

Caso clínico

Using platelet-rich plasma as a treatment in cosmetic surgery. Clinical cases report

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Abstract

Under the context of countering cellular biochemical processes of aging research began to study and use the platelet-rich plasma, properties given modulator and stimulator of proliferation of epithelial cells and mesenchymal cells and has served as an adjuvant in various therapy focused on tissue regeneration. The platelet-rich plasma was initially used in complications and delayed healing wounds fibrous evolution. But their current applications extend beyond the use of cells for regeneration of joints autoimmune diseases, also the platelet-rich plasma has become popular in other branches of medicine. In the field of cosmetic medicine, the platelet-rich plasma is mainly used to stimulate skin fibroblast and the cells that produce growth factors, as well as treatments for enhancer lipotransplantes. In the present study a series of clinical cases on the implementation of autologous plasma in expression lines as well as the outcome of each patient in order to assess whether or not there are documented changes in patients and effectively platelet-rich plasma can be considered the treatment of choice to reduce expression lines.

Resumen

Bajo el contexto de contrarrestar los procesos celulares del envejecimiento, investigaciones bioquímicas empezaron a estudiar y a utilizar el plasma rico en plaquetas. Dadas sus propiedades moduladoras y estimuladoras de la proliferación de células epiteliales y células mesenquimatosas, ha servido como adyuvante en diversas terapias enfocadas en la regeneración de tejidos. El plasma rico en plaquetas inicialmente fue usado en las complicaciones por cicatrización retardada y heridas con evolución fibrosa. Pero sus aplicaciones actuales se extienden más allá, como el empleo de células para la regeneración de articulaciones y enfermedades autoinmunes. El uso de plasma rico en plaquetas también se ha popularizado en otras áreas de la medicina. En el campo de la medicina estética, se utiliza principalmente para estimular los fibroblastos cutáneos y las células productoras de factores de crecimiento, así como potenciador de los tratamientos por lipotrasplante. En el presente estudio se documentan una serie de casos clínicos sobre la aplicación de plasma autólogo en líneas de expresión y el resultado en cada paciente con la finalidad de evaluar si efectivamente existe cambio y el plasma rico en plaquetas puede ser considerado el tratamiento de elección para reducir las líneas de expresión.

Key words: Platelet-rich plasma, cosmetic medicine, expression lines.

Palabras clave: Plasma rico en plaquetas, cirugía cosmética, líneas de expresión.

Introduction

Biologically, the PRP (platelet-rich plasma) is composed of serum, a small portion of cells and platelets which contain growth factors, but although the combined presence of all these elements enhances the action of PRP, the fundamentals are growth factors that exert the refresh function donor site and, in general, are the growth factor platelet-derived (PDGF), transforming growth factor-beta (TGF- beta), fibroblast growth factor (FGF), the factor insulin -like (IGF) growth, vascular endothelial growth factor (VEGF) and epidermal growth factor (EGF). TGF -BETA promotes chemotaxis repair cells, promoting proliferation and differentiation of mesenchymal cells, which can help us to regenerate damaged tissue. FGF promotes proliferation and differentiation of non-specialized cells and acts as an angiogenic factor for endothelial cells. IGF also promotes the proliferation and differentiation of mesenchymal cells and adjuvant coating epithelial regeneration process. VEGF promotes chemotaxis and proliferation of endothelial cells and blood vessel Hyperpermeability nutrition promoting infiltration site; summarizing its mitogenic, proapoptotic, chemotaxis promoter and epithelial cell differentiation effect.

The beneficial effects of the treatment have been demonstrated experimentally. In relation to angiogenesis, endothelial cells stimulate PRP close to its site of application, which promotes the proliferation and formation of new capillaries. Moreover it is mentioned that PRP is capable of stimulating the proliferation of undifferentiated cells and stimulate cell tissue maturation in which it is implanted. Likewise it has been reported that mesenchymal cells migrate to where the concentration of growth factors triggering PRP is the proliferation of these once they are in place.

Indications for use report very good results in difficult to heal wounds, maxillofacial bone defects, and cosmetic surgery. Although these applications have reported significant effects, most of the reports are anecdotal and few joined to exclude controls to definitively determine the role of PRP. These studies can often be traced to poor quality PRP produced by inadequate devices for removal because not all currently available devices are equal and there is little consensus on the production and characterization of PRP, which hinders the establishment of standards that are necessary to integrate literature in basic and

clinical science. Studies on the use of PRP in liposculpture shortening convalescence to reduce postoperative seroma formation, improving the quality of life of patients.

