**FUNCTIONAL OUTCOME OF UNSTABLE PELVIC FRACTURES**

**Dr. Kapil Pawar1, Dr. Deepak S. Howale2**

**1**Associate Professor, Dept. of Orthopedics Govt. Medical College and Shri Vinoba Bhave Civil Hospital Silvassa.

**2**Dean Govt. Medical College and Shri Vinoba Bhave Civil Hospital Silvassa.

**ABSTRACT:**

Globally, the major cause of morbidity and mortality in the younger age group is due to high- energy trauma. The connection suffer the loss of a young, active member of the population is recognizable of personal, social and economic losses to the family as well as to the nation. The mortality of major pelvic fractures without being affected by improvements in management is about 10%. Pelvic fractures constitute1- 3% in human body anatomically all skeletal injuries and about 2% of orthopaedic hospital admissions. The risk factors associated with fractures of pelvis have been identified as the age of the patient, females, mode of injury and accidental crash (lateral impacts by a heavy vehicle). More likely to be involved in these accidents are Younger people. Early death is usually due to sepsis, hemorrhage and multiple organ system failure about 40 to 50 % after these injuries. Many modalities of stabilization have been offered for pelvic fractures but the stabilization of pelvic fractures by external fixation has created large change in the management of trauma. External fixation plays not only part of revive but also dramatically altering the survival rate. Therefore many studies have claimed for good results in the functional aspect of external stabilization. **Aim:** The main aim of this study is to determine functional outcome and external fixation in the management of pelvic fractures. **Material and method:** This is a retrospective Study which is carried out in the department of orthopedics in Shri Vinoba Bhave Civil hospital, Silvassa. All patients with unstable pelvic facture who underwent surgical intervention and treated with external fixator were included in this study. Total 40 patients were included in this study with the age range from 20 years to 60 years. From all the patients for the records of data as documentation was collect by physical examination, past and present history and medical assistance and investigation such as Mode of Injury, surgery, radiographies and pattern of fracture were taken. All the Cases were followed up periodically by clinical and radiological assessment during the study. **Result:** Total 40 patients were include in this study in which age of the patients range from 20 years to 60 years. Total there are 26 male and 14 female patients. All the patients with different type of pelvis facture were evaluated. Among 40 patients, 14(35%) patients had type of injury, 16(40%) patients were in type B and 10(25%) patients were in type C. out of 40 patients, 12(30%) patients had Lower extremity fractures injuries while 9(22.5%) patients had Head injury of different levels of severity. 8(20%) patients had acetabulom fracture out of 40 patients and 7(17.5%) patients had upper extremity fractures and 3(7.5%) & 1(2.5%) patients had Urogenital injury & Urogenital injury respectively. **Conclusion:** Major cause for mortality and morbidity is a pelvis Fracture and that can be decreases by External stabilization with external fixator. Pelvis fracture associated injuries are common and often have substantial effect on the patient’s psychological status and rehabilitation period is prolonged. Therefore, proper management relent outcome is satisfactory. Hence, combination of external fixator and internal fixation was necessary in unstable pelvic as compared with stable or partially stable pelvic fracture.

