

< >

가

13 34 (21 - 64), 21 Tile B 3 , C

9 (56%) 가 13 3

: 88% 가 81% 가 50%

, 31% 14 , 2

. 16 2 , 1 3

3

:

:

가

가

*	1999	43
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742 • / 13 4

가 . 4
 , 2 , 7 , 3 ,
 5 , 9 , 2 .
 13 3 ,
 3 3 .
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 9
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 ,
 1996 1 1998 6
 16
 21
 7 , 9 43 (21-64)
 13 , 2 ,
 1 Tile B 3
 , C 13 (C1;8 , C2;3 , C3;2) (Table 1.), 16 14 (88%) 가
 9 (56%) (1), 13 81% 가
 (2), (1), 13 81% 1
 (1), (2), (2) Joel Matta ²¹⁾

Table 1. Classification of pelvic ring lesions

Type A : Stable (posterior arch intact)
A1 : Avulsion injury
A2 : Iliac wing or anterior arch fracture caused by a direct blow
A3 : Transverse sacrococcygeal fracture
Type B : Partially stable (incomplete disruption of posterior arch)
B1 : Open book injury (external rotation)
B2 : Lateral compression injury (internal rotation)
B2-1 : Ipsilateral anterior and posterior injuries
B2-2 : Contralateral (bucket handle) injuries
B3 : Bilateral
Type C : Unstable (complete disruption of posterior arch)
C1 : Unilateral
C1-1 : Iliac fracture
C1-2 : Sacroiliac fracture-dislocation
C1-3 : Sacral fracture
C2 : Bilateral, with one side type B, one side type C
C3 : Bilateral

From Tile M : JAAOS 4:143, 1996.

**Table 2.** Radiological result

Displacement	Initial reduction	F/U X-ray
Excellent(<4mm)	14	14
Good(5-10mm)	2	2
Fair(10-20mm)	0	0
Poor(>20mm)	0	0

14

, 2

(Table 2).

2

. 1

6

,

(3)

3

(2-3).

3

가

32

10mm

3

6

Tile type C2

5mm

8

(Fig 2).

. 13

4

가

3

,

,

20

가 가

가

1

24

, , pelvic sling

. 20

,

, Patric test ,

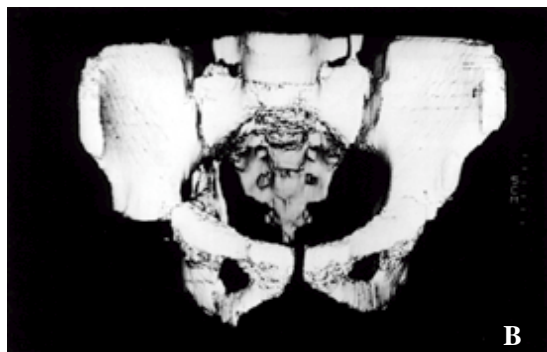
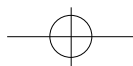


Fig 1A. Radiograph of 24-year-old woman with Lt widening of sacroiliac joint and Rt acetabular fracture.
1B. Preoperative Three-Dimension Pelvic CT
1C. Immediate post-operation. Anatomical reduction was done.
1D. Appearance 3 months after surgery. Displacement, nonunion and loosening of screws was not, and transfixation screws was removed.

가

가

. Lange Hansen⁸⁾ 6 2 , 7

, ,

가 (1.2cm) .

4 2

. 가¹⁾

Webb 2

5 .

. Kellam⁷⁾

resuscitation, provisional & definitive treatment

2cm

. Pohlemann¹⁴⁾ 4

. 73 (93%) , 5

80% . 1cm 가

resuscitation state . 28 25 2.2

. 21%

. 가

가

¹⁴⁾ .

, , 가



Fig 2A. Radiograph of 32-year-old man with Rt separation of sacroiliac joint and sacral fracture and Lt rami fracture

2B. Immediate post-operation. Anatomical reduction was done.

2C. In post-operative 8 weeks, displacement was not.

3,4)

16

15,17,18), 2

27%

7)

2%

L5 S1

L5

S1

가

4,5,17)

가

가

Matta

Tometta ²⁰⁾

Pelvic Outcome Score

SF-36 score

가

가

가

가

1).

가

. Gruen

3)

1

12 (81%)

가

Kellam

7)

10mm

, 20mm

Slatis Karaharju ¹⁹⁾

(; 5mm

1

, ;5-10mm, ;10mm

). Semba ¹⁶⁾

가 10mm

가

Joel Matta ²¹⁾

107

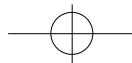
, 40 °caudad and cephalad view

REFERENCES

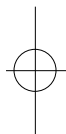
- 가 67% 4mm , 95% 10mm 가 3 107 102 10mm 88% 81%

