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FACIAL OVERFILLED SYNDROME: A REVIEW OF PATHOGENESIS, CLINICAL PRESENTATION AND MANAGEMENT

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ABSTRACT

Facial overfilled syndrome is becoming an increasingly common complication in the field of aesthetic medicine. It may result from repeated and excessive filler injections, the use of improperly selected products, or their placement in inappropriate areas of the face. Although fillers are generally considered safe, their use can lead to a variety of complications. To prevent and manage potential issues, it is crucial that practitioners performing these procedures fully understand the extent and types of adverse events that may occur. This article provides a review of current literature on the concept of facial overfilled, including its pathogenesis, clinical presentation, and treatment options.
Objective: To review selected articles, literature and recent reports on the pathogenesis, clinical presentation and treatment of facial overfilled syndrome (FOS).
Material and Methods: A literature review from PubMed and Google Scholar.

KEYWORDS

Facial Overfilled Syndrome, Fillers, Filler Overused, Complications, Unnatural Outcome, Hyaluronic Acid

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Introduction

Over the past several years, we have seen a significant development, as well as an increase in the popularity of aesthetic medicine. Tissue fillers can be a notable alternative to plastic surgery. They allow us to maintain adequate volume in recessed areas of the skin and maintain a youthful, attractive appearance. Nonetheless, with continued, ongoing development, we are also seeing an increase in the number of side effects of their use. Potential complications associated with the use of fillers depend on their type and site of application. Proper education, recognition and implementation of treatment are of great importance.[2][19]

Fillers

Low-invasive treatments such as soft tissue fillers injections involve almost every area of the face, including the lips, forehead, jawline, nose and cheeks. At the same time, with advances in aesthetic medicine, there is increasing knowledge about fillers, the interaction of these products with tissues, as well as facial anatomy, especially in terms of safety and improving treatment outcomes.[3]

In aesthetic and reconstructive medicine, facial soft tissue filling is performed using several biomaterials. Fillers may come in the form of liquids, biological fragments or suspensions of particles or microspheres, each of which has a specific method of implantation and possible complications. Fillers are categorized as temporary or biodegradable, permanent or non-biodegradable, and a combination of both materials. Soft tissue fillers are classified according to their duration of action as temporary, long-lasting, semi-permanent and permanent.

Examples of biodegradable fillers include hyaluronic acid (HA), collagen (bovine, porcine and human), poly-L-lactic acid (PLLA), calcium hydroxyapatite (CaHA) and dextran beads in hyaluronic acid.

Examples of non-biodegradable fillers include polymethyl methacrylate microspheres with bovine collagen, polymethyl methacrylate microspheres suspended in carboxygluconate gel, silicone, saturated hydrocarbons, polymethylmethacrylate silicone suspension, acrylic hydrogel particles suspended in hyaluronic acid, polyacrylamide gel, polyvinyl microspheres suspended in polyacrylamide, e-polytetrafluoroethylene, Gore-tex and autologous fat.[2][20][25]

Hyaluronic acid is an anionic, non-sulfated glycosaminoglycan that is highly hydrophilic. It is a popular choice among facial fillers because it is biodegradable and non-immunogenic. Despite their general commonalities, HA fillers differ in terms of various characteristics, such as concentration, degree of cross-linking and viscosity. There are several techniques that can be used to accomplish the midface augmentation. These substances are generally safe, but can cause complications that can vary from minor, such as local skin reactions, to serious, including skin necrosis and blindness.[15]

Complications associated with the use of fillers

Soft tissue fillers are versatile tools for improving a patient's appearance. They are generally uncomplicated to use and the patient does not require a long recovery time. This simplicity in their use should not be misinterpreted as an absence of adverse events. As with any medical intervention, an extensive knowledge of the substance, its interaction with the patient's tissues and potential side effects is crucial, especially to maximize benefits and avoid serious complications. All side effects should be taken seriously and patients should be carefully monitored.[18]

