

A COMPARATIVE EVALUATION OF THREE DIFFERENT TECHNIQUES OF INSERTING STEINMANN PIN FOR APPLYING SKELETAL TRACTION.



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Introduction

Skeletal traction is one of the most commonly used procedure in orthopaedics practice, applied for various indications like reducing dislocations, aligning fractures and correcting the deformity, etc.

Effect of insertion of different pins and the drill on the bone pin interface has been studied in terms of mechanical damage, thermal necrosis or inflammation of bone surrounding the pin.(1) Clinical complications of the procedure include pin tract infections, pin loosening, local bone comminution ,CPN palsy, etc.

Factors affecting the prevalence of such complications :-

- Insertion techniques (Hammering, Hand drill, Power drilling).
- Pin tip design.(2)

It will, therefore, be important to study the effect of various parameters of pin design and the effect of various insertion techniques on the prevalence of different complications of the procedure to evolve the safest and most effective technique for applying the skeletal traction.

3. TECHNIQUES TO BE USED

1. Hammering the Steinmann pin with a diamond tip

GROUP A

2. Hand Drilling the Steinmann pin with diamond tip

GROUP B

3. Hand Drilling the pin with spirally fluted tip

GROUP C



1. Diamond tip Steinmann pin

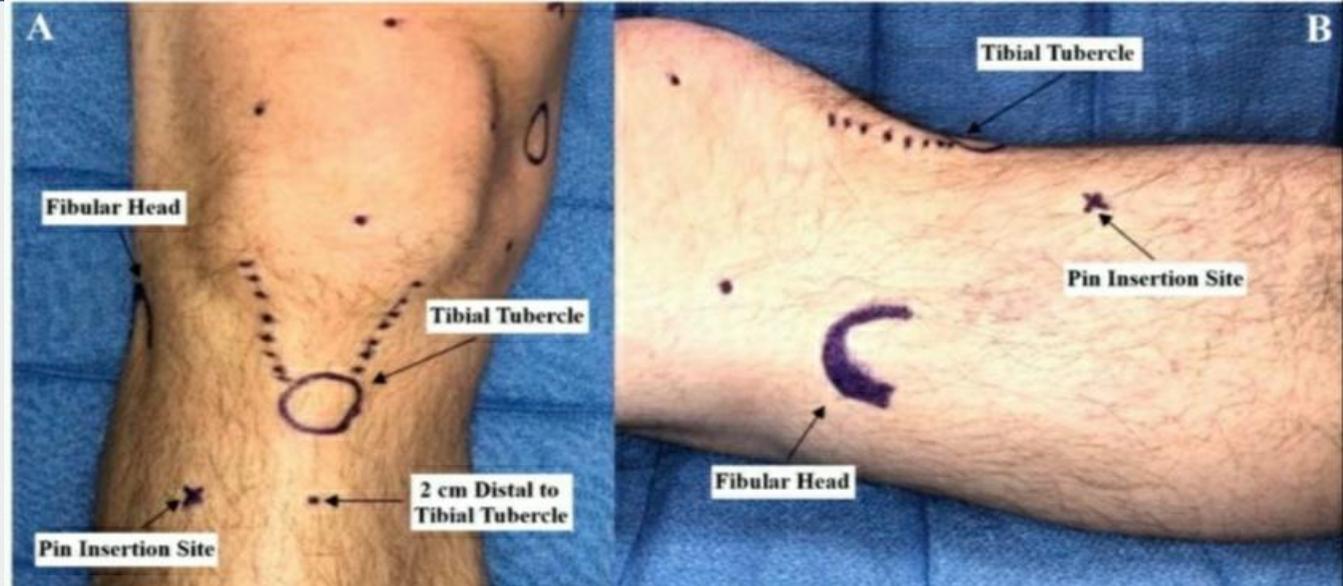
2. Spirally fluted drill bit Steinmann pin

