



TIBIAL-TALO-CALCANEUM ARTHRODESIS; CLINICAL AND RADIOLOGICAL OUTCOME WITH RETROGRADE INTRAMEDULLARY SIGN NAIL

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Article received on:

13/07/2016

Accepted for publication:

10/09/2016

Received after proof reading:

07/10/2016

ABSTRACT... Objectives: To determine the clinical and radiological outcome of Tibio-talo-calcaneal arthrodesis with Retrograde intramedullary SIGN Nail in patients with tibiotalar and subtalar joint pathologies. **Study Design:** Descriptive case. **Period:** September 2012 to May 2015. **Setting:** OPD or Emergency at Orthopaedics Unit of Ghurki Trust Teaching Hospital Lahore. **Materials and methods:** 40 patients study. Detailed history, clinical examination and investigations were done after proper consent. Pre operative diagnosis was made on antero posterior and lateral views of plan x rays. Retrograde Intramedullary fixation was done under image control. All post operative patients were followed regularly on opd basis and outcome of intramedullary fixation was determined on 6th post-operative month. **Results:** There were 40 patients who underwent arthrodesis and fixation. There were 82.5% male and 22.5% female with mean age of 41.5 years. 95% of the patients having pain improvement while only 2.5% of the patients didn't get benefit from it. Infection and non union were seen in only 1 patient. **Conclusion:** retrograde sign nail is a good option for ankle and subtalar joint arthrodesis. Early weight bearing and healing in shorter period of time are its main advantages.

Key words: Intramedullary nail. Retrograde, Arthrodesis, Osteonecrosis.

Article Citation: Ahmad S, Ikram M, Ahmed A, Aziz A, Javed S, Ahmed N, Ahmed I, Akram R, Atiq uz Zaman. Tibial-Talo-Calcaneum Arthrodesis; Clinical and radiological outcome with retrograde intramedullary sign nail. Professional Med J 2016;23(10):1227-1231. DOI: 10.17957/TPMJ/16.3526

INTRODUCTION

Tibiotalocalcaneal arthrodesis is a salvage and procedure of choice for hind foot problems that affect both the ankle and subtalar joints.^{1,2,3,4} The indications for this surgery are Arthritis, Neglected ankle trauma, Osteonecrosis of the talus, Severe mal-alignment deformities, and Significant hind foot bone loss.⁵ Numerous techniques have been described for above pathologies but none of them is universally accepted.⁶ Various types of devices for tibiotalocalcaneal arthrodesis including pins, screws, bone grafting, anterior plating, external fixators and intramedullary nails. The use of pins and screws having higher rate of mal union and nonunion. External fixators because of many disadvantages like pin site infection, poor patient's compliance, technically demanding and limited multiplanar stability made it unfavorable. The primary goal of any surgery on the foot or ankle is to establish a painless, plantigrade foot that fits in a shoe. Lexer for the first time in history in 1906 described the tibiotalocalcaneal

arthrodesis with intramedullary fixation using cadaveric bone graft among the calcaneus, talus and tibia.⁷ Retrograde intramedullary nailing provides a load-sharing fixation device with superior biomechanical properties and is an excellent choice for use in Tibio-talo-calcaneal arthrodesis. IM nails have been developed to apply compression to the TTC complex during installation. The major advantages of this surgery is a small incisions and dynamization while it is contraindicated in Infection, severe vascular disease and severe mal-alignment of the tibia.

MATERIAL AND METHODS

This study was carried out on 40 patients of either sex aged above 18 years having ankle and subtalar joint instability/arthritis, Osteonecrosis of the talus, Neglected club foot, or Neglected ankle dislocation. Patients with active infection or having Peripheral vascular disease or severely deformed distal tibia or Failed arthrodesis or Useless/ insensate limb were excluded from the

study. All the patients were diagnosed by means of anteroposterior and lateral views of plain X-rays. After taking consent from ethical research committee informed consent was taken from the attendants of all the patients and were prepared for the surgery. The surgery was performed under spinal anesthesia and were placed in supine position using radiolucent operating table. Retrograde nailing with proximal and distal locking done after ankle arthrotomy and arthrodesis keeping 5 degrees of valgus, Neutral dorsiflexion/ plantar flexion, 5 to 10 degree external rotation and Talus aligned under tibial plafond.

