

Wound Care 2017

3rd International Conference on

Wound Care, Tissue Repair & Regenerative Medicine

Embassy Suites by Hilton Dallas Park Central Area

September 11-13, 2017 Dallas, Texas, USA

Title: Translating Wound management with Regenerative Medicine

Authors:
Sandeep Shrivastava 1; Romil Rathi and Roopam Shyam
1.Professor & DEAN ; J.N.Medical College ;Datta Meghe Institute of Medical Sciences (DU) , Sawangi , Meghe ,Wardha, MS, India.

Complex Wounds:



Acute Wounds : Tendons & Bones exposed



Severely Necrotising tissues with infection



Infected Compound Fractures





Pressure Sores / Bed Sores , Trophical Ulcers



3rd International Conference on
Wound Care, Tissue Repair & Regenerative Medicine
Wound Care 2017
Embassy Suites by Hilton Dallas Park Central Area
September 11-13, 2017 Dallas, Texas, USA

Current solution:

Intense Interventions with

Drugs: Antibiotics , Analgesics etc
Dressings: Intense local antimicrobial,
Devices: Vacuum Assisted etc
Surgery: Debridements & Reconstruction

Huge Resources are Spent



Autologous Platelet Rich Plasma

A good Choice from Regenerative Products- Stem cells/ MSc/ PRP.

Ease of Preparation

No Ethical Issues

Safety- Autologous

Easily Accessible

Low Cost- Affordability

On going Clinical Evidences:
Tendon Healing , Bone healing, Cartilage Healing



3rd International Conference on
Wound Care, Tissue Repair & Regenerative Medicine
Wound Care 2017

Current emerging Evidence in Literature: ADJUNCT TO STANDARD WOUND CARE

Associated with Uncertainties & Variations

PREPARATION : VARIED leading to a concentration upto 3 to 10 times.

FORM: Activated GEL / / SPRAY / LIQUID- infiltration

Delivery : Mostly as LOCAL APPLICATION over the wound.

DOSE: Quantity- UNCERTAIN

Repeat dose : Variable : once to 7th day to 3 monthly.

END POINT: VARIED, No certain end point .



STARS -THERAPY
Sandeep's Technique forAssisted Regeneration of Skin

Product: Autologous PRP.

Preparation: 20 ml venous blood-Double spin

Form: Fresh prepared Liquid

Delivery: Local Infiltration Technique: :

Subcutaneous Injection technique: 22G 10ml Syringe.

Progressively in wound margin at a distance of 1 cm

Dose : 0.2 to 0.5 ml / 1 cm @ 4th day.

End point: Till wound healed / less than 1 sq. cm



3rd International Conference on
Wound Care, Tissue Repair & Regenerative Medicine
Wound Care 2017

Clinical Protocol:

Inclusion: Haemoglobin =>10gm% and Platelet count >100000/ul

Exclusion: Clotting disorder or Haemto-oncological disorder & Oncological wounds.

1.No Surgeries: Preservation of every bit of tissue
if unclean wounds: Cetrimide Bath.
2. No Complicated Dressings: SALINE Moist dressings- daily/ alt days
3.No Antibiotics: Repeated Cultures - every week .
Start Antibiotics - Worsening of wound
- Other infections
4. No Analgesics / anti-inflammatory:
Only Vitamin C (Patient Satisfaction)
5.No Reconstruction: Option given for surgical reconstruction
if Patient opts than surgery undertaken.



OBSERVATION & RESULTS Technique & Early Results

Original Article

STARS therapy: "Sandeep's technique for assisted regeneration of skin"

Sandeep Shrivastava, Pradeep K. Singh, Shaunak Taywade

Department of Orthopaedics, J.N. Medical College, Datta Meghe Institute of Medical Sciences, Wardha, Maharashtra, India

Address for correspondence
Dr. Sandeep Shrivastava,
Department of Orthopaedics, J.N. Medical College, Datta Meghe Institute of Medical Sciences, Wardha, Maharashtra, India.
E-mail: drsandeepshrivastava@gmail.com

