

Treatment of Chronic and Severe Pes Planovalgus Deformity using SymALIGN® Evans and Cotton Osteotomy Wedges

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CASE STUDY

Pes planovalgus (Flatfoot) is a common deformity of the foot which includes abduction of the forefoot, calcaneus valgus, and considerable pain.¹ When conservative therapy fails, surgical treatment, such as Evans osteotomy or Cotton osteotomy procedures, involves lengthening of the lateral column and restoration of the medial longitudinal arch. In an Evans osteotomy procedure, a lateral opening in the calcaneus is filled with a bone graft to create lateral lengthening. A Cotton osteotomy involves the insertion of a wedge dorsally in the medial cuneiform to cause plantarflexion, restoring medial arch height. A number of complications associated with these procedures have been reported, including non-union, subsidence and displacement.²⁻⁴ Graft displacement is of particular concern due to potential difficulty in repairing a displaced graft. SymAlign Evans and Cotton osteotomy allograft wedges were developed to minimize the chance of graft displacement.⁵ The wedges are sourced from donated human tissue using dense cancellous bone from femoral heads and condyles, talus, or calcaneus. SymAlign wedges have a specific texturing design that increases the coefficient of friction between the graft and the bone at the implant site.⁵ The SymAlign osteotomy wedges, with their unique textured design and high density, are designed specifically to resist graft displacement and maintain deformity correction.⁵

The following describes the use of a SymAlign Evans osteotomy wedge to correct a chronic and severe case of pes planovalgus deformity.

Patient

48-year-old male

The patient presented with moderate pain in the left foot, including painful inversion of the foot against resistance, pain along the superficial deltoid ligament and medial ankle gutter, as well as along the lateral malleolus with fibular impingement. The patient reported that he has suffered from chronic symptoms of flatfoot since childhood. Previous treatment attempts included bracing, splint, and different shoe gear with no relief. “Too many toes” sign was present in stance (Figure 1). Radiographic inspection revealed loss of height of the medial longitudinal arch in the left foot, valgus deflection of the heel, lateral deviation of the midfoot, and forefoot varus (Figure 2). These corresponded to an increased Meary’s angle (18°) and a decreased calcaneus inclination angle (4°). A diagnosis of pes planovalgus was confirmed, as well as posterior tibial tendon dysfunction (PTTD), equinus, and hallux valgus. The patient had a pre-operative AOFAS ankle-hindfoot score of 30%.

Procedure

A 3 cm horizontal incision was created on the lateral side of the calcaneus. The Evans osteotomy was performed, and an 8mm SymAlign Evans osteotomy allograft wedge was inserted into the osteotomy site. The site was secured using a BME ELITE® Compression Implant from DePuy Synthes.

Next, a 3 cm longitudinal incision was created over the dorsal aspect of the medial cuneiform. The Cotton osteotomy was

performed in the center of the medial cuneiform. A 6.5 mm SymAlign Cotton osteotomy allograft wedge was inserted into the osteotomy site, which was secured using a BME ELITE® Compression Implant (DePuy Synthes).

A medial calcaneal slide, gastrocnemius recession, and Austin-Akin bunionectomy were additionally performed.

Results

At 12 weeks post-operative, the patient was no longer in pain and was in running shoes. The patient returned to normal daily activities by 4 months post-operative, with an improved AOFAS ankle-hindfoot score of 97%. Radiographic images taken at 5 months post-operative (Figure 3) revealed noted improvements in both the calcaneal inclination angle, to 14°, and the Meary’s angle, to 4°. It was noted that the use of the SymAlign Evans osteotomy wedge reduced the calcaneocuboid and talonavicular joints, and the Cotton wedge corrected the forefoot varus deformity.

Conclusion

This case demonstrates the successful treatment of severe and chronic pes planovalgus deformity using both SymAlign Evans and Cotton osteotomy allograft wedges. The patient was satisfied with the results, and has asked for the same procedure to be done on his right foot.

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Figure 1.

“Too many toes” sign seen in the left foot stance, indicative of pes planovalgus deformity.

