Bladder Herniation Due To Implant Failure In A Type B-1 Pubic Symphyseal Diastasis

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Abstract

Internal Fixation of pubic diastasis is a safe procedure relatively free of serious complications and is a standard treatment choice for tile's type B-1 injuries. We present one interesting case of late implant failure in an adequately fixed pubic diastasis leading to bladder herniation.

Introduction

The incidence of pelvic injuries has been on the rise in the past few decades due to increasing incidence of high energy trauma1. Pelvic fractures are unique in respect to immediate threat to life necessitating urgent measures to be taken and as well to high incidence of urological injuries associated with them2-7. Amongst pelvic fractures, pubic symphyseal disruption might have higher incidence of genitourinary complications as compared to more common lateral compression/internal rotation injuries2.

Pubic diastasis is frequently managed with external or internal fixation8-11. Internal fixation is a relatively safe procedure with infrequent complications and allows for direct and sound repair of bony as well as soft tissue pathology10. We present an interesting case of chronic bladder herniation along with anterior abdominal wall hernia due to internal fixation failure after adequate fixation in an elderly patient.

Case Report(s)

A 50 year old male patient presented to our emergency department after being involved in a motor vehicle collision where he was an unrestrained back seat passenger. At presentation, patient was not fully oriented but was hemodynamically stable. Further examination revealed an open fracture of left tibia and fibula and a gap at pubic symphysis. There was no blood at urethral meatus and a Foley's catheter was easily passed which revealed clear urine. After initial resuscitation in emergency room, plain radiographs of left leg and trauma series was obtained which confirmed fracture of left leg in distal fourth and pubic diastasis of 5 cm without any apparent sacroiliac joint fracture or dislocation. Thus injury was atypical tile's type B-1 injury and a noncontrast CT scan of pelvis confirmed lack of significant posterior instability. A pelvic binder was applied but it failed to achieve adequate reduction. Patient was shifted to operation theatre where open fracture of left leg was debrided and an external fixator was applied. Pubic diastasis was managed by internal fixation with a reconstruction plate on cephalad surface. A Pfannenstiel incision was used for surgical exposure. Rectus sheath was found fully avulsed from left side and partially from right side. After no apparent bladder injury was found intraoperatively. After adequate reduction of diastasis a 6 hole 3.5 mm reconstruction plate was applied and secured with 3 screws on either side of superior surface of pubic bone. Rectus sheath of both sides was secured to pubic bone with nonabsorbable sutures and wound was closed with a drain in retropubic space. Postoperative period was uneventful and sutures were removed after 2 weeks in the outpatient department. Due to poor skin condition, fracture of left leg was managed with external fixation alone and a patellar tendon bearing cast was applied after removal of fixator at 8 weeks at which time gradually progressive partial weight bearing was started. Recovery was satisfactory till 5th month when patient presented with hernia of lower abdominal wall which was of insidious onset. There was no history of fresh trauma or any urinary complaints. On examination there was an infraumbical abdominal wall hernia and a gap at symphysis pubis was felt(Illustration 1). Pelvic radiograph and an ultrasound was ordered which showed implant failure and herniation bladder neck through the gap created in pubic area with a deficient and disrupted distal end of rectus sheath. A general surgery/urology consultation was obtained and patient was readmitted for a revision surgery. At revision surgery bladder neck area was found to be herniating through the gap between pubic bones and bladder wall was found to be adherent to the back surface of pubic body. After careful release of bladder and removal of implant, reduction of diastasis was achieved and secured with dual plate. A preperitoneal prolene mesh was used retroperitoneal lower abdominal area. Postoperative period was uneventful and patient has not shown any signs of recurrence at a follow up of 6 months.
Discussion

Pelvic fractures represent about 3% of skeletal fractures\(^9\). Except in elderly patients, it is invariably the result of high energy blunt trauma and thus is associated with injuries to internal organs in large percentage of patients resulting in high mortality rates. Till date the best predictor of mortality after pelvic trauma is the injury severity score rather than the type of pelvic fractures\(^10\).