Patients were discharged on 2nd or 3rd post operative day and followed in outpatient department. Splint was advised for 2 -3 weeks and non weight bearing for 6 weeks. Radiographs were done on follow up visit to assess the alignment and later to assess fusion of ankle and subtalar joints. Patients were allowed weight bearing after 6 weeks. Patients were followed for at least 6 months. Pre-operative, immediate Post operative and follow up xrays at 6 months were taken. (Figure 1a, 1b, 2a, 2b, 3a and 3b). Pain was measured on Visual analogue scale at 6 months. Decrease in pain score of 3 or more was taken as significant clinical improvement.

RESULTS

There were 40 patients who underwent tibio-talocalcaneal arthrodesis with retrograde intramedullary sign nail fixation. Among them 33 (82.5%) male patients and 7(17.5%) females patient with mean age 41.5 ±5 years. Male to female ratio were 4.71□ 1.

The patients who need this procedure having different pathologies. Among them 3 having Rheumatoid Arthritis, 19 were post traumatic ankle arthritis, 11 having degenerative osteoarthritis and 7 having neuropathic pathology. (Table-I)

	Number	Percent
Rheumatoid arthritis	3	7.5%
Post traumatic	19	47.5%
Osteoarthritis	11	27.5%
Neuropathic	7	17.5%
Total	40	100

Table-I. Causes of tibio talar and talo calcaneal pathologies

At 6 months xray ankle joint fusion was found in 38 patients (95%), non union in 1 patient (2.5%) and one patient lost in follow up. Pain improves in all 38(95%) patients who having radiological ankle joint fusion and were fully satisfied with the procedure .Only 1 patient having infection who later on presented with non union and ankle pain (Table-II)

	Number	Percent
Radiological fusion	38	95%
Non union & infection	1	2.5%
Lost to follow	1	2.5%

Table-II. Outcome of Surgery



Figure-1a and 1b

DISCUSSION

The treatment of patients with arthritis, pain and deformity of the ankle and subtalar area is still a major problem and is extremely difficult to get excellent results. The main surgical goals of the tibio-talo-calcaneal arthrodesis are to satisfy patient, reduce pain and promote a stable and plantigrade foot with good function.

In our study 82.5% of the patients were male while remaining were female. However higher percentage of females were found in different studies.^{8,17}



Figure-2a and 2b



Figure-3 a and 3 b (6 months post operative)

The mean age of our patients were 41.5 % while higher mean age were found in different

studies.^{7,8,13,14}

In our study the main indications for arthrodesis were post traumatic which were 47.5%. However in Poplika study the main indication were rheumatoid arthritis.¹⁷

In most of the studies higher rate of non union and persistent pain were found while in our study only one patient having non union and persistent pain while 95% of the patients were enjoying pain free life with full union. Similar findings were found in Mendicino et al study.¹⁵ higher rate of union were found in Boer et al study² but lower rate found in different studies.^{13,14}

Infection is the main complication of this procedure. However in our study only one patient having infection which was treated with IV antibiotics and wound debridement. It didn't require removal of implant while the study of Anderson shows higher rate of infection which get healed after removal of implant.¹⁰ similar findings in other studies.^{13,14}

Literature has shown that different studies having different union times. Mean union time of our study were 18 weeks while in the study of Iwin the mean union time were 16 weeks which is earlier than our study.⁹ however similar time were taken in Thomson study.¹¹ but higher time taken in most studies.^{2,14,15} there were no stress fracture in our study however in Iwin study the stress fracture rate were high.¹²

Patient satisfaction with the procedure was also assessed in our study. As compared to other studies in the literature, the patient satisfaction rate are higher in almost all the studies in the literature which is 95%.^{2,14,16}

CONCLUSION

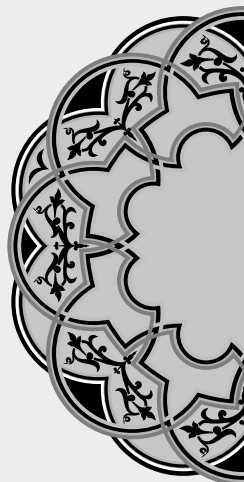
Arthrodesis is an end stage procedure should be considered only after all conservative treatments fails. Tibio-talo-calcaneal fusion with retrograde nailing and bone grafting is a successful salvage procedure in severe ankle and hind foot arthrosis with deformity. Patient satisfaction rate is high,

though infection is major problem and precautions should be taken to reduce its incidence.

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“The greatest mistake we make is living in constant fear that we will make one.”

Unknown

AUTHORSHIP AND CONTRIBUTION DECLARATION

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