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The dynamicity of the life is increasing with the advancement of civilization and so does the rate of accidents day by day. The fractures of tibial shaft have long been considered difficult problem. Still the ideal treatment of such fractures has been a matter of controversy. The conventional method of above knee immobilization in plaster cast has many complications such as:

1. Increased time of hospitalisation, convalescence or both.
2. Stiffness of the joint and decrease range of joint movement.
3. Increased rate of nonunion, delayed union and malunion.

The surgical method of open reduction and internal fixation with plate, is better alternative but has certain disadvantages and complications such as:

1. Vascularization of fractured area is impaired as periosteum is further damaged, which may result in deficient nutrition of osteogenic cells and subsequent delayed union and nonunion.
2. Increased rate of infection.
3. It inflicts surgical trauma.
The intramedullary nailing of fracture shaft tibia followed by early weight bearing with P.T.B. cast is an more acceptable method. The nailing may be closed or open depending upon case but when open, it is without or least damaging to periosteum thereby preserving vascular supply.

It has certain advantages such as:

1. It inflicts minimal surgical trauma.
2. Sub periosteal blood supply is not further disturbed.
3. Chances of infection are minimal.
4. Short hospital stay.
5. Low incidence of nonunion, delayed union and malunion.

In cases of open nailing fracture reduction was visible through incision but in cases of closed nailing we have to rely upon the clinical judgment of fracture reduction, positioning of guide wire and ultimately of the nail. In only one case the nail failed to pass in the distal fragment as the fracture stability was misjudged because of intact fibula. It was later discovered on X-ray and corrected in the next sitting.

The maximum number of cases (53%) ranged between 18 to 27 years of age and males (93%) outnumbered females (7%) which should be due to their more active outdoor life making them more prone to trauma.
Majority of the cases had fracture at junction of middle and distal one third of tibia (60%) followed by the fracture of middle one third of tibia (33%) and the least number of cases (7%) had fracture at junction of upper and middle third.

This low incidence is probably because of more soft tissue covering of bone in upper part than in middle and lower region. Tibia being subcutaneous in most of the length, had high incidence of open (Grade I) fractures (40) then any other long bone.

Comminuted (40%) and oblique (27 percent) fractures were more commonly seen in our study which may be because of the position of tibia between two hinge joints so that twisting forces make it more vulnerable to the above type of fractures.

Lottes et al (1952) in his series of 216 tibial shaft fractures treated 102 cases by closed nailing and rest by plating or conservative method. They introduced the nail from the prespinal surface of the tibial plateau keeping the leg horizontal. The same position of limb was used by lottes (1954), Alms (1962); Zuckman and Maurer (1969); Hamza et al (1971) ; and Smith (1974). In all our patients the site of introduction of nail was the same as above but we kept the limb acutely flexed to about 135° while introducing the guide wire and about right angle, suspended by the side of table while
achieving reduction and negotiating the guide wire in the distal fragment. The knee was again flexed to about 135° making the leg almost vertical and placing the sole over the operation table while the nail was threaded over the guide wire and hammered home.

Lottes et al (1952) used Lotte's triflanged nail without using any guide wire. Alms, Zuckman and Maurer (1969) and Hamza et al (1971) used Kuntscher clover leaf nail bent 10 to 20 degree anteriorly near the upper end for easier extraction. In all of our cases we used Kuntscher clover leaf nail. The tip of the guide wire was made blunt so that it may not perforate the posterior cortex of proximal tibial fragment and moreover the soft tissues and vessels after the guide wire had passed through the proximal fragment but had not found its way in the distal one.

Lottes et al (1952), Zuckman and Maurer (1969) and Hamza et al (1971) did not ream the medullary canal for fear of jeopardising the blood supply. Alms (1962) reamed the medullary canal as a routine before seating nail hence in his series, in most of the cases 11 mm diameter nail was accepted. We did not ream the medullary canal so in 9 cases (60%) 9 mm diameter nail was passed while in 4 cases (27 percent) 10 mm diameter nail was introduced.
In our study of 15 cases one case (7 percent) had failed closed reduction as the fibula was intact and because of pre-existing partial stability of the limb it was difficult to know clinically whether the guide wire and the nail were correctly placed. Post-operative x-ray revealed the nail lying in the soft tissue. Eventually open nailing had to be done in this case.

In one case distraction at the fracture site occurred after nailing. Retrospectively this could be attributed to oversized nail-diameter wise. Under intravenous effect of pentothal sodium firm punches were given over the heel with counter pressure given by the assistant over the knee. The check X-ray showed good apposition of the fragments.

Operative time for successful closed nailing ranged from 20 minutes to a maximum of 50 minutes at an average of 36 minutes. The maximum time of 50 minutes was taken in three cases in which open nailing was done after an interval of 2 weeks of m injury. The time of 36 minutes on an average is much less than the time taken for any surgery in which open reduction and internal fixation is done hence nailing has an advantage of having shorter time of exposure to the surgical trauma.

Average hospital stay in the series of Lottes et al (1952) was 1.2 months. Whereas it was three to four weeks in the series of Hamza et al (1971). In our series
54 percent of cases had an hospital stay of four weeks, while 5 (33%) cases had hospital stay of 3 weeks and two cases had stay of two weeks. Increased period of hospitalization in these cases was because we gave time for blisters or punctured wound to heal.

