

Role of Autologous Platelet Rich Plasma in Scald Burn

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How to cite this article:

Nandha Kumar S, Ravi Kumar Chittoria, Barath Kumar Singh P/Role of Autologous Platelet Rich Plasma in Scald Burn/RFP Journal of Plastic Surgery and Transplantation. 2023;4(2):63-65.

Abstract

Aim of this case report is to assess the role of Autologous platelet rich plasma (APRP) in management of scald burns. Clinical examination of the scald burns before and after use of Autologous platelet rich plasma (APRP) was done. Autologous platelet rich plasma (APRP) is effective in healing of scald burns wound.

Keywords: Autologous Platelet Rich Plasma (APRP); Scald Burns; 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.¹ APRP is also used in post burn management and is an important factor in improving the post burn quality of life of the patient. Several modalities have been tried and tested over time to achieve the above goal that include fractional CO₂ laser therapy.² 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 scald burns 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 an 8-year-old male child, with no comorbidities, with alleged history of scald burns over back of both thighs with hot water. (Fig. 1) On examination, the patient's vitals were stable. On local examination, second degree deep burns over back of both thighs. He was admitted for management of the scald burns and burns care was given in the form of intravenous fluids, antibiotics, and managed according to WHO protocol.

Autologous Platelet Rich Plasma 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 3.2% Sodium Citrate 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

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Received on: 28-03-2023

Accepted on: 20.04.2023



Fig. 1: Scald burn wound

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 3 sittings once in 5 days spanning over 2 weeks (Fig. 2). The scar being assessed with



Fig. 2: APRP application over scald burn

Vancouver scar scale and patient satisfaction.

RESULTS

The scald burn improved with adequate patient satisfaction with a final Vancouver scar scale of.⁶ No complications were noted. The therapy was well tolerated. (Fig. 3)



Fig. 3: Healed scald burn 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. 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 pro-inflammatory 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.^{2,3} 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.^{4,5} Application of activated APRP also provides 5 to 10 times the normal concentration of growth factors that include PDGF, VEGF, TGF- β locally also accelerating wound healing. Addition of calcium salts also helps in activation of platelets.^{6,7,8,9}

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. More over, injecting APRP prior to grafting or flap placement could provide an uneven surface for a regular uptake.

CONCLUSION

Autologous platelet rich plasma is an effective

measure in improving burn scar remodelling and is a good choice for treating burns.

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