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Case Report

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Non-Invasive Treatment after Infection in Rhinoplasty: Case Report

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Abstract : Rhinoplasty is a standard surgical procedure for correcting aesthetic and functional nasal defects. However, it can lead to complications, both immediate and long-term. Immediate complications like infection can result in tissue loss and scarring, causing severe aesthetic and functional issues. Correcting these nasal sequelae requires techniques that balance optimal results with minimally invasive procedures in an area already compromised in its tissue support and blood circulation. The risk of necrosis associated with hyaluronic acid fillers in areas of limited arterial circulation is well-documented. Recent research has highlighted the properties of facial fatty tissue in skin aging, photosensitivity, and stem cell differentiation. Additionally, polydioxanone threads, widely used in surgical and aesthetic applications, have been shown to promote neocollagenesis, growth factor production, and tissue support. This report presents a case of severe nasal sequelae following post-rhinoplasty infection, that was treated by using adipostructuring, bioactive product deposition in nasal fat compartments, and insertion of polydioxanone monofilament threads.

Keywords: Rhinoplasty complication; Infection; Adipostructuring Technique (AST); Bioactive ingredients; PDO threads

INTRODUCTION

Rhinoplasty is a surgical technique that corrects aesthetic and functional problems. In 2020, more than 2 million rhinoplasties were performed in the USA, 15% of all aesthetic procedures. The complications which are classified as immediate and late, the first being epistaxis, periorbital ecchymosis, septal hematoma, infection, and skin necrosis. In contrast, the late ones include the scar's hypertrophy and the septum's perforation and enophthalmos. In terms of infections, ranges of 0.1 - 0.5% have been published [1]. The causes involved in this are de-vascularized bone spicules and hematomas. The bacterial germs most frequently associated with these are Streptococcus pyogenes and Staphylococcus aureus [2]. It is "tempting" in patients to think about using filler products such as Hyaluronic Acid to correct tissue loss. However, the complications of this technique in patients who had a rhinoplasty and added infection can produce devastating results since the arterial circulation in this territory is minimal and with new and unknown anastomoses, which could lead to extensive areas of necrosis [3,4]. That is why the presentation of this report and the use of non-invasive techniques constitute suitable therapeutic alternatives for this type of complication.

CASE REPORT

A 44-year-old female patient suffering from a complication - infection – during year 2021 after a rhinoplasty, (Figure 1) shows the septic process after his surgery and prior to hospitalization for treat-

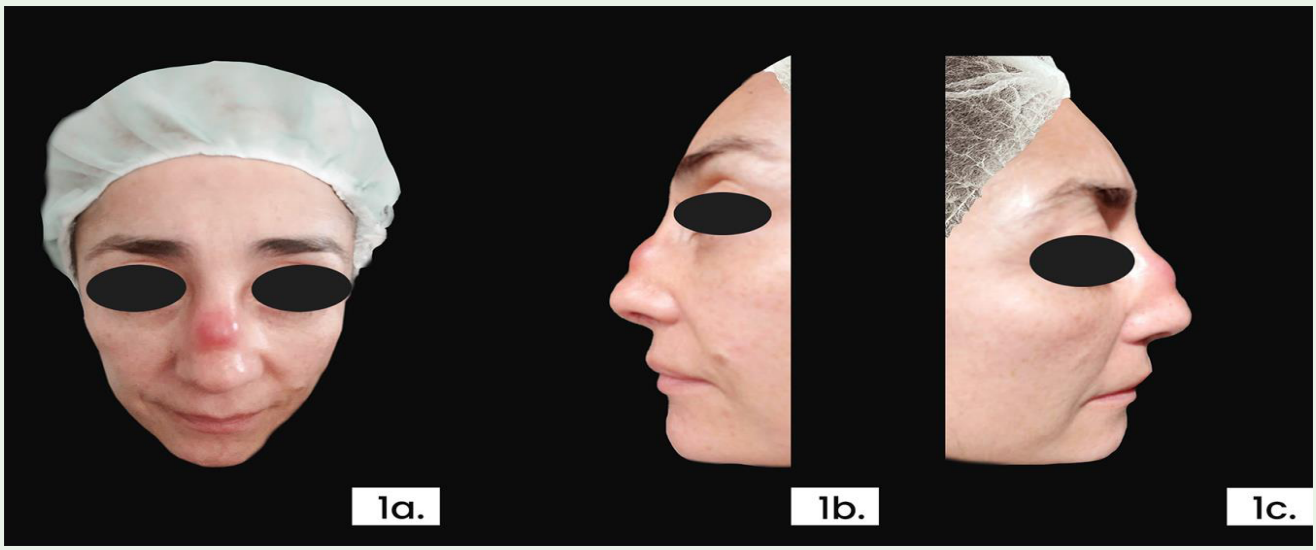

Figure 1: 1a, 1b, 1c. Front and side view images during the course of the nasal infectious process, an inflammatory septic collection is seen on the nasal dorsum. (Photos contributed by the treating surgeon).

