Case Report

Platelet-Rich Fibrin and Punch Graft Combination in the Management of Venous Stasis Ulcer: A Great Duo

Yusuf Can Edek, Mehmet Gülengül, Esra Adışen

Department of Dermatology, Gazi University Faculty of Medicine, Ankara, Türkiye

Abstract

Venous leg ulcers are the most common cause of leg ulcers, and various factors, such as venous hypertension and venous reflux, play a role in the etiopathogenesis of these ulcers. Although various treatment modalities can be used for the treatment of venous leg ulcers, ulcer management can be challenging in some cases and has led to the search for new treatment modalities. In this case report, we present a male patient who underwent punch graft and platelet-rich fibrin treatment for venous stasis ulcer.

Keywords: Leg ulcer, platelet-rich fibrin, punch graft

Introduction

The most common type of leg ulcer is venous ulcer. The etiopathogenesis of venous ulcers may involve several components, including venous hypertension, venous reflux, venous thrombosis or non-thrombotic venous obstruction, and insufficient muscle pump function. The treatment options for venous ulcer include compression therapy, local wound care, wound dressings, and tissue grafts; however, venous ulcer care can be challenging occasionally and requires a combination of therapeutic approaches.[1] Here, we describe a male patient who underwent punch graft and platelet-rich fibrin (PRF) treatment for a venous stasis ulcer.

Case Report

A 55-year-old man presented to our dermatology outpatient clinic with a painful ulcer on his right leg. His past medical history included hypertension with perindopril + indapamide and chronic venous insufficiency with daflon. The patient described an ulcer on his right leg that had increased in size over the past month. Dermatologic examination revealed an ulcer on the right leg above the lateral malleolus measuring 2.5 cm^2 (calculated with imitoMeasure®) with irregular borders and fibrin tissue on the lesion (Figure 1). Based on clinical analysis and Doppler-ultrasound examination, the ulcer was considered a venous-stasis ulcer. Upon treatment resistance with ulcer debridement, wound dressing, and compression therapy, we decided to apply PRF treatment. Initially, 10 cc of the patient's venous blood was drawn into a PRF tube. The blood was centrifuged in a Nuve-NF 200 centrifuge device at 1300 rotations per minute for 8 minutes. PRF material was placed on the ulcer, covered with a sterile gauze piece, held in the area with a sterile bandage, and repeated weekly. Two weeks after PRF treatment, following wound bed preparation, we decided to apply the punch graft method, which stands out

Submission: 26-Oct-2024 **Web Publication:** 30-Dec-2024
Acceptance: 08-Dec-2024

Access this article online

Quick Response Code:

Website: www.turkjdermatol.com

DOI: 10.4274/tjd.galenos.2024.91300

Adress for correspondence: Yusuf Can Edek, MD, Department of Dermatology, Gazi University Faculty of Medicine, Ankara, Türkiye,
Email: yusuf-can-35@hotmail.com
ORCID ID: 0000-0002-3877-8681

How to cite this article: Edek YC, Gülengül M, Adışen E. Platelet-rich fibrin and punch graft combination for the management of venous stasis ulcer: a great duo. Turk J Dermatol. 2024;18(4):165-167.

in the literature as an effective method for ulcer management, to ensure complete epithelialization. Graft material, including the epidermis and dermis, was taken from the anterolateral side of the thigh under sterile conditions using a 4 mm punch under local anesthesia. Topical antibiotic was applied to the donor area and allowed to heal with secondary intention. The collected grafts were placed in the holes opened with a 4 mm punch in the wound bed, wrapped with sterile gauze, and compression bandages were applied. During the patient's follow-up, after the placement of the grafts, rapid epithelialization of the ulcer was observed, and complete healing was observed in the fourth week after the procedure (Figure 2). Informed consent was obtained.

Discussion

The combined use of PRF and punch graft treatment modalities appears to be an effective combination treatment in ulcer management. PRF affects the wound healing process by having roles in cell proliferation, cell differentiation, chemotaxis, and angiogenesis through the platelets, growth factors, and cytokines it contains, as well as via its fibrin matrix.[2] Somani and Rai,[3] in their study to show the accelerating effect of PRF on ulcer treatment, divided 15 patients with venous ulcers into two groups, applied PRF closure to one group and saline closure to the other group, and at the end of four weeks, the reduction in ulcer area was 85.51% in the PRF group and 42.74% in the saline group. Dorjay and Sinha[4] used PRF in the treatment of various leg ulcers, venous ulcers, diabetic foot ulcers, and post-traumatic ulcers. In addition to its wound healing-accelerating effects in ulcer management, PRF is a safe and inexpensive treatment method, causing it to emerge as an increasingly used treatment method in dermatology practice.

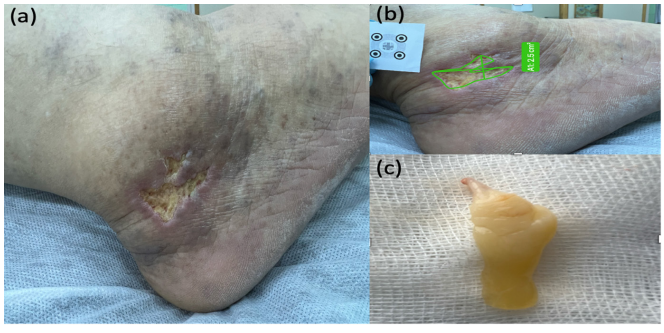

Figure 1. (a, b) Ulcer on the right leg above the lateral malleolus measuring 2.5 cm^2 (calculated with imitoMeasure®), with irregular borders and fibrin tissue on the lesion, (c) appearance of the PRF material
PRF: Platelet-rich fibrin