First, there is not a recommended standard for the degree of increase in platelets in the PRP, some researchers have suggested that the PRP be achieved was 3-to 8 -fold increase in platelet count.

Since most individuals have platelets near the range of 250,000 per cubic millimeter, the concentration should be increased by approximately 1,000,000 per cubic milliliter concentration can be a therapeutic level. Secondly, the centrifugation must be sterile and precisely suitable for separating platelets from red blood cells and at high concentrations without aduction platelet lysis.

Platelet-rich plasma and tissue engineering

A scar can develop different shapes depending of the patient so that scar tissue cannot be molded or predicted in how long it will take to form. It involved several factors including the patient's race, type of injury, affected skin area, the type of suture used, not to mention the ability of the surgeon. If the scar that is left is deforming very visible or is in a visible area, has an impact on the patient's life. From the moment an injury occurs, the body directs its efforts at healing the loss of continuity. It's called production phase. This lasts about three months and during this large number of cells come to the wound in order to close the loss of continuity of tissues; however the cells are first come fibroblasts which produce extracellular matrix rich in collagen I, inelastic and poorly organized.

In the second phase, called scar maturation, the cells disappear, the collagen fibers are oriented and the scar is bleached and flattened; in the best case yet for the kind of healing many people are subject to poor healing processes and thus discomfort can be reduced by using agents that promote tissue regeneration.

The platelet-rich plasma can be used to improve fitness in many ways and to regenerate damaged tissue. Another application of this treatment is the fight against aging. Therapy with Platelet Rich Plasma can promote in the patient a more complete tissue organization translated into a smoother, wrinkle-free skin in different parts of the body, especially the face.

The best results have been in the wrinkles around the eyes, cheeks and mid-face, neck, jaw line, chest and neck, back of hands and arms, hair growth on the scalp. PRP use tremendously accelerates the rate of normal regeneration pathways that exist in the body. At the time of healing, the body produces many factors and cell types, which accumulate in the wound in order to start the healing process, with the PRP of these processes can be arranged to reduce the healing process and exacerbate feedback.

Is a safe treatment since it is generated by removal of autologous blood, which is why it is not possible to transmit any disease. The blood of the patient is placed in the PRP centrifuge machine and spun. In less than fifteen minutes, the plasma rich platelet form ready for use.

Role of PRP in aging

PRP treatment for revitalizing the epidermis is one of the latest developments in cosmetic medicine to treat facial aging. By allowing separate plasma growth factors from the patient, can enhance, stimulate and accelerate tissue regeneration. Growth factors infiltrate the skin of the face, neck and chest to start and accelerate the regeneration of tissues, thereby increasing the brightness, softness and thickness of the skin and retarding the effects of aging.

This procedure can be administered to prevent and delay the process of facial aging from 35 years of age and older and to correct and regenerate age 45 and older. The results are visible within three weeks of treatment and gradually make progress over the coming months to improve the texture and tone of the face. One of the limitations is that treatment cannot remove wrinkles and advanced minimally perceptible improvement in people who abuse alcohol and snuff. Improvement is not guaranteed when the cracking is very severe; however the use of mesenchymal cells may be helpful. The assigned aesthetic doctor should discuss the appropriateness of treatment in each patient to ensure optimum results.

In short, for over 20 years PRP has been used safely in a variety of conditions with promising implications. Unfortunately, most studies to date are anecdotal or involve small samples. Without a doubt we are seeing increased clinical use of PRP, however more clinical trials are certainly needed. In this paper

we present below a series of clinical cases in which plasma rich in autologous platelets was used to reduce the healing time and revitalize the expression of different patients.

Methodology

To obtain blood samples, intravenous access via a needle was made which allows removal of the venous blood and this was stored in labeled bags ready to anticoagulant centrifugation process. The average volume of a blood bag was 440-460 mL, and these were stored in a suitable location until centrifugation.

Cell separation

The centrifugation step was performed to allow obtaining the maximum concentration of platelets per volume unit, without breakage thereof. Plasma was centrifuged with a digital computer which ensures that time and speed parameters are appropriate.

The first centrifugation was performed at a rate of 280 g (1,400 rpm) for 7 minutes, this is accomplished by first centrifuging the whole blood to separate into a lower red band of RBCs and an upper yellow plasma. This plasma contains a relatively low concentration of platelets (that is what is called low or platelet poor plasma, PPP). Between a strip and the other is the highest concentration of platelets and leukocytes called fringe, and the lower band are red blood cell components. Yellowish plasma (PPP) of the blood tube is removed with a syringe and then introduced into a new tube, the test tube cap is placed and the second centrifugation is performed.

