

An Early Detection and Treatment are Essential for Healing Vascular Leg Ulcers. Double Focal Compression Bandaging Technique

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Received: January 23, 2023

Published: February 13, 2023

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Abstract

Double focal compression bandaging technique is a modality of compression therapy, based on physiological concepts such as arteriogenesis and angiogenesis. We use gauze and bandages to get pressure on the wound bed, which stimulates arteriogenesis and angiogenesis in the ulcer area, leading to its healing. Early detection and treatment of the ulcer is essential to avoid a small ulcer becoming huge, very difficult to treat. Failure to do so, will bring the patient along a painful path to heal vascular ulcer. Primary care physicians and nurses, we are in a very positive position for the early detection of these vascular ulcers. By way of illustration, we report a clinical case that was diagnosed in the emergency department as an ulcer with cellulitis and treated with antibiotics. Twenty-four hours later, he was treated in our office, using only double focal compression bandaging technique. The ulcer healed a month later.

Keywords: Early Detection; Vascular Leg Ulcers; Double Focal Compression Bandaging

Introduction

A large ulcer, initially, it was small. Do not cause a small ulcer to become a large ulcer. Hence the importance of early detection and treatment. When epithelialisation does not take place in wound healing, from a clinical point of view, it can be said to be due to a vascular or neoplastic cause, hence the importance of making a differential diagnosis. Of course, there are diseases that slow his recovery, but in this paper, we focus on the detection, diagnosis and early treatment of leg ulcers. A thorough diagnostic process followed by adequate treatment may result in marked improvement of the outcomes, with up to 67% healing rate at 12 weeks and up to 81% within 24 weeks. An early diagnosis and appropriate causal treatment may prevent progression of the illness [1]. From my clinical experience and findings, in the management of leg vascular ulcers, a leg traumatism always precedes the onset of an ulcer. Compression therapy should be

the first treatment option. Currents treatments used in the early stages of chronic venous disease appear to have no effects to progression to chronic venous ulceration. In some cases, surgery can be indicated to achieve a good result and avoid recurrences [2]. There are factors related to the size of venous leg ulcers as, the ulcer duration, the diameter of perforating veins around the ulcers, the reflux time of common femoral veins, the reflux time of great saphenous veins, and the reflux time perforating veins [3]. Although the early surgical intervention to correct superficial venous reflux can improve healing and decrease recurrence rates [4], we think that an early treatment with compression therapy, it is the first therapeutic option.

Material and diagnostic tools

The material and diagnostic tools are relatively simple and cost-efficient: A/Gauzes for padding and doing focal compression on

wound bed. B/Adhesive bandage for attaching focal compression. C/Inelastic bandage (10x10 cm; short stretch) for external compression bandage. D/Saline physiological solution for cleansing the ulcer surface. E/Adhesive tape for fixing the bandages. F/Hand Doppler for checking peripheral pulses, and a device for calculating the ankle/arm index. G/A weight-control scale [5].

Method

We apply a simple compression bandage modality, which I called Double focal compression bandaging technique: The first bandage is used for the focal compression of the wound bed, and another bandage covers the first, to achieve a gradual external compression from the toes to the knee, each turn of the band covers the preceding tour by 50-70%. The area of the ulcer receives the pressure of 3 layers (that of the pressure over the wound bed, and the double effect of the external gradual compression) (Figure 1). To apply this technique safely in primary care, it is necessary to follow three simple steps: 1st/To establish a differential diagnosis. 2nd/To establish a clinical diagnosis. 3rd/Measurement of the Ankle Brachial Index to exclude severe arterial disease [6].

Figure 1: Double focal compression bandaging technique.

The therapeutic effect of this technique is based on two physiopathological concepts like arteriogenesis and angiogenesis. The ulcer is caused by a deficiency in tissue perfusion. We have to reverse this deficit, and we can do that, by exerting focalized pressure on the affected area with a padding-gauze, and a gradual external compression bandage, from toes until 2 cm below the knee, with an inelastic bandage (10x10 cm; short stretch). The identification

of angiogenic growth factors was the basis for the development of novel strategies for the treatment of occlusive vascular diseases. Therapeutic angiogenesis resulting in capillary sprouting (angiogenesis) and collateral vessel development (arteriogenesis) may be a potential alternative for patients suffering from critical limb ischemia [7].

