

Guidelines Based Management of Venous Ulcer

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Abstract

Venous disorders causing a permanent increase in venous pressure are by far the most frequent reason for ulcers of lower extremity. Venous ulceration is the most severe and debilitating outcome of chronic venous insufficiency in the lower limbs and accounts for 80 percent of lower extremity ulcerations. The recurrence of venous ulcers is a common thing due to the recurrence of varicosities and non-compliance of the patient to the treatment. Various other causes for lower extremity ulcerations could be arterial insufficiency, prolonged pressure, diabetic neuropathy and systemic illness such as rheumatoid arthritis, vasculitis, osteomyelitis, and skin malignancy. A thorough investigation of underlying venous disorder is a prerequisite for a differentiated therapy. Venous ulcer causes a significant burden for the health care system. This article highlights the role of SWCR guidelines in management of venous ulcer.

Keywords: Venous; Ulcer; Guidelines.

INTRODUCTION

Venous ulcers are one of the common complications of venous insufficiency disorders venous ulcers also known as stasis, insufficiency or varicose ulcers, are the result of incompetent venous valves causing pressure in the veins to increase. These typically occur along the

medial or lateral aspect of distal leg.^{1,2} The resulting venous hypertension causes blood pooling when it is not as efficiently pumped back towards the heart, otherwise known as venous insufficiency. They are difficult to manage because of their chronicity and recurrence. Chronic wounds are burdensome for healthcare providers as many require weeks and months to heal, often necessitating complex treatment regimens and a multidisciplinary approach. The Society for Wound Care and Research (SWCR) is a Society of unique blend of academic, clinical, research and social Service.² It was founded in the year 2006 with an aim to promote practice of better wound care and research. SWCR (Society for Wound Care and Research) guidelines has 4 components with acronym SWCR.^{3,4} S means systematic analysis of patient and wound, W for wound bed preparation, C for clinical decisions and repair, R for repair, reconstruct & rehabilitate. This article assesses the role of SWCR guidelines in management of venous ulcer.

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MATERIAL AND METHODS

This study was conducted in the Department of Plastic Surgery in a tertiary care institute. Informed consent was obtained from the patient under study. Department scientific committee approval was obtained. It is a single center, non-randomized, non-controlled study. A 50 years old lady, hailing from Tamil Nadu, with no known comorbidities was admitted with infected ulcer over the left leg. On assessment, she was found to have incompetent Saphenofemoral junction of the left lower limb. The patient was initially treated with conventional dressing. As the ulcer did not show any evidence of healing and was infected (Fig. 1). Infection was managed with local antimicrobials & antibiotics according to culture sensitivity. Wound bed was prepared in accordance with TIME concept mentioned in the guidelines, the

ulcer was serially assessed and documented according to bates Jensen wound assessment tool. We used regenerative methods like autologous platelet rich plasma therapy (Fig. 2), low level laser therapy (Fig. 3) vitamin D granule and sucralfate therapy (Fig. 4), for wound bed preparation. In addition, we used heterografting of wound with collagen to supply growth factors to the raw area, in accordance with SWCR guidelines were done to aid granulation of raw area. As wound was wet in nature, moisture control was done using negative pressure wound therapy (Fig. 5). His wound bed gradually improved, in the meantime incompetent saphenofemoral junction and multiple incompetent perforators were ligated. Once wound bed and patient was ready for reconstruction, clinical decision was taken to reconstruct with a skin graft (Fig. 6).



Fig. 1: Wound at presentation



Fig. 2: Autologous platelet rich plasma application



Fig. 3: Low level laser therapy application



Fig. 4: Vit D and sucralfate therapy



Fig. 5: Negative pressure wound therapy



Fig. 6: Split skin grafting done



Fig. 7: Healed wound at the time of discharge

RESULTS

Post-operatively the wound healed well without any complications and patient was discharged with rehabilitative advice including compression stockings. SWCR guidelines for management of venous ulcer was found to be useful in management of venous ulcer associated with chronic venous insufficiency. Post-operative period was uneventful.