Lottes (1954) reported an incidence of 3.3 percent deaths occurring within a week of operation, 2.1 percent deep infection and 2.1 percent non union in a series of 254 patients. Smith studied 219 fractures of tibial shaft treated by open reduction and internal fixation and found delayed union occurring in 48 percent and infection in 20 percent. Burwell (1971) reported that 181 fractures of the tibia treated with open reduction and internal fixation using urns or venable plates had a non union rate of 4.4 percent, an infection rate of 6.6 percent. Berkin and Marshall (1972) fixed three sided plates in 92 tibial fractures which resulted in 3 deaths, 6 infection and eleven delayed union. In our study two cases (13%) had superficial wound infection which were healed in due course of time. No case had deep infection or nonunion.

Lottes et al (1952) recorded an angular deformity (Three degree or more) in 5.7 percent cases and a shortening (six mm or more) in 1.9 percent cases. They had no case of rotational deformity. Weissmen and Herold (1966) treated conservatively and found shortening amounting to 3", 2", 1 ½" and 1"
respectively in four out of 150 cases. Sarmiento (1970) treated 135 cases of fracture shaft tibia by a functional below knee brace and found an average shortening of about 6.4 mm with no rotational deformity seen. Dehne et al (1961) reported average shortening of 0.9 cm. Nicoll (1964) reported shortening of more than 2 cm in 2.5 percent of his cases treated by conservative methods. In the present series we had two cases who had shortening of one cm. No case had angulation and rotational deformity.

Nicoll (1964) reported ankle stiffness long after union had occurred in 25 percent of his cases. Weisman et al (1966) observed temporary limitation of movements in the knee and ankle in most of the patients during the first few months after plaster was removed. Joseph (1974) found frequent possibilities of knee and ankle stiffness with above knee cast. Emerson and Grabies (1983) followed up tibial fractures immobilised with bilateral frames and found that the most frequent complaint was ankle and foot stiffness. We had no case who had any limitation of ankle or knee stiffness because while tapping down the nail we threaded on the guide wire another Kunstcher nail of similar diameter as the one being introduced. This greatly facilitated the seating of nail without trouble. It was because of this improvisation that we were able to sink the upper end of the nail a few millimeters in the tibial plateau without inflicting any soft tissue and bony trauma which
went a long way in restoring full range of knee extension post-operatively.

In the present study soon after nailing long leg dorsal slab was given. after the removal of stitches, PTB cast was applied and patients were allowed to walk in PTB cast, initially with the help of stick or walker, later unassisted. Average duration for assisted protected weight bearing was 2 weeks and for unassisted protected weight bearing it was 2.5 weeks. Unprotected unassisted weight bearing was started at an average of 10 weeks which is much earlier than in the series of Lottes et al (1952) and Lottes (1954). Lottes et al (1952) allowed full weight bearing in cast at an average of 1.5 months and unprotected unassisted weight bearing was resumed on an average five months after injury.

Due to the presence of nail in the medullary canal it was difficult to judge the progress of union clinically as the stability at the fracture site was achieved soon after successful nailing was done. Criteria of absence of pain at the fracture site, good muscle tone and resumption of unassisted weight bearing were certain features to judge the progress of union. Radiologically start of formation of bridging callus and partial obliteration of fracture line were other criteria to consider the rate of union.

In our study average period of start of bridging callus formation and partial obliteration of fracture line were four weeks and eight weeks respectively.
Absence of pain at the fracture site was reported to be four weeks on an average. Unprotected unassisted (full weight bearing) was 10 weeks. In patients where early weight bearing was started resulted into minimal periosteal callus and early obliteration of fracture site.

Osler Lindon reported average healing time as 22.3 weeks in patients treated conservatively. Robert Funstein (1945) reported average healing time to be 11.2 weeks for clinical union and 30.4 weeks for radiological union. Average time of union of fracture was 16 weeks according to the study done by Nicoll (1964) in his survey of 705 cases treated conservatively.

Karlstrom and Olerud (1975) treated tibial fracture with stable external frame fixator. The average time for full weight bearing without external support was 7.9 months. Dehne (1961) treated fracture tibia by immobilization in a near skin tight cast with knee in full extension and in these cases average healing and mobilisation was within four to six months.

Vandor Lindon and Larson (1979) reported average time of healing in fractures treated by plate and screw as 12 weeks as compared to conservative treatment where the healing time was found to be 17 weeks.

Out of 15 patients of successful nailing 13 were working men who returned to their work at an average interval of 9 weeks. The early return to work could be attributed to early weight bearing, restoration of joint movements and consequently, also to early fracture
On the other hand conservative method of above knee cast immobilization, not only prevents early ambulation but also delays return to work. Michael Alms (1962) found an average period of 11 weeks and 22 weeks in patients treated by closed nailing and above knee plaster cast respectively. Slatin (1967) noted that 90 percent of his cases of fracture leg treated by long leg cast could resume work by 12 months.

Follow up varied from 51 weeks to 5 weeks. No case was lost to follow up. Patients reported faithfully whenever called to the hospital.

Out of 15 cases nine underwent closed nailing and six open nailing. No post operative complications was found in any patient except superficial infection in 13% cases and two patients had shortening of limb by one cm. Excellent results were found in 73 percent whereas good in 27 percent of our clinical study.

The technique of nailing which had been done by the workers before, had been simplified by us, as in this no costly instruments or apparatus were used and we could get 100 percent healing with good alignment of fragments, absence of infection, early ambulation and rapid return to work. We believe that due to the simplicity of the technique it can be brought into practice even at a small centre by a person with some experience related to the subject mentioned above.