

Outcomes of Hindfoot Joint-Sparing Reconstructive Procedures for Flexible Progressive Collapsing Foot Deformity: A Prospective Cohort Study

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INTRODUCTION:

Treatment of Progressive Collapsing Foot Deformity (PCFD) is controversial and surgical procedures utilized usually depend on the type and rigidity of deformities present (PCFD classes and stages), degree of soft tissue involvement, and surgeon's preference. Multiple surgical procedures are usually performed concomitantly to achieve adequate correction. Prospective data regarding the utilization of hindfoot joint-sparing reconstructive procedures in the treatment of flexible PCFD is scarce, and little is known about the influence of the different procedures utilized to treat PCFD in deformity correction and patient-reported outcomes (PROs). The objective of this prospective study was to evaluate the most used hindfoot joint-sparing procedures utilized by a single-surgeon to treat flexible PCFD, and the influence of the utilized procedures in deformity pattern corrections, and PROs.

METHODS:

This is an IRB-approved, prospective, and comparative cohort study. Adult PCFD patients with flexible deformity (stage 1), no history of surgical treatment, and that failed conservative treatment for >3-months were enrolled. Patients underwent surgical treatment by a single surgeon. Patients were excluded if a hindfoot fusion procedure was needed intraoperatively to achieve correction. Types, numbers, and sizes of surgical procedures utilized were recorded. Weight-bearing CT (WBCT) measurements of overall 3D deformity, Classes A (hindfoot valgus), B (abduction), C (medial column instability), D (peritalar subluxation), and E (ankle valgus tilt) were assessed preoperatively, and at first 3-months WBCT. PROs were recorded preoperatively and at the most recent follow up. Descriptive statistics were used to report the frequency of deformity and procedures utilized. Pre and postoperative measurements and PROs were compared with paired T-tests/Wilcoxon. Multivariate regression analysis was used to correlate procedures utilized with deformity correction and PROs. P-values of >0.05 were considered significant.

RESULTS:

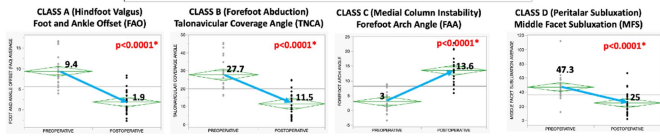
A total of 29 patients included (28 feet, 79%F, 21%M), mean age and BMI of respectively 47.6-years and 34kg/m². Average number of procedures performed was five and mean follow up was 19.1 months (range, 3 to 40). Frequency and sizes of medial displacement calcaneal osteotomy (MDCO), first ray plantarflexion procedure (Cotton/LapiCotton), and lateral column lengthening (LCL) procedures were, respectively: 100% (8.9mm displacement), 100% (66% LapiCotton/34% Cotton, 8.3mm wedge-opening), and 39% (6.8mm wedge-opening). Soft-tissue procedures performed: 83% Posterior tibial tendon (retensioning/FDL transfer/allograft reconstruction), 34% peroneal tendon (brevis-to-longus and brevis lengthening), 76% gastrocnemius-recession, 38% spring ligament (retensioning / reconstruction / augmentation), and 31% deltoid ligament (retensioning / reconstruction / augmentation). Significant improvement postoperatively was observed in all PCFD measurements performed and PROs (Figure). However, no direct correlation was found between procedures performed/measurement improvements and PROs.

DISCUSSION AND CONCLUSION:

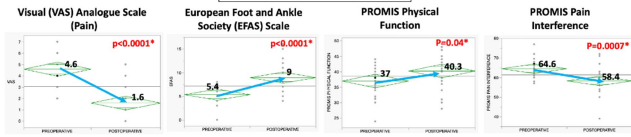
In this prospective comparative cohort study of flexible PCFD patients undergoing surgical treatment with hindfoot joint sparing surgical procedures, we observed significant postoperative improvement in all deformity patterns assessed (Classes A, B, C, and D) as well as PROs. MDCO, and first ray plantarflexion procedures (Cotton or LapiCotton) were the most commonly utilized procedures and were performed in all cases. Even though deformity correction and PRO improvements were observed postoperatively, no direct correlation was observed between PROs and specific surgical procedures performed or deformity pattern corrections (PCFD classes).

OUTCOMES OF HINDFOOT JOINT-SPARING RECONSTRUCTIVE PROCEDURES FOR FLEXIBLE PROGRESSIVE COLLAPSING FOOT DEFORMITY: A PROSPECTIVE COHORT STUDY

PROGRESSIVE COLLAPSING FOOT DEFORMITY WEIGHTBEARING CT MEASUREMENTS



PATIENT REPORTED OUTCOMES (PROs)



OUTCOMES OF HINDFOOT JOINT-SPARING RECONSTRUCTIVE PROCEDURES FOR FLEXIBLE PROGRESSIVE COLLAPSING FOOT DEFORMITY: A PROSPECTIVE COHORT STUDY

Graphical plots in the top row represent comparisons of preoperative and postoperative Progressive Collapsing Foot Deformity (PCFD) deformity patterns: for Class A (Hindfoot Valgus), Class B (Midfoot Abduction), Class C (Medial Column Instability), and Class D (Peritalar Subluxation). Significant improvements were observed postoperatively for all deformity patterns. Bottom row depicts graphical plots of comparisons between preoperative and postoperative Patient Reported Outcomes (PROs) assessed. All PROs improved significantly postoperatively.