

# Role of Autologous Platelet Rich Plasma in Pressure Injury

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## Abstract

Aim of this case report is to assess the Role of Autologous Platelet Rich Plasma in management of pressure sores. Clinical examination of the pressure sores before and after use of autologous platelet rich plasma (APRP) was done. Autologous platelet rich plasma (APRP) is effective in healing of pressure sores.

**Keywords:** Autologous platelet rich plasma; Pressure sores; Wound; Management.

## INTRODUCTION

Autologous platelet rich plasma (APRP) has gained its importance in medical field since its first use in sports medicine and open-heart surgeries. It is widely used in plastic surgery and in cosmetic medicine because of its wound healing properties. APRP is also used in post burn management and is an important factor in improving the post burn quality of life of the patient. Autologous platelet rich plasma (APRP) is a safe, easily accessible, and upcoming modality

that is finding its use in various fields of medicine. Its use in pressure sore management is still being studied but is an application worth concentrating.

## MATERIALS AND METHODS

This study was carried out in the department of Plastic Surgery in a tertiary care centre in South India after getting written informed consent from the patient and approval from the department. The subject is a 60-year-old male who is a known case of type 2 diabetes mellitus, systemic hypertension, coronary artery disease s/p PCI, with anaplastic oligodendroglioma s/p resection and adjuvant chemoradiotherapy, cerebrovascular disease, lupus nephritis, and Parkinson's disease who presented with non-healing ulcers over the back. On examination, the patient's vitals were stable. On local examination, grade IV pressure sores were noted over the presacral and bilateral trochanteric region, BJWATS-54. (Fig. 1) He was admitted for management of the pressure sores and pressure sore care was given in the form of iv fluids, antibiotics, PRBC transfusion, albumin, PPN and dressing. He was managed with daily regenerative dressing with NPWT.

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**Fig. 1:** Pressure Injury

APRP preparation was done in the operation theatre while dressing change of the patient using standard and validated technique described. 9 ml of whole blood was taken from peripheral vein with sterile precautions and 1 ml of heparin was added to make it 10 ml (blood: anticoagulant at 9:1). The centrifugation tube was placed in centrifugation apparatus. The solution was centrifuged at 3000 rpm for 10 minutes. Three portions were seen after first centrifugation. Upper portion containing plasma and platelets, middle portion containing White blood cells (WBCs) with some platelets (Buffy coat) and lower portion containing Red blood cells (RBCs). Middle and lower portions are discarded. Upper portion was transferred taken in a new tube for re-centrifugation at 4000 rpm for 10 minutes. Following which two portions were seen. Upper 2/3rd portion containing platelet poor plasma and lower 1/3rd portion containing

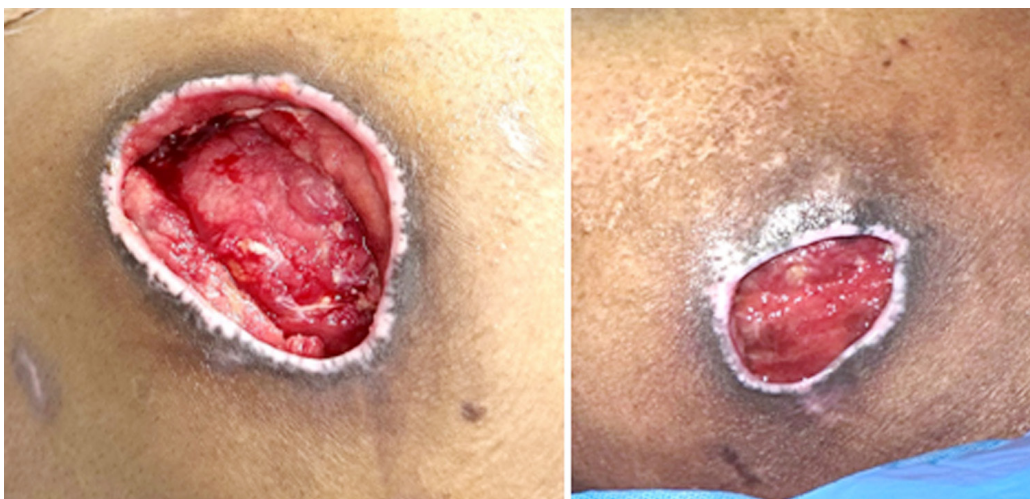
platelet rich plasma & erythrocyte with platelet Clump. Lower 1/3rd portion was used for APRP therapy. APRP being injected over 8 sittings on weekly basis spanning over 2 months (Fig. 2).



**Fig. 2:** Autologous platelet rich plasma wound bed preparation of pressure injury. (Fig. 3)

## RESULTS

Autologous platelet rich plasma helped in the



**Fig. 3:** Healing pressure injury wound after APRP

## DISCUSSION

Autologous platelet rich plasma (APRP) as the name implies refers to the plasma derived from the patient's own blood with a platelet count higher than the platelet count in the peripheral blood of the patient.<sup>1</sup> Historically having been used to treat thrombocytopenia, the use in other specialities became widespread with its use in sports medicine to treat musculoskeletal injuries. Its use in wound management results from the observation that wounds have a proinflammatory environment that impairs healing. In addition, wounds have a high protease activity that impairs functioning of growth factors. APRP used in a chronic wound serves as a source of growth factors and thence has mitogenic, angiogenic and chemotactic properties.<sup>2</sup> APRP has also been shown to stimulate human dermal fibroblast proliferation and thus increasing the deposition of TYPE I collagen, the above mechanism being proposed to its use in scar management.<sup>3</sup> Application of activated APRP also provides 5 to 10 times the normal concentration of growth factors that include PDGF, VEGF, TGF- $\beta$  locally also accelerating wound healing. Addition of calcium salts also helps in activation of platelets.<sup>4,5,6</sup>

Usually, around 1 to 1.5 ml of APRP can be obtained from 10 ml of patient's blood. Hence, the disadvantage of the use of APRP lies in its use in wounds of a large surface area that would require a large volume of blood which in a patient with a chronic non healing wound or a traumatic wound requires consideration. Moreover, injecting APRP prior to grafting or flap placement could provide an uneven surface for a regular uptake.<sup>7,8</sup>

## CONCLUSION

Autologous platelet rich plasma is an effective measure for enhancing the wound bed preparation of pressure injury.

### *Conflicts of interest*

This study does not require any institutional approval.

## DECLARATIONS

**Authors' Contributions:** All authors made contributions to the article

**Availability of data and Materials:** Not applicable

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**Consent for Publication:** Not applicable

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