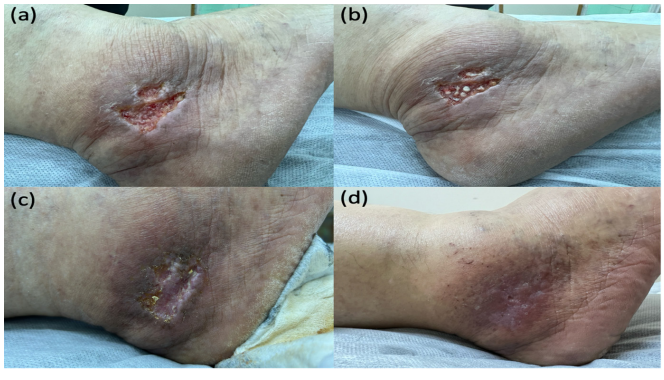

Figure 2. (a) Appearance of the ulcer 2 weeks after PRF treatment; (b) location of skin grafts on the ulcer; view of the ulcer 1 week (c) and 4 weeks (d) after the punch graft procedure
PRF: Platelet-rich fibrin

The punch graft method is a minimally invasive surgical method in which mini-graft materials containing the epidermis and papillary dermis are taken using a punch, scalpel, or curette and placed directly into the ulcerated area. One of the advantages of this method is its ability to be used as an outpatient procedure without the need for hospitalization. In addition to its impact on accelerating wound healing, it also plays a significant role in decreasing ulcer-related pain. Studies in the literature have reported the use of punch graft applications for treating venous, arterial, and diabetic ulcers.[5-7] Preparing the wound bed before applying the graft increases the success rate of the graft treatment. Negative-pressure wound therapy can be performed for this purpose, and PRF is also one of the methods that can be applied.[8,9] We used PRF before graft implantation to prepare the wound bed.

Although there is no case in the literature in which punch skin graft placement in combination with PRF application, in their study, Wang et al.[9] achieved lower postoperative infection and amputation rates via PRF treatment before full-thickness skin graft in diabetic foot management. Carducci et al.[10] achieved successful treatment results by combining the platelet-rich plasma (PRP) and punch graft method in mixed arterial and venous leg ulcer management.

In this case report, we describe the first case of a leg ulcer treated with a combination of PRF and punch graft in the literature. We want to emphasize that this combination can be an effective, practical, and inexpensive approach to ulcer management.

Ethics

Informed Consent: It was obtained.

Footnotes

Authorship Contributions

Surgical and Medical Practices: Y.C.E., M.G., E.A., Concept: Y.C.E., M.G., E.A., Design: Y.C.E., M.G., E.A., Data Collection or Processing: Y.C.E., M.G., E.A., Analysis or Interpretation: Y.C.E., M.G., E.A., Literature Search: Y.C.E., M.G., E.A., Writing: Y.C.E., M.G., E.A.

Conflict of Interest: The authors declared that they have no conflict of interest.

Financial Disclosure: The authors declared that this study received no financial support.

References

1. Abbade LP, Lastória S. Venous ulcer: epidemiology, physiopathology, diagnosis and treatment. Int J Dermatol. 2005;44:449-456.
2. Napit IB, Shrestha D, Neupane K, Adhikari A, Dhital R, Koirala R, Gopali L, Ilozumba O, Gill P, Watson SI, Choudhury S, Lilford RJ. Autologous blood products: leucocyte and platelets rich fibrin (L-PRF) and platelets rich plasma (PRP) gel to promote cutaneous ulcer healing - a systematic review. BMJ Open. 2023;13:e073209.
3. Somani A, Rai R. Comparison of efficacy of autologous platelet-rich fibrin versus saline dressing in chronic venous leg ulcers: a randomised controlled trial. J Cutan Aesthet Surg. 2017;10:8-12.
4. Dorjay K, Sinha S. Platelet-rich fibrin in nonhealing leg ulcers: a simple and effective therapeutic option. J Cutan Aesthet Surg. 2021;14:160-165.
5. Nordström A, Hansson C. Punch-grafting to enhance healing and to reduce pain in complicated leg and foot ulcers. Acta Derm Venereol. 2008;88:389-391.
6. Conde-Montero E, Pérez Jerónimo L, Peral Vázquez A, Recarte Marín L, Sanabria Villarpando PE, de la Cueva Dobao P. Early and sequential punch grafting in the spectrum of arteriolopathy ulcers in the elderly. Wounds. 2020;32:E38-E41.
7. García-Madrid M, Sanz-Corbalán I, Tardáguila-García A, Molines-Barroso RJ, López-Moral M, Lázaro-Martínez JL. Punch grafting for the management of hard-to-heal diabetic foot ulcers: a prospective case series. Int J Low Extrem Wounds. 2023;22:542-547.
8. Dumville JC, Land L, Evans D, Peinemann F. Negative pressure wound therapy for treating leg ulcers. Cochrane Database Syst Rev. 2015;2015:CD011354.
9. Wang Y, Wang Y, Wang X, Zhao Y, Ruan S, Cao H. Effect of leukocyte-platelet fibrin-rich wound reconstruction followed by full-thickness skin grafting in the treatment of diabetic foot Wagner grade 4 ulcer gangrene (toe area). Platelets. 2023;34:2131752.
10. Carducci M, Bozzetti M, Spezia M, Ripamonti G, Saglietti G. Treatment of a refractory skin ulcer using punch graft and autologous platelet-rich plasma. Case Rep Dermatol Med. 2016;2016:7685939.