

Utilization of a peroneus brevis muscle flap for calcaneal fat pad atrophy secondary to radiation treatment: A case report and treatment course

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It has been well-documented that peroneus brevis muscle flaps are an excellent option for coverage of small to medium sized soft tissue defects of the distal lateral lower extremity. They are widely used due to their reliable blood supply, minimal donor site morbidity and lower technical demand as compared to other lower extremity muscle flaps. To our knowledge, no study has evaluated the efficacy of the use of a peroneus brevis muscle flap for an intractable calcaneal scar tissue. We present a unique case in which the peroneus brevis muscle flap was used to assist with eliminating pain from an intractable calcaneal scar secondary to radiation treatment.

Keywords: Muscle flap, rear foot, lower extremity, reconstructive surgery

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Peroneus brevis muscle flaps are widely used for distal lateral lower extremity soft tissue defects due to their reliable blood supply, minimal donor site morbidity and lower technical demand as compared to other muscle flaps [1-3]. The efficacy and utility of this muscle flap has been well-documented in the literature. Since the first discussion of a distally based peroneus brevis flap in 1997, the indications for this flap have vastly expanded and the technique has since been simplified into 5 steps [4]. It has been documented that partial or full flap necrosis is a common complication, with an occurrence of up to 41% [4]. However, with advancements in postoperative dressings and wound care modalities, this complication can be well managed [3,4]. In this case report, we present a patient with a unique indication for a distally based peroneus brevis flap.

Case Report

The patient is a 40-year-old male who presented with a painful lateral calcaneal scar after removal of clear cell sarcoma and subsequent radiation treatment years ago (Figure 1). The patient complained of significant pain to the area with activity and irritation from shoe gear. He had undergone numerous conservative treatment options without relief of symptoms. He was unable to perform duties required of his job due to pain. His goal was for pain reduction to help return to normal activity levels at work.

A staged procedure was planned. The index procedure included scar excision, a peroneus brevis muscle flap and application of an external fixator to allow for stability of the flap and to allow full flap incorporation (Figure 2). A secondary procedure, performed 7 weeks later, included external fixator removal and skin graft application (Figure 3).

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Figure 1 Pre-operative clinical picture.



Figure 2 Intraoperative picture of muscle flap after placement.

Intra-operatively adequate bulk and length from the peroneus brevis muscle to cover the calcaneus and aid in scar revision (Figure 2). Slight distal tip necrosis was seen at 2 weeks post-index procedure, but was managed adequately with serial in-office debridements and local wound care.

Following the secondary procedure, epithelialization was seen over the majority of the muscle flap. Complete muscle flap incorporation and donor site closure with 90% epithelialization was noted at 6 months post-index procedure. At 12 months post-index procedure, a small soft tissue defect with granular base remained on the plantar lateral aspect of the calcaneus (Figure 4). This small soft tissue defect closed at 16 months postoperatively. The patient reports significant improvements in pain scores, subjective ambulatory tolerance, ability to return to work at full capacity and improved quality of life.



Figure 3 Intraoperative picture of skin graft placement.



Figure 4 Twelve-month post-index procedure clinical picture.

Discussion

The traditional applications for the peroneus brevis muscle flap are well-recognized and utilized. Painful calcaneal cicatrix is a less commonly seen pathology; however, when assessing these patients the peroneus brevis muscle flap should be considered as a viable option to eliminate intractable scar, relieve pain and improve patient function. Our case example demonstrates successful use of the peroneus brevis muscle flap for this novel indication.

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