**Keywords:** Pelvis, Fracture, External fixator, clinical outcome

**Introduction**

Globally, the major cause of morbidity and mortality in the younger age group is due to high- energy trauma. The connection suffer the loss of a young, active member of the population is recognizable of personal, social and economic losses to the family as well as to the nation. The mortality of major pelvic fractures without being affected by improvements in management is about 10%[[1]](#endnote-1),[[2]](#endnote-2)&[[3]](#endnote-3). Recent study on pelvic fractures have given importance to the incidence of the injury is steadily increasing. Pelvic fractures constitute1- 3% in human body anatomically all skeletal injuries and about 2% of orthopaedic hospital admissions[[4]](#endnote-4),[[5]](#endnote-5). In persons a bimodal pattern The frequency of pelvis fractures occurs with peak observed in aged 20-40 years and later in aged older than 65 years[[6]](#endnote-6). The incidence related to pelvic fractures ranges between 13-17% of all cases and has been specified death as a result of pelvic fracture occurs in less than 1% of the patients admitted with this injury[[7]](#endnote-7),[[8]](#endnote-8). In trauma the third most common cause of death represent Pelvic fractures[[9]](#endnote-9),[[10]](#endnote-10). For trauma patient due to Delayed recognition and inappropriate management with pelvic injury can lead to a poor and fatal outcome[[11]](#endnote-11). The risk factors associated with fractures of pelvis have been identified as the age of the patient, females, mode of injury and accidental crash (lateral impacts by a heavy vehicle)8. More likely to be involved in these accidents are Younger people. Early death is usually due to sepsis, hemorrhage and multiple organ system failure about 40 to 50 % after these injuries6. Study done by Tornetta et al has achieved a high long-term success rate with operative management of pelvic fractures whereas Study done by Mirada et al has found no difference on cases of pelvic fractures in the outcome among operatively and non-operatively managed4,[[12]](#endnote-12). Many modalities of stabilization have been offered for pelvic fractures but the stabilization of pelvic fractures by external fixation has created large change in the management of trauma. External fixation plays not only part of revive but also dramatically altering the survival rate[[13]](#endnote-13),[[14]](#endnote-14). Therefore many studies have claimed for good results in the functional aspect of external stabilization. The main aim of this study is to determine functional outcome and external fixation in the management of pelvic fractures.

**MATERIAL AND METHODS**

This is a retrospective Study which is carried out in the department of orthopedics in Govt. Medical College and Shri Vinoba Bhave Civil hospital, Silvassa. All patients with unstable pelvic facture who underwent surgical intervention and treated with external fixator were included in this study. Total 40 patients were included in this study with the age range from 20 years to 60 years. From all the patients for the records of data as documentation was collect by physical examination, past and present history and medical assistance and investigation such as Mode of Injury, surgery, radiographies and pattern of fracture were taken. All the Cases were followed up periodically by clinical and radiological assessment during the study.

All the patients having pelvic fractures were classified and have divided into three types A, B and C by the Tile classification adopted by the OTA[[15]](#endnote-15) as shown in table below.

**Table 1: Pelvis injuries classification by Tile M**

**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

**RESULTS AND OBSERVATIONS**

**Table 1: Age and gender wise distribution**

|  |  |
| --- | --- |
| **Age group(years)** | **No of patients** |
| 20-31 | 17 |
| 31-40 | 13 |
| 41-50 | 7 |
| 51-60 | 3 |
| **Gender** | **No of patients** |
| Male | 26 |
| Female | 14 |

Total 40 patients were include in this study in which age of the patients range from 20 years to 60 years. Total there are 26 male and 14 female patients.

**Table 2: Applied treatment methods in different groups (n=285)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **Treatment**  |  |  |
| **Type of Fracture/ Treatment Group** | **No of Patients** | **Conservative** | **Open Reposition & osteosynthesis** | **Transosseous osteosynthesis with external fixation** | **Combined Osteosynthesis** | **No. of surgery performed in each group** |
| **A ( Group I)** | 14(35%) | 2 | 1 | 4 | 3 | 4 |
| **B (Group II)** | 16(40%) | 1 | 4 | 2 | 3 | 6 |
| **C(Group III)** | 10(25%) | 1 | 1 | 4 | 2 | 2 |
| **Type of treatment as a whole** | 40 | 4(10%) | 6(15%) | 10(25%) | 8(20%) | 12(30%) |

From the above table it shows that all the patients were classified in different group as group I, II & III according the classification as type A, B & C. Patients with the minimal displacements, were managed by traditional conventional ways without anatomic-functional disorders. With the use of backbone apparatus as external fixator were applied in pelvic injuries of type B1, type B2 fractures and in type C1.1 fractures when there is a partial congruence of the sacroiliac joint. Stabilization with external fixator and internal fixation were performed in the patients with severe rotational and vertically-unstable injuries.

From the above table all the patients with different type of pelvis facture were evaluated. Among 40 patients, 14(35%) patients had type A injury, 16(40%) patients were in type B and 10(25%) patients were in type C.