Aims and Objectives

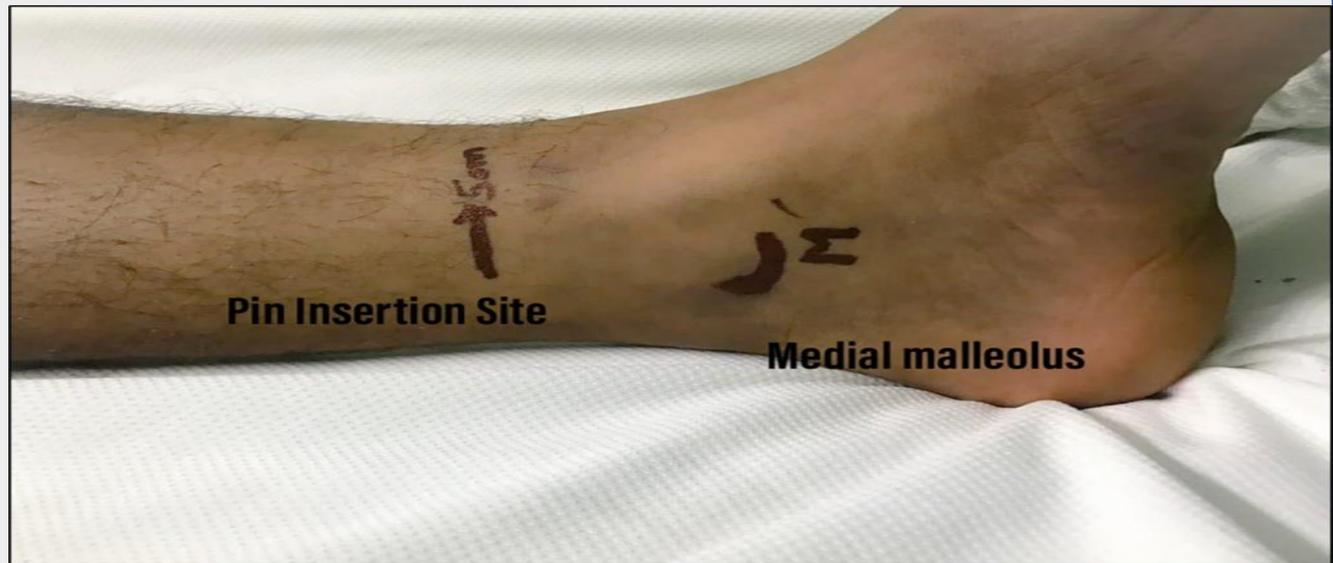
To assess and compare the pin tract related complications among three commonly employed techniques of pin insertion for applying skeletal traction.

Methodology

60 patients with lower limb trauma/deformity requiring skeletal traction which were divided into three groups using three different techniques of inserting Steinmann pin and inspected daily for pin tract related complications for 15 days.



