

Post-Traumatic Bladder Neck Distraction Injury in Paediatric Trauma Patients: Case Series

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Abstract

Isolated post traumatic bladder neck disruption defects are very rare in paediatric age group. Most of the urethral and bladder injury in the paediatric age group is associated with pelvic trauma[1]. Here we present a case series of three patients with isolated bladder neck disruption defects following pelvic trauma.

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I. Case Series

We report our experience of 3 paediatric patients who presented to our institution with isolated bladder neck disruption injury. The patients were of age group 5 to 10 years and presented between 2017 to 2019. Two of the patients were female and one the patient was male. Two patients presented within 4 hours of the injury and the last one presented within 12 hrs of the injury. All three patients had associated pelvic fractures. The patients presented with lower abdominal and pelvic hematoma with blood at meatus and inability to pass urine. The male patient could not be catheterised. The female patients were catheterised by the surgery resident in trauma centre with urine collecting bag showing gross hematuria. All the patients were hemodynamically stable and showed no signs of peritonitis with x ray abdomen showing no gas under the diaphragm. The patients were taken up for contrast enhanced CT of abdomen and pelvis, which showed intraperitoneal extravasation of contrast. In only one injury was reported at bladder neck being classified as Type IV urethral injury according to Goldman Modification of Colapinto and McCallum classification of Urethral Injury. All the necessary pre-operative measures were taken and patients were taken for operative repair.

All 3 patients had complete disruption of the posterior urethra from the bladder at the level of bladder neck. There was no injury to ureteric orifices in any of the cases. Primary urethro-vesical anastomosis was done over Foley's catheter with 4-0 Polyglactin sutures in interrupted parachuting fashion. Suprapubic drainage was done in all cases. Per urethral catheter was removed in 4th week. Postoperatively, all patients were continent and were voiding with good urine flow. Male patient developed stricture at anastomotic site which was initially managed conservatively but after 6 months Bladder neck incision was given after which the patient was relieved of all symptoms. All patients were followed by Uroflowmetry and good flow rate was observed.

Table 1: Patient information:

Patient characteristics	Patient no. 1	Patient no. 2	Patient no. 3
Age	10yr	7yr	5yr
Sex	Male	female	Female
Time of presentation	10 hrs	3hr	3 hr
Pulse (permin.)	124	110	120
BP (mm of Hg)	90/60	94/66	90/66
Hb (gm/dL)	10	11.8	10.6
Creatinine (mg/dL)	0.7	1.1	1.0
Associated pelvic fracture	Yes	Yes	Yes
Associated abdominal injury	No	No	No
CT scan	Defect in anterior wall of bladder with intraperitoneal	Contrast seen extravasating from bladder neck	Intra and extraperitoneal extravasation of contrast

	contrast leakage	intraperitoneally Foley bulb not seen in bladder	Foley bulb not seen in bladder
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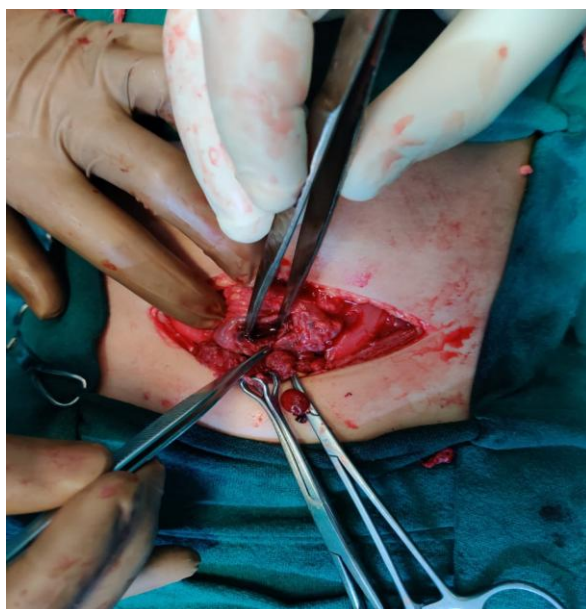


Fig. 1 disrupted bladder neck.

