



## Treatment of non-healing wound with Platelet Rich Plasma (PRP) dressing; Cellular Dressing

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### ABSTRACT

Chronic wounds/ non-healing ulcers are a growing socioeconomic problem all over the world. All the conventional treatments relating to chronic wound healing/ulcer is time consuming and expensive. Platelet rich plasma dressing might prove the first line remedy for the same and should be promoted as it is safe and cost-effective.

### INTRODUCTION

A wound is a type of injury which happens relatively quickly in which skin is torn, cut, or punctured (an *open* wound), or where blunt force trauma causes a contusion (a *closed* wound). In pathology, it specifically refers to a sharp injury which damages the dermis of the skin. A wound can be classified as- Clean wound, contaminated wound, infected wound and colonized wound where the wound is a chronic one and there are a number of organisms present and very difficult to heal (i.e. a bedsore).

The wound-healing process consists of four highly integrated and overlapping phases: homeostasis, inflammation, proliferation, and tissue remodeling or resolution [1]. Management of chronic non-healing wound/ulcer is a major medical/surgical problem which requires immediate attention as it can anguish the patient as well as the doctor. All the conventional treatments relating to chronic wound healing/ulcer is time consuming and expensive.

Wounds that exhibit impaired healing, including delayed acute wounds and chronic wounds, generally have failed to progress through the normal stages of healing. Such wounds frequently enter a state of pathologic inflammation due to a postponed, incomplete, or uncoordinated healing process. Non-healing wounds result in enormous health care expenditures, with

the total cost estimated at more than \$3 billion per year in the United States [2, 3]. A practical classification of a non-healing wound is one that fails to heal spontaneously within 3 months [4]. Common chronic types of wounds are venous leg ulcers, ischemic wounds, diabetic foot ulcers, and pressure wounds [5]. Growing evidence supports that chronic wounds can be attributed to an adversely combination of structural damage and establishment of a chronic bio-film infection, inducing host responses, further structural damage, and thereby generation of a vicious circle [6, 7, 8, 9].

Skin grafting of chronic venous ulcers improves healing rate [10] unless there is chronic *Pseudomonas aeruginosa* (PA) infection locally at the time of surgery [11]. No significant difference in healing rates was found when comparing different types of dressings beneath appropriate compression bandages in a Cochrane study, where the authors compared hydrocolloids, foam dressings, alginates, low-adherent dressings, and hydro-gels [12]. Topical application of epidermal growth factor (EGF) to non-healing venous ulcers did not promote re-epithelialization [13]. Topical silver or silver dressings are used in infected wounds of all origins, but evidence for their efficacy is lacking [14]. An experimental tool used in combination with standard wound care, topically applied working platelet concentrate or plasma (PRP), may be used to boost chronic inflammatory wounds into the state of proliferation and healing as they release multiple growth factors and cytokines into the wound mimicking natural healing conditions [15,16].



**Figure 1 :** Showing Healing Process of Wound.

### Case

A 22 Years Old Patient having Lower Limb Paresis and suffering From Non-Healing Wound on Left Buttock.

### History

Patient was hail & healthy 5 years back. At that time he got injury over back which was diagnosed as prolapsed thoracic disc and was operated for the same. After three years he is progressively suffering from lower limb paresis. As he got bed ridden, he developed an ulcer on his left buttock which was not responding to conventional treatment with local antibiotics and systemic antibiotics. Then he consulted the dermatologist for further treatment. At the time of presentation the ulcer was 5x4 cm in size and 1.5 cm in depth.

### MATERIALS AND METHODS

The affected area was first cleaned properly with spirit then local dressing with PRP was applied to the patient every alternate day for one month. Fresh pad of PRP was used for each dressing and was kept on the wound for 30 minutes till it got absorbed. Then the area was covered with perforated glacial paper and lastly pressure dressing was done using cotton & bandage. No local or systemic antibiotic was given to the patient during the treatment.

### RESULT

After 15 dressings with PRP the wound was completely healed.

### DISCUSSION

Presently as for pressure ulcers, standard treatment consists of pressure relief, surgical debridement and maintenance of a clean wound environment along with systemic antibiotics. Dressings containing antimicrobial or pain relieving substances used beneath compression bandages are currently being developed [17] and are typically used for chronic wounds of vascular origin. The above patient has taken local as well as systemic antibiotic treatment for more than six months with no effective results and has also suffered from associated complications such as paresis of both lower limbs since then. In this study we tried local application of PRP on this non-healing wound/ulcer every alternate day for one month. This way of treatment has been mentioned in literature [15, 16] as well as used by few clinicians and hereby, we are strengthening their view with this case as this might be the first treatment of choice in non-healing wound/ulcer.

### CONCLUSION

PRP is an effective treatment of choice in non-healing wound/ulcer as it is safe, less time consuming and cost effective.

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**Consent**

The authors declare that written informed consent was obtained from the patients before being recruited for this research.

**Ethical approval**

Ethical approval has been taken from our institution's ethical committee.

**Competing interests**

Authors have declared that no competing interests exist.

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