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Comparative study of outcome of conservative and operative management in pubic symphyseal fracture

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Abstract
Introduction: The aim of this study is to evaluate the clinical outcomes of pubic symphyseal fracture when managed conservatively using pelvic binder along with bed rest and when managed with open reduction internal fixation using pubic symphyseal plating.
Materials and Methods: We have performed a retrospective study and have taken 40 patients divided into 2 groups of 20 each patient and have followed then through patients with associated acetabulum fractures, spinal fractures or visceral injures were excluded from this study.
Results: Almost all the patients who presented with pelvic diastasis were having one or other associated fracture involving pelvic ring or surrounding structures or injury, isolated pelvic diastasis was comparatively infrequent and they were relatively stable which were managed conservatively by enlarge. When there was pelvic instability and patient was fit for operative management ORIF was preferred choice mostly in younger patients.
In case of osteoporotic bones, associated comorbidities, visceral injuries conservative management can be preferred over operative management in stable and partially stable fractures.
ORIF gives early symptomatic relief to patient as compared to conservative management.
Conclusion: Weather to manage patient conservatively or operatively depends on variables such as patients profile, age, type of fracture, hemodynamic stability, associated injuries etc.
Pelvic ring stability plays most crucial role in determination of patient management, in case stable pelvic ring fractures given everything else is adequate can be managed conservatively but in case of pelvic ring instability early intervention is needed. Even after ORIF- pubic symphyseal plating is done intra operative complication and post operative care is something a surgeon should always watch for.

Keywords: Pubic symphyseal plate, ORIF, plate, pelvic fracture

Introduction
Pelvic fractures are not uncommon and are routinely seen due to high energy trauma although isolated pelvic fracture is uncommon and is mostly associated with injury to surrounding structures. Most common type of pelvic trauma is lateral compression type of injury caused with displaced or nondisplaced pubic rami fractures.
Causes of pelvic fractures
A pelvic fracture may result from a high-energy force, such as that generated during:
A car or motorcycle collision
A crush accident
A fall from a significant height.
Osteoporotic bones
These fractures can be divided into open and closed fracture which can be further classified into
Stable fracture. In this type of fracture, there is often only one break in the pelvic ring, and the broken ends of the bones line up adequately. Low-energy fractures are often stable fractures.
Stable pelvic fracture patterns include:
Iliac wing fracture
Sacrum fracture
Superior pubic ramus fracture
Inferior pubic ramus fracture
2, Unstable fracture. In this type of fracture, there are usually two or more breaks in the pelvic

ring and the ends of the broken bones do not line up correctly -Displaced. This type of fracture is more likely to occur due to a high-energy event.

Unstable pelvic fracture patterns include
Anterior-posterior compression fracture
Lateral compression fracture
Vertical shear fracture

Symptoms
A fractured pelvis is almost always painful. This pain is aggravated by moving the hip or attempting to walk. Often, the patient will try to keep their hip or knee bent in a specific position to avoid aggravating the pain. Some patients may experience swelling or bruising in the hip area.

