

A Rare Case of Symptomatic Planovalgus Foot with Triple Coalition

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Learning Point of the Article:

The incidence of tarsal coalition is low, and the occurrence of a triple coalition with a planovalgus deformity is extremely rare. Most cases of symptomatic tarsal coalition are treated conservatively; in this case, despite two years of conservative management, symptoms were not relieved and worsened; hence correction of the deformity at the apex, at talonavicular coalition was performed to achieve a plantigrade foot with the best functional result. Based on the available literature, this approach provides a good functional outcome at a single intervention.

Abstract

Introduction: Tarsal coalitions in the general population are low, possibly due to the asymptomatic nature. In the symptomatic group, however, the presentation is usually during adolescence or early adulthood. The occurrence of a triple tarsal coalition is extremely rare, especially if not associated with a syndrome.

Case Report: We report a case that has the unique configuration of talocalcaneal, talonavicular, and calcaneocuboid coalitions with a planovalgus foot. We review the available literature on this rare occurrence and outline our management in this case to achieve a plantigrade, painless functional foot.

Conclusion: Symptomatic triple coalition planovalgoid cases, require a surgical corrective procedure in order to achieve a plantigrade foot.

Keywords: Tarsal coalitions, rigid flatfoot, planovalgus foot, triple coalition.

Introduction

Tarsal coalition is the abnormal fusion between adjacent tarsal bones, which may be partial (fibrous or cartilaginous) or complete (bony)[1]. The incidence of tarsal coalition is low, 1–2% of the general population, and the incidence of symptomatic cases even less[2]. Calcaneonavicular and talocalcaneal are the most common coalitions followed by calcaneocuboid and talonavicular, to a lesser extent [3]. The occurrence of these coalitions usually results in rigid deformity. Most cases are managed conservatively with activity modification or orthotics. However, when symptoms are persistent, and the biomechanics of the foot are altered, resulting in damage to adjacent joints due to overload, a more aggressive approach has to be taken [4]. We present a rare case of a triple coalition in a young female, presented with the symptomatic planovalgus foot, and managed with corrective

procedures.

Case Report

A 24-year-old female patient presented with complaints of painful deformity of her right foot with marked restriction of activities. Over the past 2years, she received conservative management in the form of medications, physiotherapy, and orthotics without any relief. Clinical examination revealed a planovalgoid foot along with a tight gastrocnemius, with a preserved ankle range of movements (Fig. 1). The subtalar and transverse tarsal joint movements were absent, along with tenderness over the subtalar, talonavicular, and calcaneocuboid joints. The diagnosis was confirmed with standing radiographs. Radiographs demonstrated the congenital fusion of subtalar, calcaneocuboid, and talonavicular joints with heel in valgus

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Author's Photo Gallery



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Figure 1: Standing clinical picture demonstrating a planovalgoid deformity on weight-bearing.

(Fig. 2).

Given her disablement and failure of conservative modalities over the past 2years, a decision of surgical management was undertaken. Her pre-surgery American Orthopedic Foot and Ankle Society (AOFAS) score was 35. Correction of heel valgus with a sliding medial calcaneal osteotomy, release of Achilles tightness with gastrocnemius recession, and correction of a collapsed medial longitudinal arch with a corrective fusion of talonavicular joint was planned. In a floppy lateral position, a gastrocnemius recession was performed followed by a medial displacement calcaneal osteotomy. The osteotomy was fixed with two 6.5 mm cannulated cancellous screws, pushed through the subtalar joint up to the neck of the talus. Finally, to correct the sag at the talonavicular joint, a dorsal open wedge osteotomy was carried out at the level of the talonavicular joint, packed with iliac crest bone graft and fixed using a plate, and screws to restore the medial arch (Fig. 3). Postoperatively, she was immobilized for 4 weeks. Progressive weight-bearing with ankle range of motion physiotherapy was advised at the end of 6 weeks. The patient went back to all activities of daily living by 4 months. Her post-surgery AOFAS score was calculated as 72. At present, at 18 months post-surgery, she is asymptomatic (Fig. 4 and 5).

Discussion

The global incidence of tarsal coalition is unknown; this could be primarily due to its asymptomatic nature; however, at present, it is assumed to be <1%[2]. Le Bouq's theory proposed



Figure 3: Post-operative radiographs demonstrating reconstruction of the medial arch along with a talonavicular fusion and hindfoot reconstruction with a calcaneal slide osteotomy.



Figure 2: Anteroposterior and lateral radiographs demonstrating collapsed medial arch and triple coalitions (talocalcaneal, talonavicular, and calcaneocuboid).

a failure of differentiation of mesenchymal tissue either due to a first-trimester insult or due to an autosomal dominant defect [5, 6]. Pfitzner proposed the ossification of adjacent accessory bones as another possible reason for the origin of coalitions [7]. Common coalitions are talocalcaneal and calcaneonavicular. Most cases can be treated with conservative measures. However, for refractory cases, there is controversy regarding the surgical intervention period and the procedure required to achieve maximum symptomatic relief as well as prevent further complications [8]. Tarsal coalitions with severe planovalgus deformities treated by simple resections tend to have poorer outcomes based on a literature review. Lisella et al. conducted a retrospective case series in which, along with coalition resections, hindfoot reconstructions were performed. The functional outcomes were better than coalition resections alone. All these patients had mild arthritis, and hence, no fusions were done [9]. The presence of triple coalitions, talocalcaneal, calcaneocuboid, and talonavicular is scarce [10]. In patients showing signs of arthritis, a fusion procedure is advised. The literature has suggested corrective triple fusion in such cases [11]. There are sporadic case reports in the literature which mention its conservative management; however, when the coalition results in arthrosis, a double fusion, along with correction of hindfoot deformities, has shown good functional outcomes [12].

In the case reported by us, the patient had no relief following conservative management of 2 years and was disabled with extreme restriction of activities of daily living, affecting her ankle. To reduce, symptoms of foot pain and prevent deterioration of the ankle joint surgical intervention were undertaken. The correction of equinus and valgus of the heel



Figure 4: Weight-bearing clinical pictures of the same patient at the end of 18 months post-surgery showing correction of deformities.





Figure 5: Weight-bearing radiographs of the same patient at the end of 18 months post-surgery showing correction of deformities.

was carried out as a hindfoot deformity corrective procedure. The apex of deformity being at talonavicular joint, corrective fusion at a talonavicular coalition, was carried out to recreate the arch. Failure to correct the biomechanics of the foot would result in complications such as degenerative arthritis of unaffected joints, pathological fractures, and a poor functional outcome[10].

Conclusion

The management tarsal coalition cases associated with symptomatic arthritis may require the fusion of affected joints.

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When associated with a planovalgus foot, the biomechanics of the foot and ankle have to be taken into consideration to provide a better functional outcome.

Clinical Message

The incidence of a (-) tarsal coalition is low, and the occurrence of a triple coalition with a planovalgus deformity is extremely rare. Most cases of symptomatic tarsal coalition are treated conservatively; in this case, despite 2 years of conservative management, symptoms were not relieved and worsened; hence, correction of the deformity at the apex, at talonavicular coalition, was performed to achieve a plantigrade foot with the best functional result. Based on the available literature, this approach provides a good functional outcome at a single intervention.

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