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# MANAGEMENT OF PUBIC SYMPHYSIS DIASTASIS WITH A NEW SURGICAL TECHNIQUE

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## ABSTRACT

The management of unstable pelvic fractures by internal fixation was studied extensively at Mayo Hospital, Lahore during 1989 - 1992 and a new surgical technique was developed for the management of Pubic Symphysis Diastasis. From then onwards patients presenting with stage two or three diastasis were treated by this technique. In this technique 50-60mm long 4.5mm cortical screws were inserted into pubic bone mass parallel to pubic symphysis and wires encircled around the screws and passed through the bone.

In the present study ten patients treated by this technique during the last two years have been included. Most (80%) of these patients were male, mostly (90%) had stage two diastasis, 60% had some associated injuries, four patients presented with some complications which were successfully treated. In all the patients it provided a stable fixation and all patients were ambulatory with full weight bearing on the second post-operative day. Thus this technique proved to be a simple, very economical and yet very stable method for the management of these problems. This also eliminated the need for 12 weeks bed rest, two plates to achieve a stable fixation and also the risk of wires cutting through the bone mass.

**KEY WORDS** Pubic Symphysis, Diastasis, Internal Fixation.

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## INTRODUCTION

Management of unstable pelvis fractures has remained a problem for both patients and the treating Surgeons. After the biomechanics of these injuries was understood, many techniques of internal fixation have been reported in the literature.

Management of pubic symphysis diastasis alone with tension band wiring technique, although was simple but has been associated with high incidence of cutting of wires through the bones and loosening of the fixation. The other techniques of application of single and double plates were technically more difficult, required bigger exposure, more instrumentation, and bending of the plates to adapt to the contours of the pelvic ring. All this led to the development of a new operative technique.

This whole process of development of this new operative technique started when management of unstable pelvic fractures by internal fixation was studied extensively at Mayo Hospital, Lahore during 1989 - 1992. During this study one of us (S.M.A.) experienced that when 50-60mm long 4.5mm cortical

screws were inserted into pubic bone mass parallel to pubic symphysis and wires encircled around the screws and passed through the bone. From then onwards the patients with Symphysis Pubis diastasis were treated by this technique and it proved to be a simple, very economical and yet very stable technique for management of these problems. This also eliminated the need for 12 weeks bed rest, two plates to achieve a stable fixation and also the risk of wires cutting through the bone mass.

There are numerous classifications of Pelvic Fractures which have been suggested by different people.

Marvin Tile (1984) from Canada extensively studied the biomechanics of pelvic ring fractures and devised numerous classifications for different injuries.

In North America the best known classification is devised by Pennal et al. (1980). According to him the two major disruptive forces involved are:

1. External Rotation or Antero-posterior Compression Injury.
2. Internal rotational deformity or a lateral compression injury.

Le Tournel (1984) in Paris proposed a classification according to site(s) of injury.

Mears & Rubash (1986) later expanded this system to include the open pelvic fractures & other complex fracture variants of the Ring & Acetabulum.

Watson-Jones (1938), Key & Conwell (1951), Conolly & Hedberg (1969), Huittinen & Slaten (1971), Monhan & Taylor (1975) have also classified Pelvic fractures in the past.

### CLASSIFICATION OF SYMPHYSIS PUBIS DIASTASIS by Marvin Tile (1984)

Symphysis Pubis diastasis injury is also referred to as the antero-posterior compression or open book type injury. Antero-Posterior forces applied to anterior superior iliac spines of fixed Pelvis or forces applied through externally rotated Femora to Pelvis result in this kind of injury..

#### STAGE I

Disruption of Symphysis Pubis only (less than 2.5cm). Mostly seen in Postpartum period & rarely results in

permanent disability. The treatment is mainly conservative.

But in post trauma cases anterior dislocation may persist for many months.

#### STAGE II

Disruption more than 2.5cm & Associated with disruption of Ant. Sacro-iliac & the sacrospinous ligaments.

