, endoscopic realignment, Pelvic Fracture, Suprapubic Catheterization, Retrograde Urethrogram.

INTRODUCTION

Pelvic fracture with posterior Urethra rupture is associated with morbidity such as Urethral Stricture, Erectile dysfunction and incontinence ⁽¹⁾. There is still controversy on the immediate management of these injuries. Some Urologists advice initial placement of Suprapubic Cystostomy followed by delayed Urethroplasty 3 to 6 months later ⁽²⁾, while others suggest immediate realignment. The patients managed with Suprapubic Cystostomy results in Stricture formation in 95% of cases requiring a delayed Urethroplasty ⁽³⁾. Thus it carries the morbidity of being on SPC for 3 to 6 months followed by the morbidity of undergoing a major Surgery and its attendant complications.

www.earthjournals.org

Some Urologists suggest that early Urethral realignment as initial treatment for posterior Urethral disruption associated with Pelvic fracture with or without Surgical repair may adversely influence out come. Where as others attribute the morbidity of Pelvic fracture Urethral avulsion to trauma magnitude rather than to management of the acute disruption of the membranes Urethra⁽⁴⁾. The current definition of Primary realignment refers to immediate stenting of Urethral distraction with a Catheter without Pelvic dissection or sutures⁽⁵⁾.

More recently realignment has been performed endoscopically, under fluoroscopic guidance or by using magnetic urethral catheters ^(6, 7, 8). Primary realignment with above techniques obviates the need for long term Suprapubic drainage, and reapproximates the proximal and distal ends of Urethra before significant malalignment develops and incidence of Stricture formation is found to be much less compared to the patients managed by SPC alone. Virtually 100% of patients managed with SPC alone result in complete obliteration requiring a major Urethroplasty later, while only 50% of patients with primary alignment go on to development strictures most of which can be managed with endoscopic procedures like visual internal urethrotomy or visual dilatations .

MATERIALS AND METHODS

We treated 27 men with posterior Urethral injuries from August 2005 to August 2008. Of the men, 12 were managed with Supra pubic Catheter and delayed Urethroplasty and 15 were treated with the aim of establishing Urethral Continuity either immediately or with in two weeks after trauma. Mean patient's age was 34 years (16-58). 24 patients were involved in motor vehicle accidents and 3 had fall from height. Diagnosis is established by clinical examination and retrograde Urethrogram in all patients. 12 out of 27 men had associated severe injuries like fracture lower limbs, fracture Spine and Chest and head injuries. All of the above patients were managed by SPC alone followed by a delayed Urethroplasty.

Of the remaining 15 patients, 3 patients had Bladder injuries and 3 patients had intra peritoneal Bleeding (1 case of Splenic trauma and 1 case of liver trauma and 1 mesenteric tear) For the above patients emergency Laparotomy was done and Urethral trauma dealt by early Urethral Catheteric realignment and open Suprapubic Cystostomy. In this open procedure a 6-8 Fr. infant feeding tube was gently passed perurethrally and retrieved through retropubic space. Another infant feeding tube passed antegradely through the Bladder neck and retrieved through retropubic space without much disturbing the hematoma in retropubic space. Both are tied together and brought out through the Urethra. A 16 Fr. Foleys Catheter tied to the end of the Infant feeding tube outside the Urethra and gently negotiated into the The above procedure did not involve any retropubic dissection, the Pelvic Bladder. hematoma not disturbed, Pubo prostatic ligaments are not divided and vest sutures or traction not applied. The above procedure was successful in 4 out of 6 cases. In other two cases the Per urethral feeding tube directly entered the bladder and Foleys Catheter negotiated into the bladder. In all cases 16 Fr. Foleys Catheter kept as SPC.