We divide adverse events associated with aesthetic medicine procedures into mild ones, such as local infections, granuloma formation or allergic reactions. However, there are also more serious complications,

such as skin and tissue necrosis and blindness, which arise from unintentional arterial embolization or vascular compression and are associated with significant risk to the patient.[4][22]

Many complications, especially those related to vascular abnormalities, are related to procedural problems, which emphasizes the importance of understanding the properties of fillers, injection techniques and facial anatomy. Preventing side effects is very important, as is detecting and managing complications.[4][27]

Pathogenesis

The pathogenesis of facial overfilled syndrome is multifactorial. One of the main causes is a lack of awareness in the aesthetic medicine industry. Many people perform procedures without proper education and training, following the theory that facial aging is caused by loss of facial volume.[1]

In recent years, a group of researchers has identified a disorder underlying the facial overfilled syndrome, which is characterized by an unbalanced transformation of the functional facial anatomy at rest and during facial expressions. Patients with FOS display overly voluminous cheeks, an unnatural smile, sunken temples and reduced mobility of the mouth area. The syndrome can be caused by overfilling of facial compartments, but also by inappropriate filler placement. Researchers have described for the first time in the literature an anatomical structure in the middle part of the face, which has been named the transverse facial septum and which is connected to the lower surface of the greater zygomatic muscle and forms the lower border of the superficial and deep fat compartments. Together with the superficial musculofascial system of the midface (SMAS), the transverse facial septum has been described as crucial to the natural expression of the face and the physiological movement of both the superficial and deep fat compartments. The latter compartments are a prime target for minimally invasive cheek volumization procedures using soft tissue fillers. It is likely that excess filler in the midface can affect the physiological mobility of the soft tissues by increasing local volume, thereby affecting the normal movements of the transverse facial septum, greater zygomatic muscle and midface.[3]

The transverse facial septum provides support for the deep medial and lateral cheek fat compartments. Contraction of the greater zygomatic muscle during smiling can potentially tighten the septum and change its conformation. This change can lead to a cranial shift of the midface fat compartments and consequently increase the anterior projection of the midface. Filling it with autologous fat or soft tissue fillers can increase the total volume of the midface, resulting in altered facial expressions and an unnatural distribution of midface volume, which is the core of the facial overfilled syndrome.[7][23]

In addition, the illegal market for injectables continues to grow in many parts of the world as patients look for a quick and inexpensive way to get an improved appearance. These injectables are usually not performed in a medical facility, by an unlicensed supplier. One of the most popular illegal fillers is a type of silicone known as biopolymer.[5]

Moreover, due to the relatively smaller and brachycephalic shape of the skull, the more prominent zygomatic process, and the zygomatic arch, people of Asian descent are more prone to facial overfilled syndrome, even with a small amount of filler.[8]

Clinical presentation

Facial overfilled syndrome is characterized by an unnatural, sometimes even deformed appearance of the face, which is usually due to excessive use of fillers. It doesn't happen overnight, and it's not a one-time occurrence, but a progressive condition. FOS can manifest itself in a variety of ways: over-filling the forehead can result in a “flowerhorn” shaped forehead, over-injection of the substance in the cheek area shifts the eyes upward, leading to “sunset shaped eyes”, over-injection of the substance in the nose can result in a wide nose or an Avatar style nose, while an over-filled mid-face can contribute to a flying saucer or pillow shaped face. An overfilled chin can result in a “witch's chin” or a “dagger's chin”.