Figure 2: 2a. Frontal view, laterorrhinia and right cartilaginous sequestration located cephalad to the alar cartilage , 2b. Left view, significant loss of cartilaginous dorsum and severe osseous/cartilaginous unevenness, 2c. Lateral right view, loss and significant subsidence of the nasal dorsum, 2d. Asymmetry of the nostrils, slight deviation of the columella and poor projection of the nasal tip.

ment indicated by her treating surgeon. After two years, she requested a medical assessment. The clinical examination confirms a significant deformity of the nasal pyramid, which highlights the collapse of the cartilaginous structures, proper medial cartilaginous sequestration, laterorrhinia, and a significant osteocartilaginous unevenness with loss of nasal dorsum (Figure 2).

Adipostructuring Technique [5] (AST), which consists "of the panniculopathic reorganization of the facial fat compartments depending on its structure, physiology and biomechanics, without extracting them under any circumstances" was carried out , in nasal fatty remnants with a deposit of Adipoestructure Mioface Harmony Ⓡ (AMH), record Institute of Public Health of Chile (ISP) 2601C-3/23.4/23.2/23, -one session a month for three months- and subsequently use of Aphrodite monofilament Polydioxanone threadsⓇ (PDO), ISP 2616/23. AST of the nasal dorsum, the columella, nasal wings and pyramidal structure is performed with a cannular carving technique, performing movements with the amperage cannula and torque on the nasal panniculopathic system and the cart as seen in (Figure 3).

A 23 G- 40 mm cannula is used to deposit microdoses of 0.1 ml -in each nasal adipose compartment- of AMH consisting of active principles that make up the restructuring system, such as centella asiatica [6], caffeine [7], organic silicon [8] , rutin [9], mellitus extract [10], sodium pyruvate [11], dimethyl amino ethanol [12] and L-carnitine [13] ,among others [14]. After what was described, in 3 months, 57 27 G monofilament PDO threads 13mm were applied in,

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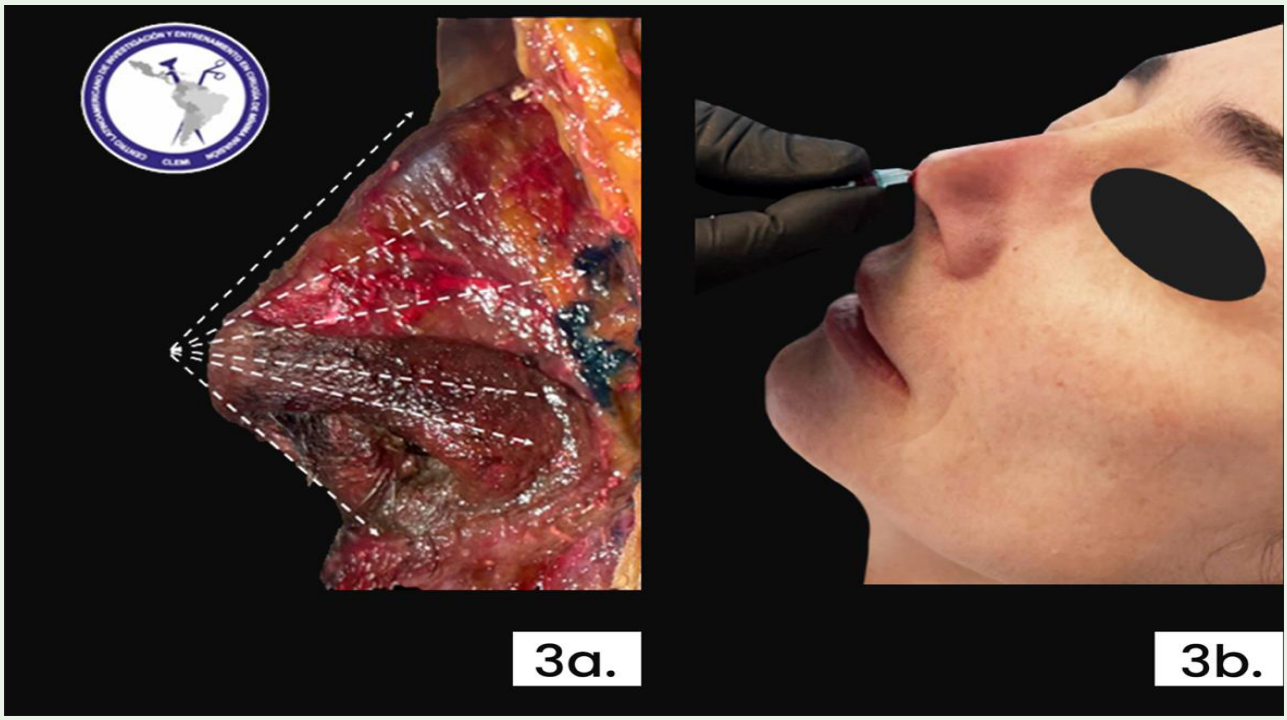

