EXTENDED ABSTRACT

Utilization of Lyophilized Platelet-Rich-Plasma in Aesthetic Facial Treatment

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Introduction

Platelets are important for hemostasis and wound healing. Several growth factors have been discovered in alpha granules [Tsay, el al., 2005]. Platelet-rich plasma (PRP) is obtained by centrifuging autologous blood and isolating the platelets. As a result, PRP devices are generally divided into two concentration systems: lower (2.5–3 times baseline concentration) and higher (5–9 times baseline concentration) [Dhurat,&Sukesh, 2014].

Conventionally, PRP is prepared either through commercial kits or a specialized 'table top cold centrifuge' device in the clinic set-up. 30 ml of venous blood draw will yield approximately 3-5 cc of PRP depending on the baseline platelet count of an individual, the device used, and the technique employed such as using citrate dextrose A to prevent platelet activation prior to its use. However, in clinical practice, the platelet levels are not measured in the aforementioned conventional method. Lyophilized platelet-rich plasma is a technology where isolated and purified PRP are stored for a prolonged period. Generally, they are sent to the central laboratory with proper environment control for centrifugation and further processing. The lyophilized PRP is then checked for sterility and sent back to the medical facility for administration. Before each treatment session, the lyophilized PRP can be simply reconstituted with normal saline or other activator such as collagen [Murdiastuti, et al., 2019]. PRP has been employed in a variety of medical applications, including tendon repair, reconstructive medicine, wound healing, hair loss, and aesthetic medicine. Furthermore, application of PRP in medical aesthetic also indicate improvement for skin texture, wrinkles, mild collagen loss, skin tightening and toning, acne scars, and face volume in previous studies [Frautschi, et al., 2017; Peng, 2019; Samadi. Et al., 2019].

We report a case study of lyophilized PRP usage in facial esthetic treatment. Clinical photo comparisons were used as result to observe the efficacy of lyophilized PRP.

Case Report

Case Design and Subject

Patient gave her formal consents for the use of their personal and medical information as well as photos and laboratory data in the publication of this case report.

Lyophilized PRP preparation

The preparation of lyophilized PRP (Biolpyh™) was performed in the central laboratory of Hope Cell Sdn. Bhd. (KL, Malaysia). For each patient, 100 ml of autologous blood was collected at once into a blood tube containing ACD. Upon receiving the sample, a series of separations and concentrations of platelets was performed. They were partially activated before the vacuum freeze-drying process. Using a single procedure, 10 vials of 2 ml lyophilized powder (Biolpyh™) were produced. The lyophilized powder was stored at 25±2 degrees Celsius and at 1 atmospheric pressure.

Lyophilized PRP application

Before the treatment session, each vial of lyophilized PRP (Biolpyh™) was reconstituted in 5 ml of normal saline using a sterile syringe. The platelet-rich solution was administered intradermally and subcutaneously. Approximately 1 to 2 vials were administered for each treatment session.

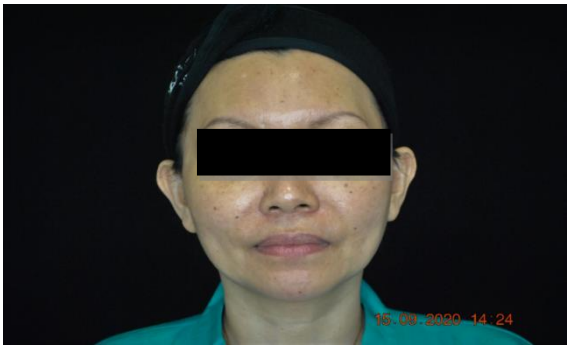

Figure 1A: Before

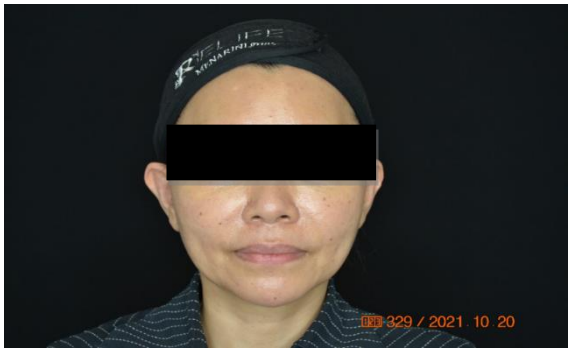

Figure 1B: After

Case study

This is a 49-year-old female who presented with clinical signs of ageing eg sunken temple, sunken cheeks, chin recession and coarse skin texture). The lyophilized PRP solution (Biolpyh™) was injected into her temporal areas, forehead, cheeks and chin subcutaneously. In addition, her skin over her whole face was injected intradermally. She received 3 treatment sessions at one-month intervals. Only minor bruising was noted after the treatments. After comparing clinical photos, we noted that the outline of her forehead, temporal area, and cheeks became smooth, the fine lines, wrinkles and pores on her skin texture showed apparent improvements (Fig. 1A, B).

Discussion

The use of PRP in medical treatments was considered relatively safe and efficient. PRP is commonly utilised in orthopaedic surgeries, reconstructive medicine, and wound healing promotion to speed tissue recovery [Shirata, & Kato, 2019]. PRP is also becoming more prominent in the treatment of medical aesthetics.

Lyophilized PRP may be an ideal method to establish quantitative PRP treatment for medical aesthetic. Despite the wide applications of PRP, there are currently no established standards for acquiring PRP in order to achieve the most effective plasma solution or platelet concentration, hence most treatment was based on qualitative measurement [Peng, 2019]. For

lyophilized PRP, the number of platelet was quantified prior to administration. Thus, clinicians are able to provide more precise prescription, design better treatment proposal and predict the treatment outcome based on the platelet count. In addition, due to the short shelf life of PRP, patients must have blood obtained each time before centrifugation for conventional PRP [Yeung, et al., 2018], but lyophilized PRP preparation requires only a single blood collection which provide better user experience.

In this case study receiving lyophilized PRP treatments, clinical improvements and positive clinical feedback were noted. Decreasing fine lines (wrinkles), improvement of skin textures, and smoother facial outlines were observed. In addition, increased elastic fibers were observed. No obvious fibrotic changes or foreign body reactions were noted.

PRP contains a number of growth factors that may aid in fibroblast activation and tissue regeneration. Platelet-derived growth factor (PDGF), vascular endothelial growth factor (VEGF), and insulin-like growth factor (IGF) are all growth factors generated by platelets and are linked to tissue repair [Pierce, et al., 1991].

PDGF activates collagenase, increases fibronectin synthesis, and is necessary for collagen remodelling in normal wound healing, according to a large body of evidence [Verma, et al., 2019].

However, this study had certain limitations. We only collected the samples in a single case study. Therefore, more cases and data collection are required in further studies to identify the ideal growth factor levels and clinical outcomes.

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