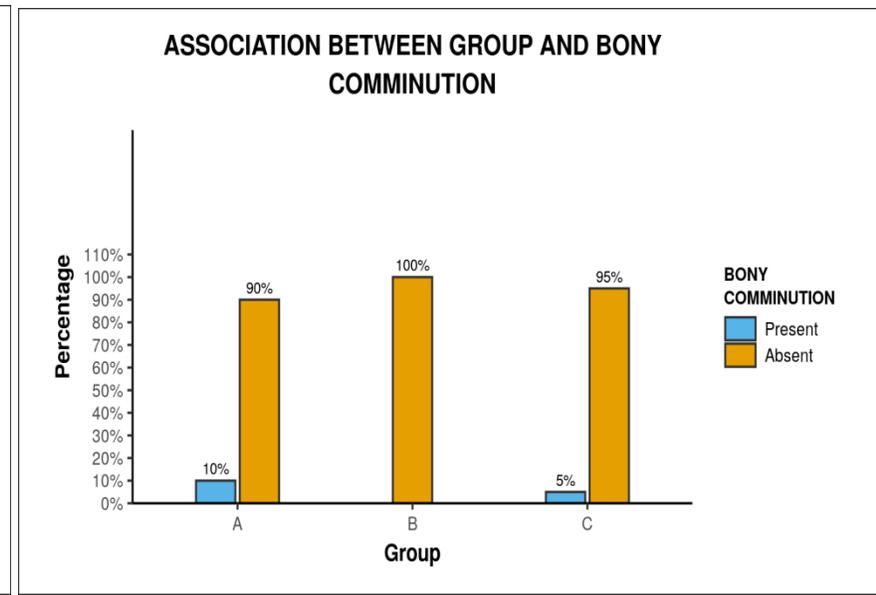
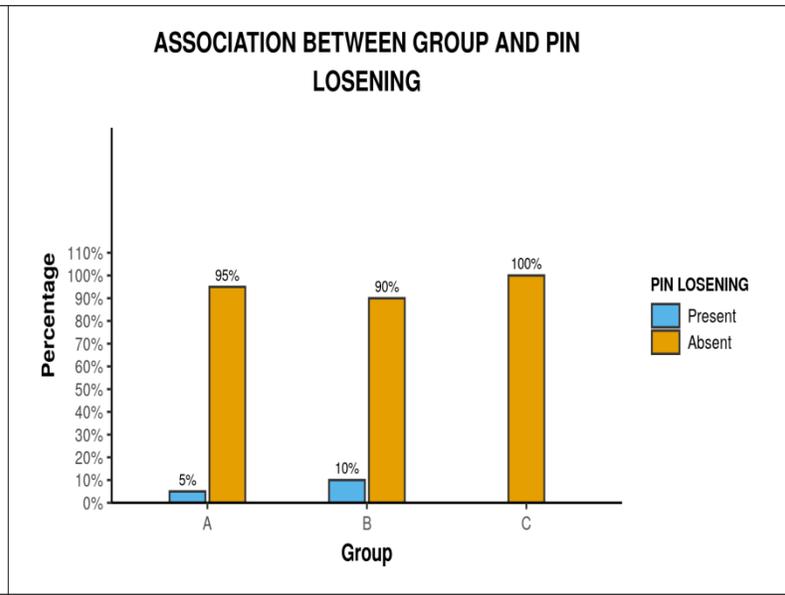
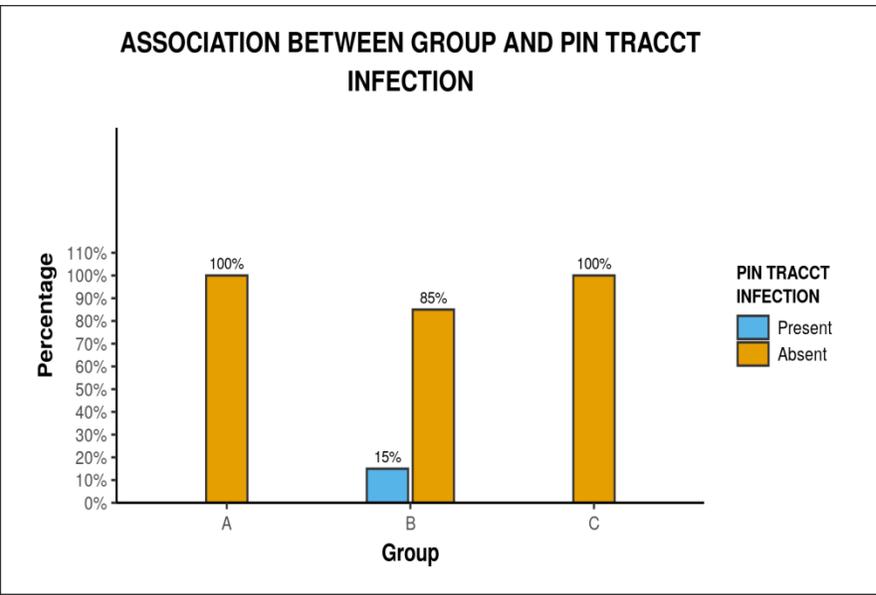
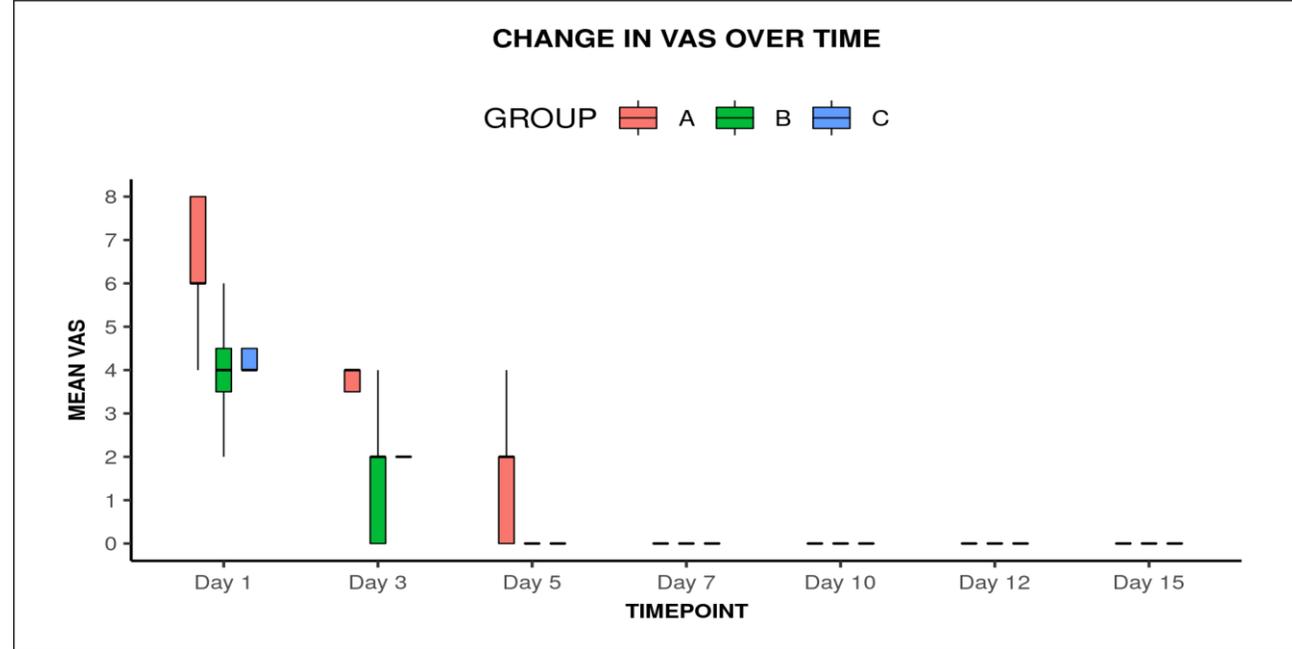
Anatomical surface landmarks drawn on the skin for UTSP insertion.