Classifications used in pelvic fractures

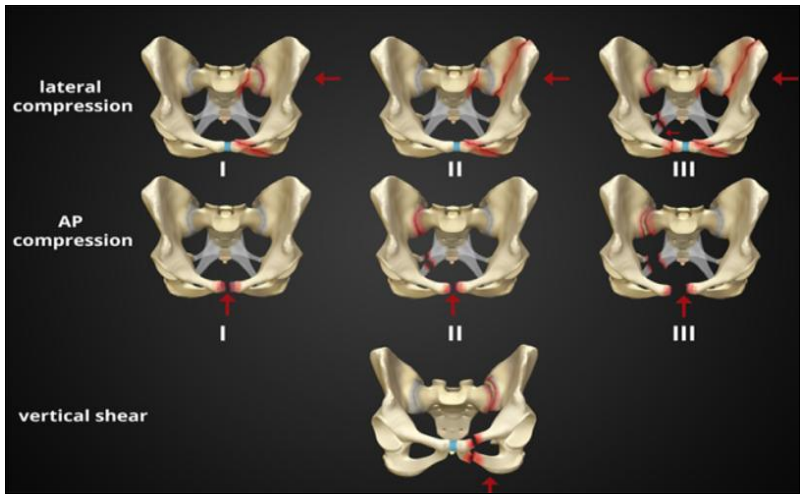

Image 1: Young and Burgess classification of pelvic fracture

Table 1: Classification of pelvic ring fractures AO

Type-A stable fracture (Intact posterior arch)	Type- B partially stable fracture (Incomplete disruption of posterior arch)	Type-C unstable fracture (complete disruption of posterior arch)
A1 Avulsion Injury A2 Iliac wing or anterior arch fracture A3 Transverse sacrococcygeal fracture	B1 Open book injury (external rotation) B2 Lateral compression injury (internal rotation) B2-1 Ipsilateral anterior and posterior injury B2-2 contralateral - bucket handle injuries B3 bilateral	C1 unilateral C1-1 Illiac fracture C1-2 Sacro-illiac fracture dislocation C1-3 sacral fracture C2 bilateral with one side type b and one side type C C3 bilateral

Materials and method
Study design: A retrospective study analysing the patient management, improvement and outcome of patients who had pubic symphyseal fracture
We did a retrograde study of patients presented in outpatient and emergency of CHA in last 5 years and they were divided into two groups of 20 each consisting of patients that were managed conservatively and those who were managed operatively and they were followed through. The outcome was assessed as favourable and unfavourable according to predefined criterion.

Inclusion criterion
patients having pubic symphyseal fracture with-anterior pelvic ring disruption with or without pubic rami fractures.
SI joint disruption osteoporotic bones.

Exclusion criterion
Associated acetabulum fracture
Associated visceral organ damage
Patients with extruded/open pelvic
Patients with skeletal immaturity
When it comes to conservative management a lot things should be considered and explained to the patients as well, the need of operative management in case conservative managements fails. Out of 20 patients most of them were able to resume their routine work and were able to perform routine tasks after prolonged bed rest few developed complications such as bed sore and muscle weakness from non-weight bearing but were able to regain normal contour after physiotherapy and bedsore care. In some diastasis reduced but never completely disappeared but that did not hinder them in performing routine tasks and clinical outcome was comparable.

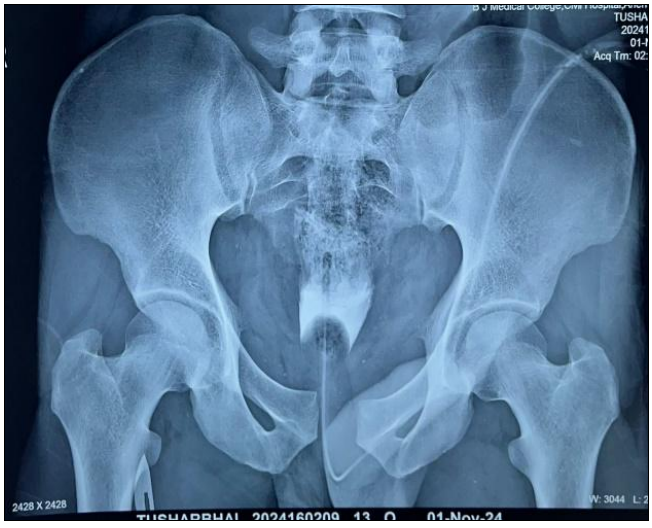

Image 2: A 25 year old male had complain of pain over pelvic region since 1 day which was associated with trauma – Road traffic accident. Xray is suggestive of Pubic diastasis.

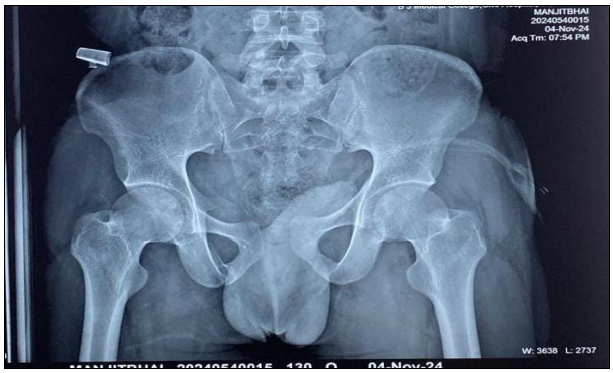

Image 4: A 23 year old male with history of fall of heavy object 2 days back was brought in, on radiological investigations done xray is suggestive of pelvic diastasis with inferior pubic rami fracture.

