WHICH IS THE BEST TREATMENT OPTION FOR OPEN BOOK PELVIC FRACTURES! INTERNAL FIXATION OR EXTERNAL FIXATION.

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ABSTRACT

Introduction: Pelvic fractures occurs in three percent of all fractures. Adult pelvic fractures are usually categorized as unstable and stable. **Objective:** The aim of the analysisis to compare results between internal and external fixation methods for fixation of pelvic fracture. **Study Design:** A prospective randomized trial. **Place and Duration:** In the Orthopedic Department, from March 2018 to March 2020 (Two Years) **Methods:**In our study of about 24 months; according to the Tile's classification, open book pelvic fractures were managed by two alternative methods: internal fixation using plate and screws and External Pelvic Fixator. Data was analyzed according to the Performa protocol and SPSS 25.0 was appliedfor this purpose and chai-square test was used for variables. **Results:**In our study we included Twenty-four open book fracture patients. We distributed them in group A and in group B. Twelve patients were managed byexternal fixators in Group A and O.R.I.F method was applied in 12 patients in Group B using plate and screws. For both group; total observation duration was six months. Patients were surveyed radiographically and clinically with Majeed pelvic score and satisfaction of patient. Generally, there were 9 excellent, 7 good, 4 fair and 5 bad. Amongexcellent 9patients 2 were from group A and 7 were from group B. Among 7 good results; 3 were from A and 4 were from B group. Captivatingly, there were no unsatisfactory results in group B and bad results while there were 4 fair results and 5 poor results in the group. A. This transformation is statistically very important with <0.002 p value. **Conclusion:**Open reduction and internal fixation with plate and screws provides best and improved results as compared with external fixator fixation for open book pelvis fractures

Keywords: Open book pelvic fracture, Pelvis fracture, External fixation, internal fixation.

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INTRODUCTION

Pelvic fractures occurs in three percent of all fractures. Adult pelvic fractures are usually categorized as unstable and stable[1-2]. Stable fractures are caused by trauma of low energy, likesimple fall in elderly patients and are treated simplywith rest and walking or crutches. While unstable fractures have noteworthy mortality and morbidity[3-4]. Falls and road traffic accidents are often cause of the high-energy trauma. Unstable open book pelvic fractures have 25% mortality rate. The bowl-shaped bone pelvis,supports the spine and shields the abdomen organs.The pelvis, alike other bones, is subject to injuries[5-6]. It may break due to forces of high-energylike road traffic accident or falling from high altitude. The pelvic fractures incidence is increasing with increased road traffic accidents[7]. The most common mortality cause is bleeding into the retroperitoneal space[7-8]. About 6% of pelvic fracture patients need hospitalization, and 5-16% die despite of best treatment. The Tile's classified pelvic fracturesinto 3 types as A, B, and C. Type "A" simple fractures are about 16%, "B" rotationally unstable pelvic fracture 49%, and a "C" vertical and rotational pelvic fracture 35%[8]. Open book fractures are classified as type B. In this type of fracture, the right and left pelvis halves are divided into rear and front.The pelvis is opened more at anterior side as compared back side and it appears like a book. B1, B2, and B3 are the sub classes of type B fracture. In B1 type, symphysial diastasis of open book is below to 2.5 cm. In B2 type, it is above 2.5 cm, and B3 has compression on lateral side[9-10]. B2 type is unstablepelvis fractures mostlynecessitate stable reduction and stabilization in the primary post-traumatic period, which minimizes morbidity and

mortality. In practice, 2 procedures are more frequently used to treat such pelvic unstable fractures. The one is close reduction andexternal fixation, the other open reduction and fixation with plates and screws[11-12]. In Pakistan, the unstable pelvic fractures incidence is growing daily because of high-energy trauma such as industrial accidents and road accidents.

To address this issue, this study was conducted to identify the utmostsuitablemanagementfor pelvic unstable fractures.

MATERIAL AND METHOD

We conducted this prospective randomized trial in the Orthopedic Department of our hospital for two years duration from March 2018 to March 2020.By systematic sampling; 24 total patients were divided into 2 groups, fixator group was used in A Group and open reduction and fixation with plate and screws was used in B Group. All patients with open book fractures who sustained injury within a week, no other injury, age range between 16 and 50 years and both male and females were included in the study. Patients younger than fifteen years and older than fifty years of age,metabolic bone disease, Tile's type A and C, open pelvic fracturesand known hip, knee arthritis and rheumatoid arthritispatients were not included.

Data collection procedure: 24 patients were selected after the criteria selection. All patients reported to the ER department. After the first fluid resuscitation, all patients underwent X-ray, ultrasound and computed tomography for bone and visceral changes. Painkillers, antibiotics, prophylaxis against D.V.T were given. As an initial emergency room management external pelvic binder was applied to all patients and were prepared for the final surgery.

GROUP A: 12 patients were selectedfor this group. Pelvic stabilization was performed with an external fixation. After preparation, Schanz screws were placed on both sides at iliac crest, these screws were fixed with anexternal compression rods. Pelvic diastasis was decreased, and the postoperative image was confirmed with an image intensifier, and then postoperative care was given. The volunteers were allowed to walk with a partial weight bear load and on the third postoperative day; the patients were discharged and advised to take care with cleaning the pin area.