Anatomical surface landmarks drawn on the skin for LTSP

Results

| Parameters | GROUP A | GROUP B | GROUP C |
|---------------------|-------------|-------------|-------------|
| VAS Score | 6.30 ± 1.34 | 4.00 ± 1.45 | 4.50 ± 1.57 |
| PTI | 0(0.0%) | 3(15%) | 0 (0.0%) |
| Pin loosening | 1(5%) | 2(10%) | 0(0.0%) |
| Bony comminution | 2(10%) | 0(0.0%) | 1(5%) |
| Other Complications | 1 | 0 | 0 |



Conclusion

We compared results of three different techniques of inserting Steinmann pin for skeletal traction particularly in terms of pin tract related complications.

- Hammering the Steinmann pin with a diamond tip was found better than drilling it due to lesser pin tract infections and pin loosening though Hammering the pin is likely to cause bony comminution at the local pin site.
- Mean pain VAS score was better in hand-drilled as compared to hammered inserted Steinmann pin.
- Pain at the local site subsided in all patients in 7 days.

- Drilling the pin with spiral fluted drill tip caused fewer pin tract infections in the study due to minimized thrust and heat production which maximizes clearance of bone chips with no pin loosening.

- ❖Drilling the pin with spirally fluted drill bit tip had least pin tract related complications compared to drilling with diamond tip pin and hammering and was found to be the best.

1. Egger EL, Histan M, Blass CE, Powers BE. Effect of fixation pin placement on the bone to pin interface. Vet Surg 1986;15(3):246-52
2. Matthews LS, Green CA, Goldstein SA. The thermal effects of skeletal fixation-pin insertion in a bone. J Bone Joint Surg 1984;66-A: 1077-83.