

Plantar Fibroma Excision technique guide

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Background of Plantar Fibromatosis

Plantar fibromatosis is a connective tissue disorder that involves proliferation of fibroblasts. Excision is frequently done when the mass has become painful to bear weight or when entrapment of the plantar medial neurovascular bundle occurs. The fibromas are located within the plantar fascia, adjacent to the superficial layer of the intrinsic musculature and during the excision these muscles are exposed. In addition, the neurovascular bundle of the plantar medial foot is also frequently exposed. It is typical to remain non-weight bearing after the excision secondary to the plantar incision, which provides maximum exposure to the mass. The effects of immobilization have been shown to impact the fibrosis and scarring that can occur following any surgical procedure, especially when surgery involves well vascularized tissue such as skeletal muscle.

OrthoWrap™ Bioresorbable Protective Sheet

The OrthoWrap™ Bioresorbable Protective Sheet can be utilized for the management and protection of tendon injuries where there has been no substantial loss of tendon tissue. The OrthoWrap™ sheet minimizes soft tissue attachments to the device in case of direct

contact with other tissues. It can be cut with sterile scissors, shaping the material according to the preference of the surgeon for the anatomic considerations of the patient and surgical procedure. The OrthoWrap™ sheet is then sutured into place using absorbable suture. This clear sheet allows for good visualization of the tissues to ensure proper placement. However, the mechanical integrity and handling of the material is simple and allows for repositioning as often as necessary to ensure proper placement is achieved.

Discussion

When excising a plantar fibroma, a section of the plantar fascia is removed. Wide margins are desired to help prevent recurrence. This leaves direct contact between the subcutaneous tissue in the plantar arch and the superficial layer of the intrinsic musculature. The highly vascular muscle layer and the vascularity of the subcutaneous tissues lend itself to forming fibrotic tissue. This coupled with the period of immobilization following the surgery increases the risk of forming scar tissue. Fibrosis in this area may lead to other

complications as well. Since the plantar medial neurovascular bundle is located between the abductor hallucis and flexor digitorum brevis muscles in the superficial muscle layer, fibrosis can cause neuritic symptoms. This complication is more likely in the procedures involving recurrent fibromas secondary to the more extensive dissection and greater exposure of the first layer of intrinsic muscles. Limiting the chance of fibrosis and subsequent soft tissue attachments may increase the overall success of the fibroma excision.

The OrthoWrap™ Bioresorbable Protective Sheet is made from 70:30 Poly (L-lactide-co-D,L-lactide), more commonly known as PLA. This material has been used in other podiatric and orthopedic materials such as fixation implants. The

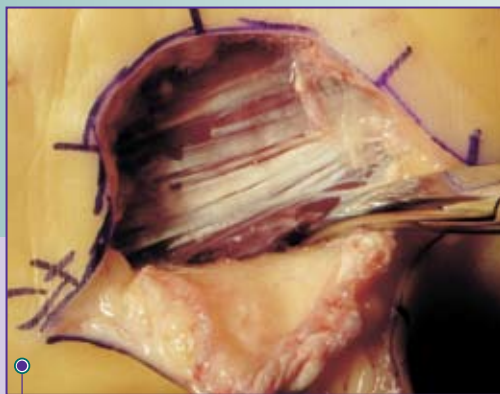
OrthoWrap™ sheet has a non-porous hydrophobic nature that resists attachments. The degradation of PLA weakens the OrthoWrap™ sheet, however it is impermeable throughout the critical healing period and up to 8 weeks, retaining nearly more than 80% of the original mechanical strength for the 0.02mm sheet and nearly 100% of the mechanical strength for the 0.05mm sheet. Loss of 50% of the mechanical strength is not seen in either size until after 20 weeks. The retention

of mechanical strength is adequate since it functions during the main period of scar tissue formation.

By using the OrthoWrap™ sheet to cover the intrinsic muscles, as demonstrated in the cases above, formation of fibrotic tissue and subsequent soft tissue attachments between the tissue layers is less likely. This is important when the disorder being treated is one of exuberant fibrotic tissue in an area that is likely to develop soft tissue attachments or scar tissue.

Summary

The OrthoWrap™ Bioresorbable Protective Sheet has proven to be a cost effective and inert product. It can be used as a protective sheet overlying the intrinsic muscles and neurovascular bundle potentially exposed during plantar fibroma excision to prevent soft tissue attachments. While early success has been observed with this technique, further investigation is required to determine the efficacy of the OrthoWrap™ sheet in plantar fibroma excision and in other foot and ankle surgery procedures.