In this young male patient who was having pubic diastasis along with inferior pubic rami fracture we managed patient conservatively by giving pelvic binder and anklet traction for rami fracture and patient was advised bed rest for minimum 6 weeks and was followed up after 2 months

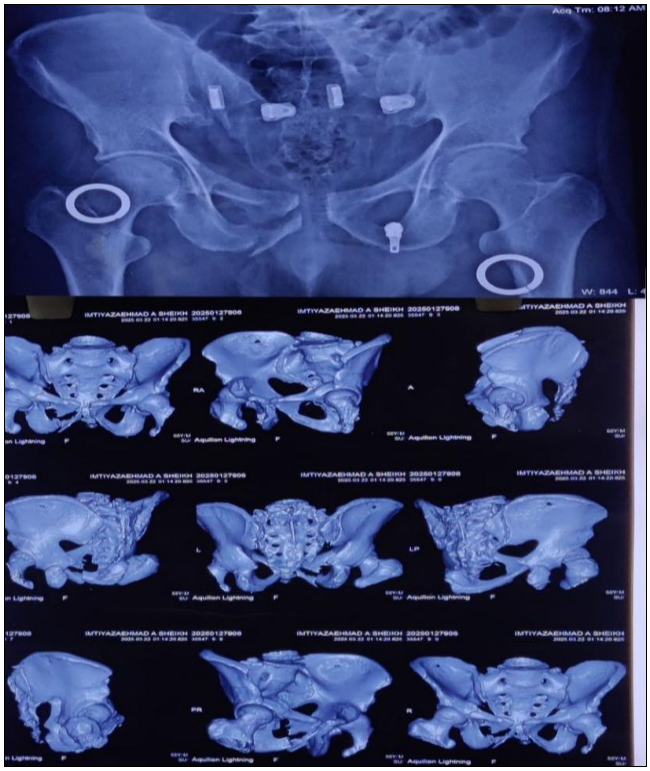

Image 4a: A 55 year old male who was in road traffic accident was wheeled in with pain over abdomen and pelvic region he underwent radiological investigations which was suggestive of superior and inferior pubic rami fracture with pubic diastasis with right side sacroiliac joint disruption

Image 4a

Patient was given pelvic binder and repeat radiograph were done to check if pelvis was reduced or not which was unsatisfactory following which patient underwent routine preoperative workup and was posted for early pelvic reduction surgery which was done using anterior approach using Pfannenstiel incision after soft tissue dissection pubic body and symphysis was exposed following which proper alinement was checked and ORIF was done using 6 hole plate 6 star headed screws were used of longest length possible following which CRIF was done using 1 x 4.5 mm CCS for right Sacroilliac joint.

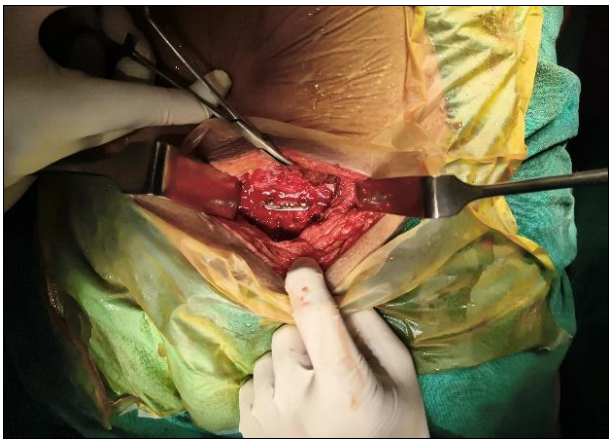

Image 4b: Using anterior approach via Pfannenstiel incision 6-hole plate is secured with screws

