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BIBLIOGRAPHICAL REVIEW OF TREATMENT OF THE MALAR AREA WITH HYALURONIC ACID

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ABSTRACT

Stabilized hyaluronic acid of non-animal origin has lately been used in different regions of the human body; Since its approval by COFEPRIS in 2000, for the treatment of wrinkles, folds and since 2006 its use has been indicated for different areas of soft tissue atrophy at the facial level, with the main regions of the malar, chin or depressions in the mandibular border, etc. The production of hyaluronic acid has been boosted worldwide and we have different physical characteristics, in addition to the amount of crosslinks and the concentration per ml. All these characteristics mean that hyaluronic acid can form several subtypes, which makes it very versatile, allowing it to help refinement in facial volumetric rejuvenation. In this study, the mechanism of action, the indications, precautions and recommendations that should be taken to have an adequate and safe treatment will be presented.

HISTORY AND MAIN FUNCTIONS OF HYALURONIC ACID

Hyaluronic acid was discovered in 1934 by the German pharmacist Karl Meyer and John Palmer who managed to isolate it from the vitreous body of the eyes of cows. In 1942, the scientist Endre Balazs was able to synthesize the acid from the combs of roosters, which to this day continues to be one of the sources of hyaluronic acid. Later the parts of the body that contain large amounts of hyaluronic acid were discovered, this substance is mainly found in tissues and organs of our body such as: connective tissue in the spine, cartilage, synovial fluid of the joints and epidermis (table I); Among its main properties we have that it allows the hydration of the skin by the physiological action of water retention; (10,3) in addition, it also helps to provide firmness and softness in the skin by lubricating the collagen fibers; (3) it serves as a defensive barrier since it prevents the movement of certain pathogens. (table II). The metabolism of Hyaluronic Acid (HA) is very dynamic, it is degraded by several types of enzymes: Hyaluronidase, beta-D glucuronidase, betaD-N-acetyl-hexosaminidase; the first being the most important. (4, 10).

Clinical uses: It is currently used in many areas of health, due to the functions and properties it possesses:

In orthopedics, it is used for joint problems; In the study conducted on "Acute local reaction after intra-articular infiltration with Synvisc," new findings are discussed that highlight the benefits of the use of hyaluronate in patients with osteoarthritis, effectively reducing inflammation.

In plastic surgery it turns out to be a non-invasive alternative that helps to rejuvenate the skin.

MATERIALS AND METHODS:

A bibliographic review was carried out, using databases such as Google scholar, Scielo, Science Direct; Keywords were used such as hyaluronic acid, malar zone; making combinations with the conjunction Y (AND) and the disjunction O (OR), terms such as: Filling materials, Facial remodeling, Malar region, Rejuvenate, Beautify, Prevent were also included

For the selection of studies, observational publications, bibliographic reviews, and systematic reviews were included. The quality of the articles was assessed by STROBE for observational studies; Based on the selected articles, the generalities about hyaluronic acid, the objectives, are initially described, to conclude with the results, discussion and conclusions.

CONCEPT AND CHARACTERISTICS

HA (hyaluronate at physiological Ph), is a glycosaminoglycan, a polysaccharide of high molecular weight (between 100,000 and 8,000,000), with a structure of repeating disaccharide units, made up of 200-10,000 linear polyanionic polymers of N-acetylglucosamine linked to acid D-glucuronin (Fig. 1) [D-glucuronic acid (1-B-3) N-acetyl-D-glucosamine (1-b-4)] n. Each of the HA molecules is 2.5 μm in length, but can be as long as 20 μm. The total concentration in humans is about 15 g, renewing a third every day. Its plasma half-life is 2.5 to 5.5 minutes (2).

One of the main functions of hyaluronic acid HA is hydration, lubrication and cellular stabilization, it represents an alternative in the treatment of facial aging and has been used for more than a decade in the filling of soft tissues to correct depressions in the skin, wrinkles and skin folds and lasts for 4-12 months. (3,28)

The suitable filler material should have the following characteristics:

- It should be biocompatible with the implantation area,
- Induce minimal reaction to foreign body,
- Remain stable in the implanted place,
- Maintain its volume and not make prominence on the skin,
- Do not migrate at a distance and do not be phagocytosed [2,3].

Among the adverse effects these can appear many years after treatment and, sometimes, the removal of the injected material is the only therapeutic possibility.

ADVERSE REACTIONS

HA does not have specificity for any organ or species, so no skin tests are needed prior to HA injection because it is biodegradable (5). The few reported cases of hypersensitivity reactions due to this filler material could be due to impurities from bacterial fermentation, such as the presence of DNA, rather than the HA itself.