In rest of the 9 patients emergency laparotomy was not required; these patients are initially dealt by SPC. Once the patient is stable, patient is taken up for Endoscopic alignment within 7 to 14 days. In our procedure of Endoscopic alignment patient was kept in modified lithotomy position under general anaesthesia and Urethroscopy done with 10 Fr. rigid pediatric scope. Once the injured area is located, guide wire or 4Fr. Ureteric Catheter is gently passed across the injured area. If any resistance is encountered a second guide wire is passed by the side of it. The entry of the guide wire or Ureteric catheter into the Bladder through the Bladder neck is confirmed by antegrade scopy through the SPC tract. Then a 16Fr. Foley's catheter is then negotiated over a guide wire into the Bladder and confirmed by antegrade Scopy through the Supra pubic tract and the Bulb inflated with 15cc of water. The

www.earthjournals.org

procedure was successful in 7 out of 9 patients. In one patient where the above procedure failed the guide wire was passed antegradely by antergrade Cystoscopy through SPC tract and could be retrieved through retrograde scopy by grasping the guide wire with an alligator. In one patient the guide wire or ureteric catheter could not be negotiated across the injured area either antegradely or retrogradely and hence the patient was left with SPC alone and was managed with Urethroplasty later. Thus the procedure was successful in 8 out of 9 cases.

All the patients with catheter realignment are followed up with pericatheter studies after 4 weeks. If there was no extravasation, perurethral catheter removed, SPC blocked and patient is allowed to void. If the patient had extravasation, perurethral catheter is maintained for another 2-4 weeks and if extravasation subsided perurethral catheter is removed. Then the patient is kept on Clean Intermittent Catheterization. RGU repeated after another two months and SPC removed if there is no stricture. Patient is kept on regular follow up every three months for 2 years.

Method of Management	No. of Pts	Acute RGU		No. of Strictures (%)			Impotence
		Partial Complete Rupture	Rupture	Total Number	Requiring Urethroplasty	Requiring VIU/DIL	-
1. SPC + Delayed repair	12	11	1	11 (91.6%)	10 (83%)	1 (8.3%)	5 (41.5%)
2.Emergency open alignment	6	5	1	2 (33.3%)	1 (16.6%)	1 (16.6%)	2 (33.3%)
3.Endoscopic alignment	8	7	1	4 (50%)	1 (12.5%)	3 (37.5%)	2 (25%)
4.Failed endoscopic alignment	1	1	0	1	1	0	0

RESULTS Table 1 : METHODS OF MANAGEMENT AND RESULTS.

The results of the 27 patients managed differently are shown in table 1. In 13 out of 15 patients in Catheteric alignment group, the RGU shows complete rupture of Urethra and in 10 out of 15 patients the Ureteric Catheter or guide wire could be passed across the injured area easily indicating they are partial injuries. The Urethral Catheters were kept for a mean of 6.5 weeks (Range 4 to 9 weeks).

Table I also shows the relationship between the method of early management and the development of Urethral Stricture. Of the 15 patients treated with Catheterization 7 (46%)

www.earthjournals.org

patients developed Urethral Stricture out of which 3 (20%) patients had to undergo a major Urethroplasty and 4(26.6%) patients could be managed with Visual Internal Urethrotomy and visual dilatation. No patients of this group required Pubectomy or abdomino – perineal approach.

11 (91.6%) out of 12 patients managed with SPC alone developed complete obliteration out of which 10 (83%) patients required a major Urethroplasty later. One patient could be managed with core through VIU. 2 out of the 11 patients required transpubic approach for associated fistulous tracts to the perineum and 2 patients required abdomino perineal approach as these patients had a cavity requiring omental packing. Rest 7 patients could be managed with progressive Perineal Urethroplasty.

4 out of 12 patients in SPC group were permanently Impotent after injury and 1 patient has become impotent after Uretrhoplasty (transpubic approach) i.e., totally 5 (41.5%) patients have become permanently impotent in SPC group. In Urethral alignment group, 11 out of 15 patients have regained their potency within 1yr i.e., 4 (26.6%) out of 15 patients were permanently impotent. No patient was incontinent in both the groups.

