

WCNC 2017
2nd International Conference on
ADVANCES IN SKIN WOUND CARE AND TISSUE SCIENCE
November 9-10, 2017 // Frankfurt, Germany

Platelet Rich Plasma for Management of Complex wounds.

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Introduction to Problem:

People tend to get Injured and develop wounds





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Complex Wounds:



Acute Wounds : Tendons & Bones exposed



Severely Necrotising tissues with infection



Infected Compound Fractures





Pressure Sores / Bed Sores , Trophical Ulcers



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Current solutions Includes :

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

Huge Resources are Spent



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Challenges in Management:



Loss of Skin / Tissues

Infections ,

Non Healing/ Delayed healing

Dying / Necrosis/ Gangrenes

Co-Morbidities -Diabetes, Elderly.



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In search of solution to enhance Healing in such conditions

Ideal Solution would have

- **No Drugs- Antibiotics / Anti-inflammatories**
- **No Major dressings -VAC's ; Antimicrobial**
- **No Surgeries: Major Debridements or Plastic Reconstructions**
- **Can be done by everyone and in All Health Care Settings**

Potential: Regenerative Medicine Therapy



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3 Key Regenerative Medicine Products in Clinical Use are

STEM Cells

Mesenchymal Cells

Platelets- Rich Plasma



Autologous Platelet Rich Plasma

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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



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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 .



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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



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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.



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Original Article

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

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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/cloth) and multiple surgical interventions/ reconstructions. Such interventions and modalities require expertise and huge 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), prepared in local tube/centrifuge machine at the time of surgery, on every 4th day till complete repair takes place and local skin regenerates. The wounds are dressed daily/alternate day with only water tables. 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, non-healing post surgical flaps and chronic non-healing ulcers including diabetic and pressure ulcers. **Results:** All the wounds healed after PRP administration and requiring no further drugs, complex dressings and surgical reconstructions. **Conclusion:** It is safe, effective, efficient, and easily reproducible technique with predictable results in his own complex wounds in which surgical reconstructions are not possible. This article is considered as a huge step forward in preservation of resources and prevention of morbidity.

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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 chronic site, risks and side effects of pharmacological agents, antibiotic resistance, etc.

Role of all[2] first described growth factor from platelets. The regenerative medicine is being evolved in this era, offers a shining ray of hope to overcome many diseases. The key regenerative biologic product includes stem cells, mesenchymal cells, and platelets. Platelet as blood product is being used as platelet rich plasma (PRP) and have very promising results for the treatment of various wound ranges including of tendons and bones.[3,4] It is also used as local gel application for local care in the treatment of wounds, concurrent judgment to existing wound management practices.[5,6] The early results, as reported in literature are encouraging.[7,8]

Chellappan 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*, Mahadeshkar M, Tayade S, Mehta Mahendra 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 savings.

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), prepared as local subcutaneous injection (PRP) wound margin 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 tables. It is a prospective interventional study of 35 cases of acute wounds over limbs associated with problems such as compound fractures, amputations, infections, post surgical necrosing flaps treated with STARS therapy treated at Acharya Vinoba Bhave 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 intense 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

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, infected fractures, post surgical necrosis of flaps were included. The Patients of bleeding disorders, Hematological 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



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Study : Prospective Case (Intervention) Pilot study. Jan 2013 - July 2017 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.



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Results : Acute Post-traumatic Wounds





Acute injury in 3 year old child






Infected compound fracture in 32 year old male



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Results :Clinical Evidences- Sole Reconstruction










During treatment

At end of Treatment

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Results :Chronic Ulcers / Sores

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Bed sore in 65 year Female






Chronic ulcer of Right Sole in 52 year diabetic female



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22 yrs F : Post traumatic - Impending Gangrene of Toes

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56 year Male - Post traumatic gangrene of all fingers : Middle two fingers - amputated but rest are salvaged.









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42 yrs M : Necrotising fascitis with Gangrenous development of whole leg and foot - Whole leg salvaged ;











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Clinical STAGING of PRP induced wound healing

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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



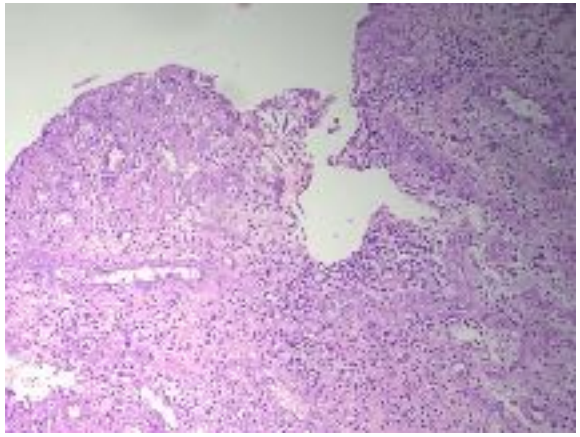
STAGE IV:
Maturation of Epithelization



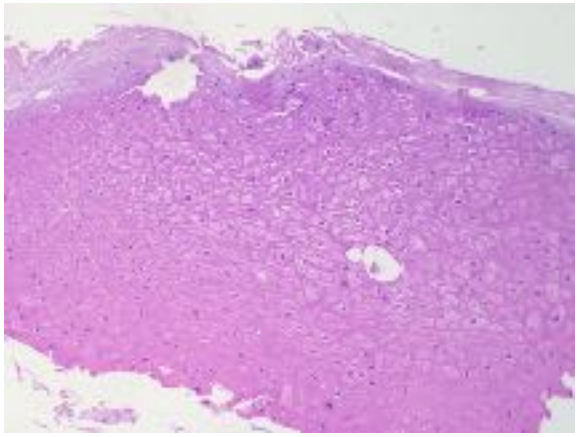
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HistoPathology Evidence: Wound healing & Skin Regeneration

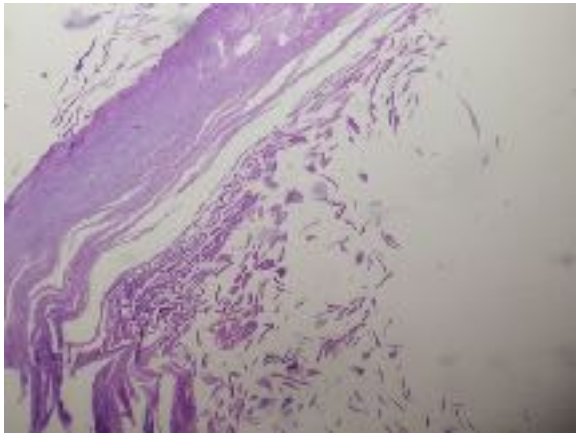
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48HRS:
Phagocytic concentration



10 DAY:
Defect Filling with Neo-angiotic tissue



21 DAYS:
Collagen led Healing



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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!!



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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



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TAKE HOME MESSAGE:

PRP :
Tissue Regenerator
Infection Controller
Auto- Debrider
Analgesic effect
Hence an exciting Option!!

Regenerative medicine -Potentials to Translate the Complex Wound Management

Limitation: Pilot study , no control arm.

Conflict of Interests: None.



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