

# **Titanium Coated Polyetheretherketone Wedges Successfully Correct Acquired Flatfoot Deformities Without Additional Fixation**

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**INTRODUCTION:** Surgical correction of acquired flatfoot deformities is commonly achieved through joint sparing osteotomies including the Evans osteotomy of the calcaneus and/or the Cotton osteotomy in the medial cuneiform. Traditional surgical technique employs bone graft and fixation. However, fixation hardware can lead to complications, pain and loss of function<sup>1</sup>. New wedges made of titanium plasma coated polyetheretherketone (TPC-PEEK) are designed to encourage bony ongrowth. Therefore, the objective of this study was to evaluate the clinical and radiographic healing of patients undergoing Evans and Cotton osteotomies with TPC-PEEK wedges without further fixation to correct acquired flatfoot deformities.

**METHODS:** Institutional Review Board approval was obtained to perform a retrospective analysis of patients treated with TPC-PEEK wedges without fixation for the surgical correction of acquired flatfoot deformities. Patients were assessed for radiographic ongrowth, complications and loss of surgical correction at 6 weeks, 10 weeks and 16 weeks post-operative.

**RESULTS:** A total of 20 patients were treated to correct acquired flatfoot deformities. One patient was treated with a Cotton osteotomy, 8 patients were treated with an Evans osteotomy, and 11 patients were treated with both a Cotton and an Evans osteotomy using TPC-PEEK wedges. Study results found that all 20 patients (100%) demonstrated a stable osseointegration pattern with no lucency between the implant and the surrounding bone and maintained correction following treatment. Serial radiographs showed bony ongrowth consistent with good implant stabilization. CT scans, when available, showed early bone bridging formation across the implant window consistent with the x-ray findings. Additionally, patients obtained clinical healing with no pain following treatment. One patient reported a complication. One patient had sural neuritis that resolved with physical therapy.

**DISCUSSION:** This early analysis demonstrates the ability of TPC-PEEK wedges used in reconstructive procedures (Cotton and Evans osteotomies) to correct acquired flatfoot deformities without the need for additional fixation. Early bony ongrowth provides early evidence that stabilization of the implant is achieved in the reconstructive osteotomy and alleviates the need for additional fixation that can cause pain and soft tissue complications. While additional research is required to fully evaluate these TPC-PEEK wedges, including long-term follow-up with CT scans to confirm long-term fusion, this study demonstrates their ability to correct acquired flatfoot deformity without the need for additional fixation.

**SIGNIFICANCE/CLINICAL RELEVANCE:** This study provides early evidence that TPC-PEEK wedges can be used in reconstructive procedures to correct acquired flatfoot deformities without additional fixation thereby alleviating the complications associated with fixation hardware.

## **REFERENCES:**

1. Lutz M and Myerson M: *Foot Ankle Int.* 32(3): 278-287, 2011.