Percutaneous Secondary Lateral Ankle Stabilization Using Semitendinosus Allograft in Ehlers-Danlos Syndrome Patients

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Statement of Purpose

The purpose of this study was to review two patients with Ehlers-Danlos syndrome (EDS) who underwent a percutaneous lateral ankle stabilization using semitendinosus allograft who would not have been suitable candidates for a traditional lateral ankle stabilization.

Literature Review

The modified Bröstrom continues to be the gold standard in chronic lateral ankle stabilization (CLAI)[1]. However, EDS patients do not have the native tissue integrity to support Bröstrom or autograft procedures. Studies have shown that patients with CLAI can see improvement with allograft reconstructions. However, many of these published reports are open procedures which may lead to wound healing complications for EDS patients due to their poor collagen production.

In 2012, Youn published a case series of 15 ankles who underwent percutaneous lateral ankle stabilization using semitendinosus allograft[2]. They noted improvements in talar tilt, anterior drawer, VAS, subjective satisfaction, and Karlsson-Peterson scores with an average 18.1 months follow up. However, only 4/15 of their patients had generalized ligamentous laxity (GLL). This study also did not specify the cause of the GLL.

In terms of EDS specifically, there is one case report by Larholt in 2014 on a patient with EDS who underwent an open plantaris autograft lateral ankle stabilization[3]. Although a good result may have been achieved, a plantaris autograft increases patient morbidity as well as operative time. This coupled with the fact that EDS patients have poor native tissue may mean this is a suboptimal procedure. According to our literature review, there is currently no published study on percutaneous allograft lateral ankle stabilization in patients with EDS.

Case Study

Case 1: A 22 year old female with PMH of EDS, arrhythmia and right knee MRSA presented with chronic right ankle instability of greater than 6 months. Instability was confirmed with clinical evaluation, stress inversion, anterior drawer test, and MRI. Failed conservative care included protection, rest, ice, compression, elevation, bracing, and physical therapy. Surgery was indicated because she could not perform activities of daily living (ADLs). She underwent percutaneous secondary lateral ankle stabilization in October 2013.

Case 2: A 38 year old female with PMH of EDS, GERD, fibromyalgia, neuropathy, IBS, Raynaud's, depression, and anxiety presented with chronic bilateral ankle instability of greater than 6 months. The patient's instability was confirmed and had failed conservative therapy as mentioned above. She also could not perform ADLs. She underwent percutaneous secondary lateral ankle stabilization on her right ankle in August 2017.

Figure 1: Significant preoperative talar tilt under fluoroscopy

Figure 2: Positive preoperative anterior drawn sign under fluoroscopy

Figure 3: An approximately 12 cm semitendinosus allograft is used for the procedure.

Figure 4: The semitendinosus allograft is placed into the talar neck using a 5.5 mm interference screw.

Figure 5: The allograft is tunneled through the deep tissues towards the fibula. A guide wire is then placed from anterior to posterior into the fibula.

Figure 6: The allograft is tunneled through the fibula from anterior to posterior and held in place with a 4.5 mm interference screw.

Figure 7: A guide wire is placed from lateral to medial into the calcaneus. The allograft is cut, whipstitched, and held in place in the calcaneus using a 6.25 mm interference screw.

Figure 8: The final minimally invasive result is depicted.

Figure 9: Postoperative AP and lateral X-rays

Analysis and Discussion

Case 1: The patient was 17 at the time of surgery with a BMI of 16. Her postoperative course was uncomplicated until she required a revision after sustaining an injury to her operative limb during a fall. The revision occurred in November 2016. Her last clinical visit was in January 2017. She had an American Orthopaedic Foot and Ankle (AOFAS) hindfoot score of 90/100. She stated she would have the procedure again. She has returned to all activities without limitation or bracing.

Case 2: The patient was 37 at the time of surgery with a BMI of 46. Her postoperative course was uncomplicated. Her last clinical visit was in August 2018. She had an AOFAS score of 85/100. She stated she would have the procedure again. She has returned to all activities without limitation or bracing.

The ultimate goal of surgery in the treatment of CLAI is to restore the normal biomechanics of the rearfoot[4]. Unfortunately, there is limited research regarding the surgical management of patients with EDS[5]. There is only one published case study by Larholt in 2014 of a patient with EDS who underwent a plantaris autograft lateral ankle ligament reconstruction. However, this was an open procedure and used native tissue.

Literature by Youn in 2012 demonstrated good results with percutaneous lateral ankle stabilization using allograft but had less than a third of its patients with ligamentous laxity and did not mention EDS.

Analysis and Discussion Continued

This case study presents a viable treatment for EDS patients. All procedures were performed by a single surgeon, Dr. Ramdass. Its advantages are that it is minimally invasive, does not rely on native tissue, and has a shorter operative time than autograft procedures. The AOFAS hindfoot scores are excellent but the sample size is very small. Also, the follow up time is only an average of 37 months. Additional research involving lateral ankle stabilization in EDS patients is required in order to determine the best evidence based approach to this difficult and unique surgical problem.

References

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Financial Disclosures

Dr. Ramdass is an Osteomed consultant.