ABSTRACT

Chronic diastasis following a syndesmotic injury can lead to ankle joint instability and loss of joint congruency. Failure to restore the fibula into the proper anatomic position within the incus increases the focal stress on the talus and can accelerate degenerative changes. In the case of failed syndesmotic repair, fixation options are limited. If promptly diagnosed, the syndesmosis may be amendable to open debridement and subsequent fixation with two interosseous screws. However if latent diastasis is found, syndesmotic fusion by bone block arthrodesis is recommended. An allograft repair technique for surgical reconstruction of chronic instability following syndesmotic rupture is presented.

INTRODUCTION

The ankle syndesmosis is the distal ligamentous complex that stabilizes the tibiofibular joint. It consists of the anterior inferior tibiofibular ligament (AITFL), the posterior inferior tibiofibular ligament (PITFL) and the interosseous tibiofibular ligament which is the thickened continuation of the interosseous membrane (1). The syndesmosis ligaments is a dynamic structure that permits normal talar motion and accommodates the irregular trapezoid shape of the talus (2). The fibula is the lateral stabilization for joint concurrency and the syndesmosis allows the fibula to migrate distally, translate anterior medially and internally rotate with talocrural plantarflexion (3). The ligament is commonly injured with hyper dorsiflexion and external rotation at the ankle (4,5). Syndesmotic injuries may be subtle and difficult to diagnose based on static measurements of a two dimensional radiographic parameter especially without concomitant fracture or obvious dislocation (6,7). Syndromic reduction is the only predictor of functional outcomes following ankle fractures (8-10). Fibular malposition increases forces on contact pressure to the talus (11). Malreduction of the syndesmosis is undiagnosed and can increase the risk of early ankle joint arthritis (12,13). Studies show a greater than 50% malreduction rate when evaluated on computed tomography (14).

CASE REPORT

A case is presented of a 33 year old female whom was referred from another provider for additional treatment after suffering an external rotation ankle fracture requiring internal fixation. The initial postoperative course proceeded without complication. Interosseous ossification is seen. Patient underwent supervised physical therapy at seven weeks after surgery and transitioned to a lace up ankle brace without pain.

With the syndesmosis reduced, the 1st guidewire is placed for the tibiofibular tunnel to prepare for reaming at 5cm proximal to the joint. The first arm of the ‘forked’ graft with interlocking stitches on each end is routed through the tunnel. The 2nd guidewire for reaming is located approximately 2-3cm distal to 1st guidewire and about 1cm proximal to palatiod. Two of the three arms are pulled through the tibiofibular tunnels recreating the double or stacked interosseous ligament. Both arms were tensioned prior to interference screws application with the clamp in place. The fibular plate was reapplied and the syndesmosic screws were placed. The clamp was removed and a fibular tunnel was drilled from anterior to posterior between distal screws. A tendon passer was utilized to direct the 3rd arm of the graft from posterior to anterior. Finally the fibula was drilled from anterior lateral to posterior medial and the 3rd arm of the graft was routed from the anterior fibula. The graft was secured by interference screw and successfully recreated the AITFL.

DISCUSSION

Surgical options following latent syndesmotic diastasis are limited. This technique provides a dynamic option for failed syndesmotic fixation before resorting to syndesmotic fusion by bone block arthrodesis (15). This procedure reconstructed the interosseous ligament as well as the anterior inferior tibiofibular ligament imparting an anatomic repair. Grass and Zwipp showed both pain and chronic instability were relieved in 15 of 16 patients at an average follow up of 18 months with a similar technique (16). Due to the initial indirect repair, syndesmotic injuries are susceptible to latent diastasis and chronic instability. Metallic screws are removed prior to unrestricted weight bearing in most patients but no true test exists to determine ligametous healing. Failure of syndesmotic restoration will increase tibial contact and accelerate cartilage damage (17). The treatment for chronic syndesmotic instability by bone block arthrodesis restricts the natural motion of the fibula and causes similar consequences as if left untreated. The use of tendon allograft reconstruction provides a more anatomical repair and restores more natural motion of the ankle joint.

REFERENCES


SYNDROMETIC LIGAMENT RECONSTRUCTION FOR TREATMENT OF CHRONIC DIASTASIS

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The syndesmic screws were removed after 6 months with no instability or diastasis noted. The patient relates periodic ankle joint stiffness but has not required further surgical intervention with over 2 years of follow up from the initial injury.