International Surgery Journal
Gupta M et al. Int Surg J. 2021 Jun;8(6):1938-1941
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: https://dx.doi.org/10.18203/2349-2902.isj20212298

Case Report

Achilles tendon Z-plasty with rollover tensor fascia lata graft for correction of equinus foot deformity

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Received: 13 April 2021
Accepted: 15 May 2021

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ABSTRACT

Equinus deformity is a condition in which dorsiflexion movement of the ankle joint is limited or decreased. Equinus deformity arises due to contracture/shortening/tightening in achilles tendon or soleus muscles or gastrocnemius muscle. The lengthening procedure of the achilles tendon can be done by various techniques such as the open or percutaneous method and Z-plasty versus sliding technique. Here we reported a case of post-traumatic equinus deformity of the right foot. The patient's dorsiflexion movement was restricted. In this case, the patient was operated for open Z-plasty of the achilles tendon with rollover tensor fascia lata graft for lengthening of the contracted achilles tendon. The patient was discharged on the third postoperative day uneventfully. After 7 months of follow-up, the patient was walking normally without limping with the full range of motion at the right ankle joint as similar to his left ankle joint.

INTRODUCTION

Equinus deformity is also known as ankle flexion contracture.[1] Equinus deformity is a condition in which dorsiflexion movement of the ankle joint is limited or decreased. People with equinus deformity try to compensate for their limited dorsiflexion movement by various ways such as increasing pressure on the ball of the foot, flattening of the foot arch, toe walking, bending abnormally at the hip or knee. Equinus deformity arises due to contracture/shortening/tightening in achilles tendon or soleus muscles or gastrocnemius muscle. There are various causes for the shortening of the achilles tendon. It can be acquired as post-traumatic, diabetic foot and acquired flat foot or congenital as cerebral palsy and club foot.[2]

The lengthening procedure of the achilles tendon can be done by various techniques such as open or percutaneous methods and the Z-plasty versus sliding technique.[3] The traditional open Z-plasty for achilles tendon has some pros and cons. In pros, open Z-plasty of achilles tendon provides controlled lengthening under the vision and prevents excessive lengthening, and decreases injury of the tibial neurovascular bundle and sural nerve. In cons, there are chances of tendon rupture, adhesion, scarring, pain, and wound dehiscence.[4] To overcome such problems we performed Z-plasty of achilles tendon with rollover tensor fascia lata (TFL) graft. The TFL graft provides extra strength and a smooth gliding surface which prevents adhesion formation and scarring.[5] The foremost intention of surgery was to get improvement in the dorsiflexion of the ankle and to correct the foot deformity.

CASE REPORT

A male (28 years) patient, otherwise healthy, presented to OPD with the chief complaints of walking on his toes and limping of the right foot for one year and pain in the right

lower leg for one month. There was a history of a road traffic accident 15 months back and sustained a closed injury over the right leg which healed spontaneously. Gradually patient noticed limping on walking followed by pain. On examination, his hindfoot was 4 cm short from the ground in comparison to his left foot (Figure 1). His dorsiflexion movement was restricted. The preoperative MRI showed an altered signal intensity lesion seen in the achilles tendon suggestive of fibrosis and calcification. Diagnosis of post-traumatic equinus of the right foot was made. Then patient underwent surgery in the form of open Z-plasty of the achilles tendon with rollover TFL graft.

Figure 1: Equinus deformity of the right foot.

In surgery, spinal anesthesia and thigh tourniquet were used. The patient was kept at a prone position, with feet a little away from the edge of the table. Skin preparation and draping were done and the boundary of the achilles tendon and a lazy-S paramedian incision was marked and given (Figure 2).

The skin flap was raised and the Achilles tendon was exposed (Figure 3). After the Z-plasty, full range of motion at the ankle joint was achieved on a table (Figure 4). Z-plasty repair was done with 2-0 prolene. The TFL graft strip was harvested from the left thigh in a standard manner (Figure 5). The TFL graft rollover was done over the achilles tendon and fixed with 3-0 prolene (Figure 6). The wound was closed in layers with 3-0 vicryl and 3-0 nylon (Figure 7).

The dressing was done. Below the knee, a POP splint was applied after keeping the ankle joint at an appropriate position. The first dressing was changed on the third postoperative day.

Sutures were removed after two weeks and pressure garment and physiotherapy were started. The primary, as well as the donor site, wound both were healed without complications (Figure 8).

Figure 2: Skin incision marking.

Figure 3: Exposed achilles tendon.

Figure 4: After Z-plasty of achilles tendon.

Figure 5: Harvested tensor fascia lata graft.

Figure 6: After Z-plasty repair and tensor fascia lata rollover graft.

Figure 7: After skin closure.

Figure 8: Well healed TFL donor site.

Figure 9: After 7 months of follow up.

The splint was removed after 4 weeks followed by a foot drop splint. The assisted walk was started after 8 weeks. Later on 7 months of follow-up, the patient was able to walk normally without limping and achieved a normal range of motion of the right ankle as normal as the left ankle joint (Figure 9). The surgical results were evaluated using the American Orthopaedic Foot and Ankle Society (AOFAS) ankle-hindfoot scale.[6]

DISCUSSION

The achilles tendon is the strongest tendon of the body and has thin and supple overlying skin. The tibial neurovascular bundle is located just medial and the sural nerve is just lateral to the achilles tendon. The open Z-plasty of the achilles tendon is an effective method for the treatment of achilles tendon contracture but has a higher contracture recurrence rate, rupture of the tendon, scarring, adhesion formation, and pain.[7] To overcome all these problems, we used the TFL rollover graft. The TFL graft provides strength for preventing the rupture of the tendon; it also provides the smooth gliding surface for the tendon excursion and prevents scarring, adhesion, and pain. This technique is unique and corrects the foot deformity with very minimal extra effort.

CONCLUSION

This case demonstrated the essential need and usefulness for the development of a unique technique to correct the equinus deformity of the foot which is in the form of open Z-plasty with TFL rollover graft. Further study is needed to identify the ideal patient population and technique, which is challenging in posttraumatic conditions.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Gupta M, Goel A, Varshney D, Biswkarma VK. Achilles tendon Z-plasty with rollover tensor fascia lata graft for correction of equinus foot deformity. Int Surg J 2021;8:1938-41.