Results

We show the photographic sequence of the clinical evolution of the ulcer, in elderly patients, healed with this technique. We draw attention to the first case, which has been poorly diagnosed and treated with antibiotics and anti-inflammatory drugs. The patient came to our clinic 24 hours later, removing the antibiotics and being treated, solely, with double focal compression technique. Two months later, the ulcers were healed.

Case Report 1

An 82-year-old man with various chronic diseases, arterial hypertension, anticoagulated by atrial fibrillation, dyslipidemia, and osteoporosis. The patient was diagnosed with invasive bladder cancer (07-22-2022) that, due to age and co-morbidity, was not recommended for surgery. They propose a symptomatic palliative treatment. Three months later (10-08-2022), he fell and suffered two ulcers in both legs. He went to an emergency department, where he is treated with antibiotics. Twenty-four hours later (10-10-2022), he came to our medical-office, and this is how his legs looked (Figure 2). There were ulcers surrounded by an erythematous area. The wound bed was necrosed. I think he was diagnosed with cellulitis, hence the prescription for antibiotics. The antibiotic was removed, and we applied double focal compression bandaging technique, following the clinical course of the ulcer daily, for two weeks. to detect any sign or symptom of infection, but this did not happen. According to our experience, focalized pressure on the wound prevents infection [8]. Considering the positive development of ulcers and the reduction of edema, after one month of treatment, we replaced the bandage with strong compression stockings, which were removed at night, just before going to sleep. We found a decrease in edema after the application of compression therapy, which we maintain for the cardiovascular benefits they provide to the patient [9]. In one month, the ulcers nearly healed, and in two and a half months, the resolution was completed (Figure 3).

Figure 2: Post-trauma necrotic leg ulcers with swelling in the left leg and erythema.

A/ Before applying double focal compression bandaging technique.

B/ 2.5 months later treatment.

Figure 3: Significant decrease in edema, after applying compressive therapy.

Figure 4: Clinical course of both ulcers until healing.

Case Report 2

This is a very similar case to the previous one, when early treatment is key to reducing edema and healing ulcers at the back of his left leg. An 82-year-old man suffering from ischemic heart disease and co-morbidity suffered trauma in his left leg. He has two small ulcers on the back of your leg, that in three weeks is not progressing well, despite the treatment, then come to our consultation. He's had pain and edema in his left leg for a week. Peripheral artery disease was excluded by measurement of ankle/brachial index (ABI=0.90). Due to severe oedema, low molecular weight heparin was used for two weeks, to prevent thrombosis. We started treat him (04-29-2016) with double focal compression bandaging, and the ulcer healed within a month. Early screening and treatment are essential for the treatment of these vascular leg ulcers (Figure 5).

Figure 5: Decreased edema after applying double focal compression bandaging technique.

Figure 6: Healing of ulcers located on the back of the left leg, one month after treatment.

Below we report several clinical cases. All were detected early and treated, only, using the double focal bandaging technique, but before applying this technique, we established a differential diagnosis, a clinical diagnosis based on signs and symptoms, and discarded serious peripheral arterial disease.

Simply, we show the photographic sequence of the clinical course of the ulcer until its healing. No antimicrobial agent was required, because no signs and/or symptoms of infection, were detected. The pressure focused on the wound bed prevents infection [8]. Everyone was advised to wear pressure socks once the ulcer has healed. This bandaging technique can heal ulcers, but not chronic venous insufficiency leading to venous hypertension.