**Table 3: List of associated pelvic injuries**

|  |  |
| --- | --- |
| **Associated injury type** | **No of Patients (Percentage %)** |
| **Lower extremity fractures** | 12(30) |
| **upper extremity fractures** | 7(17.5) |
| **Head injury** | 9(22.5) |
| **Acetabulom fracture** | 8(20) |
| **Urogenital injury** | 3(7.5) |
| **Urogenital injury** | 1(2.5) |

Out of 40 patients, 12(30%) patients had Lower extremity fractures injuries while 9(22.5%) patients had Head injury of different levels of severity. 8(20%) patients had acetabulom fracture out of 40 patients and 7(17.5%) patients had upper extremity fractures and 3(7.5%) & 1(2.5%) patients had Urogenital injury& Urogenital injury respectively as shown in above table.

**Table 4: Overall functional outcome (n=40)**

|  |  |
| --- | --- |
|  | **Functional outcome** |
|  | **Excellent** | **Good** | **Intermediate** | **Weak** |
| Type A | 6 | 4 | 3 | 1 |
| Type B | 3 | 5 | 5 | 3 |
| Type C | 2 | 2 | 4 | 2 |
| **Total** | 11(27.5%) | 11(27.5%) | 12(30%) | 6(15%) |

According to the Majeed’s score, functional outcome as total combination of type A, type B and type C pelvic fracture after the undergoing treatment 27.5% of patients present excellent, 27.5 % good and 30% Intermediate and 15% weak clinical outcome as shown in above table.

**DISCUSSION**

A life threatening emergency appropriate As pelvic fracture in which careful and rapid general assessment and precise radiological studies are carried out to determine the displacement and degree of instability present in order to plan the management. Historically, depending on their severity pelvic injuries had been treated by a variety of closed methods. Unstable pelvic injuries treated by conventional measures often result in significant disability, besides the mortality can reach up to and about 21.8% 3,15,[[16]](#endnote-16),[[17]](#endnote-17). The most common cause of pelvic fracture is a Road Traffic Accident which involved 70% of patients[[18]](#endnote-18). As the study done by Berner et al morbidity and mortality of the patients with open pelvic fractures were higher than in patients with closed injuries were reported where as Kobak et al studied reported death due to sepsis in a patient with open fracture which is less similar to this study[[19]](#endnote-19),[[20]](#endnote-20). The unstable pelvic injuries can be Stabilisation by achieving external and/or internal fixation[[21]](#endnote-21). Pelvic fractures are still among the most devastating musculoskeletal injuries despite advances in knowledge regarding underlying pathophysiology and enhancements in the surgical techniques[[22]](#endnote-22),[[23]](#endnote-23). According to the study Moreno et al and Dalal et al due to motor vehicle collision 40% and 57% were unstable pelvic fractures respectively[[24]](#endnote-24),[[25]](#endnote-25). A study done by Sen et al reported that there is no such relationship between fracture types and mechanism of injury where as in this study also not evaluation of such relationship[[26]](#endnote-26). According to study of Arroyo et a, determined the risk factors of complications such as infection, thromboembolism and cardiac events in patients with pelvic fractures. Injuries caused by mechanisms other than blunt trauma, shock, age, and medical co-morbidities, time to procedure were associated with infection.[[27]](#endnote-27),[[28]](#endnote-28). In this study, there is observation that external fixation using backbone apparatus had major role during surgical treatment of pelvic bone fracture. Therefore, more combination of external fixation and internal fixation was necessary in unstable pelvic fracture compared with stable or partially stable pelvic fracture.

There are some limitations in this study which as summarized below: its retrospective design limited by its value of this study, lack of a control group and long term outcome. The interpretation of treatment outcome of pelvic fracture patient may be biased by neurological and other concomitant injuries.

**CONCLUSION**

Major cause for mortality and morbidity is a pelvis Fracture and that can be decreases by External stabilization with external fixator. Pelvic fractures by high-energy traumas are severe lesions and a great number of associated lesions. By using simple and minimally invasive method it can be readily applied even under local anesthesia. Pelvis fracture associated injuries are common and often have substantial effect on the patient’s psychological status and rehabilitation period is prolonged. Therefore, proper management relent outcome is satisfactory. Hence, combination of external fixator and internal fixation was necessary in unstable pelvic as compared with stable or partially stable pelvic fracture.

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