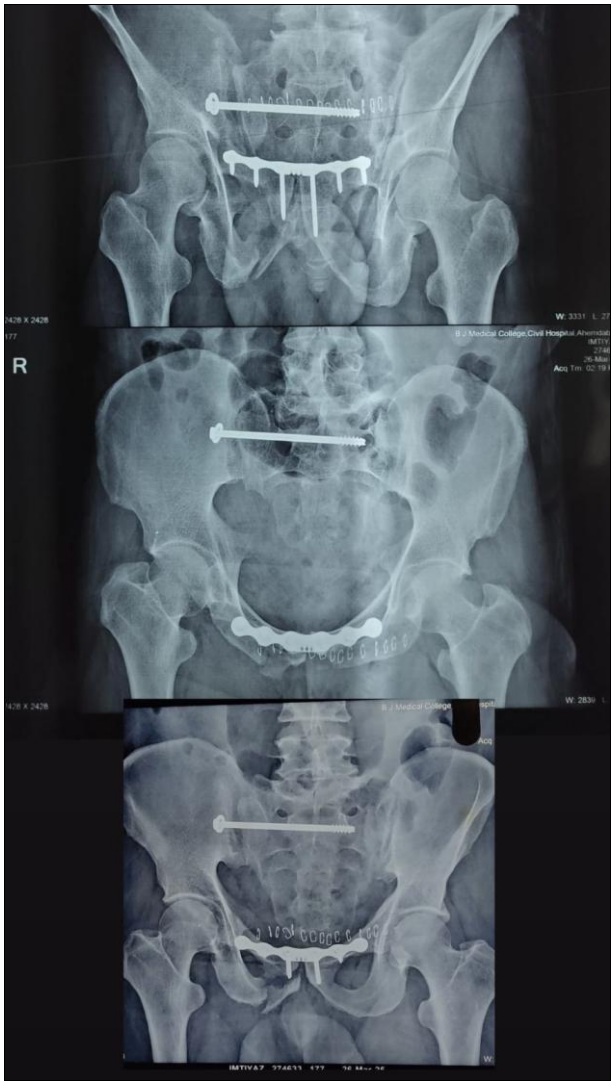

Image 4c: Postoperative radiograph

Patient was given pelvic binder and was advised 8 weeks bed rest.

Preoperative radiological investigations Xray was done with pelvic anteroposterior, inlet and outlet view.

Case scenario 4

A 18 year old male who was in road traffic accident was brought in with pain over abdomen and pelvic region he underwent radiological investigations which was suggestive of superior and inferior pubic rami fracture, fracture of body

of sacrum with pubic diastasis.

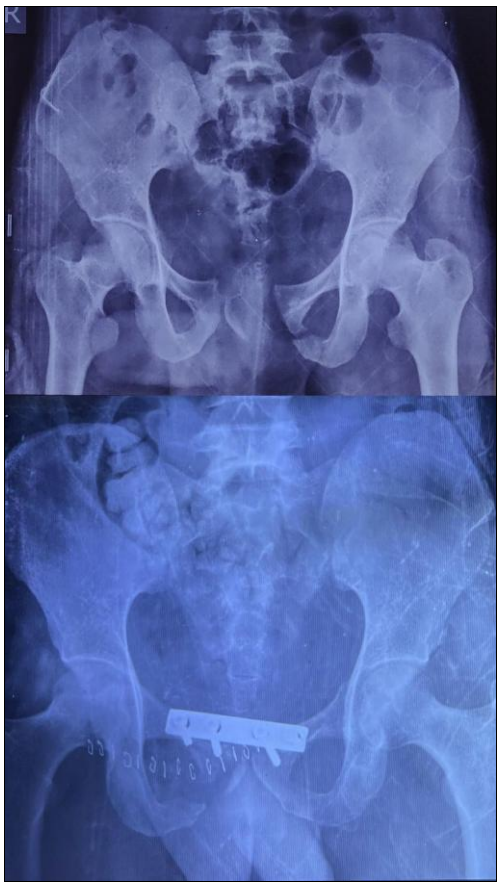

Image 5: Preoperative and post operative radiograph of patient managed with open reduction and internal fixation using 4-hole plate.