Case Report 3

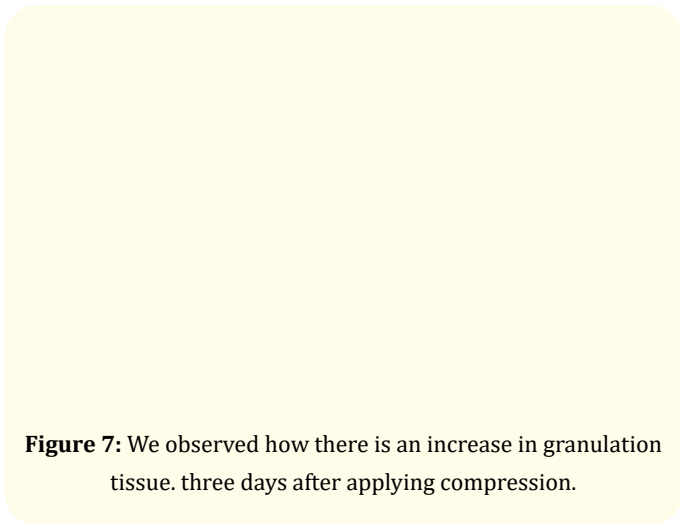


Figure 7: We observed how there is an increase in granulation tissue. three days after applying compression.

Case Report 4

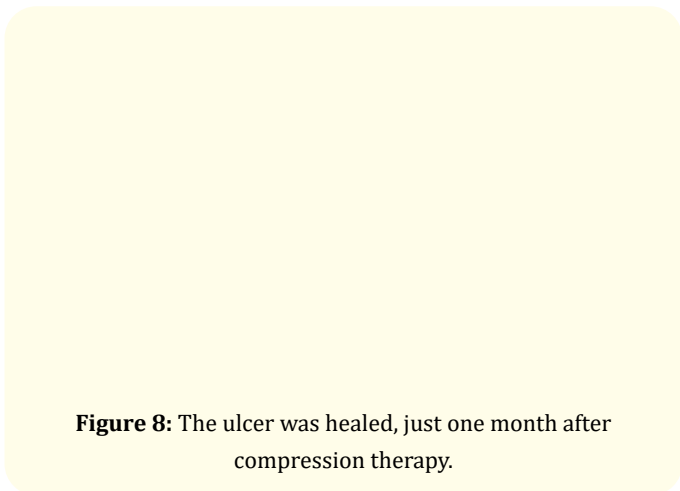


Figure 8: The ulcer was healed, just one month after compression therapy.

Case Report 5

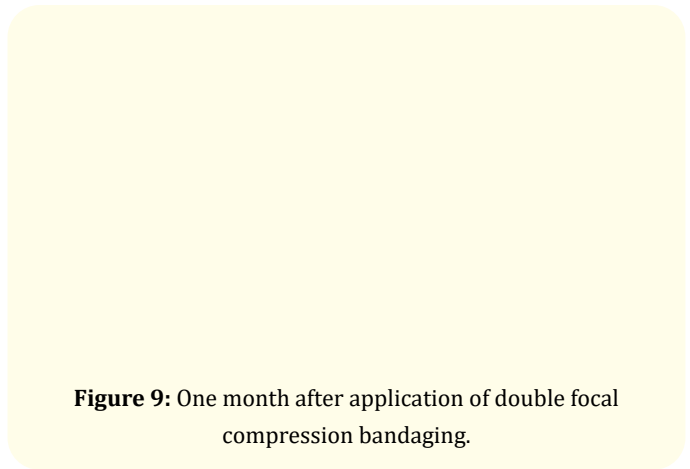


Figure 9: One month after application of double focal compression bandaging.

Case Report 6

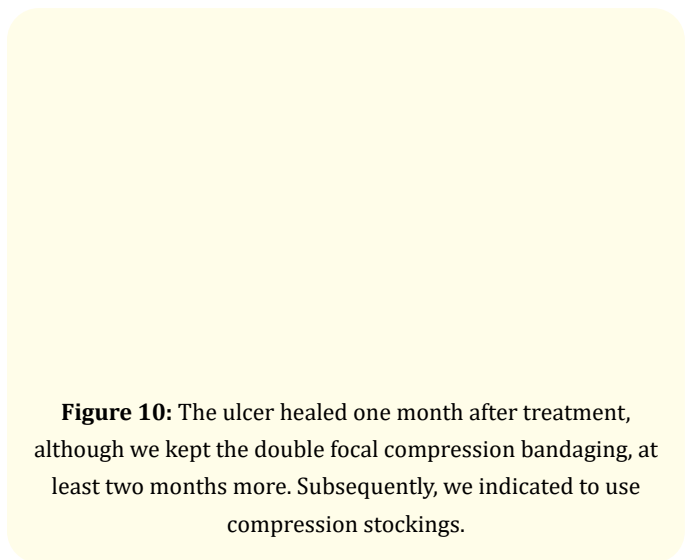
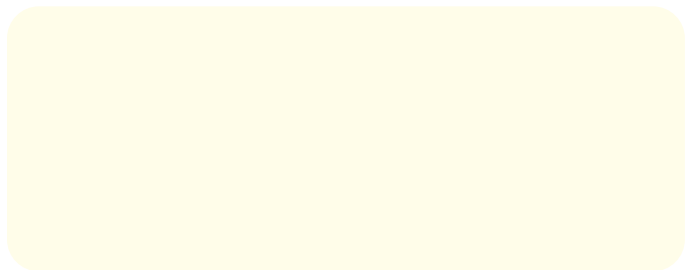


