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A comparative study of classical rail road track technique and modified cystoscopic rail road technique in management of 50 cases of complete urethral rupture

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Abstract
Aims-To compare therapeutic efficacy of Classical Rail road technique and Modified cystoscopic Rail road technique in management of complete urethral rupture.
Material and method-In this study,50 patients of complete urethral rupture are divided into two groups, one group (25 patients) is treated by Classical Rail Road technique while another group (25 patients) is treated by Modified cystoscopic Rail road technique. After the treatment, regular follow-ups at 7 days, 15 days, 1month, 3 months are taken. During each visit patients are monitored for retention of urine, urinary complaints, recurrence of urethral stricture.
Observation and results-There is significant difference of p value ($p<0.05$) in hematuria, urinary tract infection and S.P.C. healing in follow-up after 7 days and highly significant difference of p value($p<0.001$) in thin stream of urine, stricture in cystoscopy & double stream of urine in follow-up after 15 days. This indicate M.C.R.R.T. is better than C.R.R.T.
Conclusion-Modified cystoscopic rail road technique is totally under vision of surgeon so better approximation of disrupted end of urethra so there are less complications. Patient of traumatic rupture of urethra should be manage by modified rail road technique as per our study.

Keywords: rupture urethra, classical rail road technique, modified cystoscopic rail road technique

1. Introduction

Urethral injuries arise from a variety of different insults, ranging from external violence to urethral instrumentation. Most results from blunt trauma, with penetrating injuries more commonly reported in the military setting [1]. The maleurethra is anatomically subdivided into anterior and posterior segments at the level of the urogenital diaphragm, and mechanism of urethral injury may also be sub classified along these lines. Posterior urethral injury usually occurs in close proximity to the external (i.e., voluntary) urethral sphincter mechanism, and is usually initiated by a massive shearing force that results in pelvic fracture and disruption through the membranous urethra [2]. Membranous urethral disruptions are associated with multiple organ injury, whereas anterior urethral injuries usually occur in isolation. Examples of anterior urethral injuries include straddle trauma-crushing the immobile bulbous urethra against the pubic rami, or a rupture of the corporal bodies (e.g., penile fracture), leading to laceration through the adjacent urethra. Iatrogenic injuries affect both anterior and posterior segments of the urethra, a possibly because of increasing numbers of transurethral procedures and radical prostatectomies.

Urethral injuries include a high index of suspicion, with avoidance of urethral catheter passage until a potential urethral injury has been excluded. Certain clinical signs and symptoms will point the clinician towards a possible urethral injury, with a properly performed radiographic study confirming the diagnosis. Once the presence of a urethral injury has been diagnosed, the injury may be sub classified according to well-defined radiographic findings. These findings, as well as the overall condition of the patient, will in turn guide judicious initial management of the injured urethra.

Timely and accurate diagnosis of urethral injuries leads to appropriate acute management and reduces long term morbidity. In this study various modality of treatment like Classical Rail road technique and Modified cystoscopic Rail road technique for complete urethral rupture and the postoperative complication have been studied.

2. Material & Method

The study was to be conducted over a period of 2 year. Patients with age 20 to 100 years with traumatic rupture of membranous urethra were included in the study. Patients with infective urethral rupture were excluded. Total 50 patients participated in study. Patients was divided into two groups (25 patients in each group), one group was treated by Classical Rail Road technique while another group was treated by Modified cystoscopic Rail road technique. After the treatment regular follow-ups at 7 days, 15 days, 1month, 3 month were taken. During each visit patient was monitored for retention of urine, urinary complain, recurrence of urethral stricture.

This is a comparative study of Classical Rail Road technique and Modified cystoscopic Rail Road technique in management of 50 cases of complete Urethral rupture. We included the patients who come with the retention of urine, blood at urinary meatus, haematuria, poor stream of micturition. In this study

urethral rupture was treated by two means Classical Rail Road technique and Modified cystoscopic Rail Road technique.

Classical Rail Road Track Technique

Rail Road technique is an older classical method of treating complete rupture of membranous urethra. Complete rupture of membranous urethra causes floating of prostate and disruption of through the internal meatus into the retro pubic space. Lister's metal boogie is passed from the drawing the C-shaped boogie and steadily advancing the Lister, while keeping their tips in contact, it is possible to guide the Lister boogie into the bladder, pass the side of the rupture. The C-shaped boogie is withdrawn and a piece of plain rubber tubing of such a size as to fit tightly, is threaded on to the beak of the second boogie, which is withdrawn, caring with it the rubber tubing. Outside the external urinary meatus the boogie is disengaged from the rubber tubing and to the latter is the fastened, by means of a stitch, the tip of the Foley's catheter. This silk thread is used for changing the catheter later on if needed. Balloon of the catheter is neck. The bladder is closed around a Malecot catheter.