ABSTRACT

Background: The wound management is a huge complex problem consuming billions of dollars. The standard treatment includes adequate therapeutics with drugs (such as antibiotics), intense local dressings (such as negative pressure/autolytic/cleft) and multiple surgical interventions/ reconstructions. Such interventions and modalities require expertise and great resources. Still the outcomes are unpredictable and associated with morbidities at donor (otherwise normal) sites. Materials and Methods: The "Sandeep's Technique for Assisted Regeneration of Skin" (STARS) is therapy for complete healing of wounds with Autologous self activated Platelet Rich Plasma (PRP), impacted as local subcutaneous injections in the wound margin and underneath the necrotic Flap, on every 4th day, till complete regeneration takes place and full skin regenerates. The wounds are dressed daily/alternate day with only water saline. It is a Pilot study of patients treated with STARS Therapy treated at Acharya Vinoba Bhave Rural Hospital, J.N.Medical College, Wardha, INDIA. The different types of wounds were acute wounds with exposed deep tissues such tendons and bones, compound fractures, infected wounds, sloughing post surgical flaps and chronic non healing ulcers including diabetic and pressure ulcers. Results: All the wounds healed after PRP administration requiring no further drugs, complex dressings and surgical reconstructions. Conclusion: It is safe, effective, efficient, and easily reproducible technique with predictable results in own certain wounds in which surgical reconstructions are not possible. Thus it shall be considered as a huge step forward in preservation of resources and prevention of morbidity.

Keywords: Autologous platelet rich plasma, Sandeep's technique for assisted regeneration of skin

Access this article online

Quick response code

Website:

DOI:

loss of sensations. These are very difficult to manage and needs multiple modalities including complex local care such as with negative pressure therapy, antibacterial dressings, antibiotics and multiple stage surgeries such as debridements, reconstructions with skin grafting, rotational flaps or free flaps.[1] Such modalities are associated with further morbidities like edema, pain, risks and side effects of pharmacological agents, antibiotic resistance, etc.

Role of different growth factors from platelets. The regenerative medicine is being evolved in this era, offers a ray of hope to overcome many diseases. The key regenerative biologic product includes stem cells, mesenchymal cells, and platelets. Platelet or blood product is being used as platelet rich plasma (PRP) and have very promising results for the treatment of various wound ailments including of tendons and bones.[2,3] It is also used as local gel application for local care in the treatment of wounds, concurrent adjuncts to existing wound management protocols.[4,5] The early results, as reported in literature are encouraging.[6,7]

Gupta et al., J Regen Med 2016, 5:1
http://dx.doi.org/10.4172/2325-9620.1000127

Journal of Regenerative Medicine

Original Article

A SCITECHNOL JOURNAL

Developing Ideal Solution for Acute Wound Treatment by Regenerative Medicine

Sandeep Shrivastava*, Mahadeokar S, Tayde S, Mole Mahmood and Gupta A

Abstract

People tend to get injured, leading to wounds with issues of multiple tissues including skin, subcutaneous tissue, tendons and bones. Their effective management is a complex process, but the outcomes many a time remain unpredictable. The complications involve further tissue loss, infections and non healing ulcers leading to huge morbidity. Throughout the world, huge resources are spent, consuming billions of dollars towards manage these wounds and lessen the morbidity. A simple therapy for effective wound management if developed, will lessen this health problem at some lot of extents.

Method: The "Sandeep's Techniques for Assisted Regeneration of Skin" (STARS) is therapy for complete healing of wounds with Autologous self activated Platelet Rich Plasma (PRP), impacted as local subcutaneous injections in the wound margin and underneath the necrotic Flap, on every 4th day, till complete regeneration takes place and wound heals. The wounds are dressed daily/ alternate day with only water saline. It is a prospective interventional study of 35 cases of acute wounds over Bones associated with problems such as compound fractures, amputations, infections, post surgical necrosis, having failed treatment with standard treatment strategies in the Rural Hospital, J. N. Medical College, Wardha, INDIA.

Finding: The final outcome is considered / near complete healing of all the wounds without requiring any surgical or invasive medical intervention.

Interpretation: This method of treatment assisted with Platelet rich plasma as regenerative medicine product is safe, easy, effective and efficient mode of wound management. It is simple innovation, which can be adopted universally as an ideal treatment for wounds, minimizing the morbidity and preserving the resources across the globe.

