Case Report

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Management of Crush Injury Pelvis with Shock in A 4 Year Old Child

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Abstract

Pelvic fractures in the pediatric population are rare. The skeletally immature pelvis is flexible and therefore a pelvic fracture in an immature skeleton suggests significant force with a high probability of associated concomitant injuries. Despite these being potentially devastating injuries, there are no clear guidelines with respect to the investigation, classification and management of these fractures. Here we present a case of 4 years female who presented to us with complex pelvis with shock.The patientwas managed by a team of specialty trauma surgeons with good short terms results.

Keywords: Shock; Pelvic Fracture; Pediatric Pelvic Fracture; Management of Pelvic Fracture**.**

Introduction

Pelvic fractures in children are rare [1, 2]. They are typically associated with high energy trauma and are often associated with other potentially life-threatening injuries [3-8]. For this reason management of these associated injuries are important aspectsin the management of pediatric fracture pelvis.

Pelvic fractures in childhood tend to be a marker of severity, since the associated injuries are usually severe, mostly requiring surgical treatment and contributing to a high mortality rate (12%). For them to occur, a high-energy trauma is necessary which is commonly as a result of road traffic accidents (80%) [9].

Because pelvis is in close proximity to major blood vessels and organs, pelvic fractures may cause extensive bleeding and other injuries that might require urgent intervention.This can be destructive to the accident victim and have the potential of causing long term problems affecting mobility and difficult delivery problems in females [10-14].

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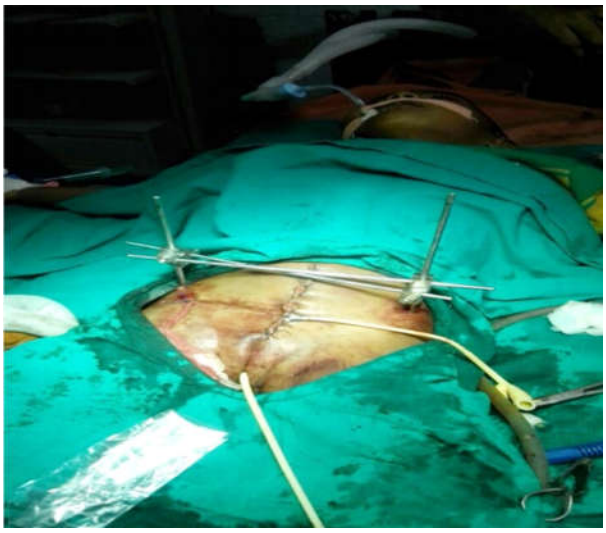
Case Presentation

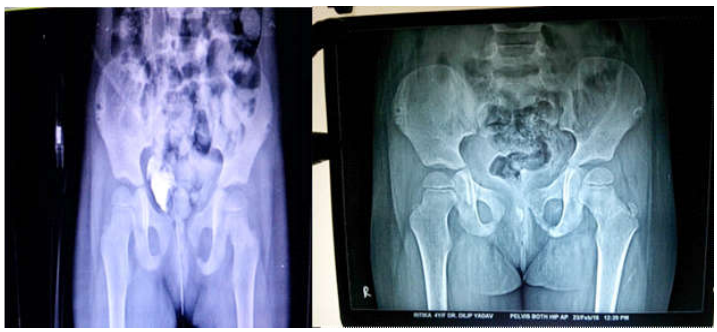
A 4 year old female was brought to the trauma center who was hit by a four wheeler vehicle while walking on a footpath. At the time of her arrival to the trauma center, the patient was drowsy but breathing spontaneously. The pulse was thready i.e. having low volume and the patient was having tachycardia (PR=170/min) with a non-recordable blood pressure. Her airway, breathing and ventilation was normal except that she was tachypnoeic (RR=28/min). Her vitals pointed towards hemorrhagic shock. On examination, pelvic compression test was positive and there was presence of vaginal bleeding and perineal hematoma. Pelvic binder was immediately applied and IV line established. She was immediately started on with IV crystalloids. As there was no improvement in vitals after infusing 2 liter IV crystalloids given as a bolus and due to lack of facility available for angiographic embolization at the center, patient was planned in for laparotomy. Meanwhile preparing in for laparotomy a bedside X-ray pelvis was done which showed an open book type of injury. There was a simultaneous presence of a fracture neck femur of the left side as well.