Modifed Cystoscopic Rail Road Track Technique

In Rail road technique, the C- shaped boogie is passed through SPC wound up to the internal urinary meatus, torn end of urethra. No. 21 Sheath & cystoscope is passed through external urethral meatus under vision. Sheath is manipulated up to the tip of C shaped boogie slowly withdrawing of C-shaped boogie and steadily advancing the sheath & cystoscope, while keeping the tip in contact. C-shaped boogie is withdrawn & cystoscope negotiated up to bladder. Catheter is guided through sheath up to bladder. Bulb of catheter is inflated with water.

3. Observation and Results

In this comparative study of Classical Rail Road technique and Modified cystoscopic Rail Road technique in management of 50 cases of complete Urethral rupture, urethral rupture was treated by two means Classical Rail Road technique or Modified cystoscopic Rail Road technique. After the treatment regular follow-ups at 7 days, 15 days, 1month, 3 month were taken. During each visit patient was monitored for retention of urine, urinary complain, recurrence of urethral stricture, blood at urinary meatus, haematuria, Poor stream of micturition. Our observations are as follows.

Table 1: Immediate Postopretive Complication

	Hematuria	Lower abdominal pain
C.R.R.T.	25(100%)	14(56%)
M.C.R.R.T.	25(100%)	12(48%)
Fisher's Exact test (p value)	1	0.77

Incidence of hematuria and lower abdominal pain were almost same in both the groups on immediate post operative day.

Table 2: Follow-Up after 7-Days

	Hematuria	Infection	S.P.C. Site healing
C.R.R.T	20(80%)	15(60%)	15(60%)
M.C.R.R.T.	03(12%)	05(20%)	22(88%)
Fisher's Exact test (p value)	0.0001	0.008	0.05

80% Heamaturia, 60% Infection present in Classical Rail road Technique while 12% Hematuria, 20% Infection present in Modified Cystoscopic Rail Road Technique after 7-days follow-up. S.P.C. site healing was present in 60% of cases in Classical Rail Road Technique & 88% of cases in Modified Cystoscopic Rail Road Technique. So there is significant difference of p value in hematuria, urinary tract infection and S.P.C. healing in follw-up after 7 days. This indicate M.C.R.R.T. is better than C.R.R.T.

Table 3: Follow-Up after 15-Days

	Thin stream of urine	Stricture on cystoscopy	Double stream of urine
C.R.R.T.	22(88%)	22(88%)	22(88%)
M.C.R.R.T.	03(12%)	05(20%)	04(16%)
Fisher's Exact test (p value)	0.0001	0.0001	0.0001

88% Thin stream urine, stricture in cystoscopy, Double stream of urine present in Classical Rail road Technique while 12% Thin stream urine, 20% stricture in cystoscopy, 16% Double stream of urine in Modified Cystoscopic Rail Road Technique after 15 days follow-up. There is significant difference of p value in thin stream of urine, stricture in cystoscopy & double stream of urine like complication in follow-up after 15 days. This indicate M.C.R.R.T. is good enough than C.R.R.T.

Table 4: Follow-Up after 1 Month

	Stricture on cystoscopy	Poor stream of urine	Burning micturation
C.R.R.T.	23(92%)	23(92%)	23(92%)
M.C.R.R.T	04(16%)	02(08%)	03(12%)
Fisher's Exact test (p value)	0.001	0.001	0.001

92% stricture in cystoscopy, Poor stream of urine, Burning micturition present in Classical Rail road Technique while 16% stricture in cystoscopy, 08% Poor stream of urine, 12% Burning micturition in Modified Cystoscopic Rail Road Technique after 1 Month follow-up. This is also statistically significant ($p<0.005$). This indicate M.C.R.R.T. is better than C.R.R.T.

Table 5: Follow-Up after 3 Months

	Stricture on cystoscopy	Poor stream of urine	Burning micturation
C.R.R.T.	24(96%)	24(96%)	22(88%)
M.C.R.R.T.	03(12%)	01(04%)	02(08%)
Fisher's Exact test (p value)	0.001	0.001	0.001

96% stricture in cystoscopy, 96% Poor stream of urine,88% Burning micturition present in Classical Rail road Technique while 12% stricture in cystoscopy, 04% Poor stream of urine, 08% Burning micturition in Modified cystoscopic Rail Road Technique after 3 Months follow-up. There is significant difference of p value in poor stream of urine, stricture in cystoscopy & burning micturation like complication in follw-up after 3 months. This indicate M.C.R.R.T. is better than C.R.R.T.

4. Discussion

Membranous urethral injury associated with pelvic fracture is common but there is significant long-term morbidity including stricture, incontinence and impotence irrespective of treatment. The high incidence of urethral stricture in this series is not unexpected considering experimental evidence, which has shown that unless the cut ends of the urethra are sutured together immediately, urethral transection leads to fibrosis and stricture.

