

Register-based Study of 1-year Postoperative Results After Surgical Treatment of Adult Acquired Flatfoot Deformity

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INTRODUCTION:

There are many surgical interventions used to treat AAFD with little high-level evidence that supports one intervention over another. Previous research has shown large regional variations regarding types of surgical interventions used in the treatment of AAFD in Sweden. Many units use hindfoot arthrodesis (HFA; talocalcaneal, talonavicular, calcaneocuboid, or naviculocuneiform) rather than lateral column lengthening (LCL) or medial displacement calcaneal osteotomy (MDCO) to treat AAFD grade IIa-b even though it is not recommended.

We aimed to explore the 1-year postoperative results after surgical treatment for AAFD and compare the patient reported outcomes for feet treated with osteotomy (LCL or MDCO) to feet treated with HFA.

METHODS:

Swefoot is a quality register for foot and ankle surgery in Sweden. In June 2023, we retrieved data from Swefoot on all feet treated surgically for AAFD between January 2014, to May 2023. We included feet treated between February 2017, and May 2022.

Preoperatively, patients complete two PROMs: the 3-level version of EuroQol 5 Dimensions (EQ-5D-3L) and the Self-Reported Foot and Ankle Score (SEFAS). The EQ-5D-3L is a generic PROM where the patient answers questions regarding 5 dimensions of their general health summarized in an index ranging from 0 (worst) to 1 (best). The SEFAS is a region-specific PROM where patients answer questions regarding their function and pain in their foot and ankle as well as their quality of life (QoL) summarized in a score ranging from 0 (worst) to 48 (best). The minimally important change (MIC) in SEFAS score, clinically relevant, is 5 points.

The surgeon reports data regarding the diagnosis, type of interventions used and postoperative regimes.

The classification system used in Swefoot is based on Myersons modification of the classification by Bluman et al.

We compared mean pre- and postoperative PROMs (SEFAS score, EQ5D index, and EQ5D VAS) using paired-samples t-test for all feet and separately per severity grade.

For all patients with grade II, we used multivariate linear regression to investigate how the use of HFA compared to heel osteotomy was related to the outcome postoperative SEFAS score and logistic regression for the dichotomous outcome satisfaction with the surgery. The model was adjusted for BMI, rheumatic disease, gender, age, and preoperative SEFAS score. We calculated the regression coefficient (B) with a 95% confidence interval (CI). We also analyzed the relationship between surgical method (osteotomy compared to HFA) and 1-year postoperative satisfaction with surgery using logistic regression analysis and calculated the predicted change in odds ratio ($\exp B$) with a 95% CI.

RESULTS:

667 feet were treated during this period. In our study group 218 had a complete pre- and postoperative SEFAS score and 133 (61%) of these patients were women. The median age was 60 (range: 16-83) and the mean BMI 28.3 (SD 4.6).

The mean preoperative SEFAS score was 18.5 (SD 6.7) and the mean postoperative SEFAS score was 29.7 (SD 9.7). The mean change in SEFAS score was 11.2 (CI 95 % 10.0-12.4). The mean preoperative EQ5D index was 0.44 (SD 0.32) and the mean postoperative EQ5D index was 0.70 (SD 0.26). The mean change in EQ5D index was 0.26 (CI 95 % 0.21-0.31).

For all grades of AAFD, there was a statistically significant improvement of SEFAS score from pre- to one year postoperative, and the lowest improvement was observed in grade IIb with a mean change of 10 (95% CI 7.9-12.10) points.

There were 179 flatfeet grade II) with pre- and postoperative SEFAS scores that had undergone surgical treatment with either osteotomy (MDCO or LCL) without HFA (n=145) or HFA with or without osteotomy (n=34).

The effect of osteotomy without HFA, compared to HFA, on postoperative SEFAS score was positive (B=2.84, CI 95% - 0.57 to 6.26) but not statistically significant.

There were 294 flatfeet grade II) that had been treated with either osteotomy (MDCO or LCL without HFA, n=235) or HFA (with or without osteotomy, n=59) where the question regarding postoperative satisfaction with surgery was answered.

Among the feet treated with osteotomy, there were 177 (75.3%) patients satisfied with the surgery, 1 year postoperatively. In the HFA group, there were 40 (67.8%) patients satisfied with the surgery.

There was no statistically significant effect of osteotomy without HFA, compared to HFA, on the odds of 1-year postoperative satisfaction with surgery ($\exp B=1.01$, 95% CI 0.41-2.50) and not statistically significant. Female sex had a statistically significant positive effect ($\exp B=2.20$, 95% CI 1.10-4.37) on the odds of 1-year postoperative satisfaction.

DISCUSSION AND CONCLUSION:

Patients treated surgically for AAFD in Sweden had a statistically significant and clinically relevant improvement in SEFAS score from preoperative to 1-year postoperative. There was no statistically significant or clinically important difference in outcome between patients with flexible AAFD treated with osteotomy compared to those treated with HFA. However, more randomized controlled trials exploring the outcomes of different surgical interventions used in the treatment of AAFD are needed to generate evidence-based guidelines of high quality and homogenize the treatment on a national level. The Swefoot is a young register and data are continually added which means new studies with larger sample sizes and longer follow-up time can be expected using data from this register in the future.