Figure 10: The ulcer healed one month after treatment, although we kept the double focal compression bandaging, at least two months more. Subsequently, we indicated to use compression stockings.

Case Report 7

Outcome applying double focal compression bandaging.



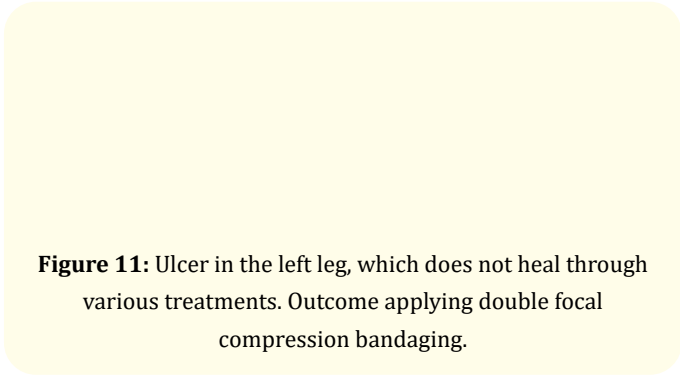


Figure 11: Ulcer in the left leg, which does not heal through various treatments. Outcome applying double focal compression bandaging.

Case Report 8

Double Focal Compression Bandaging in the heel ulcers.

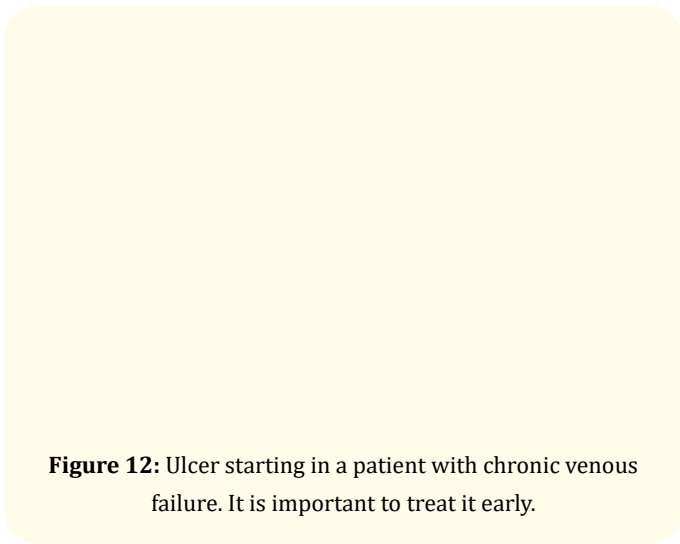


Figure 12: Ulcer starting in a patient with chronic venous failure. It is important to treat it early.

We present two clinical cases of heel ulcers, that were healed with this technique.

Case Report 1

The first case is a 76-year-old male with an ulcer in the heel of his left leg for months, who does not respond to various treatments, so he comes to our medical consultation. Peripheral pulses are present. We only use a double focal compression bandaging. The ulcer healed within 3 months (Figure 13).

We kept a daily record of the clinical progress of the ulcer, to detect any signs or symptoms of infection.

