

Dorsal venous foot ulcer caused by an intermetatarsal perforating vein*

Case report

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Keywords

Perforator, foot ulcer, venous insufficiency, foam sclerotherapy, surgery

Summary

This case report describes a woman (age: 79 years) with a recurrent venous ulcer located on the left dorsal foot. Duplex investigation showed that this ulcer was caused by an intermetatarsal insufficient perforating vein (PV). Finally Duplex-guided sclerotherapy of the causing PV has been chosen as therapy and the ulcer was successfully healed.

Schlüsselwörter

Perforansvene, Ulkus, venöse Insuffizienz, Schaumverödung, Chirurgie, Fußrücken

Zusammenfassung

Dieser Fallbericht beschreibt eine 79-jährige Patientin mit einem rezidivierenden venösen Ulkus am Fußrücken. Die Ultraschalluntersuchung zeigte, dass dieses durch eine insuffiziente intermetatarsale Perforansvene verursacht wird. Letztlich wurde die ultraschallgezielte Schaumverödung als Therapie gewählt. Das Ulkus wurde damit erfolgreich zur Abheilung gebracht.

Mots clés

Veine perforante, ulcère dorsal du pied, insuffisance veineuse, sclérothérapie par mousse, chirurgie

Résumé

Il s'agit du cas d'une femme de 79 ans, souffrant d'un ulcère veineux récidivant à la face dorsale du pied gauche. Un examen par écho-doppler a montré que cet ulcère était causé par une veine perforante incontinentement entre 2 métatarsiens. Un traitement par sclérothérapie de la veine perforante, sous guidage échographique a été choisi et a permis d'obtenir la guérison de l'ulcère.

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Ulkus am Fußrücken verursacht durch eine intermetatarsale Perforansvene

Fallbericht

Ulcère veineux du dos du pied causé par une veine perforante inter-métatarsienne

Description d'un cas

Typical venous ulcers are located in the area of the ankle. Venous ulcers are seldom located on the dorsum of the foot (1) and, as in this case, most venous ulcers are refractory to treatment.

Anamnesis

A healthy woman (age: 79 years) was admitted in August 2005 because of two painful active non-healing ulcers on the left foot and lower extremity. The ulcers developed 1.5 years ago and the patient had no prior episodes of cellulitis or deep vein thrombosis.

Diagnosis and therapy

Diagnosis I

The foot pulses were palpable; the foot (25 cm²) and crural ulcers (2.5 cm²) had similar wound characteristics with moderate secretions (Fig. 1a). Although the typically local signs for a venous aetiology, such as perifocal hyperpigmentation, hyperkeratosis, atrophy blanche lesions, and visible varicose veins were absent, we found the putative source of these ulcers to be an insufficient, short saphenous vein (SSV) by Duplex ultrasound scanning (2). With soft manual compression and decompression of the ulcers, we detected a swinging blood column, followed by a ventral insufficient side branch, coursing over the lateral calf to a small insufficient SSV.

Therapy I

In August 2005, we performed an endoluminal laser-obliteration of the SSV, minimal invasive exhaeresis of the insufficient side branches, and shaving of both ulcers, followed by a mesh graft transplantation. The histologic examination of the tissue confirmed the lesion to be a venous stasis ulcer. Postoperatively, we documented an occluded SSV and completely healed grafts within two weeks.

Diagnosis II

In November 2005 the patient was readmitted, presenting with a small recurrent ulcer in the middle of the healed graft on the dorsum of the foot. Following six months of frustrating local wound management, the ulcer enlarged slowly up to 1.5 cm² in size and became painful during activity (Fig. 1b).

* This case was presented at the 1. Wachauer Venensymposium (June 1–3, 2007) in Melk (Austria) and at the Arctic Fjords Conference and Workshops on Chronic Venous Disease (October 2–6, 2007) on Hurligruten (Norway).



Fig. 1 Foot and crural ulcers

a) before treatment

b) healed crural ulcer and recurrent foot ulcer after endoluminal laser-obliteration of the short saphenous vein (SSV) and mesh graft transplantation

c) healed foot ulcer after sclerotherapy.

