Long-term Outcomes of the "All-Inside" Arthroscopic Brostrom Procedure: A Retrospective Review

Charles A. Sisovsky DPM AACFAS[1], James M. Cottom, DPM FACFAS[2]

[1]Fellow, Florida Orthopedic Foot and Ankle Center, Sarasota, FL,   [2]Fellowship Director, Florida Orthopedic Foot and Ankle Center, Sarasota, FL

FLORIDA ORTHOPEDIC Foot & Ankle Center

Purpose

Lateral ankle ligament reconstruction is a viable treatment option for patients with a history of ankle sprains, especially those with confirmed injury on advanced imaging such as MRI. Historically, surgical correction involved an open approach utilizing local soft-tissue reconstruction or tendon transfer procedures. Recently, however, the use of arthroscopy has been used which has resulted in faster recovery, quicker OR times, and decreased time to weight bearing. The purpose of this study was to determine long-term outcomes based on AOFAS, FFI, VAS, and Karlsson-Peterson (KP) scores and whether or not the patient would have the procedure done again.

Methodology

This is a retrospective review evaluating patients who underwent arthroscopic lateral ankle ligament reconstruction. Inclusion criteria consisted of: arthroscopic reconstruction using a push-lock, no other concomitant procedures, and at least a 4-year follow-up. Exclusion criteria included those who had any additional procedure and those patients whom the push-lock was not used. All patients had the same post-operative protocol which consisted of protected partial weight bearing in a controlled ankle motion (CAM) walker for 2 weeks. Full weight bearing in CAM walker for 2 weeks, starting physical therapy at 21 days. Full weight bearing a 4 weeks in an athletic shoe. Charts of 70 patients were reviewed. Of the 70 patients, 23 responded to questioning. Post-operative AOFAS, FFI, VAS, and KP scores were obtained. Average follow-up was 61 (range 52.3 to 72) months. Demographics of all patients are shown in Table 1. Figures 1-5 show a condensed version of the surgical process.

Demographics	
# of patients (n)	23
Average Follow-up (months)	61 ± 5.7
Mean Age (years)	41 ± 17.3
Mean BMI (kg/m²)	30.9 ± 6.9
Laterality, R	13
Male	10
Diabetes	0
Workers Compensation	1

Table 1. Patient demographics

Results

Of the 23 patients, 10 (43%) were male. The mean age was 41 (range 15 to 83) years. The mean BMI was 30.9 (range 20.5 to 45.5) kg/m². Pre-operative AOFAS, VAS, and FFI scores were 52.9, 7.4, and 85.4, respectively. Post-operative AOFAS, VAS, FFI, and KP scores at 6-months were 93.6, 0.5, 16.1, and 90.6, respectively. Finally, post-operative AOFAS, VAS, FFI, and KP scores at 4 to 5 years were 92.8, 1.1, 13.3, and 82.3, respectively. Furthermore, 21 (91.3%) patients said they would have the procedure done again. (Table 2.) Lastly, an unpaired t-test was ran which showed no significant change in AOFAS, VAS, FFI, or KP scores from 6-months to 4 to 5-year. (Table 3) There were no major complications reported.

6-month to 4-5 year	
AOFAS	p=0.45
VAS	p=0.28
FFI	p=0.51
KP	p=0.20

Table 3. p-values showing no significant change in short- and long-term

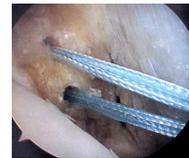Fig.1: Push-lock location with sites 1-4 marked

Fig.2: First and second bone anchors in anterior fibula

Fig.3: Sutures 1-4 exiting their respective sites

Fig.4: Capturing suture ends to secure to fibula

Fig.5: Securing sutures to fibula utilizing push-lock modification technique

Results					
	Pre-op	6-month	4 to 5-year	Procedure Again?	
AOFAS	52.9	93.6	93.2	Yes	No
VAS	7.4	0.5	1.1	21	2
FFI	85.4	16.1	13.3		
Karlsson-Peterson		90.6	83.3		

Table 2: Pre- and post-operative results; AOFAS: American Orthopedic Foot and Ankle Score, VAS: Visual Analog Scale, FFI: Foot Function Index

Literature Review

Acute ankle injuries are one of the most common problems seen in sports medicine. For the most part, these injuries are self-limiting but studies have shown residual symptoms can last from months to even years after the injury[1]. Once conservative therapy, of at least six months, fails, surgical correction is recommended. Surgical options typically fall into two categories; open versus arthroscopic. Currently, this is the first long-term follow-up study of solely arthroscopic-assisted lateral ligament repair with no other concomitant procedures. Our results are similar to the long-term follow study by Nery et al, who showed average post-op AOFAS scores of 94.7% with an average follow-up of 9.8 years[5]. However, their study looked at patients who also underwent microfracture as well as other OCD repairs.

Analysis & Discussion

Our data show excellent long-term results in patients with chronic lateral ankle instability who underwent the "all-inside" arthroscopic Brostrom procedure. The goal of this study was to determine the long-term outcomes of patients who underwent the modified technique described by the secondary author[3]. This modified technique utilizes a push-lock anchor into the lateral aspect of the fibula, approximately 3 cm distal from the the tip of the fibula. Our study is limited in that our sample-size is low and it is a retrospective review. However, to the authors' knowledge, this is the first long-term study that assesses strictly arthroscopic lateral ligament reconstruction with no other concomitant procedure. We thought this was unique in focusing on one procedure and its outcomes. We understand that prospective, randomized studies are required but this study shows that this technique is reproducible, outcomes remain consistent, pain is greatly reduced, and function is reestablished in the short- and long-term.

References

1. Anandacoomarasamy A, Barnsley L. Long term outcomes of inversion ankle injuries. Br J Sports Med. 2005 Mar;39(3):e14; discussion e14.
2. Nery C, Raduan F, Del Buono A, Asaumi ID, Cohen M, Maffulli N. Arthroscopic-assisted Broström-Gould for chronic ankle instability: a long-term follow-up. Am J Sports Med. 2011 Nov;39(11):2381–8.
3. Cottom JM, Baker JS, Richardson PE. The "All-Inside" Arthroscopic Broström Procedure With Additional Suture Anchor Augmentation: A Prospective Study of 45 Consecutive Patients. The Journal of Foot and Ankle Surgery. 2016 Nov;55(6):1223–8.