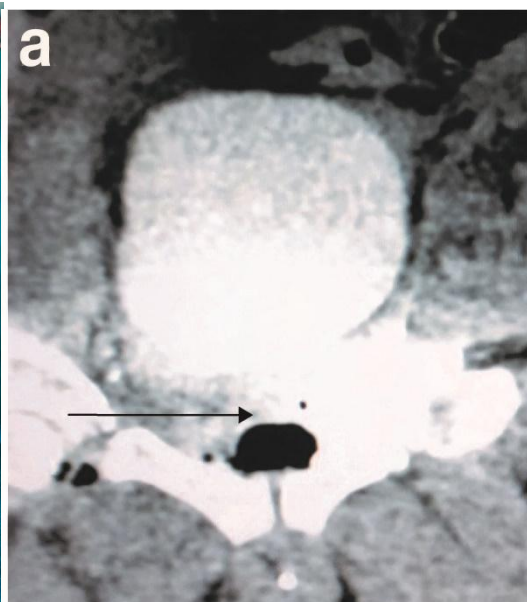


Fig. 2CECT showing contrast extravasation at bladder neck

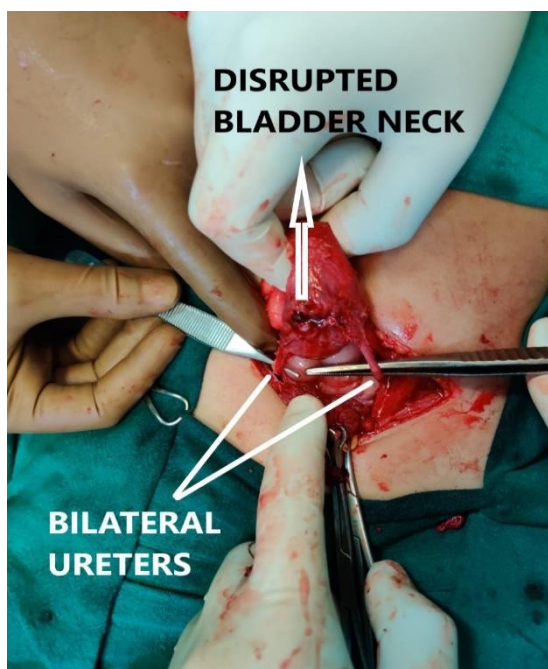


Fig. 3Bladder neck disruption

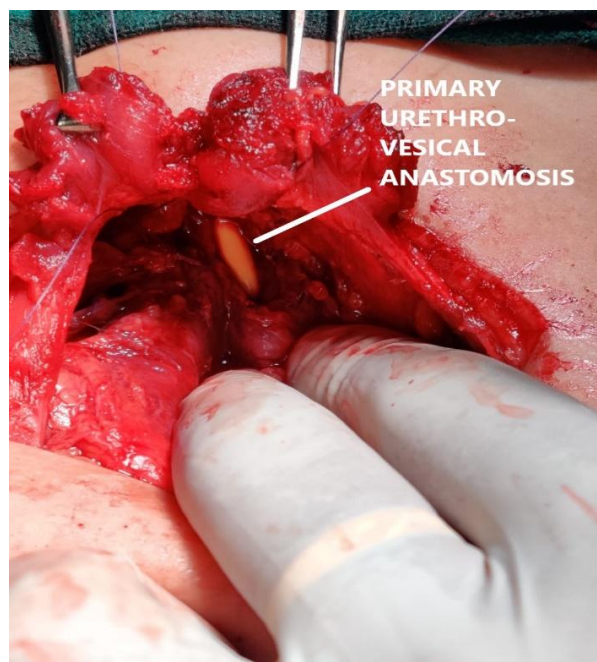


Fig. 4Primary urethro-vesical anastomosis

II. Discussion

Incidence of posterior urethral injuries in children is rare (0.47-4.2%) [2] and it is commonly seen secondary to road traffic accidents. The posterior urethral injury is rare in paediatric age group because paediatric pelvis has greater elasticity of sacroiliac joint and symphysis pubis and greater plasticity of bone, hence greater force of energy is required for pelvic fracture [2]. The risk of complete bladder neck distraction injury is more common in children than in adults. The proposed mechanism behind this could be due to the intra-abdominal location of the bladder which is mobile and smaller, cranially placed prostate which is fixed, which predisposes bladder neck disruption in children.

All these patients were operated immediately and primary urethro-vesical anastomosis was done. The opinion is divided in these types of cases between immediate and delayed repair. The immediate repair is done within 1 week and the delayed repair can be delayed to 6 weeks to 3 months after suprapubic drainage. Early

repair leads to immediate relief with much less dense stricture formation which can be easily managed endourologically as seen in one of our cases and lower chances of fistula formation. Although immediate repair may require more blood transfusions owing to more blood loss and tissue planes and demarcation are poorly preserved leading to post op morbidity. If there is simultaneous bowel or viscera injury immediate repair may be a better option. While proponents of delayed repair cite decreased blood loss, lower operating times and patient morbidity as the patient is operated when his general condition improves [3].

Routh JC and Husmann DA have noted that immediate repair of the bladder neck injury decreases the incidence of acute complications like urinary extravasation which can lead to pelvic urinoma, abscess, osteomyelitis or necrotizing fasciitis, although, they have noted a higher incontinence rate of upto 75% [4]. Balkan E et al., found a lower stricture rate of 16.6% in paediatric patients with posterior urethral injury undergoing early repair versus a stricture rate of 37.5% in patients who underwent delayed repair [5]. Similar to these two studies we have found a low complication rate in paediatric bladder neck distraction injury patients treated with immediate repair. There can be associated ureteric injury, hence abdominal approach is preferred. Voelzke BB et al., have advocated immediate repair for the bladder neck injury to prevent the associated complications by placement of a urethral catheter across the injury site with tacking urethral sutures for tissue approximation in addition to suprapubic tube placement in the acute setting [6]. Even in case of adult bladder neck injuries, Mundy AR supports early repair for better outcome and to reduce morbidity associated with the delayed repair [7].

In our experience with bladder neck distraction injury in paediatric patients, immediate primary repair is easier than the delayed repair because during delayed repair, severe fibrosis with resultant dense stricture limits the optimal reconstruction in the small calibre paediatric urethra.

III. Conclusion

Considering the rare occurrence of paediatric bladder neck distraction injury and paucity of literature of similar cases, we suggest that immediate urethro-vesical anastomosis can give good long term results in cases of paediatric bladder neck distraction injury.

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