DISCUSSION

The Society for Wound Care and Research (SWCR) is a Society⁵ which was founded in the year 2006 with an aim to promote practice of better wound care and research, render community health care related to wound by bringing out publications in the form of journals, newspaper articles, books, handbills, maintain a web site, establish scholarships, foundations and lectureship and to provide grants and other benefactions either in India or elsewhere which are designed to enhance the learning in, and practice of, wound care and

research or to contribute to the establishment of the same.⁶⁻⁸ SWCR guideline is a general guideline applicable to all chronic wounds irrespective of aetiology.

Systematic assessment of the Patient and Wound

Chronic venous insufficiency can be defined as the set of clinical manifestations caused by reflux and/or obstruction of the peripheral venous system (superficial, deep, or both) which usually affects the lower limbs. Clinical examination and taking a thorough history are the first steps in diagnosis.⁹ Through history taking will reveal clinical manifestations attributed to venous involvement such as tingling, pain, burning, muscle cramps, oedema, pruritus, restless legs, and fatigue. The consequences of chronic venous insufficiency include oedema, hyper pigmentation of the skin and often, development of superficial, irregularly shaped venous ulcers. Venous ulcers represent about 70–90% of all leg ulcers, with a lifetime prevalence of 0.1% to 2%. The natural history of a venous ulcer is a continuous cycle of healing and tissue derangement that can persist for a long time and it causes substantial morbidity and recurrence in approximately 70% of cases.^{10,11} Venous ulcers have negative impact in the quality of life and high cost of treatment warrants need for exploring newer therapeutic options.

Doppler ultrasound scanning has become integral part of the physical examination in clinical vascular practice. It is very useful in assessing arterial and venous patency and to ascertain the presence of venous reflux.¹²

Triangle of wound assessment (TOWA) it is a subjective tool for clinical assessment of ulcer and is composed of 3 components wound bed, wound edge and peri-wound skin. Presence of exudate, infection/inflammation and non-viable tissue in

the wound bed and nature of wound edge, if it's undermining, sloping, granulating along with inspection of peri-wound skin to look for maceration, discoloration and excoriation is serially examined. Reliable wound healing instruments for periodic assessment of wound healing like Bates Jensen Wound Assessment Tool (BJWATS)¹³, DESIGN tool, Wound Healing Scale (WHS)¹⁴, Sassing Scale (SS), Sussman Wound Healing Tool (SWHT)¹⁵ with ability to document changes in wound status over time may be used for documenting outcome and for research.

Wound Bed and Patient Preparation:

Wound Bed preparation (WBP) is a Systematic approach to wound for identifying and removing barriers for healing. There are four components of Wound Bed Preparation (WBP) known by acronym 'TIMERS' which addresses the pathophysiological abnormalities underlying chronic wounds.¹⁶

T- Tissue management.

I- Inflammation and infection control.

M- Moisture control.

E- Epithelialization.

R- Regenerative therapies.

S- Social factors like transportation, food, shelter.

Tissue management

Tissue is either devitalized or deficient. Devitalized tissue needs removal whereas Deficient tissue needs replacement. Debridement of devitalized or non-functional tissue (fibrous scar or callous tissue) from the wound is done to control infection and promote granulation.^{17,18}

Wound debridement plays an important role in reducing the levels of bacterial biofilms, which are tightly attached to components of the extracellular matrix, surfaces of bones, surfaces of orthopaedic implants in the chronic wound beds.