The aim of the second centrifugation is to separate and further concentrated platelets obtained as final product, the PRP. This second centrifugation was done at a speed of 400 g (2000 rpm). With the latter process the tubes form an upper strip of supernatant clear yellow serum containing a very low fibrinogen and platelet concentration, and a lower fringe reddish generally formed by highly concentrated PRP. Subsequently, supernatant serum was pipetted PRP remnant of about 0.5 mm remains in each tube, depending on the initial amount collected. The normal concentration of platelets in hematocrit is 33-40 % of platelets, but after double centrifugation process can obtain a platelet concentration of approximately 330%.

Results

In this paper we evaluate the effect of autologous platelet rich plasma in patients undergoing elective facial surgery effect to correct lines of age and tissue aging marks, the three cases were treated with platelet-rich plasma by varying a concentration of 300 000 per milliliter on average, the results were very similar where there was a reduction in fine lines and marked reduction in convalescence times each.

Case 1. Brief medical history including previous treatments

The patient was referred for elective blepharoplasty procedure, so it will be administered platelet-rich plasma to reduce nursing time and reduce bruising and reduce the presence of fine lines on the face.

Outcome

The patient did not present any complications by the surgical procedure, reducing recovery time by a third than expected. She reports that the discomfort was minimal and in the future will go for a second plasma treatment. Note that the lines were reduced considerably as shown by the second and the last photo in the series (*Figure 1*).

Case 2. Brief medical history including previous treatments

The patient was referred by a process of elective rhinoplasty, he mentions the possibility of using

plasma rich in autologous platelets to firm facial contours promoting adequate oxygenation of subcutaneous tissue to reduce fine lines and somehow complete rhinoplasty treatment, reaffirming the neoplastic tissue generated on the nasal bridge.

Outcome

The patient presented to the clinic with a smooth face without lines, also reports that did not have to take painkillers and discomfort of surgery was removed in a few hours; presented no complications from the surgical procedure, and within 48 hours it was possible to integrate into their daily lives (*Figure 2*).

Case 3. Brief medical history including previous treatments

The patient was referred for a procedure to firm facial contours, blepharoplasty, cheek and commissure was performed, the procedure was elective, and so he was himself offered treatment with platelet-rich plasma to reduce potential surgical complications and reduce times epithelial regeneration.

Outcome

The subsequent patient treatment provided some discomfort during the first 12 hours, and reported taking an analgesic; however it was just a decision and reports that after the first 24 hours not provided any hassle, did not present any complication by the surgical procedure (*Figure 3*).



Figure 1. Patient Data: Age: 52 Gender: Female.



Figure 2. Patient Data: Age: 48 Gender: Female.



Figure 3. Patient Data: Age: 50 Gender: Female.

Discussion and conclusion

Currently, the use of platelet-rich plasma has been developed with countless applications in the medical field, both in cosmetic surgery, orthopedics and also in dentistry and maxillofacial surgery; in this work, the purpose and description of the mechanisms of action favored by the administration of growth factors embedded in platelet rich plasma is reported, first we have seen the effectiveness reported in the literature and reported in magazines

arbitration, the work of Dr. Ira M. German which mentioned that the use of these peptides (growth factors) accelerate the regeneration process in wounds, coupled with the work of doctors Raffoul Akhundov in 2012 where they report still more efficient processing of samples for obtaining plasma and evaluate an experimental study.

Epidermal wound healing, is conditioned for interaction between different cell populations and cytokins, this to maintain skin integrity and youth. PRP is widely used in many fields of surgery for its ability to stimulate wound healing and minimize bleeding during surgery. The preparation is autologous and can be activated to produce mitogenic effects in various cell types. In one study developed by Young Lee in 2011, indicates that fibroblast proliferate and collagen levels also rises, showing superior efficacy on collagen production compared to controls. The stimulation of de novo collagen synthesis may compensate the collagen fragmentation during a surgery or aging process, leading to tissue organization and healthy revascularization also better oxygen input.

In our clinical practice of platelet rich plasma has had tremendous results helping many people referred to both healing problems and cosmetic surgery; day by day improvement was seen in patients resulting in a significant reduction in the time of convalescence and emotional improvement by raising their self-esteem; resulting in a better quality of life.

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