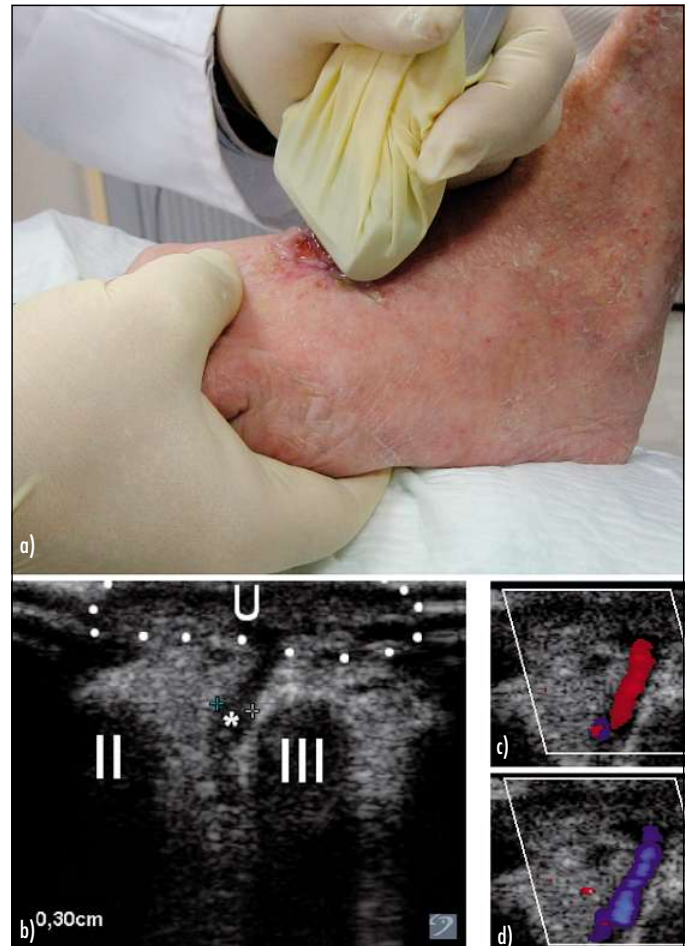


Fig. 2 Duplex investigation and imaging

a) investigation of the foot ulcer in a standing position,

b) imaging of the ulcerated area (U) and the perforating vein (*) between the 2nd (II) and 3rd (III) metatarsals,

c) venous flow directed dorsally after manual compression of the plantar surface (red)

d) venous flow directed toward the plantar aspect after decompression of the plantar surface (blue)

Duplex investigation showed no crural venous reflux. Magnetic resonance imaging of the foot performed in the lying position did not detect any pathology. Duplex investigation of the ulcer in the standing position (Fig. 2a) performed in April 2006 showed an insufficient perforating vein (PV) with a diameter of 3 mm in the proximal space between the 2nd and 3rd metatarsals (Fig. 2b). By manual compression and decompression of the plantar surface, we documented a hard flow straining in the area of the ulcerated tissue (Fig. 2c, 2d)

Therapy II

After Duplex-guided sclerotherapy of this intermetatarsal PV with 2.5 ml of 3% Polidocanol in May 2006, the vein was completely occluded by the following day and the ulcer healed within four weeks.

At follow-up in September 2007, the healed ulcer persisted (Fig. 1c).

Discussion

Different authors have shown that insufficient PVs are important in the development

of signs and symptoms of CVD (5). Venous leg ulcers are not typically located on the foot, although the haemodynamic forces of insufficient small PVs can be strong enough to effect venous ulcerations.

The physiologic function of the PVs of the foot is to connect the deep plantar venous system with the superficial dorsal veins (1). These PVs differ from those in the leg in two main aspects (3, 4):

- One-half of the PVs of the foot do not have valves, especially those smaller than 1 mm and
- in the case of PVs with valves, they face towards the superficial vein, building a

blood flow from deep (plantar) to superficial (dorsal).

In the case of valveless PVs, van Limborgh (4) described their physiology as „neutral“, pointing out that the direction of blood flow depends on pressure. We detected no visible valves by duplex.

Conclusion

We could clearly demonstrate that the venous blood column of the insufficient PV was swinging between the deep plantar venous system and the superficial dorsal ve-

nous system, straining the ulcerated area. The haemodynamic effect which causes local venous hypertension and the breakdown of the tissue, detectable as a foot ulcer, was associated with mechanically-caused pressure.

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