Case Report

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Role of Collagen Granules in Non-Healing Wound

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Abstract

Non-healing wounds pose an obstacle to patient care, leading to increased morbidity and placing time and financial strain on patient and caregiver. Newer modalities in treatment are being actively researched to further facilitate tissue growth and healing. One such modality is the use of collagen granules in non-healing wound management. There are relatively few studies in India and internationally showing its effect on healing. Here we discuss our experience with the use, effects demonstrated using collagen granules on non-healing wounds.

Keywords: Collagen; Granules; Non-healing; Wounds; Chronic wounds.

INTRODUCTION

Wounds are one of the common clinically encountered problems in practice. Chronic, non-healing wounds sum up to 1/3rd of the wounds encountered. These can lead to great impact on patients' life and leading to huge economic burden on the healthcare system, therefore calling for research on newer modalities to promote healing.[1] Collagen is a key component of the extracellular matrix and plays a vital role in wound healing.[2] Use of external sources of collagen as adjunct has been shown to promote wound healing. However, collagen in form of scaffold or gel has been commonly researched mode of administration. [3,4] Collagen granules when used, can be used to fill up wound cavities that are undermined or tunnelling with or without slough.[5] Here we would like to discuss our experience with the use of collagen granules on non-healing wound.

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MATERIALS AND METHOD

As pilot research, the investigation was carried out in a higher education facility in May-June 2023. The research was entirely descriptive; no statistical analysis was carried out. After gaining informed consent, the patient with the persistent wound (Fig. 1) was included. The patient was 59 years old, known diabetic on insulin.

Collagen granules were filled into the wound cavity (Fig. 2, 3), followed by which silver dressing was kept and vacuum assisted closure was done.

Digital planimetry has been used to measure the area epithelized at any change of dressing. Dressing was changed every 7 days, with regular assessment of the wound.

Fig. 1: Wound at the time of presentation

RESULTS

In the study, a 59-year-old diabetic male with raw wound/ulcer over the anterior aspect, distal 1/3rd of right lower extremity after 14 weeks of RTA. After the use of collagen granules, these was significant serial reduction (Fig. 4) in wound surface area as measured by digital planimetry, with intact granulation tissue layer.

Fig. 4: Improved wound bed after use of collagen granules

Fig. 2, 3: Placing of collagen granules in the wound cavity

DISCUSSION

Chronic, non-healing wounds are an adverse outcome of delayed wound healing. It can be a result of numerous underlying factors which contribute impairment of the healing process.[6] Collagen plays a vital role in regulating the process of healing and has been used in numerous novel modes of wound management. In our study, it was observed that the non-healing wound which had remained around the same size for 4 weeks since starting wound care. In wound care management, some of the important steps include debridement of dead and infected tissue, infection control, providing favourable environment for wound healing.

Collagen is a natural fibrous protein in the body that makes up the connective tissues in various sites.[7] There about 28 different types of collagens that have been further classified according to their distribution and structure. Collagen is a biocompatible structural protein, less immunogenicity, biodegradable, and biomimetic, which makes it an ideal source of biological materials for tissue engineering and regenerative medicine.[8] The composition and functionality of the collagen fibres influence the cellular response that is commonly regulated by integrin.

Collagen dressings are available in different forms such as sheets, gels, sponge, granules etc. While managing wound cavities, there might be technical difficulties while using collagen sheets, whereas it is easier to fill the cavity with collagen granules. The granules can also reach into difficult spaces/ tunnelling of ulcers if present.[9] After filling the cavity with collagen granules, secondary dressing might be required to hold the granules in place.

This method of using collagen granules is a simple, cost effective and easily reproducible. It is also helpful and easy method to use in undermined ulcers, cavities etc.

Limitations include spillage of collagen granules and anti-gravity wounds.[10] These can be avoided by careful packing of wounds and usage of secondary dressing such as silver bandages, collagen sheets etc over the packed wound.

CONCLUSION

Based on our experience, we can say that the use of Collagen granules is a simple, effective, and easily reproducible method that can be used in various types of wounds including less accessible cavities tospeed up the process of wound healing.

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