Keywords

Acute wounds; Platelet rich plasma; Sandeep's technique for assisted regeneration of skin

lesions and cannot undergo primary repair. Such wounds are managed initially by debridements, then intense local care including negative suction therapy & basic application of antibacterial solutions/ointments [1-3]. Further as they heal, a surgery is required through surgical reconstruction by Skin graft or Flap. During these treatments, intense medical management with antibiotics and analgesics is also needed. Despite all these active interventions, outcomes may be associated with complications such as donor site morbidity, infections and non healing ulcer. There is also emergence of antibacterial resistance and risk of drug induced side effects including renal failures. It also involves undertaking the surgical and anaesthetic risk. Patients with old age, cardiac problems, uncontrolled diabetics etc. may fail to undergo adequate treatment due to such high risks. Such complex management needs Plastic reconstructive expert's care under higher health centres. It is not possible to give adequate care at primary or secondary care centres. It's estimated that care of such wounds in US exceeds 50 billion dollar per year, which is 10 times of NIH's health care budget [4].

Aim and Objective

This study is undertaken to evaluate Platelet Rich Plasma (PRP), also known as Plasma rich in growth factors (PRGF) or Platelet concentrate (PC), assisted regenerative technique - "Sandeep's technique for assisted regeneration of Skin" (STARS) as definitive management for healing of acute wounds in orthopaedic situations.

Study Design

It is a prospective interventional study of 35 patients treated by STARS. The consenting patients with acute wounds having tissue losses including exposed underlying structure such as bones & tendons, infective fractures, post surgical necrosis of flaps were included. The Patients of bleeding dyscrasia disorders with haemoglobin of less than 10 gm% and low platelet counts of less than 1.5 million were excluded from the study.

Preparation of PRP

It is prepared by double spin method. Four 20 ml of autologous venous blood [5] (Figure 1). Transferring 5 ml each to 4 EDTA tubes. Until spin in at a 1200 rpm, at room temperature, for 10 minutes. Subsequently transferring the upper buffy layer to a plain tubes and re-centrifuging it at 3000rpm for 10 minutes, which separates the PRP



3rd International Conference on
Wound Care, Tissue Repair & Regenerative Medicine
Embassy Suites by Hilton Dallas Park Central Area
Wound Care 2017
September 11-13, 2017 Dallas, Texas, USA

Study : Prospective Case (Intervention) Pilot study.
Jan 2013-Dec 2016 at AVBR Hospital & J.N.Medical College Wardha , INDIA.

n=125

Age : 3 years to 72 years ; Sex : M-78 ; female :47

Types of wounds:

A.Duration:

Acute — 67

Chronic: (more than 1 month duration) -58

B: Infection

Infected: 92

Contaminated: 33

C: Aietology:

Post traumatic- 65

Diabetes-22

Trophical ulcers (other reasons)-12

Chronic Ulcers - 13

Bed sores: 10

Other Ms- 3.



Results : Clinical Evidences: Acute Post-traumatic Wounds





A. Acute injury in 3 year old child






B. Infected compound fracture in 32 year old male



3rd International Conference on
Wound Care, Tissue Repair & Regenerative Medicine
Embassy Suites by Hilton Dallas Park Central Area
Wound Care 2017
September 11-13, 2017 Dallas, Texas, USA

Results :Clinical Evidences- Chronic Ulcers / Sores





C. Bed sore in 65 year Female






D. Chronic ulcer of Right Sole in 52 year diabetic female



Results :Clinical Evidences-Wounds with Gangrenous & Necrotising Tissue.



E.42 year Male with
Necrotising and Gangrenous tissue
right leg



F. 22year female with wound
with gangrenous change of Toe



3rd International Conference on
Wound Care, Tissue Repair & Regenerative Medicine
Wound Care 2017
Embassy Suites by Hilton Dallas Park Central Area
September 11-13, 2017 Dallas, Texas, USA

