



Outcome of Unstable Pelvic Fractures after Internal Fixation: Our Experience

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Abstract

Introduction: Pelvic Fractures are usually associated with high intensity trauma, as those seen in traffic accidents. These patients present at emergency department as polytrauma and unstable pelvic fractures which has a very high mortality and even higher morbidity. Internal fixation surgery in an integral part for its management allows for a better outcome.

Material and Methods: Fifteen patients with unstable pelvic fractures after traffic accidents, treated with internal fixation surgery between 2012 to 2018 were retrospectively reviewed. Every patient had a Tile B or Tile C fracture and was followed up at a minimum of 6 months. The outcome was performed according to Survey form 36v2, Majeed pelvic score, Iowa pelvic score, Pain Visual analog score.

Results and Discussion: The average age was 48 years old and a mean follow up time of 30 months. Sixty percent had a Tile C fracture and the mean time between admission and discharge was 31 days. The mean time between admission and surgery was 13 days. Seven patients were female and 8 patients were male. The main cause of the fracture and run over accidents and motorcycle accidents. The mean score for physical SF36v2 was 60% and emotional SF36v2 was 54%. The mean VAS pain score was 3.7/10 and more than half didn't limp at final observation. The mean Majeed pelvic score was 81% and Iowa pelvic score was 70.5%.

Conclusion: The outcome of unstable pelvic fracture after internal fixation was very good with a Majeed pelvic score of 81%.

Keywords: Pelvic Fracture; Outcome unstable pelvic fracture; RTS; ISS

Introduction

Pelvic Fracture is the leading cause of morbidity and mortality in musculoskeletal trauma. Inside this group, the unstable pelvic fractures are the ones with higher rate of morbidity. Mechanism typically is a high energy blunt trauma and the mortality rate is around 1% to 15% for closed fractures, but it can be as much as 50% for open fractures with hemorrhage being the leading cause of death overall [1,2]. Closed head injury is the most common cause of death for lateral compression injuries. The mortality is increased when associated with systolic BP<90 on presentation, age >60 years, increased Injury Severity Score (ISS) or Revised Trauma Score (RTS), need for transfusion >4 units, higher Young-Burgess classification grade. Usually it is associated with other injuries as chest injury in up to 63%, long bone fractures in 50%, spine fractures in 25%, sexual dysfunction up to 50%, head and abdominal injury in 40% [3]. The prognosis is affected by SI joint incongruity of >1 cm, high degree initial displacement, malunion or residual displacement, leg length discrepancy >2 cm, nonunion, neurologic injury. This complex fracture is highly associated with chronic pain, sexual dysfunction, and infection [4].

The initial treatment of these fractures consists of bleeding management, hemodynamic restoration, stabilization of the pelvic ring, and a quick and accurate diagnosis and surgery. As a damage control procedure, patients are initially stabilized with an external fixator for temporary pelvic stabilization, and when the patient's hemodynamic state stabilized, definitive internal fixation surgery was performed, usually in 5 to 7 days.

The present study aims to critically assess the short/medium-term outcome in unstable pelvic fractures by traffic accident internally fixated with surgery [5].

Material and Methods

In this retrospective study, we analyzed fifteen patients with unstable pelvic fracture who were

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Figure 1: Tile C pelvic fracture in a 26 years old male after a motorcycle accident.



Figure 2: Inlet view after anterior plate fixation (Stoppa approach with left iliac lateral window), and posterior fixation with percutaneous sacro-iliac screws.

treated with internal fixation in our center, by the same surgeon, between 2012 and 2018. The inclusive criteria were patients with pelvic fracture rotationally or vertically unstable (Tile B or Tile C, respectively), who were submitted to internal fixation after temporary external fixation. Those who just received external fixation as the definitive treatment were excluded. Besides demographic analyses of all patients, the functional outcome was evaluated according to the Survey Form 36v2 (SF36v2), Majeed score, Iowa Score, VAS, degree of limp and return to previous work. All data were analyzed with SPSS.