Overfilled face syndrome most often affects women, while it can also occur in men. Inadequate knowledge and understanding of skeletal structures and facial soft tissue distribution in different ethnic groups and subtypes is one of the main reasons for this syndrome. Blindly following certain mathematical facial proportions without respecting the human skeleton is misleading and inappropriate.[6][24]

In most cases, overfilled face syndrome manifests as excessive midface volume and/or an unnatural smile, which is difficult to detect due to the lack of standardized assessment methods. Patients suffering from facial overfilled syndrome may not experience symptoms at all or may only complain of an unnatural appearance. Awareness of such symptoms, as well as diagnosis and implementation of appropriate treatment, is very important.[3]

Diagnosis

The foundation for the diagnosis of FOS is a physical examination of the face. The aesthetic physician and plastic surgeon can, in most cases, make the diagnosis by looking at the patient's face and assessing the placement of fillers. In some circumstances, diagnostic imaging, particularly ultrasound, MRI or CT scans, can be used to assess the distribution of fillers and to choose the most appropriate treatment.[1][30]

There are situations in which we do not know what substance has been injected. In such cases, it is important to be able to locate and identify the substance. Studies have shown that MRI can be used to determine the identity of unknown facial fillers and detect complications, including facial overfilling. MRI imaging can be very helpful in targeting corrective treatment and evaluating outcomes.[13]

Management

Treatment of overfilled face syndrome depends on the severity of the condition and the individual patient's goal. FOS can be effectively corrected by the administration of hyaluronidase. Hyaluronidases are enzymes that degrade hyaluronic acid (HA). These enzymes are widely used in aesthetic medicine because of their role in preventing complications from improper HA injection, eliminating lumps or correcting unsightly overfilling. One of the biggest advantages of using hyaluronic acid is its reversibility. Hyaluronidase dissolves hyaluronic acid and can be used to reverse its effects. This enzyme is effective in reducing swelling and improving blood flow in vascular obstructions. Hyaluronidase treatment has an acceptable safety profile, and allergic or hypersensitivity reactions are rare in aesthetic medicine.[10][12][14][21]

In the case of advanced FOS, hyaluronidase with lidocaine is injected into areas of overfilled facial areas, or irregular thickening. It is necessary for the injection to perforate the lumps, and for the needle to penetrate the biofilm or capsule surrounding the filler mass. A biofilm is a collection of bacteria adhering to a matrix made of their own secreted polymers. When the skin is punctured during a soft tissue filler procedure, the biofilm, which is on the surface of the skin, can penetrate deeper structures and release individual bacteria, causing a local or systemic infection. Biofilm-related infections should be suspected in any red, sclerotic areas that appear after treatment. It is important for the clinician to identify the layers where fillers may have been placed. Nonetheless, it is often very problematic to detect clear borders for the location of fillers, which is why injections are made at multiple depths and angles to achieve penetration into multiple biofilms or envelopes and allow hyaluronidase to work.[8][16][25]

Generally, facial lumps and thickening appear within days or weeks after filler injection and are typically painless. In all likelihood, they are the result of suboptimal techniques, such as overuse of the filler, superficial placement and incorrect use of the product. Nodules that appear early after treatment may respond to massage. In that case, observation, needle aspiration or minimal wound incision, and also the use of hyaluronidase is recommended.[9][28][29]

Mild FOS can be treated conservatively, with patients avoiding excessive and too frequent injections of fillers.[1]

Summary

Hyaluronic acid aesthetic medicine treatments are minimally immunogenic and can be enzymatically degraded by hyaluronidase. These treatments are among the most popular, and HA substances are the preferred type of filler. However, early and late complications can also occur with HA, including facial overfilled syndrome. Aesthetic physicians should be experienced in the selection and application of specific substances. As such, they should have detailed knowledge of the patient's facial anatomy, the products used during the procedure, and demonstrate knowledge of appropriate preparation and injection techniques. Most adverse events can be avoided with proper planning and technique. Achieving a harmonious and symmetrical appearance requires consideration of the face in motion, not just at rest. This concept requires a detailed understanding of the anatomical configuration and dynamic changes of the soft facial tissues covering the skeleton, as well as the age-related transformations these tissues undergo. A detailed analysis of the face, consistent with current aesthetic standards and tailored to individual anatomical nuances, is crucial.[11][17]

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