

## Functional And Clinical Outcomes of Triple Arthrodesis for Charcot Joint

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### Abstract

Intramedullary and retrograde nailing are two simultaneous processes that help develop triple arthrodesis in the pedal of an individual facing hindfoot injury. Orthopaedic doctors use evolving techniques of these treatment procedures to enhance the mitigation rate of Charcot foot disease. The study has focused on exploring existing medical journals for inductive exploration of the treatment strategy.

**Keywords:** Foot deformities, Triple Arthrodesis, retrograde nailing, Thrombosis-based prophylaxis

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### Introduction

"Triple Arthrodesis" is an important procedure bearing immense versatility that plays a vital role in mitigating different pedal conditions and is generally a fusion process that includes three joints located between the back portion of the foot, commonly known as "Hindfoot", and "Midfoot." The three joints that are included within the Triple Arthrodesis are, respectively, the joint of the subtalar region, including the talus and "calcaneus joints", the joint of the talonavicular portion and the "calcaneocuboid joint" portion. The study aims to define triple arthrodesis' functionalities and clinical impacts in mitigating Charcot joint foot disease

- Objective
- To describe the anatomical structures, different indicating factors and contradictions of the triple arthrodesis.
  - To define the different techniques related to the preparation and conduction of treatment regarding triple arthrodesis
  - To evaluate different complications and clinical importance of the triple arthrodesis procedure in the mitigation of Charcot disease

- To explore the improving care development strategies for communicating the advancement of the triple arthrodesis process in resolving Charcot's foot

### Literature Review

Triple Arthrodesis based diagnosis of different foot deformities

"Triple Arthrodesis" is a fusion process that generates a lock in the bones, which removes the cartilage from the joint's surface and creates a bridge between the bones across the joints. The process is used to mitigate various deformities in the hindfoot, including severe arthritis, pedal instability and deformities that can be mitigated using non-surgical treatment processes. Severe flatfoot disease and Charcot's foot disease generally indicate abnormal connectivity between bony regions of the feet of a human being. Different unstable situations in the foot joints generated due to the impact of neuromuscular deformities can be mitigated using the arthrodesis procedure G (Cifuentes-De la Portilla et al. 2020). Based on the predictability of the procedure, the process is utilised clinically as a definitive treatment method for most pedal impairments and helps relieve the patients from pain.



Figure 1: Different Foot deformities

(Sources: Yildiz *et al.* 2021)

#### Mitigation of Charcot Joint

Charcot's joint, commonly known as Charcot foot disease, is generally caused by type one diabetes and damages the nerves of the feet. The "Triple Arthrodesis" procedure is utilised in orthopaedic treatments to mitigate Charcot foot disease. Treating the disorders in the Charcot's joint depends on the decrement of permanent deformities within the foot that allow stability and increased ambulation within the patient's feet. Acute Charcot joint disease becomes imperative, leading to immobility of the foot, and weight restriction helps prevent permanent deformity (Diacogiorgis *et al.* 2021). The non-operative way of mitigating the Charcot joint challenges includes the triple arthrodesis process conducted by weight restriction and the development of problems,

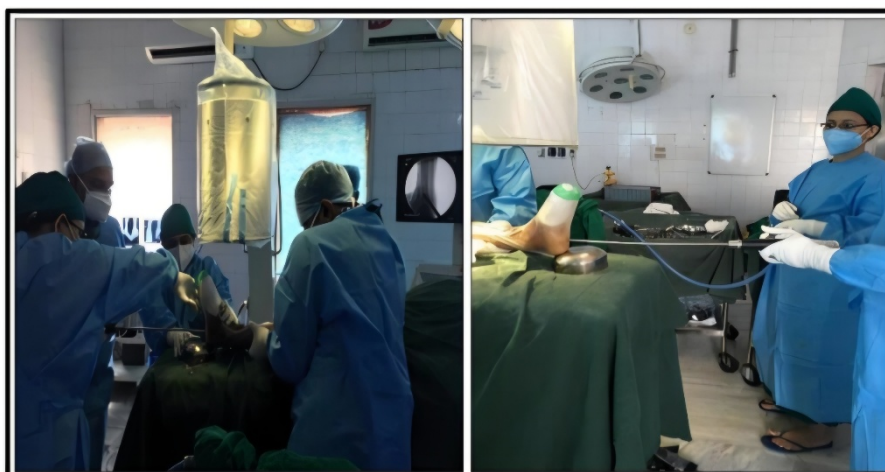
#### Methodology

The researcher used a "secondary qualitative method" to conduct further studies. This particular study focused on using the "pragmatism philosophy" to understand the levels of deformities present within human feet and the role of "triple arthrodesis" in orthopaedic surgery. Developing the "inductive approach" has helped the researcher understand the. The significance of the arthrodesis procedure in mitigating "Charcot disease" has ultimately focused on evaluating the role of the fusion treatment in foot joint deformity treatment development. An "exploratory design" is used to create a significant understanding of the benefits and risks

present within the arthrodesis procedure and the impact of using the process (Olawale *et al.* 2023). The researcher has kept an eye on collecting the necessary sets of information present in the secondary data sources, including the medical journals and previously published research papers generated by different authors (Taherdoost, 2021). Based on these journals, some systematic themes are generated by interconnecting those with the concept related to arthrodesis and Charcot joint detection for conducting a qualitative analysis of the gathered and creating patterns for generating a specific treatment process.

#### Findings and Discussion

Theme 1: Triple Arthrodesis based on retrograde nailing for mitigation of Charcot's ankles "Triple Arthrodesis", known as Charcot neuroarthropathy, focuses on the study of the disease's detection and plays a vital role in preventing the issue related to the problematic outcomes present in the Charcot disorder in the ankles. Retrograde nailing is a surgical reconstruction process that focuses on resolving the deformities within the feet that initiate significant instability in the pedal portion of the individual (Somashekar and Kumar, 2022). Different indications include different ulcerations, osteomyelitis and significant pain-related issues. Arthrodesis in the ankle region focus on choosing the method that is the main process in developing rectification and treatment for Charcot surgery and resolving the neurological deformities in humans' feet and pedal portions.



**Figure 2: “Reaming” for the “Retro Grade Nailing”**

(Source: Somashekar and Kumar, 2022)

**Theme 2: Surgery of Charcot Foot disease and post-operative arthrodesis**

Conduction of surgery in mitigating the Charcot disorder present in the feet of humans includes proper inclusion of static circular external fixators that enhance the stability rate of extreme lower portions of the limbs. Postoperative critical care helps minimise the complexities that involve development in the tribal block, including tribal rings and different foot plates that enhance the credibility of the external factors that involve modifying the stability of hybrid construction

(Stuto and Stapleton, 2022). Prospective care for this disease includes an increment of complication minimisation that successfully focuses on improving arthrodesis application. These treatment methods include heparin-based treatment of venous thrombosis-based prophylaxis that enhances the risk factors regarding ambulatory disorder as an impact of diabetes 1.



**Figure 2: Different stages of Charcot foot disease**

(Source: Stuto and Stapleton, 2022)

**Conclusion**

Charcot treatment based on surgical intervention includes the technique of arthrodesis, which develops neuroarthropathy through intramedullary nailing fixation. The treatment process enhances the ability to

mitigate the risks related to pedal deformities based on the multiplanar system successfully. The high complication rate in humans regarding the lower limb portions helps strive for a limbing salvage ratio. Triple arthrodesis helps enhance the treatment process in ankle

development, carries significant perforations in the “tibiotocalcaneal” and patellar regions, and mitigates the issues.

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