Results

Among the 15 patients studied, the mean age was 48.4 years old (18-74 year old) and the mean follow-up time was 30 months (minimum of 6 months). Seven patients were female and 8 patients were male. Eight (53%) patients were run over by a car, 4 (27%) had a motorcycle accident, and 3 (20%) had a car accident. The mean time between admission to emergency department to definitive treatment was 13.4 days (minimum 6 and maximum 26), and the mean time between admission to emergency department and hospital discharge was 31.9 days (minimum 7 and maximum 85 days). 80% of the patients had associated lesions, being the most common rib fracture (4), Acetabular fracture (3), appendicular system fracture (4), and urogenital lesion (3). According to classification of Tile, 40% had a Tile B Fracture and 60% had a Tile C Fracture. According to Young-Burgess classification, 33.3% had an Anterior Posterior Compression (APC) fracture, 26.6% had a Lateral Compression (LC) fracture, and 33.3% had a Vertical Shear (VS) fracture. At time of admission, only 66.6% were submitted to an external fixator as temporary fixation, while 33.3% remained with and pelvic binder. Our surgical approach to every patient was the modified Stoppa approach for anterior fixation and for those who were vertically unstable it was performed a percutaneous iliosacral screw (Figure 1 and 2).

The outcome was measured with different scores. The emotional SF36v2 score was 54.2 and the VAS score was 3.7/10. Only two



Figure 3: 56 year's old male with a Tile B pelvic fracture after a car accident.



Figure 4: Tile B pelvic fracture after anterior stabilization with 2 plates at pubic symphysis.

patients returned to the same work previously to the trauma. Only one patient reported pain during sex activities and 10 patients limp. The mean Majeed pelvic score is 81 and the mean Iowa pelvic Score is 70.5.

Discussion and Conclusion

The unstable pelvic fractures presented in this study were all from traffic accident. This is consistent with the literature that more than 90% of pelvic fractures result of traffic accidents. The mean age of patients was a little older (48 year old) than the mean age of Mardanpour et al. (37 year old) [4], mainly because the majority of patients was run over and was not driving the vehicle. In this small case series, we only had one case of infection, which represents a rate of 6.6% of infection, which is higher than the 4.3% reported from the literature [6].

Pelvic fractures that were just rotationally unstable (Tile B), they were just stabilized anteriorly (Figure 3 and 4) with plate and screws. The Tile C fractures were added a minimum of 2 posterior screws at Sacro-iliac joint. Controversially to the literature, in our study there was no difference in the outcome between Tile B and Tile C fractures (Figure 5). Tile B fractures had a mean physical function 57.5%, emotional function 56%, VAS score 3, Majeed pelvic score of 81.75 and Iowa pelvic score of 69. Tile C fractures had a mean physical function 63.3%, emotional function 52%, VAS score 4.6, Majeed pelvic score of 80 and Iowa pelvic score of 72.6. According to Pohlemann and Mardanpour study, 81% of Tile type B cases were excellent and good functional score, while for Tile type C, excellent and good functional score only reached in 73% of the cases [7,8]. Both researches also explained that the percentage of excellent and good functional score in Tile type B fracture is better than Tile type C fracture. In our study, surgical scar was only a problem for woman patients, and most of the patients just report a mild pain



Figure 5: A 35 years old male, motorcycle accident, 8 months to return to same work with the same performance.



Figure 6: A 25 years old female, motorcycle accident, and 8 months to return to the same work with inferior performance than before the accident.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	6,000 ^a	5	,306
Likelihood Ratio	8,318	5	,140
Linear-by-Linear Association	,005	1	,943

Figure 7: No difference between Tile classification and Majeed Score using Chi-Square test.

with sexual activities. In some published data, almost 21% patients report sexual dysfunction, although in our series of cases, no patient has experienced sexual dysfunction [9,10]. Another difference of this study to the literature is that we didn't find any difference in the outcome between internal fixation before or after 10 days [11].

Overall most of the patients in our study don't limp, and have returned to the same job as previously the accident. Our global Majeed score is 81 and Iowa pelvic score is 70 (Figures 5-7).

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