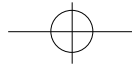
REFERENCES

 - 1) **Cole JD, Blum DA and Ansel LJ** : Outcome after fixation of unstable posterior pelvic ring injuries. *Clin Orthop*, 329:160-179, 1996.
 - 2) **Fell M, et al** : Long-term outcome after conservative treatment of pelvis ring injuries and conclusions for current management. *Zentralbl Chir*; 120(11):899-8904, 1995.
 - 3) **Gruen GS, Leit ME, Gruen RJ, Garrison HG, Auble TE and Peitzman AB** : Functional outcome of patients with unstable pelvic ring fractures stabilized with open reduction and internal fixation. *J Trauma*, 39(5):838-844, 1995.
 - 4) **Huittinen V-M** : Lumbosacral nerve injury in fracture of the pelvis. A postmortem radiographic and patho-anatomical study. *Acta Chir Scand*, 429(Suppl):1-43, 1972.
 - 5) **Huittinen V-M and Slati P** : Nerve injury in double vertical pelvic fractures. *Acta Chir Scand*, 138:571-575, 1972.
 - 6) **Johnson KD, Cadambi A and Seibert GB** : Incidence of adult respiratory distress syndrome in patients with multiple musculoskeletal injuries: Effect of early operative stabilization of fractures. *J Trauma*, 25:375-384, 1985.
 - 7) **Kellam JF** : The role of external fixation in pelvic disruptions. *Clin orthop*, 241: 66-82, 1989
 - 8) **Lange RH and Hansen ST** : Pelvic ring disruption with symphysis pubis diastasis. *Clin Orthop*, 201:130-137, 1985.
 - 9) **Latenser BA, Gentilello LM, Tarver AA, Thalgot JS and Batdorf JW** : Improved outcome with early fixation of skeletally unstable pelvic fractures. *J Trauma*, 31(1):28-31, 1991.
 - 10) **Leung KS, Chien P, Shen WY and So WS** : Operative treatment of unstable pelvic fractures. *Injury*, 23(1):31-37, 1992.
 - 11) **Matta JM, Saucedo T and Tornetta P 3rd** : Internal fixation of pelvic ring fractures. *Clin Oathop*, 242:83-97, 1989.
 - 12) **Michael A, Barry L and Spencer L** : Pelvic Ring Injures:A Long Term Functional Outcome Study. *Clin Orthop*, 329:152-159, 1996.
 - 13) **Moshieff R, Liebergal M, Fridman A, Sagiv S and Segal D** : Immediate posterior stabilization of pelvic fractures using threaded compression rods. *Harefuah*, 131(7- 8):217-221, 1996.
 - 14) **Pohlemann T, et al** : The Hanover experience in management of pelvic fractures. *Clin Orthop*, 305:69-80, 1994.
 - 15) **Roult ML Jr, Simonian PT and Mills WT** : Iliosacral screw fixation: early complications of the percutaneous technique. *J Orthop Trauma*, 11(8):584-589, 1997.
 - 16) **Semba R, Yasukawa R and Gustilo R** : Critical analysis of results of 53 Malgaigne fractures of the pelvis. *J Trauma*, 23:535-537, 1983.
 - 17) **Shuler TE, Boone DC, Gruen GS and Peitzman AB** : Percutaneous iliosacral screw fixation: early treatment for unstable posterior pelvic ring disruptions. *J Trauma*, 38(3):453-458, 1995.



- 18) **Simpson LA, Waddell, Leighton RK, Kellam JF and Tile M** : Anterior approach and stabilization of the disrupted sacroiliac joint. *J Trauma*, 27:1332-1339, 1987.
- 19) **Slatis P and Karaharju E** : External fixation of unstable pelvic fractures: Experience in 22 patients treated with a trapezoid compression frame. *Clin Orthop*, 151:73-80, 1980.
- 20) **Tornneta, Kyle Dickson and Matta** : Outcome of rotationally unstable pelvic ring injuries treated operatively. *Clin Orthop*, 329:147-151, 1996.
- 21) **Tornneta and Matta** : Outcome of operatively treated unstable posterior pelvic ring disruptions. *Clin Orthop*, 329:186-193, 1996.





Abstract

Prognosis of early internal fixation in unstable pelvic fractures

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Purpose : This study was conducted to analyze the clinical prognosis of early internal fixation in unstable pelvic fracture.

Material and Method : We analyzed the sixteen patients. The average age of the patients was 34 years(range, 21-64 years). They were followed up for average 21 months. The sixteen pelvises were classified by Tile ; Type B 3 cases, Type C 13 cases. Nine patients(56%) had the associated injuries. In 13 patients(81%), internal fixation were performed within 3 weeks after the injury. Fixation was accomplished by the plates and screws. We assessed the functional, radiological results and postoperative complications.

Result : Fourteen(88%) patients were fully ambulatory, had no limp, did not need assistive devices. Fifty percents of the patients had returned to the previous jobs and 31% had to change the jobs. On radiograph, there were 14 excellent and 2 good reduction. Three postoperative complications happened ; two superficial infections and one lumbar neuropathy, which resolved spontaneously. Three patients with associated injuries, who had delayed fixation, appealed gait disturbance and chronic pain.

Conclusion : early internal fixation of unstable pelvic ring fractures may be expected to yield satisfactory functional success and radiologic results in the majority of patients

Key word : pelvis, unstable fracture, early internal fixation

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