



Letter to the Editor

Chronic deltoid ligament insufficiency repair with Internal Brace™ augmentation


Dear Editor

We appreciate the opportunity to respond to the letter from Dr. Zhong et al. regarding our article, "Chronic deltoid ligament insufficiency repair with Internal Brace™ augmentation." This is a tremendous possibility to clarify some concepts and myths about internal brace technology, leading our readership to confusion. First of all, the Internal Brace (IB) is not an artificial ligament and does not intend to replace any native ligament function by its implantation. Therefore, it is difficult to compare to previously published literature that intended to replace native ligaments with artificial implants. It is of paramount importance to emphasize that the first step in the surgery is to restore native tension of the superficial deltoid ligament by performing a medial arthrotomy and re-tensioning or repairing the superficial deltoid ligament using an anchor. This step (informally known as the medial Bröstrom) is crucial to succeeding in this procedure as it will provide the basis to restore stability at the ankle joint. Therefore, if the patient has poor tissue quality or quantity, consideration should be given to reconstructing the deltoid ligament using auto/allograft.

Augmentation with IB is the next step after properly repairing the medial ligaments. The IB will act as a checkrein, protecting the native ligament while the collagen fibers' healing and maturation process occur. In this concept, the surgeon must avoid over-tightening the augmentation, which will be detrimental to the repaired ligament by preventing the healing process. Three essential steps realize the latter during surgery:

- 1 The surgeon positions the foot in a neutral (resting position).
- 2 Marking the amount of fiber tape that will be introduced into the bone tunnel avoids excessive tension in the brace.
- 3 A mosquito clamp is placed underneath the fiber tape as a secondary precaution to avoid over-tightening.

Proper implantation of the brace will assure free motion at the ankle joint, in particular in eversion. Overprotection of the native ligament is a concern, and therefore, we strictly adhere to these surgical principles.

Another concern is about the IB producing foreign body reaction in the ankle joint, as superficial reactions have been associated with the fiber tape use. However, placing the IB in an

extraarticular fashion can minimize this risk. This means that only the talar anchor will be placed inside the bone in the ankle joint's lateral gutter. The fibertape is then driven through the deltoid ligament and remains on top of the ligament, therefore, in an extraarticular fashion. Nevertheless, we agree that future investigations should address medial ankle discomfort and pain, scar tenderness, and limited range of motion. Anecdotally, none of our patients complained of joint rigidity.

The authors pointed out that chronic medial ligament insufficiency can produce secondary posterior tibial tendon dysfunction. Although we agree with the statement mentioned above, this patient cohort is a different scenario as our study excluded patients with lesions over six months. The reason behind this exclusion is that we believe that more than a "dysfunction," prolonged lesions hide spring ligament tears, posterior tibial dysfunction, and bony deformities that need to be addressed and are out of the scope of this investigation. Of note, all the patients underwent MRI scans that ruled out posterior tibial tendon and spring ligament tears. However, at the time of surgery, the posterior tibial tendon is examined as the first surgical step to rule out any degeneration or occult tear that may be a pain generator. Moreover, those cases may need an FDL transfer, spring ligament repair, and probably a calcaneal osteotomy.

We thank the authors for the opportunity to address these important discussion points. This study is not without limitations, and we hope future research will include comparative biomechanical studies comparing deltoid repair with and without IB augmentation, considering gapping, valgus angulation, and ultimate load to failure. Weight-bearing CT of this patient cohort may provide some insight on this behalf while re-injury rates and residual instability could be evaluated.

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