#### STAGE III

Complete Disruption of symphysis Pubis and Ant. Sacroiliac ligs. along with involvement of soft parts such as Skin, Vagina, Urethra, Bladder or Rectum.

TAYLOR (1942) from Sheffield Royal Infirmary, England after his investigations also showed that instead of direct Antero-Posterior violence, indirect violence to be a major cause as well.

Different methods of treatment available for the management of Symphysis Pubis Diastasis are:-

## CONSERVATIVE

Historically immobilization of an unstable pelvis ring fracture was mainly achieved by bed rest, Pelvic slings, skeletal traction and a hip spica cast (Mears & Rubash, 1986)

Meek et al. (1981) in Vancouver carried out a double blind study & reported a statistically significant increase in morbidity & mortality of patients treated with non-operative methods compared with a similar group managed by immediate surgical stabilization. Hassett & Border (1983) studied recumbent patients on a cellular level and came out with similar results.

## EXTERNAL FIXATION

External fixator applied to the Pelvis has been found to be Cumbersome. Gruen & Mears (1990) from Pittsburgh, Pennsylvania also showed a high incidence of pin tract infection thus resulting in loosening of frame and premature failure. Trauma series from University of Pittsburgh (1986) & Maryland (1988) also showed similar results Furthermore late complications reported by Edwards (1985) of 50 cases showed 85 percent patients

having loss of posterior pelvic reduction within 6 weeks after application of frame. Fifty percent complained of post. Pelvic pain and diminution of their level of activity two years later.

Apart from this Naser & Lindeque (1986) showed failure of closed reduction with external fixator of symphysis pubis diastasis due to interposition of the bladder & retroperitoneal fat. Mears & Fu, Tile and others have extensively studied External fixation alone for stabilization of an unstable pelvic disruption and found it inadequate which lead to the development of techniques of stabilization. (Russel, 1992).

## INTERNAL FIXATION

With the improvement of surgical approaches to Pelvis combined with superior instrumentation for pelvic reduction and stabilization, the role of internal fixation has expanded and now since 1988 it appears to be a method of choice for definite stabilization of an unstable pelvic disruption (Gruen & Mears, 1990).

The wires were used by O'Phelan (1963) to reduce Pubic Diastasis in

cases with Exstrophy of bladder. He encircled each superior pubic ramus with a heavy wire loop and tightened each. Then a third wire was placed through each of the first two loops and tightened to achieve a satisfactory approximation. In his cases the wires tended to break or cut through the pubic rami (Beaty, 1992).

The two hole plate fixation technique has been advocated by Lange & Hansen (1985) and Webb et al (1988). The A.O. group 1991 has recommended that for disruption of symphysis pubis reconstruction plate placed on superior aspect of symphysis posterior lesion cannot be stabilized then double plates, one superiorly and one anteriorly are recommended.

Stuart et al. (1990) from Newcastle General Hospital, U.K. have recommended use of stout wires and a tension band for internally fixing the symphysis pubis diastasis with speed & ease through a minimal exposure. The only limitation of this procedure was the risk of cut through & loosening.

## MATERIAL & METHODS

A total number of ten patients who presented to us with Symphysis Pubis Diastasis during the last two years were included in this study.

All these patients were classified according to the Marvin Tile's Classification of Symphysis Pubis Diastasis (as given earlier). Only patients with stage two and three diastasis were included. The patients with open injuries were excluded from this study.

