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Atrophic Scar Post Gangrene over the Whole Nose Treated by Fractional CO_2 Laser Combined with Platelet Rich Plasma Gel



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Atrophic Scar Post Gangrene over the Whole Nose Treated by Fractional CO_2 Laser Combined with Platelet Rich Plasma Gel

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Brief Description

A case of atrophic scar post gangrene over the whole nose, occurring after Hyaluronic Acid (HA) filler injection in the nose, was treated by fractional carbon dioxide resurfacing combined with platelet rich plasma gel.

Introduction

Minimally ablative fractional laser devices have gained acceptance as a preferred method for skin resurfacing. Numerous studies demonstrate the improvement in facial wrinkles, photo-damage, acne scarring and skin laxity. More recently, the use of fractional laser has been extended to the treatment of pathological scars[1].

This because fractional ablative laser induces varied biological effects into the tissue, stimulating the dermis to produce new collagen, naturally regenerating the texture and enhancing skin tone and softness. Fractional CO_2 laser is also able to create a micro-environment rich in a multitude of growth factors and cytokines which increase the good quality wound repair as demonstrated in our previous work[2]. Instead, autologous platelet-rich plasma (PRP) gel is increasingly used in almost all field of surgery for the treatment of a variety of soft and hard tissue defects, most notably in accelerating bone formation and in the management of chronic non-healing wounds[3],[4].

A combination between fractional ablative laser and PRP was established in order to improve the aesthetic aspect of a necrotic scar of the nose.

Case History

We present the case of a 37 years old female patient who has a history of previous rhinoplasty operation with alae reduction 4 years before the date of HA filler injection in the nose. The patient was injected by filler in the midline over the nasal bridge and nasal tip by a plastic surgeon. After 24 hours, patient went back to her doctor with severe pain, tenderness, swelling and erythema and she was diagnosed as a case of intravascular (dorsal nasal artery) filler injection followed by severe ischemic and gangrenous consequences, most probably due to disturbed alternative blood supply from lateral nasal artery due to previous alar reduction rhinoplasty. Patient was presented to our center one month after complication (figure 1A). Three plastic surgeons refused the management option by full thickness graft due to the minimal vascularity at the recipient site. Bilateral surgical flaps option, with its consequences of scars in cheeks, was not encouraged by plastic surgeons and it was refused by the patient.

Material and Methods

Patient was treated by fractional CO_2 laser resurfacing (SmartXide² DOT/RF system – DEKA, Italy) with variable settings for 4 sessions at 6-week interval. Four months later, patient had another 3 sessions at 6-week interval.

After every laser session, a PRP gel was applied on the wound. PRP was prepared from 9 ml blood collected in a tube prefilled with 1 ml anticoagulant (ACD-A) solution (Juvederm PERLA's Tube, Juvederm Cosmétiques, Bulgaria) followed by centrifugation 500 x g for 10 minutes, where platelet poor plasma (PPP) was separated, then 1000 x g for 7 minutes to separate

PRP. PRP gel is allowed to form as platelet rich fibrin matrix membrane (PRFMM) by adding platelet poor plasma (PPP) to calcium gluconate 10% for induction of fibrin mesh network polymerization on a special dressing (Juvederm HOD, Juvederm Cosmétiques, Bulgaria) in a sterilized dish and leaving it for 20 minutes in fridge at 40 C. PRP was added directly afterwards to the formed gel. PRP gel membrane (PRFMM) was applied immediately after each session for treated areas and kept for 3-5 days.

Discussion

Platelets-rich plasma (PRP) has been utilized and studied since the 1970s. PRP is used clinically in humans for its healing properties attributed to the increased concentrations of autologous growth factors and secretory proteins that may improve the healing process on a cellular level by enhancement of tissue remodeling. Platelet-Rich Fibrin Matrix (PRFM) was prepared as a membrane based preparation of PRP on top of a specialized dressing without the use of exogenous thrombin. The parameters for fractional CO_2 laser was adjusted to have stimulatory effects for induction of deep tissue healing with minimal ablation using a different pulse shape.

Conclusions

PRP gel prepared in the form of PRFM provides a good scaffold for scar remodeling after fractional CO_2 laser resurfacing. It acts as a reservoir for delivering growth factors (which have short half-life) from platelets and maintaining platelets concentration for enhancement of post laser fractional ablative wound care. Fractional CO_2 laser resurfacing played an important role in both tissue remodeling as a first step and enhancement of transepidermal growth factors delivery as a second step.