Pelvic fracture injury of the membranous urethra can destroy the distal sphincter in which case continence relies on an intact bladder neck. Webster reports an 18% incidence of bladder neck injury in association with posterior urethral disruption and advocates immediate reconstruction to prevent incontinence. Incontinent patients in this series may have unrecognized bladder neck injury.

Ascending urethrography, the standard investigation in the diagnosis of urethral rupture, proved misleading in patients deemed to have complete urethral disruption. These might have been managed endoscopically. Urethroscopy is recommended prior to open repair. Patients with partial rupture on x-ray and confirmed by cystoscopy, were easily managed by urethral catheterization. The high rate of stricture is misleading because these were minor complication in all cases.

No patient underwent immediate urethral repair for membranous urethral rupture. Immediate realignment is reserved for patients with associated major vascular injuries requiring reconstruction, or rectal or bladder injuries. Early primary realignment at 1-2 weeks of membranous urethral rupture is safer. Patients at this stage are haemodynamically stable and the risk of bleeding on evacuation of pelvic hematoma is minimal.

Delayed urethroplasty (at 3-6 months) is the alternative management of urethral rupture. One advantage is the simplicity of initial suprapubic cystostomy alone and this is attractive in units without a staff urologist. The majority of cases in this series had suprapubic catheterization prior to transfer. Subsequent cystography revealed the catheter in theretro pubic space in several patients. Suprapubic catheterization by open cystostomy or under ultrasound guidance is preferable. Cystography should be performed to confirm correct position. The initial conservative approach obviates the risk of converting partial to complete urethral tears.

Traumatic membranous urethral disruption is associated with significant long-term morbidity irrespective of treatment. Management should be tailored to the patient's condition and available expertise. Initial cystostomy followed by classical rail road technique or modified cystoscopic rail road technique.

In our study we want to focus on both techniques, merits & demerits and complication in post-operative period. Classical rail road technique is an older & unsafe in traumatic rupture urethra. It is a blind procedure so many times partial urethral rupture convert to complete urethral rupture & rupture both ends are not properly aligned so stricture urethra, urethritis & retrograde ejaculation developed in post-operative period. In our study 88% patients developed stricture urethra in post-operative period. Bladder neck injury is very common so retrograde ejaculation and incontinence of urine resulted in this technique. In this technique thread tied to catheter coming through S.P.C. site remain for a long time it invited S.P.C. site infection, Urinary tract infection and urethritis. Patients should required delayed open urethroplasty for stricture urethra. In contrast modified cystoscopic rail road technique is completely done under vision of surgeon by use of cystoscope so both rupture end of urethra aligned completely, no extra injury to bladder neck. So less chance of stricture urethra, urethritis & retrograde ejaculation. In our study 3% patients developed stricture urethra which is easly treated with urethral dilatation. S.P.C. is removed very next day so urethritis, urinary tract infection is very low. Patients are mobilized early so less hospital stay. In future patients will not require delayed open urethroplasty.

In this prospective study focused on classical and modified cystoscopic rail road technique. Classical rail road technique is blind procedure so difficult to approximate the rupture end of urethra so multiple complication invited in postoperative period which is projected in our study. While modified cystoscopic rail road technique is totally under vision of surgeon so better approximation of disrupted end of urethra so there are less chance of stricture urethra, urethritis & retrograde ejaculation which is also reflected our study. we will give option of modified rail road technique in place of open urethroplasty in case of rupture urethra. At the end we concluded that patient of traumatic rupture of urethra should be manage by modified rail road technique.

5. References

1. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1950215/?report=classic,
2. http://www.embryo.chronolab.com/ureters.htm
3. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3056369/
4. http://www.theodora.com/anatomy/the_male_urethra.html

5. Jordan GH. Management of membranous urethral distraction injuries via the perineal approach. In: McAninch JW, Jordan GH, Carroll PR, editors. Traumatic and reconstructive urology. Philadelphia: W.B. Saunders, 1996, 393.
6. Kaiser TF, Farrow FC. Injury to the bladder and prostatomembranous urethra associated with fracture of the bony pelvis. Surg Gynecol Obstet. 1965; 120:99.
7. Palmer JK, Benson GS, Corriere JN. Diagnosis and initial management of urological injuries associated with 200 consecutive pelvic fractures. J Urol. 1983; 130:712-4.
8. Green RS, Maier R. The urban cowboy syndrome revisited: case report. South Med J. 2003; 96(12):1262-4.
9. Antoci SP, Schiff M. Bladder and urethral injuries in patients with pelvic fractures. J Urol. 1982; 128:25.
10. Chapple CR. Urethral injury. BJU Int. 2000; 86:318-26.
11. Hemal AK, Dorairajan LN, Gupta NP. Post-traumatic complete and partial loss of urethra with pelvic fracture in girls. An appraisal of management. J Urol. 2000; 163:282-7.