

Outcome Of Ankle And Subtalar Joint Arthrodesis Using Retrograde Hindfoot Fusion Nailing System A Prospective Study

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Abstract: Ankle and subtalar joint, when painful and refractory to conservative management, needs fusion. Fusion of both joints, known as pantalar arthrodesis (PTA) is truly a salvage procedure, an alternative to amputation. Initially, PTA was done in two stages, but currently one stage procedure is the choice among which retrograde nailing is the latest. A prospective study was done on eight (n=8) adult patients treated with retrograde hind foot fusion nailing system between april 2015 to april 2018. Patients were aged between 25 - 65yrs (avg. 45 yrs), suffering from secondary arthritis due to varying causes. Pre and post-operative assessment of clinical outcome was done using the Ankle and Hind foot Scale (AOFAS). All cases in our study, were treated with retrograde hind foot fusion nailing system, united within mean duration of 16 wks (range 12 - 22 wks). AOFAS score improved from an average pre-operative score of 24 (range 18 - 30) to 78 (range 60 -86), post-operatively. So our conclusion is that, retrograde hind foot fusion nailing system is a safe and effective procedure for pantalar arthrodesis in patients with painful arthritis, refractory to conservative management.

Keywords: Pantalar arthrodesis, retrograde hind foot fusion nailing system.

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I. Introduction

Ankle and Subtalar joint arthritis, when painful and refractory to conservative management, needs fusion. Fusion of both ankle and subtalar joint is also called Pantalar Arthrodesis (PTA), which is truly a salvage procedure, an alternative to amputation.

Initially, PTA was done in two stages, first subtalar arthrodesis, followed by ankle arthrodesis. Currently, it is done in one stage. Among, various methods of one stage PTA, retrograde nailing is the latest.

Intramedullary fixation of tibio-talo-calcaneal (TTC) joint was first reported in 1906 by Lexer E*1, using boiled cadaveric bone as an intramedullary device. In 1948, Adams JC*2 reported first case of TTC arthrodesis using intramedullary nail.

PRINCIPLE:

Inspite of several methods of doing PTA, the principle of all methods remains the same. They are:-

- a) Removal of cartilage till bleeding of sub-chondral bone,
- b) Maintaining congruity of joint surfaces and proper positioning of foot and ankle,
- c) Stable fixation.

II. Material And Methods

This study was done at NRS Medical College & Hospital from April 2015 to April 2018. Patients were studied prospectively and evaluated clinically and radiologically at follow up. Total number of 8 (n=8) adult patients aged between 25-65 years (avg. 45 yrs), suffering from secondary arthritis of ankle and subtalar joints, due to varying causes. Among them one was nonspecific chronic arthritis, one was rheumatoid arthritis, while the rest were post-traumatic. All patients had severe pain, varying degrees of instability and deformities and antalgic gait.

Pre-operative and post-operative assessment of clinical outcome was done using the ankle & hind foot scale (AOFAS). Follow up was done at 3, 6, 12 months and subsequently at 1 year interval.

PRE-OPERATIVE ASSESSMENT:

Careful evaluation is of utmost importance for better outcome. All patients were assessed*3 for their bone quality, any metabolic disease, previous injuries, incisions/scar marks, skin condition, mobility of each joint, deformities and their stiffness.

Standing and on table X-Rays of both foot and ankle were taken. CT scan was useful to assess all deformities. Laboratory investigations like complete blood count, ESR and CRP were considered to rule out any ongoing infection. Pre-operative ankle and hind foot scale was recorded.

SURGICAL TECHNIQUE:*4

The surgery was carried out with the patient in supine position, under tourniquet and usually epidural anaesthesia. The approach depended on previous operative scars, skin condition and surgeon's choice. We used both Lateral trans fibular approach as well as standard Antero-lateral approach.

In lateral trans fibular approach, a small medial window was often required to prepare the medial aspect of both joints. The osteotomized fibula and distal half of medial malleolus along with its posterior soft tissue to maintain vascularity was used as strut graft. However, in standard anterolateral approach, there was no need for fibular osteotomy or any second incision on either medial or lateral sides.

The foot in relation to the tibia for fusion was positioned either neutral or 5 degree dorsiflexed, 5 degree valgus and slight external rotation. For correction of deformities, the osteotomies were modified by calculating the closing wedge.

POST-OPERATIVE CARE:

Post-operatively, a long leg back slab was applied until wound healed completely. After that, below knee cast was applied with non-weight bearing for 6 weeks. Cast removal and gradual weight bearing started at 6 weeks. Full weight bearing was allowed after 3 months.

III. Result

All cases in our study, healed with retrograde hind foot fusion nailing system, united within mean duration of 16 weeks (range 12-22 weeks). Ankle and hind foot scale (AOFAS) improved from an average pre-operative score of 24(range 18 - 30) to 78(range 60 - 86) post operatively. Male patients and patients with post-traumatic arthritis were more satisfied than others.

IV. Discussion

Retrograde hind foot fusion nailing system is a newer and good surgical procedure for pantalar arthrodesis. It has several advantages-

- Load sharing device with high mechanical stability and stiffer construct.
- Dissection required is minimal and achieves better fusion.
- Dynamic compression can be obtained by removing proximal static screw or both static and dynamic screws.

For, these reasons, nailing for pantalar arthrodesis has become popular during the last decade. Studies done by Muckley T*5, Jehan S et al*6, Boer R et al*7, Ninimaki et al*8, pelton*9 and hammett et al*10 showed good outcome and promising results with less complication rate using retrograde hind foot nailing system.

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