CASE REPORT

Role of Prolotherapy in Wound Bed Preparation

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ABSTRACT

Non healing wounds are the major problem all over the world. Many therapies have been introduced for the management of chronic non healing ulcers. Management of these ulcers is often challenging. But there is no well-established method that accelerates the wound healing rate. Prolotherapy is a method that involves injecting some irritant locally in the wound that is claimed to fasten the healing. This article discuss about the role of prolotherapy in wound bed preparation.

Key words: Prolotherapy, Wounds.

INTRODUCTION

Prolotherapy is one of the methodthat has been used in difficult wounds. Prolotherapy is a procedure in which an irritant is injected or sprayed into the wound that initiate an inflammatory reaction, thought to promote healing of wound. The most common prolotherapy agent used in clinical practice is dextrose, with concentrations ranging from 12.5% to 25%. Dextrose is considered to be an ideal proliferant because it is water soluble, a normal constituent, and can be injected safely into multiple areas and in large quantity. Hypertonic dextrose solutions act by dehydrating cells at the injection site, leading to local tissue trauma, which in turn attracts granulocytes and macrophages and promotes healing. In this article we share our experience of using prolotherapy in the preparation of wound bed.

METHODOLOGY

Patient sustained an accidental abrasion over back of right ankle , following which he developed swelling, pain over the ankle with fever chills and rigors; insidious in onset and gradually progressive. Following which due to unbearable pain he applied kerosene over the leg and foot, following which he noticed progression of swelling with blebs formation till knee .known diabetic for past 2 years on medications. He initially went to a nearby hospital, where they did fasciotomy and debridement over the right foot and leg. Following this, patient has come to JIPMER for further treatment. After wound debridement of necrotic tissues, exposed tendons, soft tissues are prepared for skin cover. Prolotherapy is used in our patient for promoting the granulation. After 3 weeks of prolotherapy

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wound bed was prepared, wound was covered with granulation tissue, and size of the wound also decreased.

RESULTS

After six sessions of prolotherapy over three week's period, the wound bed was prepared and reconstruction was planned. No adverse local or systemic effect was noted with the use of Prolotherapy.

Figure 1. Prolotherapy applied to the wound.

Figure 2. Post Prolotherapy therapy for 2 weeks.

DISCUSSION

Multiple agents are used in prolotherapy, some classified as irritants (such as phenol), some as chemoattractants (commonly sodium morrhuate), and others as osmotic agents (commonly dextrose) [1]. Although the exact mechanism of prolotherapy is not clear, proponents of the technique believe that the injection of hypertonic dextrose causes cell dehydration and osmotic rupture at the injection site that leads to local tissue injury that subsequently induces granulocyte and macrophage migration to the site, with release of the growth factors and collagen deposition. In vitro studies have shown that even concentrations as low as 5% dextrose have resulted in the production of several growth factors critical for tissue repair. Some of these growth factors include PDGF, TGF-β, EGF, b-FGF, IGF-1, and CTGF[1]. In Vitro studies have shown that the cultivation of cells in high-glucose culture medium can increase PDGF expression. PDGF has multiple pro-reparative effects in skin wounds, including the promotion of angiogenesis, fibroblast proliferation, extracellular production .TGF-β expression is also upregulated by high-glucose. TGF-β is involved in all steps of wound healing including inflammation, angiogenesis, fibroblast proliferation, collagen synthesis, matrix deposition, and remodeling, and wound reepithelialization. Other growth factors upregulated by high glucose include EGF, b-FGF, IGF, and CTGF, all having multiple preparative functions and improves healing in some animal wound models of impaired healing[2, 3].

Some studies on prolotherapy suggest that there are direct effects on collagen synthesis. There is up-regulation of matrix in response to dextrose prolotherapy[4]. Collagen expression is increased after exposure of patellar tendon fibroblasts to the prolotherapyagents dextrose and thus may contribute to tissue regeneration within a cutaneous wound. Collagen type-I synthesis is also increased in high-glucose cultivation of renal fibroblasts, in a TGF-β-mediated pathway. Changes in the cartilage matrix protein aggrecan are reported in chondrocytes cultured in high-glucose[4, 5], and in patients who have received intraarticular injections of 12.5% dextrose. In our case we have used dextrose 25% as prolotherapy agent. We have used it as adjunct to other modalities. We have not noticed any adverse effect.

CONCLUSION

In this study, we found that prolotherapy has a role in the healing of the non healingulcer and can be used as an adjuvant therapy for Wound bed preparation. But since it is a single case study, a definite conclusion cannot be made. Large randomized control trials are required to confirm the efficacy of Prolotherapy in Nonhealing Wounds.

CONFLICTS OF INTEREST

None

DECLARATIONS

Authors' contributions

All authors made contributions to the article

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