Acta Scientific CLINICAL CASE REPORTS

Volume 6 Issue 10 October 2025

Review Article

The Double Focal Compression Bandaging Insights from 25 Years of Clinical Experience

Carlos Sánchez Fernández de la Vega*

Retired Doctor, Spain

***Corresponding Author:** Carlos Sánchez Fernández de la Vega, Retired Doctor, Spain.

Received: August 29, 2025

Published: October 15, 2025

Abstract

Chronic ulcers of the lower limbs remain a major public health and clinical challenge, characterized by high prevalence, prolonged healing times, frequent recurrence, and a severe impact on patients' quality of life. Compression therapy is widely regarded as the standard of care, yet its limitations in efficacy and adherence are well documented. Double focal compression bandaging, developed from direct clinical observation, applies localized pressure to the ulcer bed to promote angiogenesis, reduce oedema, and prevent infection. More than two decades of clinical practice consistently demonstrate favorable outcomes, including complete healing within three to four months, reduced recurrence rates, and applicability even in elderly and multimorbid patients. Despite its simplicity, reproducibility, and cost-effectiveness, the technique has faced skepticism due to the absence of large randomized trials and its challenge to prevailing wound-care paradigms. These abstract highlights the potential of physiologically informed, low-cost interventions to improve the management of chronic wounds and enhance patient quality of life.

Keywords: Chronic Ulcers; Compression Bandaging; Angiogenesis; Primary Care

Introduction

Chronic leg ulcers affect up to 3% of the adult population and nearly 5% of those over 80 years old, imposing an enormous economic burden on healthcare systems while deeply undermining patients' quality of life [1,2]. Beyond the economic and clinical implications, the personal toll is considerable: patients endure persistent pain, continuous exudate, limited mobility, frequent infections, and social isolation, all of which contribute to reduced autonomy and diminished dignity. Conventional compression therapy, whether elastic or inelastic, remains the standard treatment approach [3], yet its results are frequently suboptimal. Healing is often slow, recurrences are common, and prolonged patient suffering is almost inevitable [4].

In this context, double focal compression bandaging emerged as a clinically inspired alternative, born not from laboratory design but from direct observation at the bedside [5,6]. The technique offers a straightforward and physiologically coherent strategy for wound healing, showing that practical clinical intuition can both complement and at times challenge standardized protocols.

Origins of the technique

The first applications of double focal compression bandaging were motivated by the clinical intuition that localized pressure over the ulcer bed could stimulate healing. In a patient with a refractory venous ulcer, complete closure was achieved within three months (Figure 1), a result that directly challenged prevailing clinical assumptions about chronic wound management [5].

Figure 1: Ulcers closed completely within three months with this technique.

One of the most remarkable observations was the spontaneous resolution of necrotic tissue following the application of compression. Although the technique initially could produce necrotic areas within the ulcer bed, these consistently resolved on their own, without the need for additional debridement agents (Figure 2). This finding highlights the remarkable capacity of targeted compression to stimulate intrinsic tissue regeneration and to promote an effective and natural autolytic healing process.

Figure 2: Necrotic tissue regresses spontaneously after focal compression of the ulcer bed.

The materials used were intentionally basic and easily accessible, including gauze, bandages, adhesive tape, and saline solution. Diagnostic tools were limited to simple yet functional items: a camera, a tuning fork, a monofilament, a portable Doppler, sheets for performing the Edinburgh test for intermittent claudication, and a scale for monitoring patient weight. This approach demonstrates that effective clinical outcomes can be achieved without reliance on high-technology interventions, emphasizing the importance of simplicity, careful observation, and precise technique in patient care. The technique was subsequently presented at international congresses in Rome (2004) and Rio de Janeiro (2005) [5,6], eliciting a wide range of reactions, from appreciation of its practicality and accessibility in primary care to skepticisms regarding its scientific rigor. This divergence highlights a recurring tension in medicine: innovations arising from direct clinical practice often face delayed acceptance when measured against established institutional standards.

Theoretical and physiological basis

Double focal compression bandaging is far from an arbitrary empirical technique; the clinical results obtained led me to seek an explanation, which I found in the principles of basic physics and pathophysiology. Pascal's law explains how pressure applied to a fluid is transmitted uniformly, providing a rationale for the effect of focal compression on interstitial fluid dynamics [7]. Laplace's law relates sub-bandage pressure to tension, limb radius, and the number of bandage layers, offering a framework for precise application [8]. Principles of flow continuity further clarify how reducing vessel diameter increases flow velocity and endothelial shear stress, thereby stimulating vascular remodeling [9].

Thigh compression aids in managing venous and lymphatic disorders by narrowing veins, reducing oedema, and improving hemodynamic. Its effects can be objectively assessed by magnetic resonance imaging (Figure 3) and enhanced with specialized devices [10].

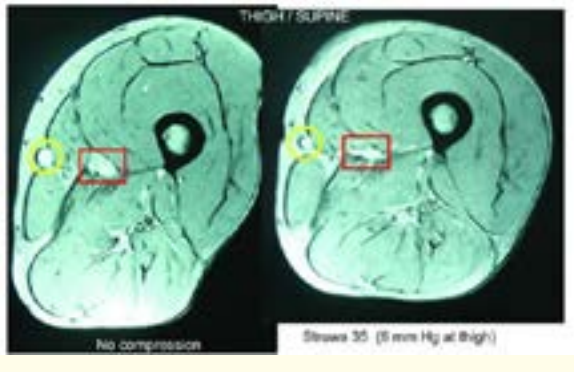

Figure 3: TMRI mid-thigh cross section in supine position, left without compression, right wearing a compression stocking which exerted a very low pressure (6 mmHg) at thigh level. The stocking leads to a change of the configuration of the thigh becoming more circular and to a clear narrowing of superficial (marked by a circle) and deep veins (marked by rectangle). Image courtesy of Hugo Partchs and G. Mosti.

From a physiological perspective, focal compression enhances endothelial shear stress, stimulating the release of nitric oxide and promoting vasodilation [11]. Relative tissue hypoxia induced by localized pressure triggers angiogenesis and the formation of collateral vessels [12,13]. Simultaneously, the reduction of interstitial oedema improves oxygen diffusion and creates an environment less conducive to bacterial growth [14].

The acceleration of blood flow can be clearly observed in sequential imaging (Figure 4), where focal compression generates spontaneous flow toward the previously compressed area. This phenomenon aligns with the fluid continuity equation: by temporarily reducing the vascular diameter through localized pressure, flow velocity increases to maintain constant volume, efficiently redistributing blood and enhancing tissue perfusion. The combination of these mechanisms explains why clinical outcomes with double focal compression often exceed those expected from conventional compression therapies, particularly in refractory or complicated wounds.

Figure 4: Applying and releasing focal compression induces spontaneous blood flow, reflecting increased velocity and tissue perfusion.

Material and diagnostic tools

In all my articles on this subject, I make a point of providing a thorough description of the materials (Figure 5) and diagnostic tools used (Figure 6), as well as a clear explanation of the technique applied (Figure 7). The purpose of this approach is to ensure that readers, if interested in only a specific article, can access all relevant information without the need to consult additional texts.

The straightforwardness of the materials employed, together with the use of basic diagnostic tools, provides this technique with

Figure 5: Material: Sterile gauze, adhesive bandages, short-stretch compression bandages, medical adhesive tape, and isotonic saline solution.

significant added value. Its implementation solely demands a precise diagnosis and rigorous follow-up of the clinical course until definitive ulcer closure.

Figure 6: Diagnostic tools: Digital camera, tuning fork, monofilament, handheld Doppler device, Edinburgh Claudication Questionnaire, and a digital scale for measuring the patient's body weight.

The technique

Figure 7: Double Focal Compression Bandaging Technique.

Documented evidence and clinical outcomes

All the results have been documented and published in international medical journals. The effects were so remarkable that, given

the limited resources with which they had been obtained, they appeared difficult to believe. Nevertheless, prolonged clinical practice has consistently confirmed their efficacy and allowed me to identify a series of fundamental findings.

Infection

All patients were instructed to seek medical attention immediately if any skin changes near the ulcer or fever appeared. The use of antimicrobial agents has not been necessary, as no clinical signs or symptoms of infection were observed. Focal pressure prevented infection, effectively preserving wound integrity without the use of systemic antibiotics [15].

In my experience, exudate cultures were performed only when clinical signs or symptoms of infection, such as cellulitis or fever, were present, situations that never occurred. To illustrate the dispensability of antibiotics, cultures were carried out; even when they tested positive due to bacterial contamination, the antibiotic indicated by the antibiogram was not administered. Whether the bacteria persisted or were eliminated, the outcome remained unchanged: complete ulcer healing achieved solely through focal compression without the use of any antimicrobial agents [16].

The explanation lies in physiology: by increasing blood flow velocity through focal compression, the activity of monocytes and other immune cells is enhanced, helping to limit bacterial proliferation and dissemination [17]. This mechanism suggests that compression not only improves tissue perfusion and oxygenation but also strengthens the innate defenses of the organism. Studies in mice have shown that accelerated circulation can enhance local immune surveillance [18].

Debridement

One of the first clinical observations that drew my attention was that the necrotic tissue initially forming in the ulcer tended to resolve spontaneously over the course of clinical evolution. In the early cases, I would use a scalpel to remove dry necrotic tissue, particularly eschars. However, I soon realized that this was a mistake. The gradual resolution of the crust corresponded to natural autolytic debridement, mediated by monocytes differentiating into macrophages, which carried out the cleansing of the wound bed. This observation served as a guide to assess clinical progress, confirming that the healing process was proceeding appropriately (Figure 8).

Figure 8: Autolytic and mechanical debridement.

The application of this technique involves two types of debridement: autolytic, mediated by monocytes and macrophages, and mechanical, achieved by removing the padding during dressing changes [19].

Peripheral arterial disease

In carefully selected cases, when the ankle-brachial index exceeded 0.5–0.6, the technique was applied safely. It was particularly striking to observe the healing of arterial ulcers in patients for whom conventional compression was contraindicated, a finding that challenges traditional clinical expectations and suggests new possibilities in the management of these complex wounds [20-24].

Heart failure

In patients with mild to moderate heart failure and without significant hemodynamic compromise, the technique was applied safely. Remarkably, ulcer healing occurred without inducing clinical decompensation, as evidenced by the absence of cardiac destabilization during treatment and by radiologic monitoring (Figure 9). Moreover, a significant improvement in patients' quality of life was observed, underscoring the broader benefits of this intervention beyond mere wound closure [25,26].

Recurrences

The recurrence rate was markedly lower than that observed with conventional compression therapies, highlighting the efficacy of the technique. It is important to remember that, although the ulcer may heal, the underlying disease persists, making the con-

Figure 9: Safe and Effective Ulcer Healing in Cardiac Patients.

tinued use of compression stockings essential to prevent new recurrences.

A patient, after the failure of other treatments, was managed with this technique and achieved complete ulcer closure within nine months. Subsequently, he did not adhere to the recommendation of using high-compression stockings and pursued alternative therapies. Nevertheless, the outcome itself demonstrates the efficacy of the technique (Figure 10).

Figure 10: The similarity between both ulcers, separated in time, is striking.

Healing time

The time required for an ulcer to heal should not be a primary concern, as healing occurs when the conditions are appropriate. From our experience, a key conclusion is drawn: early diagnosis and treatment are essential [28]. In general terms, ulcers healed within a range of one to four months; however, some cases took years to close, highlighting the importance of early intervention (Figure 11).

Figure 11: Lesion fully resolved one month after applying the technique.

Surgical and traumatic wounds

In wounds requiring surgical suturing (Figure 12) and in abrasions (Figure 14), the technique not only optimizes the aesthetic outcome by promoting more uniform healing and minimizing residual scarring, but also facilitates earlier stabilization of the injured tissue, reduces the likelihood of dehiscence, and contributes to the establishment of a microenvironment more conducive to tissue regeneration [29].

Figure 12: Optimization of the aesthetic outcome achieved through the application of focalized compression.

With the aim of assessing the difference resulting from applying focal pressure to the surgical suture versus leaving it without such intervention, this figure clearly illustrates the contrast in outcomes, highlighting the improved wound stabilization and more favourable aesthetic appearance associated with the application of focal pressure (Figure 13).

Figure 13: Distinct aesthetic outcome.

Figure 14: Applying only focalized pressure.

Resistance and controversy

Despite the favourable outcomes I have personally observed with double focal compression, I remain surprised by the skepticism it generates. I find it difficult to understand how such a simple method can be questioned in comparison to advanced, technology-based therapies. From my perspective, the resistance of the wound-care industry, focused on high-cost products, limits the dissemination of reproducible and low-cost interventions. I believe this phenomenon reflects a broader issue in medicine: many empirically effective innovations precede formal validation, yet their widespread adoption is delayed more by economic and institutional inertia than by a lack of clinical evidence.

Future perspectives

Future research should focus on rigorous clinical trials to support empirical observations, as well as on studies aimed at optimizing protocols and on strategies for implementing the technique in primary care, where simplicity and low cost could have the greatest impact. Its application could extend beyond vascular ulcers to include surgical, traumatic, and ischemic wounds, as well as the management of postoperative oedema. Likewise, educating healthcare professionals on the physiological principles underlying double focal compression could facilitate broader acceptance and reduce reliance on complex and high-cost interventions.

Conclusion

Double focal compression bandaging illustrates the profound potential of simplicity in medical innovation. Rooted in well-established physiological and physical principles, and supported by consistent outcomes in cases where other therapies had failed, it challenges the assumption that effective care must rely on technological sophistication. Beyond wound closure, this approach underscores the value of careful clinical observation as a source of therapeutic progress. By offering a reproducible, low-cost, and physiologically coherent alternative, it opens a path for wider application in primary care and invites the medical community to reconsider how innovation can emerge directly from bedside practice.

Bibliography

1. Probst S., *et al*. "Prevalence and incidence of venous leg ulcers. A protocol for a systematic review and meta-analysis". *Phlebology* 38.1 (2023): 3-10.

2. Guest JF., *et al*. "Venous leg ulcer management in clinical practice in the UK: costs and outcomes". *International Wound Journal* 15.1 (2018): 29-37.

3. O'Meara S., *et al*. "Compression for venous leg ulcers". *Cochrane Database System Review* 11 (2012): CD000265.

4. Marston WA., *et al*. "Wound healing society 2019 update on guidelines for venous ulcers". *Wound Repair and Regeneration* 27.6 (2019): 649-662.

5. Sánchez Fernández de la Vega C. "Venous Leg Ulcers. Focal Compression Bandaging". *International Angiology* 23.1 (2004): 1.

6. Sánchez Fernández de la Vega C. "Venous Leg Ulcers. Double Focal Compression Bandaging". In: 15th World Congress of In-

ternational Union of Phlebology; 2005 Oct 2-7; Rio de Janeiro. Bologna: Medimond; (2005).

7. Schuren J and Mohr K. "Pascal's law and the dynamics of compression therapy: a study on healthy volunteers". *International Angiology* 29.5 (2010): 431-435.

8. Thomas S. "The use of the Laplace equation in the calculation of sub-bandage pressure". *World Wide Wounds* (2003).

9. Nichols WW and O'Rourke MF. "McDonald's Blood Flow in Arteries: Theoretical, Experimental and Clinical Principles". 6th ed. London: Hodder Arnold; (2011).

10. Partsch H and Mosti G. "Thigh compression". *Phlebology* 23.6 (2008): 252-258.

11. Paniagua OA., *et al*. "Role of endothelial nitric oxide in shear stress-induced vasodilation". *Circulation* 103.13 (2001): 1752-1757.

12. Carmeliet P. "Angiogenesis in tissue repair". *Nature Medicine* 6.4 (2000): 389-395.

13. Hong WX., *et al*. "The role of hypoxia-inducible factor in wound healing". *Journal of Cell Physiology* 229.10 (2014): 1499-1505.

14. Bowler PG., *et al*. "Wound microbiology and infection". *International Journal of Wound Journal* 8.6 (2001): 453-460.

15. Sánchez Fernández de la Vega C. "Bacterial contamination does not necessarily mean infection". *International Journal of Angiology* 32.5 (2013).

16. Sánchez Fernández de la Vega C. "Double focal compression bandaging. Local pressure over the wound bed, this avoids application of antibiotics". In: 14th European Congress of Internal Medicine; 2015 Oct; Moscow.

17. Sánchez Fernández de la Vega C. "Focalized pressure on the wound bed prevents infection. Double focal compression bandaging". *International Journal of Information Research and Review* 07.10 (2020): 7113-7120.

18. Haist KC., *et al*. "Inflammatory monocytes mediate control of acute alphavirus infection in mice". *PLoS Pathogen* 13.12 (2017): e1006748.

19. Sánchez Fernández de la Vega C. "Wound Debridement. Double focal compression bandaging technique". *International Journal of Information Research and Review* 8.1 (2021): 7163-7168.

20. Sánchez C and Partsch H. "Healing of an arterial leg ulcer by compression bandaging: a case report". *International Wound Journal* 14.6 (2017): 1180-1182.

21. Mosti G., *et al*. "Compression therapy in mixed ulcers increases venous output and arterial perfusion". *Journal of Vascular Surgery* 55.1 (2012): 122-128.

22. Sánchez Fernández de la Vega C. "Peripheral Artery Disease. Double Focal Compression Bandaging Technique". *Acta Scientific Clinical Case Reports* 4.7 (2023).

23. Sánchez Fernández de la Vega C. "Peripheral Arterial Disease. We can fight the disease, slow its progression, but not defeat it". *Acta Scientific Clinical Case Reports* 5.3 (2024).

24. Sánchez Fernández de la Vega C. "Compression to reduce leg oedema in patients with arterial occlusive disease". Double focal compression bandaging. Veins and Lymphatics 20 December (2018).

25. Urbanek T., *et al*. "Compression therapy for leg oedema in patients with heart failure". *ESC Heart Failure* 7.5 (2020): 2012-2020.

26. Sánchez Fernández de la Vega C. "Compression therapy: Double focal compression bandaging in patient with cardiac failure". *Interventional Cardiology Journal* 5 (2025).

27. Sánchez Fernández de la Vega C. "Combatting Vascular Ulcer Recurrence: The Efficacy of Double Focal Compression Bandaging". *Acta Scientific Clinical Case Reports* 5.12 (2024).

28. Sánchez Fernández de la Vega C. "An Early Detection and Treatment are Essential for Healing Vascular Leg Ulcers. Double Focal Compression Bandaging Technique". *Acta Scientific Clinical Case Reports* 4.3 (2023).

29. Sánchez Fernández de la Vega C. "Focused Pressure over the surgical wound improves the aesthetic outcome". *International Journal of Information Research and Review* 8.9 (2021): 7352-7355.