Now all these patients were treated by the operative technique described below:

## TECHNIQUE

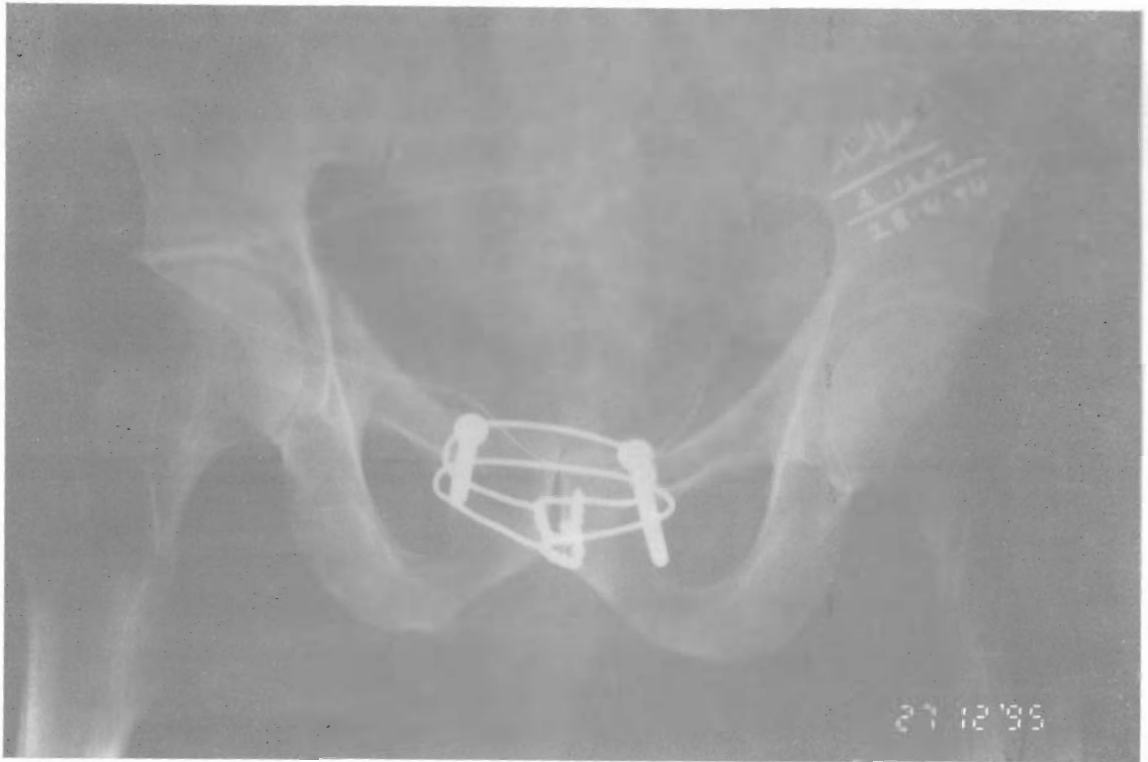
The symphysis pubis was approached through a low transverse (Modified Pfannenstiel) incision made just above it or by the same laprotomy incision if required for any other associated injury. Dissection was carried down to the symphyseal separation and subperiosteally the superior and medial aspects of the pubic bones were exposed.

Then two 50-60mm long 4.5mm cortical screws directed from anterosuperior to posteroinferior in the body of each pubic bone were inserted. Then two loops of 16 gauge stainless steel wire were passed through the bone around the screw shaft and tightened. The holes for passing the wire were pre-drilled.

Then both the wires were tightened and enough tension was generated to close the diastasis completely. The reduction can also be assisted by ilium-to-iliac compression and it is important to observe the symphysis during reduction to ensure clearance of the bladder neck, urethra and retroperitoneal fat. Then the wound was thoroughly irrigated and closed after keeping the suction drains. (Fig. I & II)



