MATERIAL AND METHOD
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The present study was carried out on 15 cases of tibial shaft fractures treated with intramedullary nailing followed by early weight bearing with P.T.B. cast, carried out in the department of orthopaedics M.L.B. Medical College, Hospital, Jhansi from Dec. 90 to March, 92. All the cases were in age group 18 to 47 years.

The following cases of tibial shaft fracture were excluded from the study.

1. Children.

2. Compound injury except grade I type.

3. Associated injuries which prevented early mobilization.


   b. To near to either ends of bone

   c. Long oblique and long spiral fracture.

5. Injury more than 3 weeks old.

Management of fractures:

All the suitable fractures were managed according to following plan.

1. First aid management of patient

2. Pre-operative evaluation of patient

3. Date collection and recording.

4. Intramedullay nailing.
   a. Apparatus and instrument.
b. Pre-operative assessment of size of nail.
c. Operative procedure.
d. Post operative care.

5. P.T.B. cast application followed by weight bearing.
6. Follow up.

1. First aid Management of the patient:

   As soon as the patient was admitted to the hospital, he was given first aid management in the form of plaster of paris above knee slab along with analgesics and anti-inflammatory drugs.

2. Pre-operative evaluation of patient:

   Cases who were fit for nailing underwent following pre-operative evaluation:-

A. General assessment.
   a. General condition.
   b. Pulse
   c. Blood pressure.
   d. Examination of other systems.

B. Local condition of skin at and away from fracture site.

C. Radiological examination for the type and site of fracture.

D. Investigations - Routine and specific.
3. Date collection and recording:

After the pre-operative evaluation, date were collected and recorded as follows:

Case No.
Name of the patient
Address
Occupation
Age/Sex
D.O.A.
Date of injury

Brief history:

Mode of injury: Fall/Road side accident/Industrial accident.

Any other associated injury

Normal limb length:

Fracture
Side: Right/Left/Bilateral
Site: Junction of proximal and middle one third/middle one third/junction of middle and distal one third).
Nature: Simple/Grade I/Punctured).
Bone involved: Tibia/both bone.
Type: Transverse/oblique/spiral/comminuted).

Date of first aid management:

4. Intramedullary Nailing of Tibia:

A. Apparatus and Instrument:

Apart from the general set of instruments, following instruments were also required.
1. Calibrated metal ruler.
2. Kuntscher nail gauge.
4. Femoral bone Awl.
5. Guide wires.
7. Mallet.
8. K. Nail extractor with hook.
10. Straight chisels and gauges.

B. Pre-operative assessment of size of nail:

Length:

During radiological examination, calibrated metal ruler was strapped by the side of the limb parallel to the bone, in such a way that its shadow would not super imposed upon that of underlying bone and the magnification of the ruler would be same as that of the bone. In antero-posterior view ruler was strapped laterally and in lateral view anteriorly or posteriorly. By seeing the X-ray required length of the nail could be readily calculated.

Diameter of nail:

During radiological examination, kuntscher nail gauge was placed by the side of limb in such a way to give the same magnification of medullary canal as that
1. Patient Chart
2. Patient Consent Form
3. Femoral Puncture
4. Guide Wire
5. Cauterized Metal Ruler
of calibrated holes. The holes were matched with the narrowest diameter of medullary canal on roentgenogram to give the required diameter of nail.

C. OPERATIVE PROCEDURE:

After appropriate anaesthesia, the patient was laid supine on the operation table. The part was painted and draped from lower thigh to just above the ankle.

Knee was flexed to about 135 degrees. About two centimeters long vertical incision was given just medial to the ligamentum patellae. The retropatellar pad of fat was exposed and the deep infrapatellar bursa opened taking care not to open the knee joint.

A femoral awl was passed through the skin incision and displacing ligamentum patellae laterally, and striking the tibial plateau over anterior end of intercondylar ridge, about two centimeter behind the anterior border to tibia. This site is extra articular. Awl was thrust further along the long axis of proximal fragment of tibia thus making the pilot track for the guide wire.

Guide wire was passed down the pilot track just short of the fracture site. Then reduction was achieved by closed manipulation and if failed then by open method.

For closed manipulation limb was allowed to
suspend vertically down by the side of the table with the knee resting at the edgy. For open reduction small skin incision was given at the fracture site, just lateral and parallel to anterior border of tibia and then skin and subcutaneous tissue was incised to reach the fracture site. Fracture was reduced under vision by manipulation without disturbing the periosteum.

Guide wire was passed further by the assistant to engage the medullary canal of the distal fragment. Knee was again flexed at 135 degrees. Kuntscher clover leaf nail of appropriate size threaded over the guide wire and hammered inside taking care of patella and second toe to lie in the same line.

Guide wire was withdrawn and wound was stitched back in single layer and dressed. Wound at fracture site was also stitched in two layers and dressed in cases of open reduction.

Long leg above knee plaster of paris slab was applied.

D. POST OPERATIVE CARE

Post operative X-rays were taken and if there was any distraction, it was corrected at the earliest by applying punches at the heel with an assistant giving counter pressure by holding the knee. Sutures were removed after 10-14 days.
5. P.T.B. CAST APPLICATION FOLLOWED BY WEIGHT BEARING

Just after removal of stitches, P.T.B. cast was applied and from the next day assisted weight bearing was started with P.T.B. cast. Unassisted weight bearing became possible within one week.

Technique of P.T.B. Cast application:

Patient was asked to sit on the edge of table, hanging the affected leg vertically with hip and knee flexed at 90 degree. A stockinette was applied from toe to 2 inches above the proximal pole of patella. A thin layer of cotton was kept on the tendoachillis region. Plaster of paris bandages were wrapped from toe to above ankle region directly over the stockinette and moulding was done over both the malleoli. The cast was extended upto just below the tibial tuberosity, achieving the firm moulding over anterior tibial surface, lateral peroneal muscle mass and posterior aspect of leg. Before the plaster completely dried, it was extended up to proximal pole of patella, while knee was held in 45 degrees of flexion by an assistant. Moulding was done over medial flare of tibia, patellar tendon and popliteal fossa. A rubber heel was applied beneath the sole in the line of tibia.

G. FOLLOW UP

The patients were re-examined clinically and radiologically at the interval of 4 weeks.
In each follow up following things were looked for:

1. Condition of P.T.B. cast for its loosening and breakage.
2. Range of movements at knee and ankle joints.
3. Roentgenograms of leg in antero-posterior and lateral views to confirm alignment and callus formation.
4. Tenderness at fracture site.

All relevant data regarding treatment, post operative care and follow up were filed and tabulated in the following way so as to reach the final results.

TREATMENT Record:

Date of operation.

Type of operation: Closed/open K. Nailing.

Length and diameter of nail.

Post-operative findings:

Condition of wound scar: healthy linear scar/unhealthy.

Date of removal of stitches

Radiological findings.

Date of application of P.T.B. cast

Date of starting assisted weight bearing.

Date of starting unassisted weight bearing.

Date of discharge.

FOLLOW UP RECORD: At the interval of 4 weeks from the date of nailing.
Date of unassisted unprotected weight bearing

Period of return to employment (weeks):
(In cases of working patients)

Limb length: