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A STUDY ON FUNCTIONAL OUTCOME OF MODIFIED TIBIOTALAR FUSION FOR POST TRAUMATIC AVASCULAR NECROSIS OF TALUS

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Abstract

INTRODUCTION: Fractures of neck of the talus with or without dislocation of subtalar joint and tibiotalar joint and talo-navicular are most devasting injuries that can happen around the ankle joint. Most of these cases are complicated with Avascular necrosis of talus and takes years to get revascularized even after prolonged non weight bearing. Some surgeons Detenbeck and Kelly recommend talectomy and tibio calcaneal compression arthrodesis as primary treatment but it was found disadvantage of widening of hind foot and shortening of foot which makes shoe fitting difficult. In modified tibio talar fusion in which the body of talus was excised and a sliding cortical bone graft was positioned anteriorly between anterior aspect of tibia and the head of talus. The advantages of this procedure is maintains relatively normal appearance of the foot, maintainance of alignment, minimizing shortening, and maximizing the remaining subtalar complex range of motion.

AIM: The main aim of this study is to evaluate the functional outcome of treated cases by using American orthopaedic foot and ankle society (AOFAS) score and visual analog scale (VAS) preoperatively and postoperatively and tibiopedal movement was assessed postoperatively.

MATERIAL AND METHODS: Patients with Avascular necrosis of talus which comes to orthopaedics department of GMC ongole from july 2024, will be included in the study after meeting inclusion and exclusion criteria. Patients were reassesed at 6 weeks, 3 months and 6 months, 12 months post operatively using American orthopaedic foot and ankle society (AOFAS) and VAS scoring.

RESULTS: In this study 84.6% patients were having excellent outcome and 15.3% patients having good outcome. Preoperative AOFAS Score was 40.80 ± 13.26 which was increased to significantly 87.57 ± 5.82 postoperatively and pain score VAS was reduced from 6.61 ± 1.57 to 1.91 ± 0.99 indicating significant reduction in pain . There was no limb length discrepancy.

CONCLUSION: The results are very good with modified blairs arthrodesis with preservation of talus providing greater intraoperative stability

KEYWORDS: Tibio talar fusion, AOFAS, VAS.

INTRODUCTION

Fracture neck of talus with or without dislocation of subtalar ,tibio talar and talo navicular joint are most devastating injuries that can happen around ankle joint. Almost all cases were lead to complication of avascular necrosis of talus and it will take years to get revascularization even after prolonged non weight bearing. Detenbeck and Kelly [(1)] recommended talectomy and tibio calcaneal compression arthrodesis as treatment but it resulted in widening of hind foot and also leading to shortening of foot. Modified procedures of tibio talar fusion had an advantage of maintaining normal appearance of foot and maintainance of alignment and minimizing shortening and maximizing remaining subtalar complex range of motion . so modified tibiotalar fusion for post traumatic avascular necrosis of talus was preferred. In this procedure, body of talus was excised and sliding cortical bone graft was placed anteriorly between anterior aspect of tibia and head of talus. Later Morris et al[(2)] also modified the procedure by placing a transcalcaneal Steinmann pin through calcaneum in to tibia and sliding tibial graft was fixed with cortical screw proximally. This resulted in foot maintaining its normal appearance and normal alignment and remaining subtalar range of movements were increased. The present study evaluates functional outcome of this modified tibio talar fusion for post traumatic avascular necrosis of

talus using American orthopaedic foot and ankle society score and visual analog scale preoperatively and post operatively. Range of Movements were assessed preoperatively.

MATERIAL AND METHODS

This is a prospective study. Patients who were admitted and treated with modified tibiotalar fusion for post traumatic AVN talus in teritiary care hospital in orthopaedic department included in study after meeting inclusion and exclusion criteria. Study duration is about 12 months with a sample size of 26 patients. Preoperatively xray was performed to all patients for confirmation of fracture and were managed with modified tibio talar fusion. All patients were followed up for 1 year with serial radiographs and tibio pedal movements were assessed postoperatively. AOFAS and VAS were assessed preoperatively and at 1 year follow up post operatively.

STATISTICAL ANALYSIS:

Statistical analysis was performed using stastistical package for social sciences software package. Data was analysed with T test and $P< 0.05$ was considered as stastically significant.

PROCEDURE:

Anterior approach was used and joint was exposed and articular surface of tibia was cleared and foot is placed in functional position that is zero degree 5 degree valgus and 10 degree external rotation and tibia and talar surfaces are placed in contact with each other and sliding tibial graft is inserted in to talar neck and fixed with 4.5mm cortical screw proximally and a transcalcaneal Steinmann pin is passed to increase stability at arthrodesis site.

POST OPERATIVE FOLLOWUP:

Post operatively, long leg cast with knee in 30 degree flexion was applied for for 6 weeks after this Steinmann pin was removed and Non weight bearing walking was allowed up to 12 weeks and weight bearing is allowed after healing of graft which was confirmed by xray and tibiopedal movements were assessed clinically.

RESULTS

Results were assessed based on range of movement and ability to perform full activities without pain. If the pedal movement is 15-20 degree and was able to do daily activities without any symptoms. This was considered as excellent and if pedal movement is 10-15 degree and patient feels occasional discomfort without restriction of daily activities it was considered as good. If movement is <10 degree and daily activities are restricted due to severe pain. It was considered as poor outcome. In this study 22(84.6%) patients were having excellent outcome and 4 (15.3%) patients having good outcome. All the patients are having satisfied ankle function postoperatively. There is significant improvement in ankle function post operatively which was indicated by significant improvement in AOFAS and VAS Scores. Preoperative AOFAS Score was 40.80 ± 13.26 which was increased to significantly 87.57 ± 5.82 postoperatively and pain score VAS was reduced from 6.61 ± 1.57 to 1.91 ± 0.99 indicating significant reduction in pain . postoperatively no limb length discrepancy was noted and heel was in normal shape and height and no limp was observed and patients gait was normal.

DISCUSSION

In 1943[3] blair described tibio talar arthrodesisis main stay of treatment for fracture of talus and in Non union and Avascular necrosis. In 1971, Morris et al, modified technique by fixing graft in to tibia with proximal screw and tibia on to calcaneum with trans calcaneal Steinmann pin. Blairs modifications leads to enchanced stability and also increase the rate of bony union and also this cortico cancellous tibial block acts as graft and also provides stability to arthrodesis site and this Steinmann pin fixation helps in improvement of stabilization of calcaneum to tibia during early postoperative period. Lionberger et al[4] used intermediate hip compression screw and modified bone staple for tibio talar compression . They reported fusion rate of 80% at 3 months . Van bergey et al [5] used anterior plate and reported healing rate 71% at 4 months and also reported functional outcome was less than normal with AOFAS score and VAS Score 7.1. usage of vascularized anterior sliding tibial graft results in promoting neovascularization which leads to better rates of fusion and functional outcomes when compared to nonvascularized grafts .kodama et al [6] studied 27 ankles and reported better functional outcome scores in vascularized graft group. We in our study, tibial articular surface is demanded but not excised with this procedure cortical bone with added cancellous bone from lower end of tibia produces sound fusion and also results in maintaining normal height of heel. Almost all the patients had successful clinical result. In this study 19 (73.07%) patients showed tibio pedal movement of 10-15 degrees and 7(26.9%) patients showed tibio pedal movement of 15-20 degrees resulting in good to excellent gait. There are many varied opinions among different authors regarding

best position for arthrodesis. Barr and record suggested 5 degree equinus [7],Watson –jones [8]suggested 10 degree and Anthony A. masicoli suggested neutral dorsiflexion as best position for arthrodesis [9].

In present study, ankles were fused at zero degree dorsiflexion with which patient is able to walk more physiologically without difficulty. By this procedure there is significant increase in AOFAS and reduction in VAS scores.

CONCLUSION

The results are very good with modified blairs arthrodesis with preservation of talus providing greater intraoperative stability and almost normal looking foot with no limb shortening. All the patients are having normal tibio pedal movement, walking without any difficulty.

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CONFLICTS OF INTEREST: NONE.

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