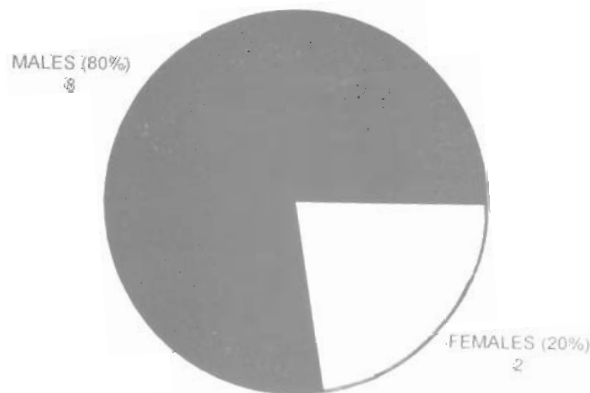
FIG-II, X-RAYS AFTER OPEN REDUCTION & INTERNAL FIXATION



**RESULTS**

1. A total number of ten cases with Symphysis Pubis diastasis were treated by this technique. Out of these eight were males and two were females. (Fig. III) All these patients ranged from an age group of thirty to sixty years

**SEX OF PATIENTS  
TOTAL NO. 10**

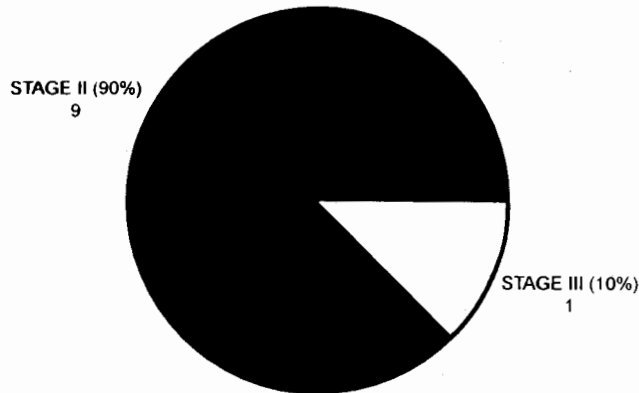


FIGG-III, SEX DISTRIBUTION OF PATIENTS REATED IN PRESENT STUDY

2. Out of these patients nine were with stage two diastasis and only one with stage three diastasis. Fig. IV.

## CLASSIFICATION PUBIC SYMPHYSIS DIASTASIS

**FIG-IV. DISTRIBUTION OF CASES OF PUBIC SYMPHYSIS DIASTASIS ACCORDING TO CLASSIFICATION**



MARVIN TILE (1984)

3. Isolated symphysis pubis diastasis was found in five patients. Three patients had vertical instability, two had fractures of Femur as well and only one patient had urethral injury.

4. Complications were seen in four patients. These are as follows:

There was wound infection in one of the patients which was successfully treated by wound toilet and antibiotics. Screw migration was seen in only one patient six months after surgery, this patient was an old man with severe osteoporosis. Sexual dysfunction was found in only one patient and this was also early and he recovered in 6

Months. Inguinal hernia occurred in one patient.

5. Wire failure, insecure fixation or loosening was found in none of the cases.

6. The patients were able to do full weight bearing (except those with associated fracture Femur or with vertical instability) within 48 hours after surgery.

### DISCUSSION

As it is quite evident from the results that this operative technique proved to be a stable method for internal fixation

in all these cases with Pubic Symphysis diastasis.

All of the four complications were not due to any fault in the operative technique as wire failure, insecure fixation or loosening was found in none of the cases. The cause of infection was possibly due to skin or air contamination. The screw migration was mainly due to the severe osteoporosis seen in this old patient. The sexual dysfunction and inguinal hernia could be related to the surgery.

The patients with isolated Pubic Symphysis Diastasis could do full weight bearing within 48 hours after surgery is a proof of the stability of this technique.

## CONCLUSIONS

Thus it can be concluded that technique appears to be the method of choice for the management of the Symphysis Pubis Diastasis (stage two & three). It provides good stability and thus makes early mobilization possible. The patient can do full weight bearing within 48 hours after surgery.

This technique also proved to be a simple, very economical and yet very stable method for the management of these problems. This also eliminated the need for 12 weeks bed rest or two plates to achieve a stable fixation. Moreover the incidence of wire cut through has also not been observed in our cases so far.

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