

Return to Sport after First Metatarsophalangeal Arthrodesis: A Systematic Review

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INTRODUCTION: First metatarsophalangeal (MTP) arthrodesis is a common surgical intervention for addressing MTP joint pain from arthritis and deformity such as hallux varus and hallux valgus. The first MTP joint plays an important role in foot and ankle biomechanics but the impact of MTP arthrodesis on return to sport (RTS) has not been well described. Although there has been great interest in this topic in the literature to date, no systematic review has been performed on the RTS after MTP arthrodesis. The purpose of this systematic review is to explore both qualitative and quantitative measures for RTS after first MTP arthrodesis to improve patient education and outcomes.

METHODS: This study is a systematic review on the topic of RTS after MTP arthrodesis using PubMed, Web of Science, CINAHL, and MEDLINE from database inception until May 10, 2023. Search algorithm used in all databases was (MTPJ OR MTP OR hallux rigidus OR cheilectomy OR metatarsal OR metatarsophalangeal) AND (arthrodesis OR fusion) AND sport. Inclusion criteria for this study was surgical intervention of first MTP arthrodesis, adult patients (older than 18 years old), studies with level of evidence I-IV, full text, articles in English, and outcomes related to sport. Exclusion criteria was articles not in full text, abstracts only, non-English articles, no outcomes related to sport, and pediatric patients (younger than 18 years old).

RESULTS: A total of 10 articles (1 randomized controlled trial, 9 observational studies) met the final inclusion criteria for this systematic review out of 249 articles found with the initial search criteria. Included patients (n=450) had a frequency weighted mean age of 58.6 years ± 5.1 years with a frequency weighted mean follow-up time of 32.1 months ± 18.9 months. For the Foot and Ankle Ability Measure (FAAM) Sport outcome tool, 153 patients (reported in 34.0% of patients) had a frequency weighted mean postoperative FAAM Sport score of 70.4 ± 21.8 at final follow up. For sporting activities reported by multiple studies (running, yoga, golf, hiking, tennis, elliptical, and biking), about 7.3% - 41.9% of patients (n=160 reports) stated that sporting activity difficulty decreased, 37.7% - 74.5% of patients (n=340 reports) stated that sporting activity remained the same, and 7.3% - 51.3% of patients (n=292 reports) stated that sporting activity difficulty increased after MTP arthrodesis depending on the sporting activity. One included article reported RTS time of 11.7 ± 5.1 weeks after first MTP arthrodesis (n=39 patients). Another included article (n= 53 patients) found that 75% returned to jogging, 80% returned to golf, 92% returned to hiking, and 75% returned to tennis after MTP arthrodesis.

DISCUSSION AND CONCLUSION:

RTS after first MTP arthrodesis is highly variable between patients and sporting type. Sporting activities, such as tennis and golf, have high rates of RTS after MTP arthrodesis along with high rates of increased difficulty. This study represents the first systematic review in the literature to date on the topic of RTS after first MTP arthrodesis. More research is needed on methods to improve both qualitative and quantitative RTS rates in adult patients after first MTP arthrodesis.

Sporting Activity	Better	Same	Worse	Total Reports
Running	29 (23.4%)	43 (34.7%)	52 (41.9%)	124 (100%)
Yoga	19 (16.4%)	49 (42.2%)	48 (41.3%)	116 (100%)
Golf	22 (17.7%)	51 (41.1%)	51 (41.1%)	124 (100%)
Hiking	35 (30.7%)	43 (37.7%)	36 (31.6%)	114 (100%)
Tennis	11 (9.4%)	46 (39.3%)	60 (51.3%)	117 (100%)
Elliptical	10 (18.2%)	41 (74.5%)	4 (7.3%)	55 (100%)
Biking	34 (23.9%)	67 (47.2%)	41 (28.9%)	142 (100%)

Table 1: Return to sporting activities rated as better, same, or worse by patients in studies by DeSantis et al. (2016), Dayton et al. (2023), and De Cuhna et al. (2019). All sports activity (running, yoga, golf, hiking, tennis, and bike) were reported in the three articles, with the exception of elliptical, which was reported in DeSantis et al. (2016) and De Cuhna et al. (2019) only. Absolute numbers/reports and (percentages) are expressed for each cell.