DISCUSSION

The management of posterior Urethral injuries associated with fracture Pelvis is still controversial. The main controversy is between Suprapubic drainage with delayed repair ^(2, 9) and immediate open realignment or Endoscopic alignment. The diagnosis of a Urethral rupture as complete or partial has been made on the basis of acute retrograde Urethrogram ⁽³⁾. Herschorn etal. have questioned the accuracy of RGU after trauma in distinguishing complete partial injuries⁽⁹⁾. A Complete rupture is diagnosed when there is contrast extravasation and by the absence of contrast medium in the Prostatic Urethra or Bladder. In acute trauma the external Sphincter and Pelvic floor spasm may prevent the entry of contrast medium into the prostatic Urethra or Bladder and hence most of the traumatic posterior Urethral injuries are diagnosed as complete ruptures based on RGUs.

Thus in the SPC and delayed repair group 11 out of 12 patients were diagnosed as complete ruptures based on acute RGU, where as in primary realignment group all but one patient were diagnosed as complete rupture on acute RGU and in 10 out of 15 patients the mere passage of a Ureteric Catheter, Guide wire or infant feeding tube retrogradely or antegradely across the rupture site could successfully establish the continuity which indicates all these patients had partial injuries. Other realignment series also show the high incidence of partial ruptures as the diagnosis was made not just on the basis of RGU but additional diagnostic procedures are used such as Catheterization, cystoscopy and operative procedures .

The above findings show that most of the cases of complete ruptures on RGU are in fact partial ruptures and if they are left alone by doing SPC, will go for complete obliteration requiring a major procedure later and hence if the patients general condition permits it is better to give an attempt of Catheteric realignment to prevent the partial injuries going for complete obliteration.

Miguel. L. Pedesta etal⁽¹²⁾ have compared primary alignment with delayed Urethroplasty and found urethral alignment not beneficial in avoiding urethral obliteration. In 1972, Morehouse and colleagues ⁽²⁾ reported high impotence and incontinence rates in patients treated with primary realignment. Sender Herschorn etal⁹ have compared delayed Urethroplasty and primary realignment in the treatment of posterior Urethral rupture and noted a significant advantage with early catheterization. Ellrott and Barrett ⁽⁵⁾ analysed the long term results of treatment of posterior Urethral rupture with primary realignment in 57 men and showed that primary realignment resulted in low incidence of erectile dysfunction (21%) incontinence (3.7%) and stricture (34%) with no requirement for intervention . Mehdi Salehipour and

www.earthjournals.org

colleagues ⁽¹⁰⁾ reported no incontinence with primary realignment, 76% having no Urethral Stricture on follow up with 24% developing Stricture requiring only dilation and VIU. 84% of patients reported a normal erection, while 16% responded to Sildinafil. The present series shows a Stricture rate of 91.6% for SPC group and 46.6% (7/15 patients) in realignment group.

10 (83%) out 12 patients with Strictures in SPC group required a major Urethroplasty later where as only (20%) 3 patients in realignment group required a major Urethroplasty. Other Stricture in realignment group were easily managed with visual internal Urethrotomy and Visual Dilatation. The incidence of impotence was similar in both the groups and there was no case of Incontinence in primary realignment group.

While Suprapubic drainage with delayed repair has been the procedure of choice for long time, several disadvantages of the therapy have been recognized. Stricture developed in nearly all cases managed with delayed repair and these Strictures are dense with considerable length between disrupted ends ⁽⁷⁾. All patients required at least 1 major operative procedure to remove the Stricture, necessitating urological expertise usually at a tertiary care centre. Even after Urethroplasty Stricture may develop in 20 to 30% of the patients who needs further Surgery. Recent advances in Endourological techniques have led primary realignment methods that are easy to perform and require minimal manipulations ⁽⁷⁾. These techniques realign the Urethra without disturbing the Pelvic hematoma and produce shorter, more anatomically aligned strictures. The resultant Strictures are short and easily opened with Urethral dilatation or visual internal Urethrotomy ⁽⁸⁾. After realignment Stricture develops in 45 to 60% of patients ^(7, 9) although the majority requires only 1 endoscopic repair and most Strictures stabilize with in a year.

