Martorell Ulceration: A Case Report and Review of Literature

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Statement of Purpose

The purpose of this study was to provide insight on different etiologies of ulcerations specifically the ulcerations caused by high blood pressure know as the Martorell ulceration.

Introduction

"Martorell's ulcer is an uncommon ischemic and extremely painful lesion located in the distal portion of the lower limb resulting from severe systemic and poorly controlled hypertension" (1).

A Martorell ulceration differs from vascular ulcers in that they are ischemic lesions that have tissue damage to the smaller arterioles of the medial artery compared to the involvement of the larger vessels seen with peripheral vascular disease (1). The shear stress caused by persistently high blood pressure levels causes endothelial remodeling with thickening of the vessel walls, luminal narrowing and results in an obstruction of blood flow reducing the skin perfusion pressures (1). These ulcers are most common in women between the ages of 50 to 70 years of age. These patients typically present with greater pain intensity than the size of the wound would suggest. These ulcers typically present with irregular edges with variable depths and a necrotic base and violaceous wound edges. Trauma can be a factor, but most ulcerations are spontaneous.

Histopathological findings are thickening of the elastic lamina, proliferation of the intimal layer and hyperplasia of the middle layer with hyalinization resulting in luminal narrowing.

Ulcer Classification Systems

Wanger

Ulcer grading	Description
Grade 0	No ulcer but high-risk foot
Grade 1	Superficial ulcer
Grade 2	Deep ulcer, no bony involvement or abscess
Grade 3	Abscess with bony involvement (as shown by X-ray)
Grade 4	Localized gangrene e.g. toe, heel etc
Grade 5	Extensive gangrene involving the whole foot

Note: Grade 1–3 ulcers are termed *non-gangrenous ulcers* and Grade 4 and 5 ulcers are termed *gangrenous ulcers*

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University of Texas Diabetic Wound Classification System

Stage	Grade			
	0	I	II	III
A (no infection or ischemia)	Pre- or post-ulcerative lesion completely epithelialized	Superficial wound not involving tendon, capsule, or bone	Wound penetrating to tendon or capsule	Wound penetrating to bone or joint
B	Infection	Infection	Infection	Infection
C	Ischemia	Ischemia	Ischemia	Ischemia
D	Infection and ischemia	Infection and ischemia	Infection and ischemia	Infection and ischemia

Case Study

55-year-old male who presented with right foot wound with associated extreme pain. This particular wound has been present for approximately 3 weeks although the patient has had similar wounds to the left foot. The left foot ulceration had a presentation with trauma to the left ankle that caused the wound and had no signs of healing after 3 months, in a similar location. The patient has a past medical history of hypertension and renal failure. The patient is non-diabetic but does have a past history of smoking but does not currently smoke. On presentation to the hospital the patient was taking levaquin and clindamycin. At the time of presentation to the emergency department, the patient was found to have a blood pressure of 194/146. During his hospital visit the patient's blood pressure we controlled with metoprolol, chlorthalidone, nifedipine and labetalol. On physical exam the patient was found to have weakly palpable dorsalis pedis and posterior tibial pulses. The patient had intact gross and protective sensation. The ulceration measured 3.5 cm x 4 cm and was located just distal to the anterior to the lateral malleolus. The wound base was fibro-granular in nature with a hyperkeratotic and necrotic peri wound. The wound did not probe to bone and was noted not to have any purulent drainage, tracking, tunneling, crepitus, fluctuance, or acute signs of infection.

The patient was diagnosed with a full thickness ulceration of the lateral ankle secondary to a Martorell Ulcer as well as hypertensive urgency. The patient was started on IV cefepime and vancomycin. An x-ray of the right foot revealed a soft tissue deficit to the lateral aspect of the foot without osseous involvement. MRI imaging revealed a large soft tissue defect/ulceration of the lateral soft tissues of the ankle and foot with adjacent cellulitis as well as a longitudinal split tear of the peroneus brevis tendon as it courses posterior and beneath the lateral malleolus. A culture swab was taken and was shown to grow E. Faecalis, E. Coli, Pseudomonas, Prevotella.

The patient was treated with daily dressing changes consisting of Dakins soaked gauze, dry sterile gauze and kerlix. The patient would eventually go on to have a split thickness skin graft applied

Ulceration of LEFT ankle from admission #1 after trauma

Ulceration of RIGHT ankle from admission #2 with a spontaneous etiology

Discussion and Conclusion

Treatment of Refractory Skin Ulcer Using Punch Graft and Autologous Platelet-Rich Plasma (3)

Punch Grafting with Platelet Rich Plasma

- The ulcers were prepared by removing fibrin with a curette and the edges of the ulcer were debrided to convert a chronic wound into an acute wound
- Platelet rich plasma was prepared using a gravitational platelet heparinized system
- The platelet rich plasma was then introduced to the edges of the wound
- The punch biopsies were taken from the arm using a 6mm biopsy punch
- Punch grafts were placed in 5mm holes throughout the ulceration leaving a 1cm distance between the holes
- The ulcer was medicated with hydrogel and a pressure dressing that remained for 8 days
- The majority of the grafts took root after 2-3 weeks resting granular islands to stimulate wound healing
- The process of re-epithelialization was completed in four months

Hypertensive ulcer of lower extremity (Martorells syndrome): clinical case with the treatment improvement (2)

Auto-dermoplasty with PRAP treatments

- Auto-dermoplasty with the anterior abdominal wall was used to obtain skin grafts measuring 2x1.5 cm and were applied to the ulcer using deep suture silk suturing technique
- After the grafting operation, local wound care was done with platelet-rich auto plasma (PRAP)
- The blood from the patient was centrifuged at 1000 rpm for 10 minutes forming two layers 1. RBC and 2. The platelets
- The RBC were taken and centrifuged again at 1500 rpm for 15 minutes
- The received PRAP was activated by 10% calcium chloride and applied to the wound
- The procedure was performed every second day
- After 3 weeks the blood pressure returned to normal and the lesion became clearer and partial epithelized
- After 6 weeks the ulcer had healed completely

. In the cases of chronic non-healing wounds a biopsy may be beneficial to better guide treatment and therapeutic modalities In the case of Martorell ulcerations they are commonly misdiagnosed and not commonly thought of. Many other ulcers can present with similar presentations such as pyoderma gangrenosum, calciphylaxis, necrotizing vasculitis and even sickle cell vasculopathy. Martorell ulcerations are important to diagnose because of the tight blood pressure control that is necessary for complete resolution and prevention of recurrence of the ulceration. PRP with grafting can be a beneficial treatment modality for these types of ulceration once infection, if present, is treated.

References

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