CORRECTION OF CLAW TOE DEFORMITY OR CROSSOVER TOE DEFORMITY BY PLANTAR PLATE TENODESIS AND EXTENSOR DIGITORUM BREVIS TRANSFER

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CLAW TOE DEFORMITY
- Hyperextension of the metatarsophalangeal joint is the key component
- The proximal and distal interphalangeal joints remain flexed.
- The weak attachment of the plantar plate at the metatarsal neck attenuates, allowing the plate to subluxate distally and dorsally, until rupture of the thin proximal synovial attachment occurs and the metatarsophalangeal joint dislocates
- The intrinsic axis alters and the intrinsic muscles fail to act as efficient flexors of the metatarsophalangeal joint

CLINICAL PROBLEMS
- Painful callosity of overlying the proximal interphalangeal joint and beneath the metatarsal head is the common presentation.
- Conservative management consists of taping, padding, shoe wear modification or insoles may help to relieve the symptoms but do not correct the deformity.

SURGICAL OPTIONS CAN BE DIVIDED INTO SOFT TISSUE AND BONY PROCEDURES

SOFT TISSUE PROCEDURE
- Flexor to extensor tendon transfer
- Problem: static tenodesis and commonly resulted in stiff toe, sacrifice the flexor tendon, not correct the displaced plantar plate

BONE PROCEDURE
- Shortening osteotomy e.g. Weil Osteotomy → stiff toe
- Resection arthroplasty or arthrodesis will result in loss of the joint integrity
PLANTAR PLATE

- An important structure responsible for the stability of the metatarsophalangeal joint
- The plantar plate experiences extension forces imposed by toe-off. This predisposes the plantar plate to attenuate or rupture, leading to instability of the metatarsophalangeal joint and the subsequent development of the claw toe deformity.

- The postoperative stiffness and discomfort would be less of a factor if the stabilization is addressed at the level of the plantar plate rather than a tendon transfer.


ARTHROSCOPIC PLANTAR PLATE TENODESIS

Lui TH: Arch Orthop Trauma Surg. 127(9):823-6, 2007

LATERAL CAPSULAR Plication

Lui TH: Arch Orthop Trauma Surg. 127(9):823-6, 2007
TENSIONING

FINAL CONSTRUCT

PROBLEMS...

- Difficult to retrieve the suture from the surface of plantar plate
- Excessive blunt dissection affect vasculature to the metatarsal head
- Lateral reconstruction not strong enough

COMPLICATION: AVASCULAR NECROSIS OF METATARSAL HEAD

MODIFIED PLANTAR PLATE TENODESIS: CADAVERIC STUDY

Lui TH. Foot & Ankle International. 31(7):584-91, 2010
MODIFIED PLANTAR PLATE TENODESIS:
CADAVERIC STUDY

Lui TH: Foot & Ankle International. 31(7):584-91, 2010
MODIFIED PLANTAR PLATE TENODESIS
改良跖板缝合术

Lui TH: Foot & Ankle International. 31(7):584-91, 2010

CASE ILLUSTRATION: PREOPERATIVE

POST-OPERATIVE

ROLE OF 2ND METATARSOPHALANGEAL ARTHROSCOPY
- Treat the concomitant intra-articular pathology e.g. synovitis, cartilage flap
- Assess the integrity of the distal insertion of the plantar plate
- Arthroscopic guide of the passage of the suture in case of presence of longitudinal tears at the insertion of the plantar plate

Lui TH: Foot Ankle Int. 28:521-3, 2007

MODIFIED EXTENSOR DIGITORUM BREVIS TENDON TRANSFER FOR CROSSOVER SECOND TOE CORRECTION

Lui TH: Foot Ankle Int. 28:521-3, 2007

Lui TH: Foot & Ankle International. 31(7):584-91, 2010
CASE ILLUSTRATION


CASE ILLUSTRATION


THANK YOU