

## MANAGEMENT OF OPEN TIBIAL FRACTURES AT AYUB TEACHING HOSPITAL, ABBOTTABAD

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*Background:* Open fractures of tibia are usually caused by high-energy injury. Management of such injuries requires care of contaminated soft tissue injury involving skin, muscles and neurovascular structures. Treatment of fracture, which is badly comminuted and potentially contaminated, is always a problem. While limb salvage is the initial aim, medium and long-term problems with soft tissue cover, infection and union are all too common and result in serious disability. *Methods:* 32 open grade-III tibial fractures were treated with AO (Arbeitsgemeinschaft für Osteosynthesefragen) tubular external fixator. The management and outcome were reviewed and tabulated. *Results:* One out of 32 required primary amputation due to delayed vascular repair. The remainder received standardized wound care consisting of surgical debridement and delayed closure of wound. Once the soft tissue envelope healed and fracture was sticky external frame was removed and patella tendon bearing cast applied. In selected cases internal Fixation was done (n=8, in 5 intramedullary nailing and in 3 plating). Nineteen cases were treated in PTB cast and 4 cases in external fixation till union. Deep infection rate was 13% and pin tract infection 10%. In 31 cases union was achieved in 32 weeks (24 weeks to 62 weeks).

### INTRODUCTION

Open fractures of tibia are usually caused by high-energy injury. Management of such injury requires care of contaminated soft tissue injury involving skin, muscles and neurovascular structures and treatment of fracture, which is usually badly comminuted and potentially contaminated. While limb salvage is the initial aim, medium and long term problems with soft tissue cover, infection and union are all too common and result in serious disability.<sup>1,2</sup> Unique anatomy of tibia with its associated soft tissues and their vulnerability to severe injury produces most of these problems.<sup>3,4</sup> The established management of severe open fracture is based on a philosophy of initial wound debridement and lavage, stabilization of the fracture and delayed wound closure.<sup>5</sup> The bone is usually stabilized with an external fixator. Soft tissue cover is delayed to allow for wound swelling and facilitates a second look procedure to reassess tissue viability. Few surgeons are now recommending early closure of wounds and in their view early closure gives better results in term of infection and union.<sup>6</sup> We managed 32 cases of open fractures of tibia at Department of Orthopaedics, Ayub Medical College; analysis of their result is presented.

### MATERIAL AND METHOD

The study was conducted from January 1999 to December 1999. Patients with open tibial fractures presenting to A/E Department of Ayub Medical College were included in the study. All open fractures were classified according to Gustilo et al classification of open fracture.<sup>2</sup> Only patients with Grade-III open fractures of tibia were included in the study.

All patients were examined and evaluated in A/E department. Wounds were examined and covered with sterilized gauze. They were prepared for surgery. First dose of I/V antibiotics was given in A/E. Usually first

generation Cephalosporin along with Gentamycin were used.

In operation theatre wound was washed thoroughly and debridement of wound was done. All dead and devitalized tissues were removed, wound washed with at least 10 liters of normal saline. All wounds were left open and no attempt was made to close the wound primarily. Fracture was stabilized with external fixator. One plane or two planes unilateral frames were constructed.

Wounds were re-examined in O.T. after 48 hours and if required a second debridement was done. Wounds were again examined after 48 hours and further debridement or wound closure done. If wound was not clean, daily dressing and cleaning of wound was done, till the wound was clean and ready for closure.

Once the soft tissue problem was taken care of, a decision was made about removal of external fixator. After 6-8 weeks, fixator was removed and (PTB) patella tendon bearing cast applied. In selected cases dynamic compresses plating (DCP) or intramedullary nailing was done.

In cases of delayed union bone grafting was done, usually after 2-3 months.

### RESULTS

We reviewed 32 extremities; all had been followed up to the end of their clinical course. There were 26 men and 6 women, with mean age of 31 years (10 years to 66 years).

Majority of fractures were caused by automobile accidents<sup>10</sup> and pedestrian vehicle accidents. Fall from height and motor cycle accidents were responsible for 6 each. Two were caused by gunshot injuries (Table-1).

Out of 32 cases, 16 were grade-III A, 14 were grade-UI B and 2 were grade-III C (Table-2).

**Table-1: MECHANISM OF INJURY (n=32)**

MEDIA	NO.
Automobile accidents	10
Pedestrian vehicle accidents	8
Motorcycle accidents	6
Fall from height	6
Gunshot wounds	2

**Table-2: TYPES OF FRACTURE (n=32)**

GRADE	NO
Grade III-A	16
Grade UI-B	14
Grade III-C	02

**Table-3: COMPLICATIONS (n=32)**

TYPE	No. and %age
Pin tract infection	3 (10%)
Wound infection	4 (13%)
Malunion	3 (10%)
Delayed union	8 (26%)

**WOUND CLOSURE**

In 3 cases wounds were closed by delayed primary suturing. Secondary suturing was done in 9 cases. Split thickness skin grafting was done in 8 cases. Local flaps were used in 11 cases.

**BONE STABILIZATION AND UNION**

After 6-8 weeks, decisions regarding definitive treatment were made. In 28 cases external fixator was removed and patella tendon bearing cast applied. Four cases were treated in external fixator till fracture united.

Bone grafting was done in 18 cases. In five cases intermedullary nailing was done while in 3 cases plating was done. Nineteen cases treated in P.T.B. One extremity ended up in amputation in which

fracture was UI-C and vascular repair was delayed more than 24 hours due to late admission in the hospital. Thirty-one cases achieved union in mean union time of 32 weeks (24 weeks to 62 weeks).

**DISCUSSION**

Thirty-two open fractures of tibia were treated in external skeletal fixators. The results compared well with published reports using external fixator for management of open fracture of tibia.<sup>9</sup> With Association Study of Internal Fixation (ASIF) tubular external fixator system it is possible to adhere to safe corridors of leg<sup>9</sup> avoiding damage to vital structures and provide wound access for dressing and definitive wound care. The wound infection rate was 13% which was comparable to other published reports.<sup>11,2</sup>

The fracture union was achieved in 32 weeks (mean 24 to 62 weeks). So the open fracture of tibia can be successfully treated with external skeletal fixator since it provides good bony stabilization and provide access to wound for wound care.

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