Case Report

Functional Interest of the Platelet Rich Plasma in the Perioral Sclerosis: An Interesting New Treatment Perspective

Alice Prevost¹, Cristina Livideanu², Zoé Cavallier¹, Franck Boutault¹, Frédéric Lauwers¹, and Raphael Lopez*¹

¹Department of Maxillo-Facial Surgery, Purpan Hospital, France
²Department of Dermatology, Larrey Hospital, France

Abstract

The incidence of buccofacial manifestations of systemic sclerosis and their impact on patients’ quality of life are often underestimated. We present the case of a 68-year-old female patient with significant microstomia that was impeding her oral hygiene care and feeding. Considering the absence of a generally agreed treatment and the wish of the patient to benefit from a quick safe and mini-invasive treatment we propose perioral injections of PRP at the rate of one session per month. After one and a half years of treatment, we obtained an improvement in interlabial distance with improvement in the MHISS score (42 to 10), significant weight gain and an improved Rodnan score (3 to 1). Given these encouraging results, we decided to conduct a feasibility study, currently underway.

INTRODUCTION

Systemic Sclerosis (SS) is a condition characterised by association of fibrotic skin and visceral lesions associated with microcirculatory involvement [1].

The incidence of buccofacial manifestations of SS and their impact on patients’ quality of life are often underestimated.

Buccofacial involvement compound with various degrees, sclerotic skin lesions, telangiectasia, thinning of the lips, perioral radial folds and a limited mouth opening due to the soft tissue retraction. As buccal sequela, bone resorption may be observed, as well as a widening of the dentoalveolar space, leading to a periodontal alteration. Other symptoms include neuralgia of the mandibular nerve, xerostomia or facial asymmetry caused by muscular involvement by muscular spasm in the case of linear scleroderma [2-4].

We present the case of Ms S aged of 68 years affected by a systemic sclerosis since 2007 leading to a severe functional prejudice.

MATERIALS AND METHODS

Ms S consulted at our department in April 2015 with complaint of an inability to carry out her oral hygiene and manage her dentures.

The maxillo-facial examination found significant microstomia with an interlabial distance less than 1 cm (however a normal temporomandibular function), very pronounced perioral radial folds, labial retraction, xerostomia, peri-implantitis with instability of her mandibular prosthesis, and weight loss with a body mass index of 16.

The patient also has polyarthritis and pulmonary fibrosis.

We evaluated the impact on her quality of life using the MHISS scale [5], with the results shown in Table (1).

Given the patient’s severe functional impairment compromising her psychological status and the absence of a generally agreed treatment, we proposed the PRP injections.

We started at the rate of one session per month performed in strictly aseptic conditions using the departmental protocol (four tubes of blood drawn, centrifugation at 2,800 RPM for eight minutes). Before starting the injections, we applied local anaesthesia (EMLA cream: Astra Zeneca®) then we injected the platelet concentrate into all the perioral folds. The local ethics committee carried out this treatment after obtaining the written informed consent and a favourable opinion.

The following parameters were recorded during follow-up:
- Interlabial distance (measured by a sliding calliper).
- The oral aperture is defined by the articular reports. In the
absence of articular comorbidities a defective oral aperture is secondary to a loss of skin elasticity leading to microstomia. As our patient was edentulous, we felt that the interlabial distance (the sliding caliper placed on the wet-dry line of the lips) was the most sensible marker,

- Rodnan Score [6] for the face (0: skin of normal texture and thickness, 1: thickened skin that can still be pinched into a fold, 2: thickened skin with inability to pinch into a fold, 3: skin thickened and stiffened at deeper levels),
- Impact on quality of life with the MHISS scale,
- Body Mass Index.

RESULTS

Interlabial distance

The patient was initially completely unable to open her mouth, which had a “pursed lips” appearance. The interlabial distance measured at M18 was 30 mm.

Rodnan score

The score went from 3 to 1 from J1 to M18

MHISS score

Initially 42, the evaluation in the 9th month found a score of 26, and the last evaluation (18th month) found a score of 10

Body mass index

The initial BMI was 16, compared with BMI of 18.7 mid-treatment and 21.1 in September 2015 (but corticotherapy had been initiated in the meantime).

Other benefits

The improvement in interlabial distance enabled us to carry out a prosthetic rehabilitation: extraction of the mandibular implants, vestibuloplasty and insertion of maxillo-mandibular implants.

We also noticed increased bleeding at injection points during the sessions, possible evidence of neoangiogenesis.

As the injection technique was similar to that used for fillers, in addition to the effect on skin elasticity we obtained a satisfactory filling effect even if only temporary (Figures 1, 2).

DISCUSSION

The local and general effect of the Platelet-Rich-Plasma injection are increasingly known and described in the literature [7-12].

The local effects at the skin and subcutaneous level were studied in particular on animals (dogs, mice).

These effects stem from several mechanisms:

- Progressive distribution of growth factors such as PDGF / IGF [7].
- The authors conclude that the PRP would consist of an intimate assemblage of cytokines, glycanic chains and glycoproteins. All these biochemical components have proven synergetic effects on cica
trization, for example fibronectin and PDGF-BB. Indeed as a rail for proliferation and migration, fibronectin potentiates the stimulatory effects obtained by PDGF-BB.
- Production of collagen and orientation of collagen fibers

A study conducted in 2015 [7] looked at the local effects of PRP injections in the evolution of wound healing of acute full-thickness skin defects in dogs. The authors show that PRP injections increase tissue perfusion and may promote the formation of organized collagen bundles. The histological study revealed a tendency towards greater collagen production and a significantly better collagen orientation in PRP treated wounds.

Another study was conducted on the dog [8] and focused on the injection of PRP on acute skin wounds. Histological analysis showed that wounds treated with PRP showed more granulation formation and collagen deposits as well as early angiogenesis.

Activation of neoangiogenesis

Studies conducted Cho-Hee Jee et al. [8], and by Karayannopoulou et al. [9], confirm the pro-angiogenic effect of PRP, which was confirmed by the study by Serratrice et al., [10].

Anti-inflammatory effect (activation of leucocyte cytokines) [11]

The PRF is not only a platelet concentrate but also a immune concentrate capable of stimulating host defense mechanisms at an injured site. And it is even probable that the perfect regulation of the inflammation observed on the sites treated with PRF is due to the feedback Cytokines trapped in the fibrin network and
released during remodeling of this initial matrix.

The general effects of PRP injections were evaluated by Wasterlain et al. [12]

The authors conducted a descriptive lab study on 25 patients before and after intratendinous leukocyte-rich PRP injection. They demonstrate that the serum levels of IGF-1, VEGF and bFGF are significantly elevated after PRP injection, supporting a possible ergogenic effect of PRP. It's appears to trigger an increase in circulating growth factors by activating biological pathways rather than serving as a vehicle for the direct distribution of pre-synthesized growth factors.

The absence of standard treatment in the context of the sequelae of scleroderma led us to propose a trial treatment.

Bennani et al. [13], recently studied the effect of a CO2 laser for microstomia in four patients, with interesting results (improvement of the interincisal distance, the MHISS score and the Rodnan score).

Sautereau et al. [14], found the same results after assessing the effects of lipofilling on 14 patients with SSc. However there was a lack of statistical significance.

Comparing to lipofilling, the technique we used has the advantage of being easier to reproduce in an ambulatory medical care. Ad it is easier and quicker to take a blood sample than to perform liposuction even when this is localised.

Our results need to be confirmed by a comparative prospective study on a greater number of patients, allowing a statistical analysis.

REFERENCES