Management of patients with pelvic injuries involves aggressive resuscitative measures in emergency room and treatment of associated injuries\(^3,4,8-11\). The reconstructive phase involving the definitive treatment of pelvic fractures is to be deferred till this emergency phase has past. During initial period pelvic binder or rapidly applied external fixator can be used to achieve some haemostasis of internal bleeding from open fracture site\(^8,9\).

As recently as 1970s, most pelvic fractures were treated conservatively with pelvic slings and skeletal traction\(^6\), but significant morbidity associated with nonoperative treatment, especially in displaced and unstable fractures, has given an impetus to development more aggressive operative approach\(^8-11\). With better understanding of pelvic anatomy in following decades a number of classification systems have been developed and most widely of those used today are tile’s and young & burgess classifications\(^10,11\). The essence of most classification systems is the mechanism of injury and the direction of resulting instability and thus guiding in the type of operative procedure required to achieve stability.

Pubic diastasis represents a rotationally unstable pelvic injury which may be associated with vertical instability\(^10,11\). Operative reduction and stabilization has been advocated for rotationally unstable but vertically stable (Tile type B, Young and Burgess type AP II) fractures with a pubic symphseal diastasis of more than 2.5 cm, pubic rami fractures with more than 2 cm displacement, or other rotationally unstable pelvic injuries with significant limb-length discrepancy of more than 1.5 cm or unacceptable pelvic rotational deformity\(^11\). Operative choice is between anterior external fixator or anterior plating with or without posterior fixation\(^8-11\). Posterior reduction and fixation is added for significant vertical or anteroposterior displacement evident on axial cuts of CT scan. Amongst patients undergoing only anterior fixation, both external and internal fixation have yielded similar results\(^5\). The choice of treatment is decided according to surgeon’s preference, contamination of field, associated injuries, presence of fractures of rami where internal fixation might prove to be more difficult\(^11\). At our institute most patients are initially managed with a pelvic binder or an external fixator and decision for internal fixation depends on reduction achieved as well as comorbidities.

Internal fixation of pubic diastasis is a relatively safe procedure with infrequent complications\(^8,10\). Although urological injuries are very frequent in pelvic injuries and more so with pubic symphyseal diastasis\(^5\), but late urological complications have been reported infrequently. Bladder herniation and subsequent entrapment has been reported after external fixation in acute setting\(^14,18\) and a case of bladder herniation after failure of nonoperative treatment is on record\(^17\) but to our knowledge this is the first case of bladder herniation after failure of internal fixation reported till date. There have been two more unusual reports of extrusion of metallic screws in urine after long standing internal fixation\(^18,19\). In one of the cases patient had developed chronic symptoms with a fistula and osteomyelitis\(^18\) but the second case lacked any chronic symptoms and presented with acute dysuria, haematuria, and voiding of metallic implant\(^9\). Both cases showed potential of retained hardware in this region to migrate and cause potential damage. In our case too one of the screws was lying free of the plate during repeat surgery and had the potential of causing more damage had it not been removed in time. Such potentially fatal complications can at least in theory be reduced by using locked plates or even biodegradable implants\(^20\) which will reduce this complication but poses yet another problem regarding detection of such implant failures. Although pubic symphysis is a largely immobile joint but there is some movement possible and at times essential. Having leg bones fracture in this case on same side might had altered dynamics of gait cycle in such a way that it could had put more than usual load at symphysis which ultimately led to implant failure.

Conclusion

In conclusion, anterior symphyseal plating is relatively free of complications but still requires close follow up to avoid any lethal complications and this procedure should not be used indiscriminately in all patients where a less invasive procedure may suffice. Although a recent series investigating the need of removal of implant has concluded in favour of retention of implant\(^21\) but still another metanalysis failed to reach any conclusion regarding this matter\(^22\). We generally prefer to avoid internal fixation in women of child bearing age
and are in favour of removal of implant whenever patient shows any symptoms that might be caused due to hardware retention.

References

Illustrations

Illustration 1

Clinical Photograph of patient showing Infraumblical hernia.
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