

A Novel Technique Of Interlocking Nailing In Compound Fractures Of The Tibia Without Image Intensifier By Nail Overlapping Technique

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Abstract

Locked intramedullary nailing is currently considered the treatment of choice for most type I, II and IIIa open and closed tibial shaft fractures. Intramedullary nailing preserves the soft tissue sleeve around the fracture site and allows early motion of adjacent joints. Unreamed medullary nails are used mostly in Gustillo's types II and III. Tibial intramedullary nailing is now regarded as an emergency procedure for stabilisation of compound fractures to allow early return of function and ambulation. It has replaced external fixator which serves as a temporary means to stabilise compound fractures in the present scenario. Interlocking nailing allows early healing of the wound with permanent stabilisation of the fracture thereby preventing the need for secondary procedure.

We hereby describe a technique of intramedullary locked nailing for compound fractures of tibia without X-ray image intensifier by nail overlapping technique. We have applied this technique in 30 cases of compound type II and III fractures of tibia and could be very useful procedure in underdeveloped countries and in rural hospitals where facilities of image intensifier are not available in emergency departments where these patients first land up.

TECHNIQUE

The patient is prepared and draped in a standard manner as for routine interlocking procedure of tibia. Wound is debrided and irrigated. Preoperatively nail length is measured by tibial tubercle medial malleolar distance (TMD) and nail diameter is measured on a lateral radiograph at the level of isthmus. The tibia is approached via patellar tendon splitting approach and entry portal is properly identified (Fig.1).

Figure 1

Figure 1: showing site of entry portal in tibial interlocking nail.



Once medullary canal is opened, guide wire is put in and fracture is reduced by closed reduction and manipulation. Once fracture is reduced and there is no angulation at the fracture site as assessed clinically, guide wire is progressed distally into the distal fragment and its position in the distal

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fragment is confirmed by gritty feel of the guide wire as it proceeds in the medullary canal of the distal fragment.

Interlocking nail of proper size and diameter is assembled with proximal jig and inserted into the medullary canal via guide wire. We did not ream the medullary canal fearing further deterioration of endosteal blood supply as most of our cases were compound fractures. Once nail is properly inserted into the medullary canal so that its tip is barely visible at its entry point, we overlap another nail of the same size over the limb externally after putting k-wire through the proximalmost hole of the jig, through the proximal tip of the overlapped nail and then through the skin and proximal aspect of the intramedullary nail at the same site as that of the overlapped nail (Fig.2).

Figure 2

Figure 2: showing overlapped nail with k-wire in the proximalmost hole of the jig and distally hand drill in the distal hole of overlapped nail.



Distally overlapped nail is put in the alignment of centre of tip of the medial malleolus. We drill the hole in the distal fragment through the hole in the overlapped nail. Once drilling through the bone is complete and drill enters the intramedullary nail we confirm the drill position by guide wire put through the jig in the intramedullary nail. A definite confirmatory feel comes if drill lies within the intramedullary canal (Fig.3).

Figure 3

Figure 3: showing how to confirm the intramedullary position of drill without image intensifier.



Once drill position is confirmed to be within the intramedullary nail we drill the opposite cortex after removing the overlapped nail. Locking bolts of proper size are then put in the same drill hole and its position may again be confirmed by means of guide wire if you have any doubt. Similarly, another distal locking screw is put in. Proximal locking is done by means of jig attached. Once locking is complete surgical incision is closed in a standard manner and antiseptic dressing is done. This is followed by postoperative radiography.

We have performed this technique in 30 cases of type II and IIIA compound fractures of tibia and the results of this technique are satisfactory with us. We have a very limited experience of the same technique in interlocking femur.

CONCLUSION

The purpose of presentation of this technique is to recommend it for immediate stabilisation of tibial fractures in institutions where X-ray image intensifier is not available in the emergency department. However this technique is blind one and has a definite learning curve.

References

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