Thermal Injury Scar Reconstruction with use of Deep Inferior Epigastric Perforator Flap (DIEP)
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Purpose
Thermal injuries are a unique set of challenges for reconstruction of the foot and ankle. These injuries, dependent upon depth, skin, and subcutaneous tissue are local factors which make reconstruction puzzling (1). Evaluation of the injury, including timing, location, degree of damage, and previous treatments attempted must be evaluated to determine a proper treatment plan. (2) When injuries are sustained to the deeper dermal/ muscular region, revascularization can be exceedingly difficult. The reconstructive phase includes collagen and fibrous proliferation, leading to scar and contracture formation. (3) Due to the minimal subcutaneous tissue present on the dorsum of the foot, it is susceptible to contracture due to the overall lack of thickness of tissues. This patient had a severe deformity of the left forefoot which was difficult to correct due to scar and contracture formation. The goal of reconstruction for these injuries is to preserve or restore the function of the limb. (4)

Deep Inferior Epigastric Perforator Artery (DIEP) Flaps for soft tissue coverage

DIEP flaps have been used for decades as a resource for coverage of significant soft tissue defects, particularly in the lower extremity. (5) They have been used in reconstruction of defects following excision of melanoma, (6) sarcoma, (7) breast cancer, (8) rectal cancer, (9) abdominal wall reconstruction, (10) as well as coverage of the digits, plantar fascia, and plantar ulceration. They have also been utilized for coverage of severe hand defects, (11) lower extremity defects after amputation, (12) foot defects, (13, 14) and foot reconstruction in diabetic patients. (15) The subcutaneous fat is thick with a vascular pedicle that is divided from the abdominal wall in a superoposterior direction, providing a robust blood supply for tissue viability. (16) While the DIEP flap is a useful tool for wound coverage, its use should be considered as a last resort before amputation. (17)

Case Study

Presentation
Retrospective analysis was completed on a healthy 27 year old female including review of records, lab, radiographic data, and surgical reports. Follow up was obtained 6 months after the procedure. The patient was referred to a Plastic and Podiatric Surgeon from her primary care physician for pain in the left forefoot. The patient had a positive history for suffering a thermal injury to the foot when scalding water was poured on the foot at the age of 3. Subsequently, the deformity progressed through the years. A review of the chart revealed that in 2006 the patient had undergone multiple procedures. Due to the severity of the injuries, significant contracture of the ankle and digits occurred to the plantar surface of the foot and digit. The patient related inability to wear shoes due to deformity. Along with surgical intervention, the patient was referred to a Podiatric Surgeon in Wisconsin. This case study is to discuss the use of these flaps in reconstruction cases of the foot and ankle.

Reconstruction of foot and ankle pathologies secondary to thermal injuries
Thermal injuries present a unique set of challenges for reconstruction of the foot and ankle. These injuries, dependent upon depth, skin, and subcutaneous tissue are local factors which make reconstruction puzzling. (1) Evaluation of the injury, including timing, location, degree of damage, and previous treatments attempted must be evaluated to determine a proper treatment plan. (2) When injuries are sustained to the deeper dermal/muscular region, revascularization can be exceedingly difficult. The reconstructive phase includes collagen and fibrous proliferation, leading to scar and contracture formation. (3) Due to the minimal subcutaneous tissue present on the dorsum of the foot, it is susceptible to contracture due to the overall lack of thickness of tissues. This patient had a severe deformity of the left forefoot which was difficult to correct due to scar and contracture formation. The goal of reconstruction for these injuries is to preserve or restore the function of the limb. (4)

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Thermal injuries cause both acute and chronic changes to tissues which require careful evaluation and comprehensive treatment. Due to the complexity of this injury, a stepwise approach to correction of deformities is needed. The purpose of this case is to discuss the presentation, surgical planning, and follow up for the use of the DIEP flap in reconstruction of severe foot deformities secondary to a thermal injury with multiple failed attempts at reconstruction.

Deep Inferior Epigastric Perforator Artery (DIEP) Flaps for soft tissue coverage

DIEP flaps are a specific type of free, vascularized flap harvested from the abdominal region. These flaps are significant due to the extra thickness of subcutaneous fat, weight-bearing ability, and multiple donor sites available with different flaps. There has been increasing use of these flaps in the reconstructive phase of diabetes, trauma, and neoplastic disease. This case study is to discuss the use of these flaps in reconstruction cases of the foot and ankle.

Library Review

Literature Review
Reconstructive surgery is an integral part of the treatment plan as all conservative measures had failed. Imaging was obtained for the acute setting, proper burn wound care and debridement are a mainstay of treatment. Even with aggressive treatment, the patient did have good results with a functionally viable foot. The additional time and intricacies of using DIEP flaps in foot reconstruction. This case builds the evidence for use of the flap has the potential lead to more durable flap with decreased complications seen with other flaps. Patient did have good results with a functionally viable foot. The additional time and intricacies of using DIEP flaps in foot reconstruction. This case builds the evidence for use of the flap has the potential lead to more durable flap with decreased complications seen with other flaps.