

Abstract

“Efficacy of autologous platelet rich fibrin (PRF) over moist sterile saline dressing in chronic venous leg ulcers– A Randomized Control Trial”

Objectives of study:

Overall: To compare the efficacy of autologous PRF with moist saline dressing in patients with chronic venous leg ulcer

Specific: To compare the mean reduction in ulcer area at end of 4 weeks.

Justification / rationale for the conduct of study: Chronic venous leg ulcers is a result of the progression of chronic venous insufficiency. This often affects the quality of life of patients and shows a protracted healing, resulting in economic burden. Cutaneous wound healing involves release of platelet growth factors and chronic wounds have been hypothesized to be deficient in them. It has been suggested that topical administration of platelet derivatives, including “platelet-rich plasma” and “platelet gel” can enhance tissue repair. Platelet derivatives have been used to accelerate tissue repair in orthopaedic surgery, dental surgery, plastic surgery, and chronic diabetic ulcers.

Justification for the study: Topical platelet derivatives have been found to be efficacious in enhancing tissue repair, including cutaneous ulcers of varied etiology, in randomized control trials.

Inclusion Criteria:

Patients with chronic venous leg ulcers of lower extremity of > 6 months duration, attending the out-patient department, having an ulcer area of 1cm x 1cm to 5cm x 5 cm.

Exclusion Criteria:

- (i) Ulcers < 6 months duration.
- (ii) Ulcers of other etiology e.g. neuropathic ulcer/arterial ulcer/diabetic ulcer/ulcer with Underlying vasculitis.
- (iii) Patients with osteomyelitis affecting the area of the ulcer.
- (iv) Ulcers with exposure of tendons or bones.
- (v) Ulcers with area <1cm x 1cm or > 5cm x 5cm
- (vi) Ulcers with copious discharge /overt infection /infected with Pseudomonas.

- (vii) Hb < 11 gm/dl and/or platelet count < 1,50,000/ mm³
- (viii) Patients receiving anti-coagulants/ anti-platelet drugs/ bleeding diathesis.
- (ix) Patients with age < 18 years or > 65 years
- (x) Pregnancy and lactation
- (xi) Non-consenting patients

Methodology:

Study design: Open labeled prospective randomized control trial

No. of groups to be studied, their names and definitions: 2 groups

Group 1 (Treatment Group): Patients with chronic venous ulcer receiving Platelet Rich Fibrin (PRF) along with standardized regimen of good wound care and rest.

Group 2 (Control Group): Patients with chronic venous ulcer receiving moist saline dressings along with standardized regimen of good wound care and rest.

Sample size : 15

Sampling method:

All patients with chronic venous ulcer of lower extremities, and satisfying the inclusion & exclusion criteria shall be included in the study.

Randomization technique:

Simple randomization technique will be used to allocate the treatment to patients. It will involve computer generated random numbers which will be sealed in an envelope.

Preparation of platelet-rich fibrin (PRF):

PRF preparation requires a table centrifuge under sterile precautions. 10 ml of patient's own whole blood will be drawn into vacutainer tubes without anticoagulant and immediately centrifuged at 3000 rpm for 15 minutes. A fibrin clot is obtained in the middle of the tube, just between the RBCs

at the bottom and acellular plasma at the top. 10 ml of whole blood will yield about 2.5 ml of clot. This clot will be removed from the tube under aseptic precautions with the help of sterile forceps and the attached RBCs will be scraped off and discarded. Fibrin clot will be used for dressing immediately.

Dressing procedure:

Group 1 will receive PRF clot dressing. It will be applied over the wound surface in a thin layer and covered with sterile saline gauze (primary dressing) followed by cotton pad and roller bandage (secondary dressing). The secondary dressing will be changed daily whereas the primary dressing will be left in place for 1 week. After 1 week, all PRF remnants will be removed with water and sterile gauze. Following this, the next PRF treatment shall be given. A total of four PRF treatments at weekly intervals shall be given for a total duration of 4 weeks.

Group 2 will receive only sterile saline soaked gauze dressing which will be changed weekly.

Baseline measures after randomization:

- i) Ulcer margins (length & breadth) in mm: by measuring greatest length and the greatest width.
- ii) Digital photography taken at beginning and end of treatment
- iii) Outcome measures at the end of four weeks

Review of literature: Autologous platelet-rich fibrin matrix as cell therapy in the healing of chronic lower-extremity ulcers

A novel autologous platelet-rich fibrin matrix membrane (PRFM) was assessed for the ability to facilitate healing in patients with chronic lower-extremity ulcers. Preliminary data are presented from a prospective trial (n=21). Twelve patients were identified with 17 venous leg ulcers (VLU) and nine bearing 13 nonvenous lower-extremity ulcers. Before enrollment, the patients were evaluated for vascular status and received appropriate surgical intervention to optimize arterial and venous circulatory status. None of the ulcers had responded to a variety of standard treatments from 4 months to 53 years. Initial ulcer size ranged from 0.7 to 65 cm² (mean, 11.2 cm²). Each PRFM-treated patient received up to three applications of either a 35 or 50 mm fenestrated membrane, depending on initial ulcer size. The primary endpoints were percent and rate of complete closure as measured by digital photography, computerized planimetry, and clinical examination. Patients were followed weekly for 12 weeks with a follow-up visit at 16 weeks. At each 4-week interval, the extent of healing was assessed, and those patients with >50% reduction in wound area were allowed to continue to complete closure. Patients with <50% closure received repeated applications. Complete closure was achieved in 66.7% of the VLU patients (64.7% of

treated ulcers) in 7.1 weeks (median, 6 weeks) with an average of two applications per patient. Forty-four percent complete closure was seen with non-VLU patients (31% of treated ulcers). From the results of this small-scale pilot study, PRFM shows significant potential for closing of chronic leg ulcers.

Reference:

[Wound Repair Regen.](#) 2008 Nov-Dec;16(6):749-56. doi: 10.1111/j.1524-475X.2008.00426.x.

Ethical issues involved in the study: The study involves human subjects with minimal risk to them.

KEYWORDS: Platelet rich fibrin, venous ulcers, healing.