



## Modified Watson Jones Technique for Lateral Ankle Stabilization Utilizing the Split Peroneus Longus

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### Abstract

Fourteen percent of patients require re-operation following a Brostrom anatomical augmentation. Another study demonstrated 6% failure of a Brostrom augmentation secondary to athletic traumatic injuries. Failure of primary anatomical augmentation has been noted to occur in patients with poor quality tissue, generalized ligamentous laxity, or patients with longstanding instability greater than ten years.

After failed anatomic lateral ankle stabilization procedures, reconstructive tenodesis procedures have been described. The traditional Watson-Jones is described utilizing the entire peroneus brevis tendon, leaving its distal insertion intact. Several modifications of the procedure have been described. Harvesting peroneus longus tendon permits for greater length of the allograft and less fraying of the fibers as compared to the peroneus brevis tendon, allowing for easier tubularization and bone tunnel passage. We describe senior author's (MJM) modified Watson-Jones lateral ankle stabilization technique utilizing the split peroneus longus.

In the senior author's experience, a modification of the Watson-Jones reconstruction procedure utilizing the split peroneus longus is effective and reliable as a limb salvage procedure after a failed anatomical lateral ankle reconstruction or following a failed anatomic lateral ankle stabilization procedure.

**Keywords:** Lateral Ankle Instability; Lateral Ankle Stabilization; Watson-Jones; Brostrom; Revisional Lateral Ankle Reconstruction

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### Introduction

Approximately 20% to 25% of acute ankle sprains result in chronic ankle instability and results from failure of functional rehabilitation [1]. When functional rehab after conservative treatments fails, surgical repair should be considered.

When addressing an unstable lateral ankle, concomitant biomechanical deformities such as a calcaneal varus, subtalar joint instability, limb length discrepancy, equinovarus deformity, adductus foot, and a pronated forefoot must be evaluated and addressed for surgical success [2]. Associated injuries such as osteochondral lesions, sinus tarsi syndrome, peroneal tendinopathy, or subtalar joint instability should also be evaluated and addressed.

Historically, lateral ankle stabilization surgical procedures are performed to correct a single ligamentous repair of the anterior talofibular ligament or double ligament repair of the anterior talofibular and calcaneofibular ligaments. Other non-anatomic stabilization tenodesis procedures have been described utilizing the peroneal tendons such as the split peroneus brevis procedure or those depicted by Elmsli, Christman and Snook, Hambly, Whinfield, Lee, Nilsonne and Watson-Jones [3]. In addition to peroneus brevis and longus tendon transfers, the Achilles and plantaris tendons may be utilized to stabilize the ankle. Incorporating tendon allografts have also been described [4].

A recent study demonstrated that 14% of patients require re-operation following a Brostrom anatomical augmentation [5]. Another study demonstrated 6% failure of a Brostrom augmentation secondary to athletic traumatic injuries [6]. Failure of primary anatomical augmentation has been noted to occur in patients with poor quality tissue, generalized ligamentous laxity, or patients with longstanding instability greater than ten years [7,8].

The traditional Watson-Jones is described utilizing the entire peroneus brevis tendon, leaving its distal insertion intact. The tendon is passed through a tunnel in the fibula into the neck of the



**Figure 1:** Harvesting the peroneus longus auto graft using the entire length of the peroneus longus tendon and 25% width of the tendon. A modified whip stitch is performed with fiber wire.



**Figure 2:** An anterior to posterior bone tunnel is made approximately 2.5-3.0 centimeters from the distal tip of the fibula. Another tunnel is made anterior to posterior obliquely approximately 1.0-1.5 centimeters from the tip of the fibula.



**Figure 3:** A slightly oblique dorsal to plantar bone tunnel is made in to the neck of the talus midline and in to the inferior neck of the talus.



**Figure 4:** With a suture passer, the peroneus longus tendon is passed from posterior to anterior in the proximal fibula drill hole. The tendon is then passed underneath the extensor retinaculum of the lateral ankle toward the talar neck drill hole.

talus, back through the fibula, and then attached to itself posteriorly at the level of the fibula. Several modifications of the procedure have been described due to the technical difficulty in obtaining adequate

tendon length for the transfer.