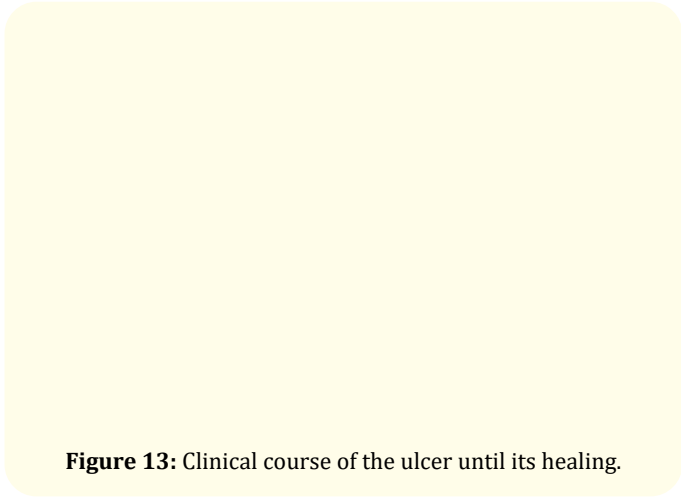


Figure 13: Clinical course of the ulcer until its healing.

Case Report 2

62-year-old woman with heel ulcer for three months without a positive result.

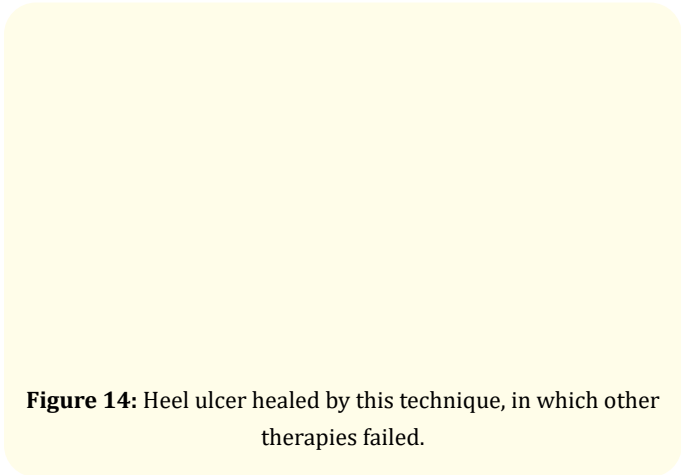


Figure 14: Heel ulcer healed by this technique, in which other therapies failed.

Case Report 3

The second case is a 95-year-old woman with advanced Alzheimer’s disease (bedded). Severe peripheral arterial disease was ruled out by measuring the ankle Arm index (ABI0.95). We apply a padding of gauze on the heel, fixing it with an adhesive bandage. We applied a bandage with gradual external compression, from the toes up to 2 cm below the knee. Daily dressings were carried out for 2 weeks, to screen for signs or symptoms of infection, but this did not happen.

Prevention, before it can form a heel ulcer, has been essential for wound healing. Given the patient’s immobility, we did not

expect such a good and astonishing result. Other therapies are used in patients with heel ulcers. Multi-layered soft silicone foam dressings are effective in preventing pressure ulcers in critically ill patients when applied in the emergency department prior to ICU transfer [10].

Figure 15: A wound that could turn into an ulcer was avoided by this technique.

Discussion and Conclusion

I could present more cases with the same outcome, the healing of the ulcer. It seems astonishing the results achieved with the application of this technique: Double focal compression bandaging. We should consider that, we only use bandages and gauze to get pressure gradients, which stimulate arteriogenesis and angiogenesis in the affected area, leading to wound healing. Admittedly, not all patients tolerate compression, but we must tell them that without pressure, there is no healing by this method. All compression-tolerant patients healed. Over 200 patients were treated for this technique, and we didn't see any failures. It should be noted that no antimicrobial agents were used as no signs or symptoms of infection were found. Finally, to say that most of the patients came from other clinics, where they were treated with different treatments, with no positive outcomes.

According to the findings of this clinical experience, this technique, by the simple material used and the results obtained, is efficient and effective and, in my opinion, should be used mostly by physicians and nurses in primary care, as the first treatment of choice for vascular leg ulcers. I understand that, given the variety of therapies available, may be controversial, however, the photographic sequence of the clinical evolution of ulcers until their healing, is eloquent. I encourage readers of this article to use the technique and verify the outcome.

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