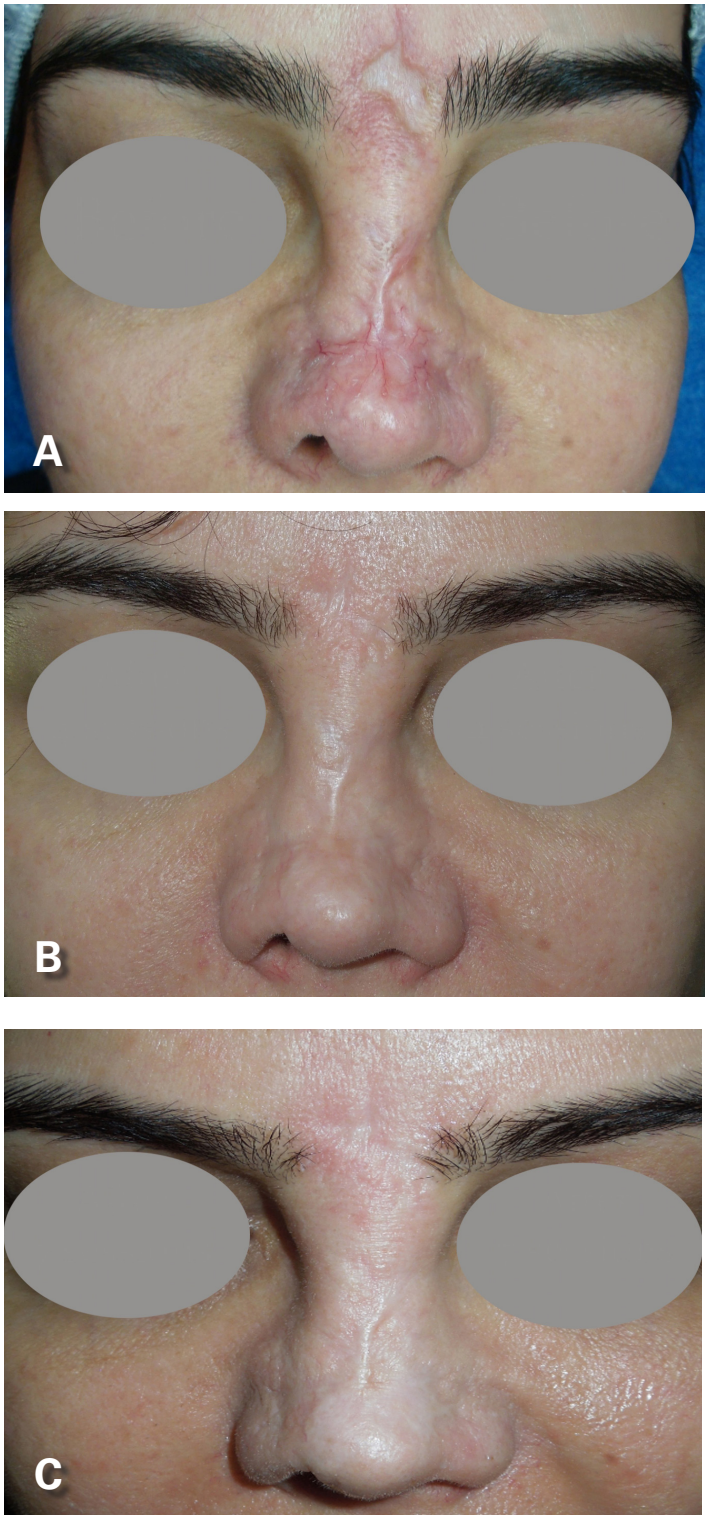


Figure 1. (**A**) Patient condition before starting the laser + PRP treatment. (**B**) Scar aspect after 4 sessions at 6 weeks' interval. (**C**) Scar aspect after 4 sessions at 6 weeks' interval. We observe a good result with a drastic reduction of the erythema and atrophy and consequently a great scar and nose aspect improvements. *[This clinical case won the 4th Anti-Aging & Beauty Trophy 2016-2017 in the category "Best Clinical Case in Laser Procedure"]*

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