

Extensor Digitorum Brevis Transosseous Transfer for MTPJ Instability: A Pilot Study

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Category: Lesser Toes

Keywords: Lessor, Toe, Extensor, Digitorum, Brevis, Instability

Introduction/Purpose: Instability at the MTPJ of the lessor toes is challenging to treat, particularly when both transverse and sagittal plane deformity coexist. Previous studies have utilized a subligamentous transfer of the EDB for crossover toes. The purpose of this pilot study was to evaluate a transosseous transfer of the EDB to correct multiplanar instability of the lessor toe. Routine exposure of the MTP was performed through a dorsal approach and a Z lengthening of the EDL was performed. The median number of concomitant procedures performed was 4 and included hallux valgus repair, neuroma excision, metatarsal osteotomy, hammertoe correction and capsulotomies of other toes as needed. 27 tendon transfers were performed in 25 patients (2nd MTPJ: 20, 3rd MTPJ: 5, 4th MTPJ: 2)

Methods: A capsular release was performed on the concave side (contracted) and the convex side (lax) of the proximal phalanx and metatarsal head were exposed. A tenotomy of the EDB was performed at the musculotendinous junction and its insertion remained intact. The EDB was then transferred through a 2.5 mm drill hole in the base of the proximal phalanx. The drill hole began on the concave side and exited on the convex side with a similar hole from the convex side of the metatarsal neck to the concave side. To correct sagittal deformity the drill hole was oriented from dorsal to plantar. A low profile 1.5 mm polyethylene suture tape augmented the EDB transfer in both the proximal phalanx and metatarsal neck. A 3.0 mm interference screw is placed distally and the tape and EDB were appropriately tensioned and proximal fixation was achieved with another interference screw.

Results: Results

Median age in years (25-75th interquartile range)	64(58-85)
Females (N,%)	24, 96%
BMI (25-75th interquartile range)	27.8(21-32)
Previous surgery (N,%)	8, 32%
Smoking history (N,%)	7, 28%
Inflammatory arthritis (N,%)	5, 25%
Median number of concomitant procedures (25-75th IQR)	4(3-6)
Preop AP MTPJ angle in degrees (25-75th IQR)	19(11.5-24.0)
Postop AP MTPJ angle in degrees (25-75th IQR)	13(4.5-20.5)
% Transverse Plane Improvement Preoperative to Postoperative	31.5% (p < 0.0001)
Preop Lateral MTPJ angle in degrees (25-75th IQR)	41(26-58)
Postop Lateral MTPJ angle in degrees (25-75th IQR)	29(22.5-36)
% Sagittal Plane Improvement Preoperative to Postoperative	29.2% (p < 0.0001)

Conclusion: At a median follow up 19 weeks (12-32 weeks), EDB transfer augmented by polyethylene tape resulted in significant improvement in the transverse (31.5%) and sagittal planes (29.2%) without using temporary K wire fixation across the MTPJ. Twenty of 25 patients (80%) were completely satisfied, 4 patients (16%) were partially satisfied and 1 patient (4%) was dissatisfied. One mild infection occurred which was treated with oral antibiotics. No fractures occurred. This study is limited by relatively short follow up and the need to confirm these findings by independent surgeons. A biomechanical study is underway to assess pull out strength of the construct