GROUP B: A total of 12 patients from this group were examined. Internal fixation was used to stabilize the pelvis from the lower transverse incision (modified Pfannenstiel). Dissection separated the symphysis, and the pubic bones were subperiosteally exposed. Manullay compression was given to reduce the pubic diastasis and fixed with plate screws having 2 screws on either side of diastasis.

Follow-up: The timeframe and assessment tools were the similar in A and Bgroups. After 3-4post-operative days all patients were discharged after the surgery. Every subject was instructed to revisit after 2 weeks for suture removal, then repeat follow-up in opd every 4 weeks for two years. At every follow-up visit, the functional score was assessed clinically and radiographically using Majeed's Pelvic Score (1989).

- 20 Points of Work.
- 30 Points of Pain.
- 10 points of Sitting.
- 36 Points of Standing.
- 4 Points of Sexual Intercourse.

A- 12 Points of Walking Aids
B-12Points of Gait Unaided.
C- 12 Points of Walking Distance.
100 clinical scores for the study. > 85 Excellent, Good70-84, Acceptable55-69, Less than 55 Poor.

Data Analysis: Data was gathered using Performa. By a non-parametric chi-square test using SPSS 25 data was analyzed. Treatment results was evaluated based on the patients' functional assessment, namely the Majeed pelvic assessment, which includes pain, condition, sexual relations, and if no attempt was made to have intercourse for any reason, the four points that scored more were also assessed in the pre-traumatic workplace or activities. The highest score is 100.

RESULTS

The mean age of the patients in this study ranged from 19 to 50 years, but was 32.65 ± 9746. It was more common in patients aged 21-25. In our study, the majority of patients were male 70% and 30% female. P-value was noted<0.007. Generally, there were 9 excellent, 7 good, 4 fair and 5 bad. Among excellent 9 patients 2 were from group A and 7 were from group B. Among 7 good results; 3 were from A and 4 were from B group. Captivatingly, there were no unsatisfactory results in group B and bad results while there were 4 fair results and 5 poor results in the group A (Table:1).

Table 1: Result of the two groups at final follow-up

Category	Group A	Group B
Excellent	2	7
Good	3	4
Fair	4	0
Poor	5	0

Intestinal injuries were supposed in 7 cases. Intestinal injuries were treated by general surgeonsconservatively. The percentage of infections of pin tract in group A was 30%, and infections of the superficial wound in group B - 15%. The deep infection in A Group was noted in four cases and a Schanz screw breakage in two case, but no such infection was noted in group B. The results were scrutinized using Majeed Pelvic score and regular x-rays were taken. Chronic osteomyelitis developed in a patient treated with an external fixator. He was

managed with systemic antibiotic therapy curettage and after that he became fine.

DISCUSSION

In major traumas unstable pelvic fractures are life-threateninginjuries andshould be stabilized as soon as possible on highest priority. In 1980; Mears treated an unstable pelvic fracture with an external fixator. In the mean follow-up of five to six years, 30 subjects were omitted from the study due to 30 involvement of acetabulum and 219 cases remained[15]. In 47.5% of cases, the results were unsatisfactory due to various problems, including 4% of the leg length, 35% non-union and 40% pain. External fixation has been extensively chosen for the final B-2 fractures treatment[16]. In 1989; Kellam achieved and maintained an 83% compression in B-2 typefractures using an external fixator, and patients were functionally normal if an adequate reduction was maintained (displacement less than 1 cm). In 1996; Cole et alstated that manycomplicationsrelated with external fixation were associatedwith an inability to sufficiently stabilize the posterior pelvic ring portion[17-18]. As a result, pelvic back pain, seat imbalance attributed to abnormal pelvis, and reducedmovement levels have been reported. Lindahl, Bostaman, in 1999, examined 110 patients with unstable fractures managed by an external fixator who observed a high complication rate; With 57% lessening, non-union 5%, mal-union 58%, subsequent pin track contamination is 24%[19-20]. In this analysis, pin tract infection noted in three patients in A group and superficial infection in only one patient in group B. In group A, two Schanz screws were broken, but the implant was not broken. Tornetta et al. In 1996, 29 patients with unstable pelvic ring injuries managed with internal fixation for more than three years of follow-up were reviewed[21-22]. Symphysis pubic disruption was the main indication for surgery. In follow-up, 96% felt no pain or only painful activity. 76% walked without aids or restrictions; 76 percent returned to work before being disabled. Rizwan and Awais in1996 treated 10 unstable pelvic fractures with tension band wiring[23-24]. They concluded that this technique provides stable mobilization. Maru 2005 reports that the Majeed pelvic scale was used in a study of 19 patients with open reduction and stabilization of the inner plate[25]. 9 excellent results were obtained, 7 good, 1 satisfactory and 1 bad, depending on the results, the best results were obtained with the internal pressure of the inner knife and the inner tip. He recommended that open reduction and internal fixation provide best fixation stability and clinical outcomes in unstable open book fractures. In this study, 6 of the 7 excellent results were open reduction and 6 were excellent results of internal stabilization

CONCLUSION

Open reduction and internal fixation with plate and screws provides best and improved results as compared with external fixator fixation for open book pelvis fractures.

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