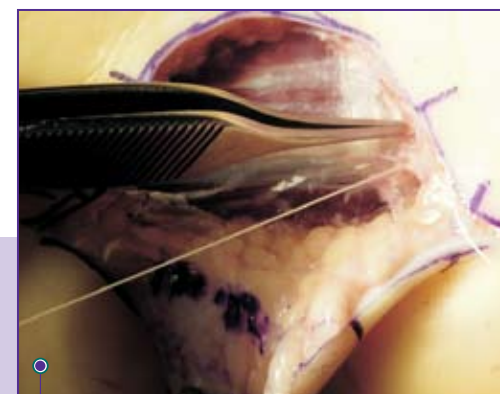
Step 1 Separating the fibroma held in the hemostat from the underlying first layer of the intrinsic muscles of the foot.



Step 2 The excised fibroma leaves the highly vascular muscle layer in direct contact with the subcutaneous tissue.



Step 3 Sizing the OrthoWrap™ Bioresorbable Protective Sheet.



Step 4 Suturing the OrthoWrap™ Bioresorbable Protective Sheet into place over the intrinsic muscles prior to subcutaneous flap closure.



Step 5 Completing the placement of the OrthoWrap™ Bioresorbable Protective Sheet over the intrinsic muscles.

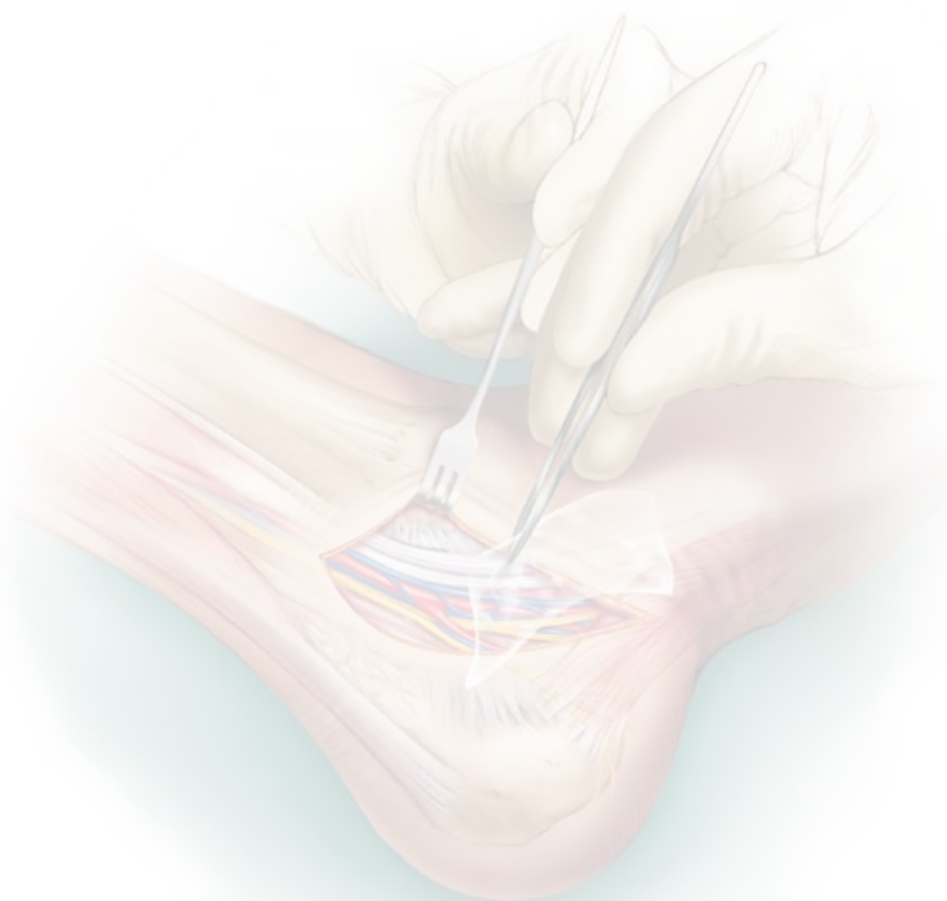


Step 6 Preparing for closure of the flap with subcutaneous and skin closure after the OrthoWrap™ Bioresorbable Protective Sheet is secured with absorbable suture.

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