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Research Article

PERCEPTION OF CONSERVATIVE TREATMENT OF DISPLACED TIBIAL SHAFT FRACTURES IN ADVANCED ORTHOPEDIC ERA OF INTERNAL FIXATION

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Abstract:

Introduction: Fractures of the tibia are very common, but the management is controversial, ranging from conservative to various surgical methods. However, standard treatment for low-energy shaft fractures of the tibia includes closed reduction and immobilization of the casting.

Objectives: To analyze the effectiveness of a conservative policy in the treatment of isolated dislocated shaft fractures of the tibia.

Place and Duration: In the Orthopedic Unit-II of Jinnah Hospital Lahore for one-year duration from May 2019 to May 2020.

Patients and Methods: All cases diagnosed with a displaced tibial fracture were treated conservatively. All displaced tibial fractures in patients over 16 years of age were included. A conservative policy was adopted that included early bone grafting when indicated. Fractures involving the knee or ankle and non-displaced fractures in adults were excluded.

Results: The healing time of comminuted fractures ranged from 19.2 to 25.3 weeks depending on the degree of comminution, and displaced fractures - from 18.4 to 25.2 weeks. Even slightly compound wounds less than 1 inch long had a noticeably delayed healing time of 25.4 weeks. Only small stab wounds, the internal relationship had no effect on the time to heal, i.e. 18.5 weeks. Varus deformity below 14 degrees (12.5%) was the most common, and valgus above 14 degrees was not found.

Conclusion: Generally, a conservative treatment policy is satisfactory, if early bone lacing is performed when indicated, bone union of all displaced tibial fractures is possible within a reasonable time.

Keywords: conservative policy, early bone grafting, Long leg plaster cast.

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INTRODUCTION:

Fractures of the tibia are common due to its superficial location. However, their management remains controversial. Management of tibial shaft fractures is often complicated and there is disagreement over the optimal treatment method. Both conservative and surgical techniques have been introduced in order to shorten the time to union while minimizing the occurrence of complications. Standard treatment for low-energy shaft fractures of the tibia includes closed reduction and immobilization of the cast. Sarmiento and Tausch *et al.* Supported conservative management. However, great advances in orthopedics, especially with regard to rigid internal fixation methods, have caused the pendulum to shift in this direction. Christensen *et al.* And Wagner concluded that "rigid internal fixation is recommended for all displaced shaft fractures of the tibia and is recommended as an urgent procedure, especially for open fractures". In their opinion, surgical treatment was obligatory for each tibia fracture with displacement. In the literature, the popularity of the bone plate, which is designed to rigidly support the fracture, is declining. This decline can be linked to two main trends in opinion. First, the belief that any method that forbids all movement at the fracture site removes the necessary stimulus for callus formation, and therefore fracture healing becomes slow; and second, the widespread belief that the bone ends are being absorbed and that any method that keeps the fragments apart after being absorbed can seriously hamper the natural healing process. Due to these beliefs, conservative treatment is an acceptable method.

PATIENTS AND METHODS:

This prospective study was conducted at the Orthopedic Unit-II of Jinnah Hospital Lahore for one-year duration from May 2019 to May 2020. Eight diagnosed cases of isolated displaced shaft fractures of the tibia were conservatively treated and early bone grafts were implanted as indicated. All displaced fractures of the tibia in patients over 16 years of age are included. Fractures involving the knee or ankle and non-displaced fractures in adults were excluded. 20% of the cases required a bone graft and the healing time was 36 weeks. On

the other hand, fractures that healed lasted an average of 17 weeks. The number of complications, most of which were minor, was considered acceptable. The exact nature of the medical treatment used depended on the type of fracture. In low-speed injuries with slight soft tissue damage, a closed reduction was performed under general anesthesia and a cast on a long leg. X-rays were taken regularly to check length and alignment, and the patch was wedged or changed as needed. Fractures that appeared unstable under anesthesia were treated by bone traction for two to three weeks; then the long legs were cast with plaster and left until the twelfth week. Open fractures were examined immediately under general anesthesia; the wound was cleaned and the skin edges excised. If the skin could not be closed without tension, a skin graft was performed as soon as possible. The fracture was stabilized by pulling the bone or gypsum on a long leg if necessary. All patients were assessed for union, both clinically and radiographically, after 12 weeks. If the fracture was united, it was allowed to carry the weight without securing it. If no union was achieved after 12 weeks, the limb was immobilized for a further four weeks and then reassessed. If fusion was still not present after 16 weeks, bone grafting was performed using bone strips from the iliac crest. Occasionally, if a delay in union was anticipated after 12 weeks, the transplant was performed earlier.