Infection & Inflammation Management

High index of suspicion of local infection in a ulcer is encountered in presence of signs of inflammation (erythema, pain, warm skin, tenderness, purulent discharge, and malodour). All Infection should be controlled with Local Antimicrobials that don't harm normal cells (Super Oxidized Solution) are preferred. Other available effective antimicrobials are Nano Crystalline Silver/ Colloidal Silver/ Ionic Silver.¹⁹ Topical silver products should not be used on individuals with silver sensitivities, and silver sulfadiazine products are not recommended for

people with sulphur sensitivities.²⁰

MOISTURE MANAGEMENT

Excess Moisture causes maceration & decrease in moisture (dry wound) causes tissue death. Establishing the optimal balance of moisture in the wound bed has dramatic effects on the healing of open wounds.²¹ Type of dressing should be titrated according to the moisture in the wound. Excess moisture in the wound needs compression bandages /highly absorbent dressings or Negative Wound Therapy (NPWT) (Vacuum Assisted Closure (VAC) / Limited Access Dressing (LAD) whereas dry wounds need moisture holding dressings (Hydrogels).²²

Edge of the wound Management

Observation of a healthy sheet of epithelial cells migrating from the edge of a chronic wound is the most sensitive indicator of the effectiveness of the other three components of TIME. Once T, I & M are taken care, E (Edge) of the wound starts showing epithelial cell migration.

Edge of the wound is managed by debriding the rolled over edges, undermining edge, callus in wound mechanically.²³

Regenerative therapies

To hasten the speed of epithelialization & wound bed granulation there is an important role of adjuvant therapies like Stem Cell Therapy, Autologous Platelet Rich Plasma (APRP)¹⁹, Growth Factors, Insulin Therapy, Phenytoin Therapy, Low Level Laser Therapy (LLLT), DAC Technology, TLC (Technology Lipido Colloid) Technology, NOSF (Nano Oligo Saccharide Factor) Technology Skin Substitutes etc.²⁴

Autologous Platelet Rich Plasma (APRP) is a biological product defined as a portion of the plasma fraction of autologous blood with platelet concentration above the baseline (before centrifugation). PRP contains high levels of platelets and also the full complement of clotting factors, the latter remaining at their normal, physiologic levels. It contains various growth factors, chemokines, cytokines, and other plasma proteins. PRP is a source of signalling molecules, and upon activation of platelets in PRP, the P-granules degranulate and release GFs and cytokines that will change the pericellular microenvironment.²⁵ Some of the most important GFs released by platelets in PRP

include vascular endothelial GF (VEGF), fibroblast GF (FGF), platelet derived GF(PDGF), epidermal GF, hepatocyte GF, insulin like GF 1, 2 (IGF-1, IGF-2), matrix metalloproteinases (MMP)2,9 and interleukin 8.⁴

LLLT, phototherapy or photo biomodulation refers to the use of photons at a non-thermal irradiance to alter biological activity.²⁶ LLLT at low doses has been shown to enhance cell proliferation of fibroblasts, keratinocytes, endothelial cells and lymphocytes.

Social factors

Patient access to hospital, food, shelter during the management of wound is considered during the treatment period.

Clinical decisions

It is necessary to evaluate and optimize factors that may influence surgical healing (diabetes, malnutrition etc and long term recurrence prior to surgery (individual's ability to adhere to a post-operative management plan), physical factors that may impair surgical wound healing, availability of equipment for the prevention and treatment of venous ulcers, testing of tolerance of care in desired position.²⁷

Repair, Reconstruction and Rehabilitation

Once venous ulcer is healed measures should be taken to prevent recurrence as appropriate. A well chosen and correctly calibrated compression stocking is beneficial in preventing recurrence along with regular clinical evaluations, patient education about skin care, limb elevation and exercise.^{28,29}

The primary treatment of venous insufficiency is done by ligation of saphenofemoral junction and perforation ligation and stripping of superficial veins either endovascular or open surgery. The patient who are not fit or not a candidate for surgery are treated with conservative approach with compression stockings.

CONCLUSION

The treatment of chronic venous ulcers is a therapeutic challenge. The SWCR guidelines are easy to remember with the acronym SWCR (systemic analysis, wound bed preparation, clinical decisions, repair, reconstruction and rehabilitation)

is effective in wound preparation and management of the venous ulcer.

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