When the results of delayed Urethroplasty are compared to those of primary realignment using recently developed endourological techniques, the complication rates are comparable. Hussman et al reported no significant difference in the rates of impotence and incontinence in patients treated with Endoscopic alignment versus those who underwent delayed Urethroplasty ⁽⁴⁾. Follis et al noted 80% potency rate in patients treated with primary realignment versus 50% in those treated with delayed Urethroplasty ⁽⁷⁾. There were no incontinent patients in the primary realignment group versus a 7% incidence in the delayed Urethroplasty group. Webster et al stated that the rates of impotence associated with primary open realignment in the past were probably a result of the severity of Pelvic disruption and not a consequence of the procedure ⁽⁹⁾.

CONCLUSION

We believe that most of the traumatic ruptures of urethra associated with fracture pelvis are in fact partial injuries even though they are diagnosed as complete ruptures on acute RGU and hence an attempt of catheteric realignment either by open procedure or by endoscopic procedure with in 2 weeks of injury will help in diagnosing most of these partial injuries. All these successfully stented partial injuries can be prevented from developing complete obliteration requiring a major Urethroplasty later.

For patients with complete ruptures the primary realignment helps in stenting the urethra preventing the development of longer, malaligned complicated strictures .For these patients if Urethroplasty is required at a later date , it becomes a much simpler procedure . The incidence of impotence and incontinence are not affected by the method of acute management.

REFERENCES:

1. Mc Annich JW, Santucci RA Genito Urinary trauma, In: Walsch PC, Retik. AB, Vaughen ED Jr. et al.editors. Campbell's Urology.8th ed. Philadelphia:WB Saunders:2002 P:3707-44

2. Morehouse, D.D., Belitsky, P. and Mackinnon, K; rupture of the posterior Urethra J.Urol., 107;255,1972.

www.earthjournals.org

3. Koraitim.MM. Pelvic fracture urethral injuries: the unresolved controversy. J.Urol, 1999:161:1433:41

4. Husmann, D.A.Wilson, T.D.Boore.T.B and Allen, T.D: Prostatomembranous urethral disruptions:management by Suprapubic cystostomy and delayed Urethroplasty, J.Urol., 144:76, 1990

5. Elliot DS, Barrett DM. Long term follow up and evaluation of primary realignment of posterior urethral disruption. J.Urol.1997;153:814-6

6. Cohen,J.K., Berg.G.,Carl,G.h.andDiamond,D.D:primary endoscopic realignment following posterior urethral disruption.J.Urol.,146:1548,1991

7. Follis, H.W., Kock, M.D. and Mc. Dougal, W.S: Immediate management of prostatomembranous urethral disruption. J.Urol., 147;1259,1992

8. James R.Porter, Thomas K.Takayama and Alfred J. Defalco,. Traumatic posterior urethral injury and early realignment using magnetic urethral catheters. J.Urol;158:425,1997

9. Herschorn, S., Thijissen, A. and Radowski, S.B: The value of immediate or early catheterization of the traumatized posterior urethra J.Urol.,148:1428,1992

10. Vladimir B.Moura viev, Michael Coburn and Ricard A. Santucci: The treatment of posterior urethral disruption associated with pelvic fracture.comparative experience of early realignment versus delayed Urethroplasty. J.Urol., 173:876,2005

11. Mehdi Salehipour, Abdolaziz Khezri, Rashid Askar, Parham Masoudi: Primary realignment of posterior urethral rupture.Urology.2005:2:211-215

12. Miguel.L.Pedesta, Ricardo Medel., Roberto Castera and Adolfo Ruarte: Immediate management of posterior urethral disruption due to pelvic fracture. Therapeutic alternatives. J.Urol.157:1444,1997