RESULTS:

Every hospital in a large industrial city has a high number of road accidents. It should be noted that more than half of the fractures had complicating factors. The tibia is the most common site of non-union in long bone fractures. However, healthy bone union was observed in all cases. We considered several factors in relation to the time needed for union and the need for a bone graft. In this series, the fractures of the middle third were the longest and required a bone graft in 31.4% of cases. Table 1 shows the effect of fragmentation (25.3, 19.2 and 19.4 weeks) and displacement (25.2 and 18.4 weeks) on fracture healing seen in the first radiograph.

Table 1: The effect of comminution and displacement on the time to union

Severity of fracture	No.	Time of union (weeks)	Grafted (percent)
Severe comminution	20	25.3	25.0
Slight comminution	15	19.2	18.7
No comminution	45	19.4	56.3
Severe displacement	35	25.2	43.7
Slight displacement	45	18.4	56.3

The distinction between strict and light was necessarily arbitrary. When grading the fragmentation, small fragments or non-displaced cracks were considered small, while fragments of butterflies or several displaced fragments were considered heavy. All fractures were displaced by selection. Those with a displacement of half the diameter were assessed as minor, and those with a larger diameter as severe. Grinding and displacement clearly affect healing time; the median time to heal in the severe groups was six weeks longer than in the weak groups. Small wounds less than an inch in length were classified as minor. The degree of complication appears to have a profound effect on the time it takes to heal the fracture. Even slightly complex wounds had noticeably delayed healing time (25.4 weeks). Only small stab wounds, internal association had no effect on time to heal [18.5 weeks] (Table 2). Table 3 presents defective adhesions, the most common Varus deformity below 14 degrees (12.5%) and valgus above 14 degrees.

Table 2: The effect of skin damage on the time to union

Severity of skin damage	No.	Time of union (weeks)	Graft d (%)
Slightly compound	9	25.4	11.3
Compound from within	11	18.5	13.7
Closed fractures	60	19.6	75.0

Table 3: Complications: malunion (n = 80)

Types of malunion	5-14°	Over 14°
Valgus	5(6.25%)	-
Varus	10(12.5%)	1(1.2%)
Medial rotation	2(2.5)	1(1.2%)

DISCUSSION:

The orthopedic literature abounds with reports on the treatment of tibia fractures with various methods. These include rigid plates, dynamic pressure plates, intramedullary nailing, locking compression plate and locking nails, external fixation, and various forms of cast braces. The aim of this study is not to arbitrate between different fractions proposing or justifying any particular form of treatment. They all have advantages and disadvantages. Long reviews already exist for reference. In our study, all fractures have united, including those considered conservative failure, and all patients are now independently mobile. This series does not support the conventional wisdom that fractures in the lower third combine the longest. It also shows that severe degrees of displacement, comminution and mixing result in significant growth retardation. This is to be expected as such fractures are caused by high-energy trauma, with associated severe soft tissue damage. Fractures of the tibia are prone to delayed or absent adhesions. To remedy this, we offered a bone graft for fractures that had not been fused 16 weeks after the injury. Some might go into reunification with further immobilization, but it is difficult to anticipate it. Our rather aggressive bone graft policy has led to the unification of these difficult cases after an average of 35 weeks. In fact, 93% of the fractures were united within eight months. There were no complications after the bone transplant and we believe it is a safe and useful procedure that ensures the bone fuses

without significantly extending the period of immobilization. Healthy bone fusion is the main goal in the treatment of tibia fractures. However, the chosen method of achieving adhesion must take into account soft tissues and cannot alone be responsible for a significant number of complications. In this series, there were neither delayed amputations nor cases of chronic osteomyelitis, and most importantly, there were no complications from surgical interventions. The problem was post-traumatic stiffness. One third of the patients had some degree of stiffness in one or more joints. One of the patients had Sudeck atrophy with clear swelling. Having a universal policy of internal fixation means imposing on most patients an operation that we believe is unnecessary and has potential for complications. The possibility of obtaining better results in problematic cases cannot justify surgery on all fractures. However, they do not always cause complications in conservative treatment, and the imposition of an operative injury on a severely damaged limb leads to complications that may lead to a catastrophe. Chronic osteomyelitis, skin necrosis, and infected non-union fractures may occur as a result of internal fixation.

CONCLUSION:

A conservative approach with early bone grafting, if necessary, is warranted as the primary treatment modality. Bone union of all displaced shaft fractures is achieved within a reasonable time. Fragmented and open fractures had healthy union.

Conservative policies are appropriate in underdeveloped countries where orthopedic facilities may be lacking. Treatment of shaft fractures of the tibia with a plaster cast can be technically difficult and requires considerable skill, especially when their reduction is indicated. Considering the fact that most patients were young, active and healthy prior to the injury, prolonged bed rest during plaster treatment and longer periods of follow-up can prevent them from having a physically demanding occupation. Therefore, patients must be informed before selecting treatment.

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