

InternalBrace Ligament Augmentation Repair



Coetzee JC,
Ellington JK,
Ronan JA,
Stone RM

Maffulli N,
Del Buono A,
Maffulli GD,
et al

Viens NA,
Wijdicks CA,
Campbell KJ,
Laprade RF,
Clanton TO

Kirk KL,
Campbell JT,
Guyton GP,
Parks BG,
Schon LC

“DO YOUR LATERAL ANKLE PROCEDURES ALL DO WELL?” Publications are now highlighting that the Broström repair can be improved with the *InternalBrace* ligament augmentation. In addition to biomechanical evidence showing time zero strength at the ATFL of ~250 N (Native ~150 N) there is now peer-reviewed clinical evidence showing faster rehabilitation and better outcomes with the *InternalBrace* ligament augmentation.^{1,2} *InternalBrace* ligament augmentation has been used successfully in both high-level athletes and normal active patients for 5+ years with documented clinical and biomechanical evidence of early return to activity and everyday life.²

Top articles highlighting *InternalBrace* ligament augmentation:

[Functional results of open Broström ankle ligament repair augmented with a suture tape \[published online February 8, 2018\]. *Foot Ankle Int.* doi:10.1177/1071100717742363.](#)

- Six to 24-month follow-up of 81 patients with a Broström and *InternalBrace* ligament augmentation
- *InternalBrace* ligament augmentation shows accelerated rehabilitation and mean return to sport of 12 weeks (3 months) and average time to full weightbearing of 16 days (range, 1-64 days)
- Motivated athletes were able to return to play, some as early as 8 weeks after surgery
- Ankle joint mechanics (dorsiflexion and plantarflexion) comparison between operative and contralateral sides showed no major differences
- Highlights limitations of standard Broström repair where ankle is often immobilized for 6 weeks before rehabilitation starts and usually takes 4-6 months before athlete can return to play

[Isolated anterior talofibular ligament Broström repair for chronic lateral ankle instability: 9-year follow-up. *Am J Sports Med.* 2013;41\(4\):858-864. doi:10.1177/0363546512474967.](#)

- “All my Brostroms do well”... or do they?
- 9-year follow-up of 42 athletes who had ankle ATFL Brostrom repair
 - **58%** returned to preinjury level of activity, **16%** returned to a lower level of activity, **26%** abandoned athletic activity
 - In addition to 42% stepping down or abandoning activity, of the patients who had no evidence of degenerative changes preoperatively, 30% had radiographic signs of degenerative changes of the ankle at 9 years

[Anterior talofibular ligament ruptures, part 1: biomechanical comparison of augmented Broström repair techniques with the intact anterior talofibular ligament. *Am J Sports Med.* 2014;42\(2\):405-411. doi:10.1177/0363546513510141.](#)

- ATFL *InternalBrace* ligament augmentation cadaveric biomechanical study testing ultimate load of failure at time 0
- Broström and *InternalBrace* ligament augmentation = ~250 N
- ATFL *InternalBrace* ligament augmentation is stronger and as stiff as the native ATFL at time 0
- “Adding strength to Broström is valuable in patients with generalized ligamentous laxity, in large patients or elite athletes, or when allograft tenodesis reconstruction is not feasible”

[ATFL elongation after Brostrom procedure: a biomechanical investigation. *Foot Ankle Int.* 2008;29\(11\):1126-1130. doi:10.3113/FAI.2008.1126.](#)

[Foot & Ankle International, Vol. 29 #11, Nov. 2008](#)

- (Human cadaveric study) Unprotected motion associated with significant lengthening of ligament after ATFL repair
- Conclusion: Need to protect the ATFL and cast during conservative rehab

INTERNALBRACE™ LIGAMENT AUGMENTATION (ANKLE INSTABILITY)

SCIENTIFIC UPDATES

Mackay G,
Ribbans W,
Anthony I,
Blyth M,
Hopper G

A review of ligament augmentation with the *InternalBrace*™: the surgical principle is described for the lateral ankle ligament and ACL repair in particular, and a comprehensive review of other surgical applications and techniques is presented. *Surg Technol Int.* 2015;26:239-255. Supports early mobilization of repaired ligament with minimal surgical morbidity

- Review of ligament reconstruction techniques and highlight of the application of *InternalBrace* ligament augmentation for ATFL Broström and ACL
- Highlights change in orthopedics from reconstruction with allograft or autograft to restoration of normal anatomy with *InternalBrace* ligament augmentation

Watson TS,
Lamour RJ

Open modified Broström ankle reconstruction with internal brace augmentation: a novel approach. *Orthopedics Today.* 2015;35(8):28.

- Novel surgical technique overview of Arthrex *InternalBrace* ligament augmentation repair to augment modified Broström
- Discusses how “increased construct strength allows the surgeon to consider implementation of an accelerated rehabilitation program, earlier return to activity and decreased recurrent instability”

Bevilaqua NJ

Stabilizing the lateral ankle via a Brostrom repair with suture tape augmentation. *Podiatry Today.* 2015;28(5).

- The technique increases the strength of the repair
- Suture tape augmentation serves to protect the repair and allows for earlier rehabilitation.

Clanton TO,
Waldrop III N,
Wijdicks CA,
Jansson K,
LaPrade RF

Anatomic suture anchor versus the Broström technique for anterior talofibular ligament repair: a biomechanical comparison. *Am J Sports Med.* 2012;40(11):2590-2596. doi:10.1177/0363546512458420.

- Ultimate load to failure of the surgically repaired ATFL is only about half that of the intact native ligament ~74 N of repaired ATFL versus ~150 N native ATFL.

Haytmanek CT,
Williams BT,
James EW,
et al

Radiographic identification of the primary lateral ankle structures. *Am J Sports Med.* 2015;43(1):79-87. doi:10.1177/0363546514553778.

- Described and defined the anatomic origins and insertions of the lateral ankle ligaments (ATFL and CFL)
- Supports anatomic repairs such as primary Brostrom with *InternalBrace* ligament augmentation

Akeshon WH

Effects of immobilization on joints. *Clin Orthop Relat Res.* 1987;(219):28-37. Clinical Orthopaedic & Related Research, Volume 219, June 1987

- Direct negative effects on joint mechanics and muscle atrophy
- Diminished proprioception (the ability to sense stimuli arising within the body regarding position, motion, and equilibrium)
- Casting negatively affects ligaments

Gates N

Arthrex, Inc. LA1-0408-EN_A. Naples, FL; 2014.

- ATFL *InternalBrace* ligament augmentation with all 4 constructs of 3.5 mm and 4.75 mm *BioComposite SwiveLock*® anchors tested
- All above 150 N (native strength) and range from 181-352 N

Waldrop N,
Liebler S

Arthrex, Inc. LA1-00015-EN_A. Naples, FL; 2015.

- Tested tensioning from talus to fibula using 3.4 mm drill for 3.5 mm *SwiveLock* anchor (244 N) and 4.0 mm drill for 4.75 mm *SwiveLock* anchor (296 N)

References

1. Anterior talofibular ligament ruptures, part 1: biomechanical comparison of augmented Broström repair techniques with the intact anterior talofibular ligament. *Am J Sports Med.* 2014;42(2):405-411. doi:10.1177/0363546513510141.
2. Functional results of open Broström ankle ligament repair augmented with a suture tape [published online February 8, 2018]. *Foot Ankle Int.* doi:10.1177/1071100717742363.