

Case Report

Pantalar arthrodesis in a case of chronic subluxated tibiotalar and subtalar joint with secondary arthritis: a case report

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ABSTRACT

Post-traumatic arthritis is the most common cause of ankle arthritis. Pantalar arthrodesis (PA) is a salvage operation that can be used to create a stable and functional plantigrade foot for those who have a painful ankle joint with significant bony destruction and/or malalignment of ankle and hindfoot producing deformities and instabilities not amenable to bracing, orthotic devices or shoes. It is commonly performed as a double staged procedure. We present a case of 50 years old male with chronic subluxated tibiotalar and subtalar joint with secondary arthritis who was operated with a single staged pantalar arthrodesis with a follow up of 6 months. A single staged Pantalar arthrodesis combining both transfibular approach for ankle and olliers approach for triple arthrodesis is an effective surgical treatment option in a case of chronic subluxated tibiotalar and subtalar joint with secondary arthritis.

Keywords: Pantalar, Arthrodesis, Fusion, Arthritis

INTRODUCTION

Post-traumatic arthritis is the most common cause of ankle arthritis that present with pain, a decreased range of motion, an altered gait and often with deformities of the ankle, hindfoot or both.^{1,2} Non-surgical management is often inadequate to prevent gait abnormalities, difficulty in fitting footwear, skin breakdown, chronic ulcers and occasionally amputation.³ In selected patients, the use of surgical intervention may improve this outcome and reduce long-term complications associated with these foot and ankle deformities. One such surgical intervention is pantalar arthrodesis (PA) which refers to the fusion of the tibiotalar, talocalcaneal, talonavicular and calcaneocuboid joints. This collection of fusions, when successful, leaves the patient with a rigid, stable and pain-free plantigrade foot. Historically, it was employed to create a functional plantigrade foot for those who had late sequela of untreated clubfoot, poliomyelitis, various congenital neuromuscular diseases, and Charcot

neuroarthropathy. Additionally, it has been offered to those who have painful joint degeneration and destruction resulting from avascular necrosis of the talus, inflammatory arthritis, such as rheumatoid arthritis, as well as primary osteoarthritis.^{4,5}

Pantalar arthrodesis is commonly performed as a double staged procedure- ankle arthrodesis in one stage and triple arthrodesis in the second. We present a case of chronic subluxated tibiotalar and subtalar joint with secondary arthritis of ankle and multiple intertarsal joints with flattening of talus treated surgically as a single staged procedure combining both transfibular approach for ankle and olliers approach for triple arthrodesis.

CASE REPORT

A 50 years old male presented to our outpatient department with a complaint of difficulty in walking since 1 year. On elaborating origin duration and progress,

the patient was relatively all right 1 year back when he had a twisting injury to his right ankle after which patient developed pain which gradually progressed over 1 year. The patient also complained of frequent ankle sprain and give away feeling for 6 months and had not bear weight (on right foot) for 3 months. The patient was a known case of diabetes mellitus for 5 years on oral medications. On examination, there was no swelling and no tenderness around ankle joint but joint laxity was present. Distal pulses were present and there were no signs of peripheral vascular disease. A preliminary X-ray revealed subluxated tibiotalar and talonavicular joint with arthritic changes around the ankle, subtalar and multiple intertarsal joint. CT scan and MRI confirmed the above findings with flattening of the talus with altered marrow signals (hyperintense in T2 and hypointense in T1 suggestive of marrow oedema) (Figure 1). Bilateral lower limb doppler was done to rule out peripheral vascular disease/thrombosis. After pre-anaesthetic checkup and controlling blood sugars pre-operatively (Hb1AC 6.5), the patient was posted for pantalar arthrodesis.