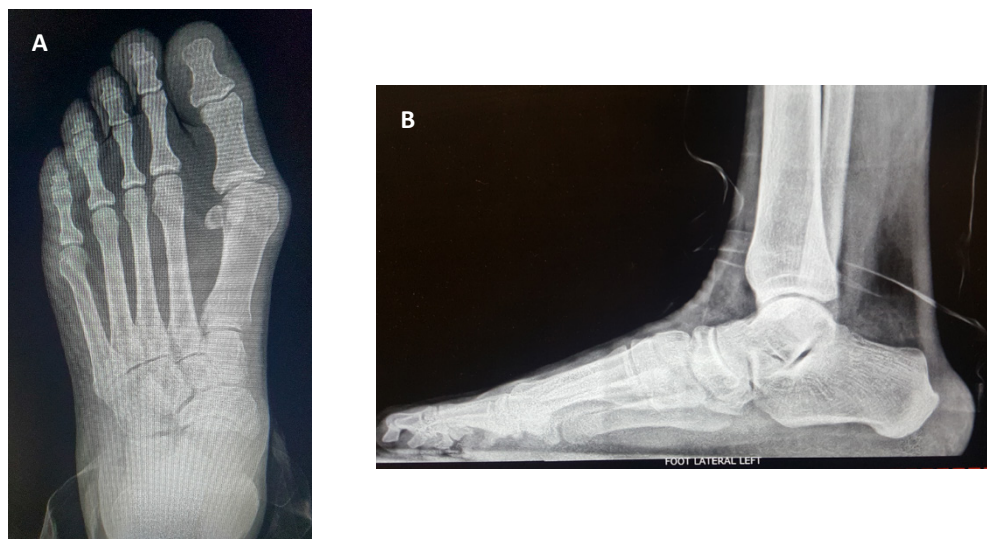


Figure 2.

Pre-operative radiographic images taken in the (A) anterior-posterior and (B) lateral views. Moderate abduction of the forefoot can be seen, as well as an increased Meary's angle and decreased calcaneal inclination angle.

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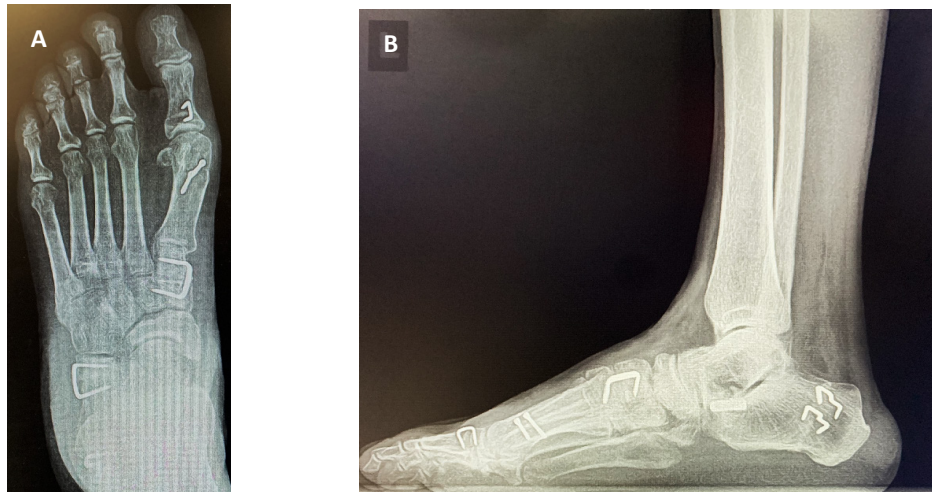


Figure 3.

Post-operative radiographic images taken 5 months after SymAlign wedges were implanted show full consolidation of the allograft wedges. (A) The anterior-posterior view demonstrated reduction of the calcaneocuboid and talonavicular joints with the use of the SymAlign Evans osteotomy wedge. (B) The lateral view revealed noted improvements in the Meary's angle and calcaneal inclination angle, and correction of the forefoot varus with the use of the SymAlign Cotton osteotomy wedge.

Results from case studies are not predictive of results in other cases. Results in other cases may vary. Bench/Laboratory testing may not be indicative of clinical outcomes.

References

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