Case Report

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APRP Spray Device: A Novel Technique for Applying APRP

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Abstract

Topical application of autologous platelet rich plasma (APRP) is used in the treatment of various types of wounds. Currently available methods for application of APRP include injectable or irrigation by syringe but have the limitation of inadequate coverage of surface area requiring large amount of APRP. To improve large surface area with minimum amount of APRP we have designed indigenously made spray device. This article highlights the preliminary pilot application of this device in one of the patient in plastic surgery. This device is easy to prepare and cost effective.

Keywords: APRP; Spray; Device.

Introduction

Autologous Platelet Rich Plasma (APRP) is the platelet concentrate in small amount of plasma which contains higher concentrations of growth factors.

Autologous platelet rich plasma is used for variety of clinical settings to improve the outcome. These include application in acute and chronic wounds, to prevent hair fall, to improve cosmetic outcomes, for the treatment in tendon, bone, ligament injuries etc.[1-7].

APRP solution is commonly used as an adjuvant therapy for wound healing in various wounds, skin graft donor site and skin rejuvenation.

Modes of application include local infiltration, irrigation by syringemethods. But these methods have limitation of coverage of large area only with large amount of APRP [8-10].

Some method or device is required to cover large area with minimum amount of APRP. This article discusses the application of new method of application of APRP using indigenously prepared spray device.

Case Detail

A forty year old male patient presented to plastic surgery department with 30 days old post traumatic post-operative raw area on the medial aspect of left fore-foot. He had no other associated comorbidities. On examination unhealthy wound of size 5x3cm over the medial aspect of left fore-foot was noted with K-wire stabilization of 1st metatarsal shaft fracture done in a private centrewith intact distal vascularity and sensation. Blood investigation values were found to be within normal limits. He was treated with wound debridement and split skin grafting (SSG) under tumescent anesthesia. Conventionally large amount of APRP (10 ml) is required to infiltrate or irrigate donor area for early epithelialization. But in this case we used only 1 ml of APRP sprayed over donor area using spray device indigenously prepared by us. The various components of device are a 10 ml container, nozzle spray connected to a tube with opening in the cap with screw closure system (Figure 1). APRP was harvested by standard technique [2]. APRP was transferred in the spray container under all aseptic precaution after spray device sterilized by ETO Gas sterilization. APRP was sprayed over the donor area (Figure 3). Donor area was covered with sterile dressing.

Fig. 1: APRP Spray Device with APRP solution

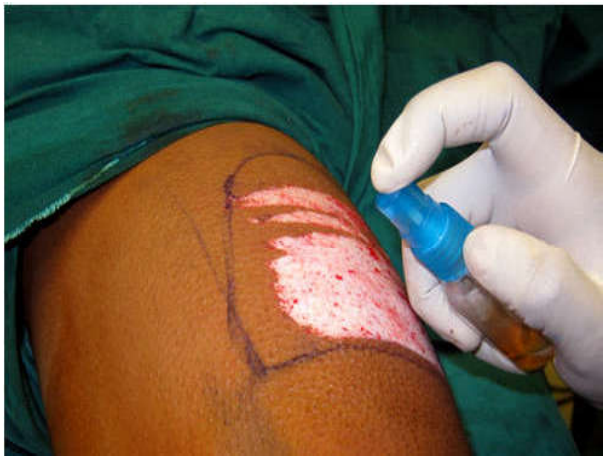

Fig. 2: Donor area being sprayed by APRP spray device

Discussion

Application of activated APRP provides higher concentration (5-10 times of normal) growth factors like platelet derived growth factor (PDGF), vascular endothelial growth factor (VEGF), transforming growth factor β (TGF-β) locally, which results in accelerated wound healing [5,8]. Activation of platelets is done by adding calcium salts or by mechanical stimulation by injecting/spraying in very small needles (26-30G). For preparation of APRP,various systems (automatic/ manual) are described in the literature [8]. Usually around 1-1.5ml of APRP can prepared from 10 ml blood.

Infiltration of APRP for large ulcers, wounds and donor sites of skin grafting may not provide uniformity in the coverage of large area, for which large amount of blood/APRP is required. Further injections into wound base and margins at multiple sites cause pain for which patient may not co-operate. To overcome these problems we indigenously designed APRP spray device as described in methodology, through which APRP could be sprayed uniformlyover the entire raw surface with the minimal quantity.Since the application is more diffuse & uniform large area of wound tends to heal better. Thissprayer device can be prepared by assembling various components easily available. It is cost effective (INR 40/-), saves quantity of APRP and covers large surface area of application. This study has limitation that it was tested only in one case (donor area of skin grafting). Its application can be extended for other indications like post burn raw areas and chronic wounds of different etiologies.

Conclusion

Spray method provides painless and uniform application of minimal amount of APRP to cover large surface area of application. This innovative cost effective device needs to be tested in large sample size with controlled study.

Conflicts of Interest: Nil

Disclosure: **Nil**

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