The peroneus brevis is inherently short, and the fibers tend to fan out and separate easily, making tubularization of the fibers and passage of the tendon through bone holes difficult. Harvesting peroneus longus tendon permits for greater length of the allograft and less fraying of the fibers allowing for easier tubularization and bone tunnel passage.

In the experience of the senior author (MJM), following a failed anatomic lateral ankle stabilization procedure, a modification of the Watson-Jones reconstruction procedure utilizing the split peroneus longus is effective and reliable.

### **Modified Watson-Jones Lateral Ankle Stabilization Using Split Peroneus Longus Surgical Technique**

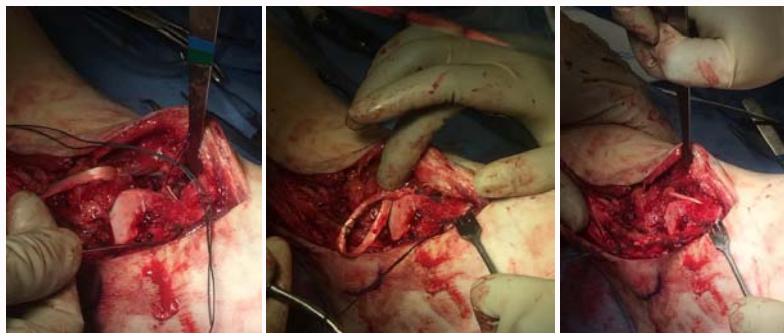
A popliteal and adductor canal block is placed by anesthesia prior in the pre-operative area. The patient is placed under general anesthesia. A thigh tourniquet is applied. After sterile prep and draping, an incision approximately 15-18 inches is marked from the proximal posterior lateral leg along the peroneal tendons to behind the fibula and curving anteriorly distally to the dorsal 4th metatarsal base. To locate the sinus tarsi, an #18 gauge needle may be utilized. Anatomic dissection is performed to visualize the peroneus longus. Pertinent neurovascular structures are identified and retracted.

Ruptured anterior talofibular ligaments and calcaneofibular ligaments or any residual hardware or anchors may be debrided at this time while still preserving the extensor retinaculum. Dissection is performed to visualize the neck of the talus. Attention is then drawn to the peroneus longus. To harvest the auto graft tendon, a full length of the peroneus longus is excised with approximately 25% width of the tendon. A modified whip stitch is performed utilizing a fiber wire.

Bone tunnels are then created with sequential drilling using 2.5, 3.5, and 4.5 millimeter drill bits. An anterior to posterior tunnel is made approximately 2.5 to 3 centimeters from the distal tip of the fibula. A slightly oblique dorsal to plantar tunnel is made in the talus neck midline and in to the inferior neck of the talus. The final tunnel is made from anterior to posterior obliquely approximately 1.5 centimeters from the tip of the fibula.

Utilizing a suture passer, the peroneus longus auto graft tendon is passed from posterior to anterior in the proximal fibula drill hole. The tendon is then passed underneath the extensor retinaculum of the lateral ankle, then passed from superiorly to inferiorly through the talar neck. While placing the foot in dorsiflexion and slight eversion, the tendon is then passed through the distal fibula hole anteriorly to posteriorly, then sutured back onto itself utilizing non-absorbable Ethibond #2 suture. Confirmation of stability of the ankle with the procedure can be confirmed with a negative anterior drawer test. If desired, a Brostrom augmentation utilizing a suture anchor may be performed followed by retinaculum repair. Layered closure is then performed.

Post-operatively, the patient is placed in a posterior splint in a neutral position. One week post operatively, the splint is removed for a wound check and the patient is placed into a non-weight bearing below knee cast for an additional three weeks. After four weeks, sutures are removed and the patient is partial weight bearing in a cast or in a removable walking boot for an additional three weeks. Gradual introduction to weight bearing into a shoe with an ankle brace is then



**Figure 5:** The tendon is passed from superiorly to inferiorly through the talar neck utilizing a suture passer.



**Figure 6:** While placing the foot in dorsiflexion and slight eversion, the tendon is then passed through the distal fibula hole anteriorly to posteriorly, then sutured back onto itself utilizing a non-absorbable Ethibond #2 suture.



**Figure 7:** Incision four weeks status-post Watson-Jones lateral ankle stabilization procedure with modification of utilizing the split peroneus longus tendon.

initiated. At ten weeks post-operatively, physical therapy is initiated.

