MANAGEMENT OF TRAUMATIC PUBIC DIASTASIS BY OPEN REDUCTION AND INTERNAL FIXATION

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ABSTRACT

BACKGROUND
High velocity antero-posterior compression injury to the pelvis leads to pubic symphysis diastasis and other types of pelvic injuries. Over the years, different authors proposed different classification system and management protocol for pelvic injuries. Open reduction by Pfannenstiel incision and internal fixation by symphyseal plate provides rigid fixation and stability to the pelvic ring, thus reduces morbidity and mortality following high velocity pubic symphysis diastasis.

KEYWORDS
Pubic Diastasis, Open Reduction, Internal Fixation.


BACKGROUND
Pubic symphysis is a strong band of fibrocartilage creating an anterior joint in the pelvic ring, which together with the posterior sacroiliac joints allows rotation and expansion of pelvis during physical activity.1 Pubic symphysis diastasis have been reported to occur in 13 - 16% of pelvic ring injuries and it typically follows a high velocity injury with predominant external rotator vector trying to split open one or both the hemipelvis. Situations like post-partum period, inflammatory arthritis, horse riding injury, etc. are other causes leading to pelvic symphysis diastasis and shows high rate of complications and mortality.2 For better understanding the biomechanics of pelvic injury and proper management protocol, different authors proposed different classification over the years. Early mobilisation and better pain management are facilitated by stabilisation of the disrupted anterior pelvic ring using either open reduction and internal fixation or a pelvic external fixator.3 In our case, open reduction and internal fixation by plate and screws across the pubic symphysis. This provides accurate reduction and now the most popular method for pubic diastasis fixation.4

Case Report
A 35 years old male patient with alleged history of high velocity antero-posterior compression injury, sustained injury to pelvis and presented with complaints of pain over anterior aspect of lower abdomen and not able to walk and stand. On presentation, patient was hypotensive and no blood was noted in external urethral meatus. Patient’s vitals were stabilised; bladder, urethral and other pelvic organ injury were ruled out by contrast CT scan.

On spine examination, no abnormality detected.

Bilateral hip joint examination reveals no bony abnormality along with full range of movement.

After appropriate investigation, patient was taken for surgery with assistance of general surgeon. Transverse Pfannenstiel incision of 8 cm was taken, soft tissue separated and bladder retracted away from the operative field, pubic diastasis was reduced with help of acetabular clamp and confirmed under vision and internal fixation with 8 hole and 4 hole precontoured reconstruction plate was done; along with this sacroiliac joint also reduced and confirmed by image intensifier.

On local examination, gross swelling and tenderness was present over the pubic symphysis region and obvious hand fist gap was appreciated in between two pubic bones.

X-ray pelvis with b/l hip antero-posterior view reveals pubic symphysis diastasis, ipsilateral sacroiliac joint dislocation with intact posterior ligamentous complex and normal b/l hip joint.

Judd view of bilateral hip reveals no acetabular fracture.

CT scan reveals pubic symphysis diastasis was 43.9 mm with verticle displacement with right sacroiliac joint dislocation and intact posterior ligamentous structure.

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Figure (A, B). Pre-Operative X-Ray and CT Scan Pelvis with b/l Hip reveals Pubic Symphysis Diastasis (43.9 mm) with Ipsilateral Sacroiliac Joint Disruption with Intact Posterior Ligamentous Structures

Figure (C, D). Post-Operative X-Ray shows Reduced Pubic Symphysis with 8 Hole and 4 Hole Reconstruction Plate and Reduced Sacroiliac Joint
injuries dealt with a number of controversies and need of adequate surgical fixation if pubic diastasis is more than 2.5 cm.

Early non-invasive stabilisation using a pelvic binder or pelvic sling to provide circumferential compression or emergent, mini-invasive, compression techniques using the external fixators or C-Clamp (Ganz et al) may be necessary to arrest life-threatening bleeding. Conservative management by external appliances may be achieved by delivering high forces, but ideal management is provided by adequate internal fixation only.7

Controversy arises on implant selection (Reconstruction or low contact dynamic compression plates), number of implant (single or double symphyseal plates) and placement of implant (superior or anterior symphyseal surfaces), but approach for internal fixation using Pfannenstiel incision is universally accepted. A few authors have suggested minimally invasive percutaneous multiple screws fixation.8

The anterior sacroiliac ligament gets violated in all cases, where the pubic symphysis is displaced more than 2.5 cm. Symphyseal plates such as special angled plates, double plate, long plates and 4 hole dynamic compression plates have been used for internal fixation in type II APC injuries.9

Anteriorly placed single symphyseal plate provides more stable fixation than superiorly placed plates in these anteroposterior compression injuries.10

Combined anterior and posterior fixation provides optimal reduction and fixation in APC type II injuries.11 Combined anterior plate fixation with sacroiliac fixation provides rigid fixation of sacroiliac joint leading to less micromotion compared to isolated anterior plate fixation.

In this case, fixation was done with dual reconstruction anterior plate (8 hole and 4 hole reconstruction plate) over the symphysis pubis, which provides rigid fixation without any early or late post-operative complications and good clinical and excellent radiological outcome.

CONCLUSION

Dual plating over the pubic symphyseal region for the management of pubic diastasis gives rigid fixation with good clinical, excellent radiological outcome with low early complications and early mobilisation of the patient prevents comorbidities such as bed sore, respiratory depression, deep venous thrombosis, pulmonary embolism, etc. Amount of reduction achieved (gap less than 5 mm) is a major independent factor in determining the long-term outcome. Limited dissection avoiding bladder injury intra-operative and preservation of intactness of rectus sheath go a long way in avoiding postoperative complications and ensuring a satisfactory long-term outcome.

REFERENCES


Case Report