Journal on Surgery

www.journalonsurgery.org

Case Report

Open Access, Volume 2

Role of Autologous Platelet Rich Plasma in Scar Management

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Abstract

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. Scar management is the most important part of cosmesis and is an important factor in improving the post traumatic quality of life of the patient. Here we present the case of a 17-year-old male with a post traumatic wound on the right knee treated with APRP for scar management.

Keywords: Autologous platelet rich plasma (APRP); Scar management.

Introduction

Scar management represent an important field in medical science as scars can negatively impact the quality of life of an individual. In addition to the cosmetic blemish, pain, tenderness, itchiness includes few other problems associated with a scar. A scar located in a precarious position can cause functional limitation in the form of scar contraction. Scar aesthetics can also have a negative influence on psychosocial health. This warrants the importance of providing a scar that is aesthetically acceptable and has minimal functional impairment.

A number of modalities have been tried and tested over time to achieve the above goal that include fractional CO_2 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 scar management is still being studied but is an application worth concentrating.

Methods and materials

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. A

Manuscript Information: *Received: Mar 26, 2022; Accepted: Apr 18, 2022; Published: Apr 22, 2022*

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Citation: *Kevin JA, Chittoria RK, Kerakada N, Thomas N, Singh PB. Role of Autologous Platelet Rich Plasma in Scar Management. J Surgery. 2022; 2(1): 1019.*

17-year-old male with no known comorbidities presented with an alleged history of road traffic accident (RTA) causing him to sustain fracture to the right tibia with associated avulsion injury resulting in a raw area over the right knee. The tibial fracture had been treated with closed reduction with external fixation leaving the raw area on the right knee that was treated with Hydrojet wound debridement with prolotherapy, insulin therapy and negative pressure wound therapy for wound bed preparation followed by keystone flap for closure. This resulted in a scar formation. The initial Vancouver scar scale was calculated to be 9 (Figure 1). Autologous platelet rich plasma (APRP) obtained by standard double centrifugation protocol using 10cc of the patient's blood was used for reducing postoperative scar formation with APRP being injected over 8 sittings on weekly basis spanning over 2 months (Figure 2). The scar being assessed with Vancouver scar scale and patient satisfaction.

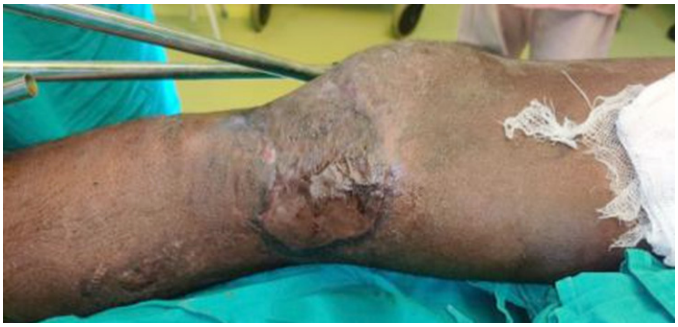

Figure 1: Initial status of the scar on the anteromedial aspect of the right knee (Vancouver scar scale 9).

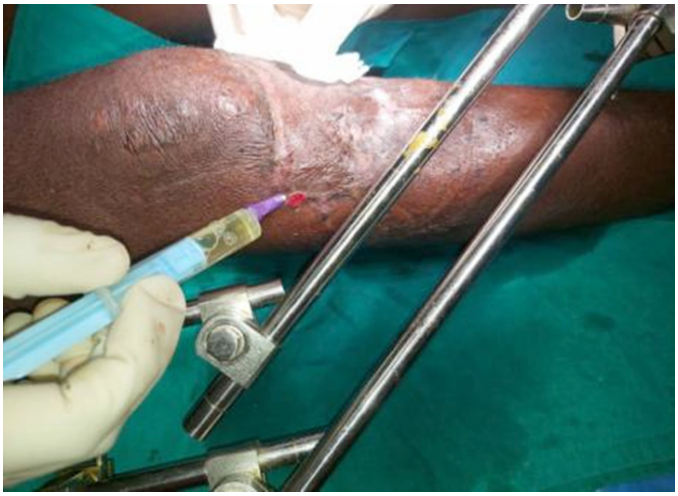

Figure 2: APRP injection into the scar.

Result

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

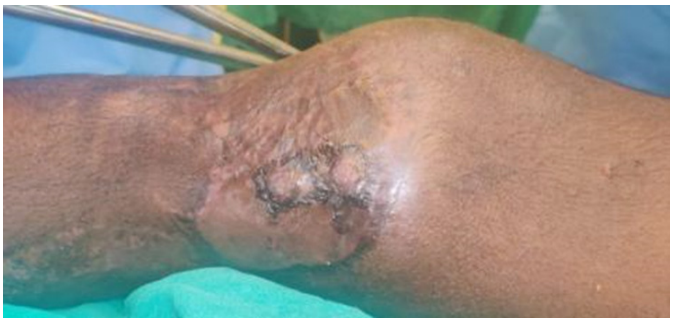

Figure 3: Final result of the scar after completion of treatment with APRP (Vancouver scar scale 6).

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 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 hence has mitogenic, angiogenic and chemotactic properties. APRP has also been shown to stimulate human dermal fibroblast proliferation and thus increasing the deposition ofTYPE I collagen, the above mechanism being proposed to its use in scar management [1,3]. 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 [7-9].

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. Moreover, injecting APRP prior to grafting or flap placement could provide an uneven surface for a regular uptake [7].

Conclusion

Autologous platelet rich plasma is an effective measure in improving scar remodellingand is a good choice for treating scars provided the patient has a good functional status and surface area to be treated is small.

Declarations

Conflicts of interest: None.

Authors' contributions: All authors made contributions to the article.

Availability of data and materials: Not applicable.

Financial support and sponsorship: None.

Consent for publication: Not applicable.

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