Clinical STAGING of PRP induced wound healing



A Infected Non Healing Diabetic Ulcer



STAGE I:
Suppression of Unhealthy Tissue & control of infection



STAGE II:
Healthy Granulation tissue



STAGE III:
Filling up of defect and peripheral to centre epithelization

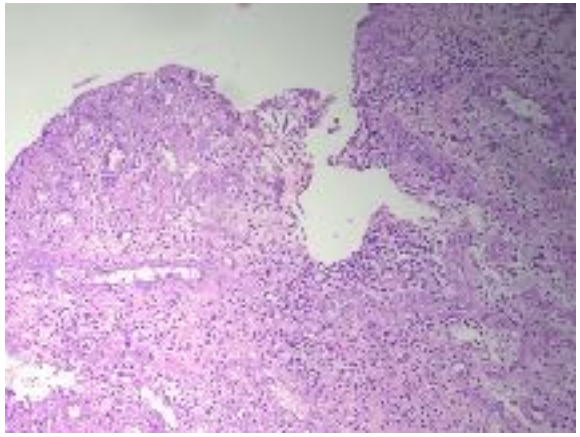


STAGE IV:
Maturation of Epithelization

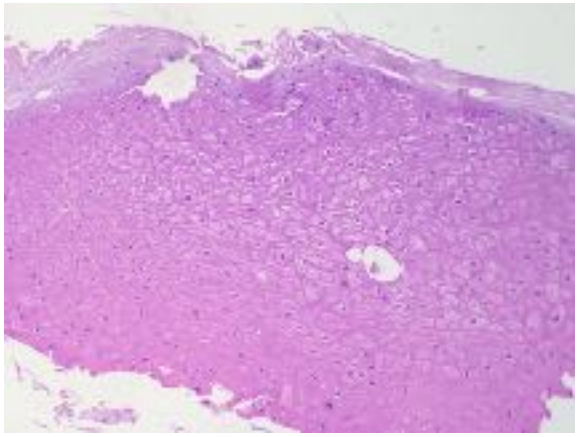


3rd International Conference on
Wound Care, Tissue Repair & Regenerative Medicine
Wound Care 2017
Embassy Suites by Hilton Dallas Park Central Area
September 11-13, 2017 Dallas, Texas, USA

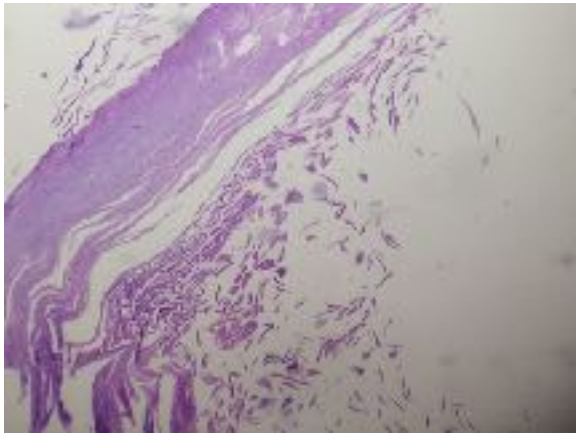
HistoPathology Evidence: Wound healing & Skin Regeneration



48HRS:
Phagocytic concentration



10 DAY:
Defect Filling with Neo-angiotic tissue



21 DAYS:
Collagen led Healing



3rd International Conference on
Wound Care, Tissue Repair & Regenerative Medicine
Wound Care 2017
Embassy Suites by Hilton Dallas Park Central Area
September 11-13, 2017 Dallas, Texas, USA

Results

Healing: Achieved in All Cases
Infection Control : In all Cases including 7 cases of MRSA.
Pain Control: 3 /125 needed additional analgesics.
Rate of Healing:
1mm per day; faster in Acute wounds than Chronic wounds.
Clinical Stage of Epithelization takes the longest time
HPE : Healing led by Collagen unlike natural which is Fibrosis.
Recurrence : 2 /125 Pts , due to secondary trauma.
Re-infection: 3 - needed antibiotics and surgical intervention - Debridement followed by PRP - Final Healed

Break Through result:
Regeneration in Necrosis & near gangrenous tissue!!



CONCLUSION

An Almost Ideal Solution for Complex Wound healing

Effective : Complete healing with Control of the Infection and Pain.
: Enhance the wound healing .

Safe :Autologous Blood Product.

Affordable and Accessible: Low cost ,
No drugs , No Surgery and No huge infrastructure required

Easily Re-producible : Can be done as office /OPD procedure by trained health care providers.

STARS Therapy - An Effective & Efficient Protocol for wound management



3rd International Conference on
Wound Care, Tissue Repair & Regenerative Medicine
Wound Care 2017

TAKE HOME MESSAGE:



PRP :

Tissue Regenerator

Infection Controller

Auto-Debrider

Analgesic effect

Hence an exciting Option!!

Regenerative medicine will Translate the Wound Management

Limitation: Pilot study , no control arm.

Conflict of Interests: None.