After laparotomy, the bleeding was controlled by packing of pelvic cavity. A supra-pubic cystostomy was performed and simultaneously 2 units of crossed matched blood was also transfused intra-operatively. For bladder rupture, repair was done and an external fixator applied for closing the pelvis cavity to reduce intra-pelvic volume. Repairing of anterior pelvic ring

was done with sutures (proline suture) by taking bite in both superior rami and pubic-tubercle and then passing the suture through obturator foramen. A transurethral catheterization was performed after repair of vaginal tear and urinary bladder.The pelvis packing was removed after 24 hours. The patient was not ambulated for a period of six week with range of motion exercises started at hip joint.The external fixator was then removed and then clinical evaluation was performed, which revealed a negative pelvic compression test. Patient was then put on a rehabilitation schedule for gradual ambulation and weight bearing.



Clinical picture in immediate post-op phase showing pelvic stabilization by external fixator and suprapubiccystostomy and trans-urethral catheterization



X-ray shows an unstable pelvicfracture with disruption of the anterior ring i.e., pubic diastasis

Discussion

Road traffic accidents account for the majority of trauma cases (80%)[9]. These were uncommon injuries before the widespread use of automobiles. Fracture pelvis is still uncommon in pediatric age group as it usually requires a great amount of force which usually is confronted in high velocity trauma as a result of road traffic accidents.

Pediatric pelvic fractures differ from their adult counterpart in many ways [15, 16, 17]. Despite of relative paucity in the literature for this particular fracture in immature skeleton, the disparities with respect to adult population are obvious with regard to mechanism of injury, fracture patterns, associated injuries, functional outcomes and mortality rates. These differences may be attributed to the unique characteristics of the child's pelvis and the high energy transfer demanded to cause a fracture.Pelvic fractures in children, with the exception of avulsioninjuries, occur as a result of high-energy trauma [18, 19].

In this report we try to emphasize on the severity with which this fracture can present and the apprehension which the treating surgeon should have while handling such cases to prevent mortality and to help the patient rehabilitate to best of his/ her potential.

If a patient is in shock as a result of trauma, then hemorrhagic shock is the first thing which one should think of. After taking care of airway, breathing and ventilation; circulatory component is there which is compromised in hemorrhagic shock. Orthopedic component leading to shock is either due to fracture pelvis or sometimes fracture shaft of femur. Perineal hematoma and blood at urethral meatus points towards possible urethral injuryand in such circumstances trans–urethral catheterization is contraindicated unless urethral injury is ruled out [20]. Our patient was brought to the emergency with features of hemorrhagic shock. Abdominal and chest examination findings were normal and the shock was attributed to pelvic injury. Management of shock is aimed at replenishing the lost volume and stopping the source of loss. As after adequate fluid infusion the vitals were still not responsive so it was immediately planned to stop the source of bleeding. X-ray revealed a Torode and Zieg type-IV injury [21]. Literature supports good outcomes in type IV fractures when managed operatively [22]. So in order to reduce the volume of pelvis and stabilize the pelvis an external fixator was applied with simultaneous packing of pelvic cavity to stop the bleeding by tamponade affect. Adequate resuscitation was monitored by urine output estimation.

In pediatric patients with hemorrhagic shock who have encountered a high velocity trauma, have a high index of suspicion for pelvic fractures with aggressive management protocol to address shock.

Conclusion

The pelvic fractures in children are a real challenging emergency which can be managed adequately with prompt intervention and aggressive management to get optimum results. Differences from adult pelvis have to be clearly understood for apprehending the severity in pediatric age group.

Conflict of Interest

None

References

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