

Significantly improved pain, function and alignment following osteotomy for hallux valgus with novel PEEK headless cannulated compression and snap-off screws

Hallie Murray, PhD¹, Peter Fennema, DSc², Jillian Mohn¹, Madilyn Riegel¹ and Hubert Rocher, MD³

¹Tyber Medical, Bethlehem, Pa, ²AMR Advanced Medical Research GmbH, Mannedorf, Switzerland, ³Clinique Du Sport Bordeaux-Merignac, Merignac, France
hmurray@tybermed.com

Disclosures: Hallie Murray (3A – Tyber Medical), Peter Fennema (5 – ADSM, a Tyber Medical Company), Jillian Mohn (3A – Tyber Medical), Madilyn Riegel (3A – Tyber Medical) and Hubert Rocher (5 – ADSM, a Tyber Medical Company)

INTRODUCTION: Hallux valgus is considered one of the most common foot deformities¹ and is associated with pain and difficulty with shoe wear. While mild cases can be treated non-operatively with shoe modifications, surgical management is indicated for progressive and more severe deformity. Therefore, the purpose of this study was to assess the effectiveness of osteotomy using novel PolyEtherEtherKetone (PEEK) headless cannulated compressive and snap-off screws to treat hallux valgus.

METHODS: A retrospective study of 54 consecutively treated patients with moderate to severe hallux valgus undergoing osteotomy with PEEK headless cannulated compressive screws (including snap-off version) between January 2017 and June 2018 were evaluated for clinical and radiographic outcomes. Eleven patients were treated with 2 screws (one headless and one snap-off). The American Orthopaedic Foot and Ankle Society Hallux Metatarsophalangeal-Interphalangeal (AOFAS) Scale was used to assess pain, function and alignment.

RESULTS: All 54 subjects obtained fusion with no reported complications following treatment. Patients had significant improvement in pain (38.9 ± 3.2 compared to 11.7 ± 11.3), function (40.3 ± 3.5 compared to 25.6 ± 8.9) and alignment (13.7 ± 2.7 compared to 4.3 ± 4.3) at 6-month follow-up compared to pre-operative assessment. At 6-month follow-up, patients had an average AOFAS score of 92.9 ± 6.1 demonstrating a mean improvement of 51.3 points compared to pre-operative scores (41.6 ± 18.8) (see **Figure 1**). Moreover, 45 patients reported excellent outcomes, 6 reported good outcomes and 3 reported fair outcomes following treatment.

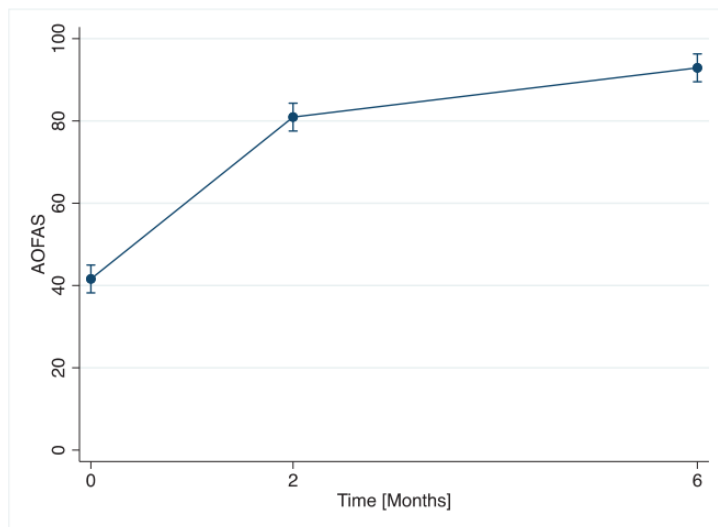


Figure 1: Graphical presentation of the development of the AOFAS score over time. Error bars represent 95% confidence intervals (obtained with a linear mixed effects model).

DISCUSSION: This study was the first to evaluate patients undergoing osteotomy novel PEEK headless cannulated compressive and snap-off screws to treat hallux valgus. Study results demonstrated good fusion outcomes and significant improvement in pain and function as demonstrated by AOFAS assessment. While additional research is required to fully evaluate these PEEK headless cannulated compressive and snap-off screws, including long-term follow-up, this initial data supports the effectiveness of these screws as a treatment option for hallux valgus.

SIGNIFICANCE/CLINICAL RELEVANCE: This study was the first to demonstrate successful fusion with restored alignment, improved functionality and decreased pain in patients undergoing osteotomy with novel PEEK headless cannulated compressive and snap-off screws.

REFERENCES:

1. Mortka K, Lisiński P. Hallux valgus-a case for a physiotherapist or only for a surgeon? Literature review. J Phys Ther Sci. 2015 Oct;27(10):3303-7