Foot and Ankle Surgery 18 (2012) 66–73

Contents lists available at ScienceDirect

Foot and Ankle Surgery

journal homepage: www.elsevier.com/locate/fas

Technical tip: Reconstruction of medial collateral ligament in correction of hallux valgus deformity with primary medial collateral ligamentous insufficiency

T.H. Lui MBBS (HK), FRCS (Edin), FHKAM, FHKCOS*, K.B. Chan MBBS (HK), FRCS (Edin), FHKAM, FHKCOS

Department of Orthopaedics and Traumatology, North District Hospital, 9 Po Kin Road, Sheung Shui, NT, Hong Kong, China

ARTICLE INFO

Article history:
Received 23 September 2010
Received in revised form 24 December 2010
Accepted 8 January 2011

Keywords:
Hallux valgus
Medial collateral ligament
Reconstruction
Extensor hallucis brevis
Tendon

ABSTRACT

In cases of hallux valgus deformity with primary medial collateral ligamentous insufficiency, there will be an abnormal hallux valgus angle with relatively normal intermetatarsal angle and sesamoid positions. Metatarsal osteotomies may not be effective to correct the deformity. Plication of the attenuated medial capsule may not be strong enough to provide long lasting correction of the hallux valgus deformity. We describe a minimally invasive technique of reconstruction of the medial collateral ligament by means of extensor hallucis brevis tendon graft. This can provide a stronger medial constraint to prevent recurrence of hallux valgus deformity.

1. Introduction

Hallux valgus is the commonest forefoot deformity faced by foot and ankle surgeon. It is characterized by lateral deviation of the first metatarsophalangeal (MTP-1) joint, metatarsus primus varus, dislocation of the metatarsal head from the hallux sesamoids, and pronation of the first metatarsal and hallux. Radiographically, there is increased hallux valgus angle and intermetatarsal angle with various degree of sesamoid subluxation. More than 150 surgical procedures have described to correct the deformity. Most of them correct the abnormal intermetatarsal angle by different kinds of metatarsal osteotomy in order to reduce the sesamoids and the metatarsophalangeal joint [1–3]. Medial capsular plication helps to correct the deformity and maintain the correction by restoration of the medial capsuloligamentous structure. Restoration of the normal intermetatarsal space does not always correct the hallux valgus deformity and medial collateral ligament reconstruction of the MTP-1 joint will be required to provide a stronger and longer lasting medial stability of MTP-1 joint. Firstly in case of primary medial collateral capsuloligamentous insufficiency, e.g. after medial collateral ligament rupture, medial collateral ligament reconstruction may be required. Secondly in metatarsus adductus is relatively small with a disproportionate hallux valgus angle. Correction of the deformity cannot be achieved solely by osteotomy of the first metatarsal. Some authors proposed multiple osteotomies to correct the deformity [4,5]. Thirdly in cases of recurrent hallux valgus deformity with relatively normal intermetatarsal angle, it can be due to attenuation of the plicated medial capsuloligamentous structure. Reconstruction of medial collateral ligament will also be needed. We describe a minimally invasive approach for medial collateral ligament reconstruction with extensor hallucis brevis (EDB) tendon.

2. Description of technique

The following description is an extension of the endoscopic distal soft tissue procedure, as it is the usual technique for correction of hallux valgus deformity in our department. However, this is not restricted to endoscopic distal soft tissue procedure and can be accompanied by other surgical procedures to correct the hallux valgus deformity.

The patient was put in supine position with pneumatic tourniquet applied to the thigh. The lateral distal soft tissue release of the MTP-1 joint and bunionectomy were performed either arthroscopically or as an open procedure. Endoscopic distal soft tissue procedure [6–9] was performed as shown in the illustrations. The endoscopic procedure is indicated in those patients without significantly abnormal distal metatarsal articular angle and when the space between the first and second metatarsal can be reduced manually [7,9]. The lateral release was performed through the first web space and by plantar portals with sequential release of the intermetatarsal ligament, adductor hallucis tendon and the lateral capsule of the MTP-1 joint. Bunionectomy was

* Corresponding author. Tel.: +852 26837588.
E-mail addresses: luithderek@yahoo.co.uk, luith@ha.org.hk (T.H. Lui).

1268-7731/$ – see front matter © 2011 European Foot and Ankle Society. Published by Elsevier Ltd. All rights reserved.
doi:10.1016/j.fas.2011.01.005

Fig. 1. The extensor hallucis brevis tendon is cut at its proximal end and retrieved to the dorsolateral wound (A, B).

performed with an arthroscopic burr through portals proximal and distal to the bunion. The proximal bunion portal was identical to the medial portal of the MTP-1 arthroscopy. Usually the MTP-1 joint and the sesamoid apparatus will be reduced after the lateral release and close up of the 1,2-intermetatarsal space. Sometimes, de-rotation of the first metatarsal before insertion of the proximal intermetatarsal positioning screw is needed to correct the pronation of the first metatarsal [7]. If the MTP-1 joint is still grossly subluxed after these procedures, reconstruction of the medial collateral ligament with the EHB tendon will be performed. The EHB tendon is identified at the dorsolateral wound at the lateral side of the extensor tendons at the level of the metatarsophalangeal joint line. This is identical to the dorsolateral portal of 1st MTPJ arthroscopy. The 1st MTPJ arthroscopy can be

Fig. 2. A bone tunnel of size of 2.5 mm is made at the base of the proximal phalanx through the toe web portal wound (A: dorsoplantar view; B: end on view). The position of bone tunnel can be confirmed by fluoroscopy (C: dorsoplantar view and D: lateral view).