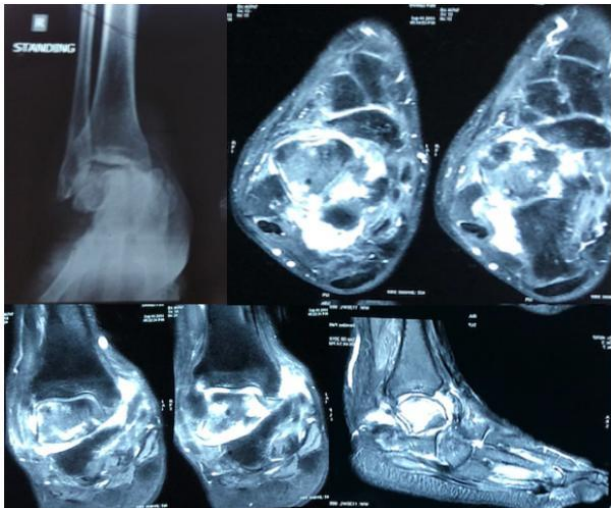


Figure 1: Preoperative X-ray and MRI showing subluxated talonavicular and talocalcaneal joint with ankle and inter tarsal inflammatory arthritis with marrow oedema of talus.

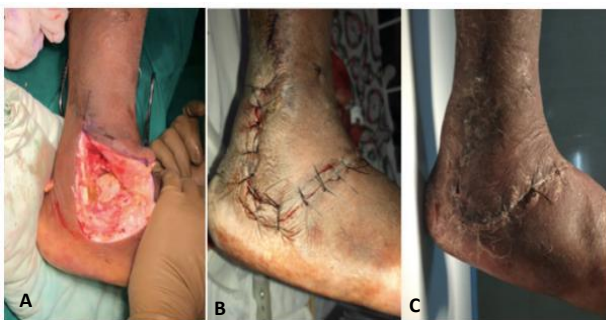


Figure 2 (A, B and C): Intraoperative thick anterolateral flap raised, postoperative closure done with interrupted simple ethilon sutures and completely healed surgical wound at 3 week.

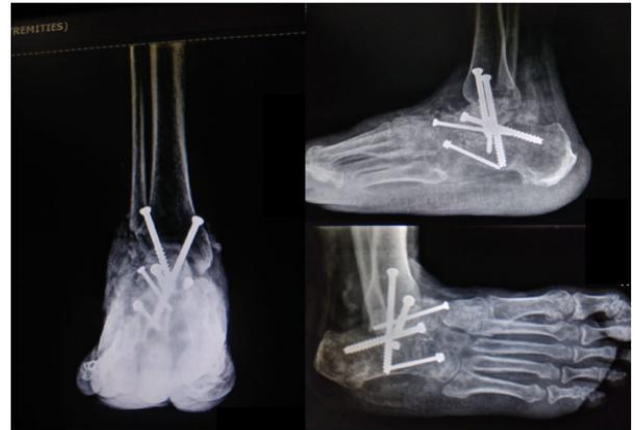


Figure 3: Post-operative X-ray (ankle anteroposterior, lateral and foot oblique) showing anatomically reduced joints stabilised with PTCC screws.



Figure 4: X-ray and CT scan at 6 months showing fusion construct.

Patient was placed in supine position with sandbag underneath ipsilateral buttocks to internally rotate the foot. Tourniquet was applied. Under spinal anaesthesia, scrubbing, painting and draping were done. An extended curvilinear incision combining both transfibular approach for ankle and olliers approach for subtalar, calcaneocuboid and talonavicular joints was taken—beginning 6 cm proximal to the tip of the lateral malleolus, continuing along the posterior border of the fibula distally. Then 2 cm distal to the tip of lateral malleolus, incision was curved anteriorly and continued obliquely and superoanteriorly toward the dorsolateral aspect of the talonavicular joint. Superficial and deep

dissection was done to raise a thick skin flap (Figure 2). The lateral malleolus was identified and osteotomized 2 cm proximal to the ankle joint line.

The ankle was then distracted with the use of a laminar spreader and debrided. Sinus tarsi fat pad was incised to expose the tarsal canal. The posterior facet of the subtalar (ST) joint was identified lateral to the tarsal canal. Using a key elevator, subperiosteally dissection was done along the posterior facet. Posterior facet was then distracted using a laminar spreader without teeth and debrided. Then calcaneocuboid and talonavicular joints were identified and the capsule was released and joints were debrided.

Under the guidance of image intensifier, guide wires were passed across tibiotalar, subtalar talonavicular and calcaneocuboid joints in an anatomically acceptable plantigrade position. The excised fibula was crushed and mixed with ipsilateral iliac crest bone graft and was used to supplement the fusion construct. Multiple 4.5 mm and 6.5 mm partially threaded cannulated cancellous screws were used to stabilise the final fusion construct. Thorough wound wash was given and closure was done in layers over a drain.