## Discussion

In chronic ankle stability, direct primary ligament repair should be the first choice of procedures. After failed anatomical lateral ankle stabilization, tenodesis reconstructive procedures should be considered.

Favorable results have been documented when utilizing the modified Watson-Jones Lateral Instability Repair and range from 72% to 93% success with good to excellent results [7-12]. Studies demonstrate good talar tilt and anterior-drawer stability radiographically post-operatively demonstrating rotational and lateral ankle stability [11]. No evidence of short or long-term deterioration of clinical results or narrowing of joint spaces have been demonstrated occur over time and with no disruption in normal gait [12]. No loss of peroneal muscle strength is detected [9].

Risks of the modified Watson-Jones procedure include wound healing complications or dehiscence, nerve entrapment, and scarring. The incision is long and may leave an unpleasant scar. Other risks include loss of ankle eversion strength and post-operative ankle or subtalar joint stiffness. Of note, the higher the incidence of osteophytes in the ankle pre-operatively is demonstrated to lead to the progression of arthrosis with time, but this finding is not related to the reconstruction method [13]. The presence of arthritic changes in the ankle preoperatively may be a contraindication to the procedure. This procedure is regarded as a limb salvage procedure.

In the hands of the senior author (MJM), the modified Watson-Jones lateral ankle reconstruction utilizing the split peroneus longus is reliable and effective as a limb salvage procedure after a failed anatomical lateral ankle reconstruction.

## References

1. Al-Mohrej O, Al-Kenani N. Chronic ankle instability: Current perspectives. *Avicenna J Med.* 2016;6(4):103-8.
2. Bonnel F, Toullec E, Mabit C, Tourne Y, Sofcot. Chronic ankle instability: Biomechanics and pathomechanics of ligaments injury and associated lesions. *Orthop Traumatol Surg Res.* 2010;96(4):424-32.
3. Bouchard J. The Modified Evans Ankle Stabilization For Correction of Lateral Ankle Instability. *The Podiatry Institute.* Chapter 12. 1994. p50-58.
4. Want W, Xu G. Allograft tendon reconstruction of the anterior talofibular ligament and calcaneofibular ligament in the treatment of chronic ankle instability. *BMC Musculoskelet Disord.* 2017;18:150.
5. Baraza N, Hardy E, Shahban SA. Re-Operation Rates Following Brostrom Repair. *JSM Foot and Ankle.* 2017;2(1):1019.
6. Petrer M, Dwyer T, Theodoropoulos J, Ogilvie-Harris D. Short-to medium-term outcomes after repair for lateral ankle instability with immediate postoperative weightbearing. *Am J Sports Med.* 2014;42(7):1542-8.
7. de Vries JS, Krips R, Siervelt IN, Blankevoort L, van Dijk CN. Interventions for treating chronic ankle instability. *Cochrane Database Syst Rev.* 2011;(8): CD004124.
8. Karlsson J, Rudholm O, Bergsten T, Faxen E, Styf J. Early range of motion training after ligament reconstruction of the ankle joint. *Knee Surg Sports Traumatol Arthrosc.* 1995;3(3):173-7.
9. Gillespie H, Boucher P. Watson-Jones Repair of Lateral Instability of the Ankle. *J Bone Joint Surg Am.* 1971;53(5):920-4.
10. Hamido F., Ibrahim S, Abo-El-Noor T, Al-Misfer A, Mutiri H, Salem H. Evaluation of the results of Watson Jones tendoesis in chronic lateral instability of the ankle. *Foot and Ankle Surgery.* 2007;13(2):56-62.
11. Lucht U, Vang PS, Termansen NB. Lateral ligament reconstruction of the ankle with a modified Watson-Jones operation. *Acta Orthop Scand.* 1981;52(3):363-6.

12. Hoy GA, Henderson IJ. Results of Watson-Jones ankle reconstruction for instability. The influence of articular damage. *J Bone Joint Surg Br.* 1994;76(4):610-3.
13. Becker HP, Ebner S, Ebner D, Benesch S, Frossler H, Hayes A, et al. 12-year outcome after modified Watson-Jones tenodesis for ankle instability. *Clin Orthop Relat Res.* 1999;(358):194-204.