Patient was given pelvic binder and repeat radiograph were done to check if pelvis was reduced or not which was unsatisfactory following which patient underwent routine preoperative workup and was posted for early pelvic reduction surgery which was done using anterior approach using Pfannenstiel incision after soft tissue dissection pubic body and symphysis was exposed, following which proper alignment was checked and ORIF was done using 4 hole plate 2x 3.5mm star headed screws for right and left side each were used of longest possible length.

On 1 year follow up patient has resumed all his daily routine work and is able to perform routine task that he used to do without any difficulty.

On 1 year follow up patient is walking with no discomfort, no pain or incision site tenderness present, radiograph was ordered PBH anteroposterior view, pelvic inlet and outlet view and it shows bony fusion. Hip range of motion straight leg rise is comparable on both sides and results are satisfactory

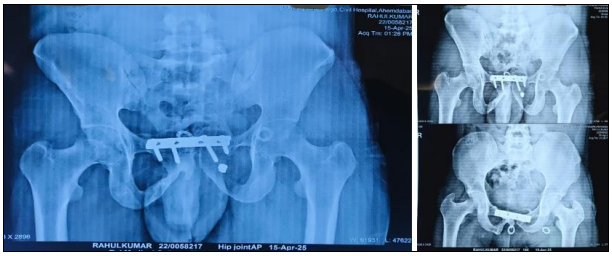

Image 6: 1 year follow up radiograph of patient with 4-hole pubic symphyseal plate

Complications: When conservative management fails to provide symptomatic relief patient is shifted to surgical management which shows early symptomatic relief.

Infection, SSI can lead to long term non healing lesion, non-union of fracture, higher morbidity due to type of injury and associated injuries.

Results

Almost all the patients who presented with pelvic diastasis were having one or other associated fracture involving pelvic ring or surrounding structures or injury, isolated pelvic diastasis was comparatively infrequent and they were relatively stable which were managed conservatively by enlarge. When there was pelvic instability and patient was fit for operative management ORIF was preferred choice mostly in younger patients.

In case of osteoporotic bones, associated comorbidities, visceral injuries conservative management can be preferred over operative management in stable and partially stable fractures.

ORIF gives early symptomatic relief to patient as compared to conservative management.

Discussion

The aim of this study was to compare the clinical outcome of pubic symphyseal fracture when managed conservatively and when managed operatively patients have been followed up for minimum of 1 year before including them in this study it is seen that young males are more likely involved in high velocity road traffic accident which is leading cause of pelvic trauma and geriatric population get pelvic fracture due to trivial trauma and are mostly managed conservatively by enlarge.

Our study shows that for minimally displaced fractures when managed with minimum 8 weeks bed rest along with pelvic binder gives good results however the pubic symphysis never truly returns to its original state but that do not hinder patient in performing their routine activities.

On the contrary when pubic symphyseal ORIF is done the patient is started with physiotherapy and strength training if they do not have any other associated fractures and on 3 month follow up pt was able to walk with no complains of pain and on 1 year follow up bone fusion is seen and patient is able to perform all activities no pain or tenderness structurally ORIF gives complete support in younger population. When conservative management fails that is when complain of pain persists and there is no improvement in radiograph patient can be switched to surgical management and results are adequate in that case.

Limitation of this study is when patient presents with extruded pelvic fracture neither conservative nor ORIF can be done we have to consider debridement and external pelvic fixation and in high velocity road traffic accident patients mostly presents with open wounds and visceral organ injuries which delays the definitive management of pelvic fracture.

Conclusion

The result of this study suggests that both conservative and operative management are satisfactory and have their own relative indications and should be formulated according to patients' profile.

In case of unstable pelvic ring fractures with pubic diastasis pt should be managed operatively where as in case of stable pelvic ring fractures involving pubic symphysis (pelvic diastasis) should better be managed conservatively if patient

do not have any associated fracture or underlying conditions.

Conflict of Interest
Not available.

Financial Support
Not available.

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