Post-operative rehabilitation: post-operative X-ray showed good alignment of ankle joint and hindfoot (Figure 3). The construct was protected initially in below knee splint for 10 weeks. Then partial weight bearing was started and gradually full weight-bearing walking over the next 4 weeks. At 6 months, a CT scan was done to see the bony fusion around the joints (Figure 4).

DISCUSSION

Ankle arthritis is a common problem, and treatment decisions can be challenging. Fifty per cent of elderly patients have some form of arthrosis involving the foot or the ankle. Post-traumatic arthritis is the most common cause, representing 70% of the cases who present with osteoarthritis.^{2,6} The three most common causes of post-traumatic arthritis are rotational ankle fractures (37%), recurrent ankle instability (14.6%), and history of a single sprain with continued pain (13.7%).⁶ Several factors have been implicated in the development of post-traumatic ankle arthritis, including fracture severity, the extent of cartilage damage, and a non-anatomic reduction.⁷ Soft tissue injuries can contribute as well, including ankle dislocations, recurrent sprains, persistent ankle instability, and osteochondritis dissecans lesions. Atraumatic causes include inflammatory arthritides, infection, Charcot, haemophilia, and crystalline arthropathies. Ankle arthritis can be idiopathic, as well.

Though ankle arthritis has less prevalence as compared to knee or hip, a substantial number of patients require treatment for debilitating ankle arthritis. The primary goal of any surgery of the foot or ankle is to establish a painless, plantigrade foot that fits in a shoe. Currently,

surgical options include allograft resurfacing, arthroscopic debridement and osteophyte resection, joint distraction arthroplasty, supramalleolar osteotomy, total ankle replacement, and ankle arthrodesis. For a young patient who is a heavy labourer, the option with the most consistent results is ankle arthrodesis. In the older patient population, the two surgical options most commonly used are total ankle replacement and ankle arthrodesis.

The literature has supported the use of pantalar fusions in patients with ankle, hindfoot, and transverse tarsal joints deformity and arthritis secondary to poliomyelitis, spasticity, rheumatoid and post-traumatic arthritis.^{2,8-11} The pantalar arthrodesis is a reasonable salvage alternative procedure for patients with severe traumatic arthropathy and neuropathic arthropathy causing pain, deformity and instability.^{8,9} For Pantalar arthrodesis to be a successful procedure, careful patient selection and meticulous surgical alignment of the foot and ankle are essential.¹⁰

Pantalar arthrodesis is commonly performed as a double staged procedure- ankle arthrodesis in one stage and triple arthrodesis in the second stage. Transfibular approach for ankle arthrodesis gives the advantage of reduced risk of nerve injury, allows an excellent exposure, easy freshening of the entire subchondral bone, possibility of correction of major malalignments and exact positioning of the hindfoot under direct vision, easy placement of compressions screws, biologic and mechanical enhancement of tibiotalar fixation as well as cosmetic advantage through screw fixation of fibular fragment.¹¹ Olliers approach has been successfully used for triple arthrodesis with excellent results and minimal complications.

A variety of complications have been reported secondary to pantalar arthrodesis attempts, including skin ulcerations, wound infections, neuropathic pain, malunions and nonunions. Risk factors for nonunion include patient's smoking history, diabetic history, neuropathy, avascular necrosis and inadequate surgical fixation. A careful planning, appropriate patient selection, preoperative medical and vascular clearance, and postoperative care and rehabilitation are must to get the desired outcome.

We presented a case of 50 years old male with chronic subluxated tibiotalar and subtalar joint with secondary arthritis that was operated with a single staged pantalar arthrodesis with a follow up of 6 months. Patient was symptom-free and full weight bearing walking 14 weeks with X-rays and CT scan done at 6 months showing bony fusion around tibiotalar, talocalcaneal, talonavicular and calcaneocuboid joint.

CONCLUSION

A single staged pantalar arthrodesis combining both transfibular approach for ankle and olliers approach for

triple arthrodesis when combined with a careful preoperative planning and postoperative care and rehabilitation is an effective surgical treatment option for a chronic subluxated tibiotalar and subtalar joint with secondary arthritis.

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Ethical approval: Not required

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