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Dr. Prujal Parekh
SAL Institute of Medical Sciences, India

Dr. Kranti Vora
QRL Bioscience Pvt. Ltd., India

Sanjana Shah
QRL Bioscience Pvt. Ltd., India

Dr. Shashank Patel
B.J. Medical College, India

Dr. Senthilkumar Natesan
QRL Bioscience Pvt. Ltd., India

Dr. Pankaj Modi
B.J. Medical College, India

Corresponding Author:
Dr. Prujal Parekh
SAL Institute of Medical Sciences, India

Cell-based therapy for chronic non-healing ulcers: A case study of venous ulcer

Prujal Parekh, Kranti Vora, Sanjana Shah, Shashank Patel, Senthilkumar Natesan and Pankaj Modi

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Abstract
Venous leg ulcers (VLUs), sometimes referred to as varicose ulcers, account for around 70 percent of chronic leg ulcers globally and are among the most common non-healing ulcers. Venous leg ulcer, primarily caused by insufficient venous circulation, are mostly found in older people and people with varicose veins. VLUs also cause substantial socioeconomic difficulties as a result of pain, discharge from the wound and chronic nature of the ulcer. As there is no effective treatment, the medical expenses mount as months passes by. This study highlights use of the autologous collagen-based gel treatment to cure persistent VLUs. This novel therapy was used to treat two male patients with non-healing venous foot ulcers who showed significant wound reductions of 83% and 93%. By applying a gel made from the patient's own blood to the wound site, the treatment reduces the risk of infection while encouraging the formation of granulation and epithelial tissue leading to healing. This case study indicates that VLU patients unresponsive to conventional treatment may benefit from this cell-based therapy.

Keywords: Venous ulcer, cell-based therapy, autologous gel, chronic wounds

Introduction

Background

The most prevalent kind of non-healing ulcers are venous ulcers. A typical form of chronic wound brought on by inadequate blood circulation in the limb is a venous leg ulcer, often referred to as varicose ulcer. It usually affects the legs or foot and might persist for a few weeks to many years. Venous ulcers account for around 70% of all chronic leg ulcers worldwide, and they are more common in older people and those who have underlying varicose veins [1]. Venous ulcers are quite common in India, but because of a lack of knowledge and access to cutting-edge treatments, they often get wrongly diagnosed and managed inappropriately leading to chronic non-healing ulcers.

Indigenous and traditional home remedies like honey, neem oil, and aloe vera are commonly used in India's healthcare practices in addition to conventional therapies. However, there aren't many reliable studies to support their efficacy in treating venous ulcers. For example, in a large community-based study, honey-impregnated dressings did not substantially promote the healing of venous ulcers after 12 weeks when compared to normal treatment [2]. These results underline the necessity of conducting more thorough clinical studies in order to verify conventional treatments and incorporate them into evidence-based treatment.

The high recurrence rates, which can be substantial and reach 50–70% after 6 months, are a major problem with Venous Leg Ulcer [3]. Given the high rates of recurrence, the morbidity of venous leg ulcer has several financial and socioeconomic repercussions. The cost of caring for patients with VLU is exponentially increases when all the factors are taken into account, such as inability to work, doctor visits, nursing care, wound care, bandages applied along with compression, surgical and treatments, and hospitalization for complications related to pain, drainage and progression, and infections. Many end up in amputation leading to decrease in quality of life and reduced life span.

Case Presentation

Patient Information

Table 1: The table shows patient characteristics

Characteristic	Patient 1	Patient 2
Age (Yrs)	55	42
Gender	Male	Male
Hb	15 gm	12 gm
Wound Site	Left Foot	Left Foot
Duration of wound	5 months	36 months
% Change in Area	83%	93%
Last Day of Consideration	42	40

First patient had more than 12 years of formal education and earned 20,000 INR while the second patient had 10 years of formal education and earned 15,000 INR monthly. Both patients reported non-healing venous foot ulcers. Both patient's wounds were initially treated using conventional techniques, which were ineffective. Patient 1 has been reported for having hypertension. No other comorbidities were reported in both patients.

Intervention

This therapy involved collecting of blood to prepare an autologous collagen-based gel, applied to the wound site and secured with a transparent, breathable dressing. Patients were instructed to keep the dressing dry and minimize pressure on the affected area. Wound assessments occurred on regular interval. Wound was washed with normal saline and sterile dressing was applied. No antiseptic or antibiotic gel was used for the dressing. Patients did not receive oral or parenteral antibiotics. Weekly follow-ups continued until the wounds fully healed.

Fig 1: The figure depicts the images of patient 1 on day 0, 35 and 42

Fig 2: The figure depicts the images of patient 2 on day 0, 11 and 40

Discussion

Despite their high prevalence, these ulcers are mismanaged frequently because of lack of standard protocol and access to cutting-edge therapies in India. The above case study shows how cell-based treatment can be used to treat venous ulcers when traditional approaches are ineffective. Both patients had minimal infection rates and notable wound reductions (83% for patient 1 and 93% for patient 2) after the treatment. By encouraging the production of granulation and epithelial tissue, the collagen-based gel seems to improve wound healing, suggesting a viable treatment option for persistent venous ulcers. Follow up of 12 months showed complete healing and no recurrence of the ulcer at the original site.

Conclusion

In India, where chronic venous ulcers are common, non-healing wounds are frequently not treated by conventional therapies. The application of autologous collagen-based gel treatment, which showed efficacy in wound healing is highlighted in this study. This innovative method provides patients better recovery, fewer problems, and a higher quality of life by encouraging the creation of granulation and epithelial tissue. This treatment offers a viable alternative given the socioeconomic burden of venous ulcers, particularly in places with limited resources and knowledge.

Acknowledgments

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