Figure 3: : 3a Planimetric design on a cadaveric figure, using the AST, 3b PDO thread insertion into the nasal dorsum. (3a. Image obtained by dissection by the authors at the CLEMI Institute).

Figure 4: 4a. The frontal view shows improvements in the laterorrhinea and nasal dorsum alignment, 4b. The lateral view shows a decrease in the bone/cartilage imbalance, 4c. An improvement in the sinking of the nasal dorsum, 4d. The nasal cavities appear symmetrical, aligned and with better projection of the nasal tip.

bilaterally ,the areas of most significant depression due to tissue loss . The nasal dorsum received [15] monofilament PDO threads of 29 G-25mm and three monofilament PDO threads of 30 G-38mm. Eight months elapsed from the beginning to the end of the treatment and the evolution can be observed in (Figure 4).

DISCUSSION

In international literature, different authors published [15-17] the distribution of SMAS and nasal fatty compartments using ultrasound images, cadaveric dissections, and nasal surgeries. They explain the distribution of fatty tissue in the dorsum, interdomal, nasal wings, submuscular, and nasolabial groove, concluding that this anatomy is vital to the success of different procedures on the nasal pyramid. The AST, the deposit of bioactive products, and the insertion of PDO threads strictly followed these anatomical specifications during all stages of treatment of our patient. Important research [18] concludes

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that "understanding the precise location of superficial and deep facial fat compartments and their boundaries is crucial for performing safe and effective minimally invasive facial procedures". New scientific publications [19] propose lines of research related to using the versatility of Hyaluronic Acid to incorporate bioactive molecules into its formulation, including proteins, peptides and drug. In an extensive review it is analyzed [14] (page 5), the bioactive products contained in AMH and their action on adipose tissue: regulation of oxidation, anti-inflammatory effect, activation of angiogenesis, collagenases, senolytic action, and stimulation of adipogenesis, among others [6 -13] (page 5). On the other hand, different researchers [20-22] highlight the role of Facial Adipose Tissue (FAT) in skin senescence and refer to Subdermal White Adipocytes (SWAT), as well as those that are closely related to the Epidermis (dWAT), and have different capacities to improve skin mechanics. Researchers should shift the paradigm of Soft Tissue Fillers (STF) [23] from neocollagenesis in the dermis to STF-stimulated spatial expansion of FAT, and they hypothesize that dermal adipocytes may play a role in the long-term effects of STF. Scientists also know that mechanical stress and different physical factors trigger the stimulation of FAT derived stem cells. These factors sustain the multifunctional capabilities and plasticity of facial dermal adipocytes and their ability to change their phenotype quickly. This may explain the role of facial dermal adipocytes in injury recovery and scar defects [24-27]. These observations could elevate dermal adipocytes to primary targets in strategies to counteract skin aging [23]. The above suggests a rationale for targeting adipose tissue in a scar-related setting. The other proposed plan considers the insertion of PDO monofilament threads widely used in surgical procedures, which has demonstrated in different scientific studies histological and molecular changes, a marked infiltration of inflammatory cells and fibroblasts, and the significant presence of Transforming Growth Factor Beta (TGF-β1) -cytokine related to the expression of collagen-[28,29]. PDO sutures cause specific changes in the surrounding tissues, resulting in neocollagenesis, fibrous fusion effect, tissue contracture, and an improved vascular environment [30].

CONCLUSION

As a result of the limited treatment options available for these severe infections, AST with its mechanical action on the remaining fatty compartments and the deposition of bioactive products, the tissue support effect and collagen stimulation of PDO threads, can offer a simple, low-cost solution with good aesthetic and functional results.

CONFLICTS OF INTEREST

The authors report no conflict of interest.

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The patient signed the informed consent form after understanding the nature of her treatment.

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