Adverse reactions from cosmetic fillers can be divided into:

- Immediate (0-2 days), they are frequent, but for the most part transitory and banal, and include pain, itching, bruising and inflammation, among others.
- Early (less than 14 days), more frequent are infections and eczema
- Late (after 14 days). they can appear months or years after infiltration, and include infections, granulomatous reactions, and migration. Among others.

Intralesional injections with hyaluronidase are the treatment of choice to reverse these local hypersensitivity reactions. Systemic hypersensitivity reactions secondary to HA injections are even rarer than local side effects

HA is probably the most widely used absorbable filler today. Its advantages with respect to collagen are that it does not require storage in a refrigerator, it does not require overcorrection, it is not mandatory to do a prior allergy test and its duration in the tissues practically doubles that of collagen, since it persists an average of 6 months.

Indications:

- Injection into lips,
- Nasolabial folds,
- Glabella,
- Cheeks,
- Lacrimonasal sulcus,
- Front,
- Mandible,
- Hands,
- Breasts or buttocks

LOCATION OF HYALURONIC ACID

The skin, given its great extension, constitutes the first reservoir of the whole body, accounting for 50% of the total (6). In the epidermis it is found in higher density in the stratum spinosum, in lower density in the basal layer and it is not found in the stratum granulosa and corneum (7). In the dermis it is found between collagen and elastic fibers, spatially related to collagen microfibrils (8). HA patterns in the skin change according to the age of the subject, tending to decrease in its free form.

HA AS A TREATMENT OF SKIN AGING

HA for the treatment of skin aging can be obtained from natural substances, such as cockscomb, shark fin and umbilical cord, or through bioengineering techniques, thanks to a bacterial fermentation process.

One of the newest cosmetic techniques in the treatment of skin aging is the one that attempts to correct wrinkles by infiltrating certain substances, among which is HA. However, the short duration of the beneficial effects requires frequent applications, partially limiting the good results obtained.

HYALURONIC ACID + DEXTRANOMER MICROPARTICLES

It is a fairly recent filler material, used since 2004 for cosmetic purposes. It is a suspension of a resorbable gel composed of a mixture of non-animal HA and dextranomer microspheres (Matridex®, Revidermintra®). Its duration is estimated at one or two years, which is the time it takes for the dextranomer spheres to degrade into sugars.

Indications

It is used for the cosmetic treatment of facial lines, wrinkles and for lip augmentation.

Adverse effects

There is only one published case of granulomatous reaction to Matridex®, on the cheek of a woman 4 weeks after injection. The biopsy showed a suppurative granuloma around a foreign material represented by HA.

PRODUCTS USED IN FILLINGS FROM THE MALAR REGION

Currently one of the most widely used fillers and undoubtedly the best studied is a "non animal stabilized hyaluronic acid" (NASHA) produced from Streptococcus equi cultures through a crosslinking process with 1,4-butanediol diglidyl ether (BDDE) giving a concentration of 20 mg / ml. and 100,000 gel particles.

In areas where greater volume is required, such as deep nasolabial and melolabial folds, cheekbones and in bioplasty or volumizing techniques, the use of Perlane®, Juvederm Ultra Plus®, or sub Q is more appropriate.

The products come pre-filled in a syringe with its corresponding 1 mL needle or cannula, or 0.5 mL in the case of Restylane® and Perlane®. In the case of sub Q®, the syringe is 2 mL.

The periocular region and cheekbones is confirmed as the anatomical region with the greatest number of manifested adverse effects and of greater severity, so it is necessary in this area to always recommend resorbable materials. The use of a cannula can avoid the risk of bruising and damage to anatomical structures.

Filler material application area

In 29.3% of the cases the area of application of the filler material was the lips and in 27.3% in cheekbones, 7.3% in the orbital-malar. (table IV)

Immediate reactions (within 72 hours after injection)

- Transient erythema
- Transient induration
- Transient itching
- Infections
- Color changes (whitening, bluish color)
- Hyperpigmentation
- Local necrosis
- Herpes reactivation
- Granulomatous formations
- Ulcerations
- Abscesses

Hyaluronic acid granulomas (Figure 1) are treated with corticosteroids, although it should be noted that many patients improve without treatment

There is no rule for hyaluronidase treatment. It is very important to know the clinical and histological differences between nodules and granulomas, because corticosteroids are effective in cell proliferation, but not in the nodules of clustered particles or microspheres.

CONCLUSIONS

The use of stabilized hyaluronic acid of non-animal origin has proven to be a safe filler of reasonable duration, and the placement in different planes of the different subtypes has allowed to prolong the effect of the filler, in addition to having satisfactory results for the patients. If we consider an effective treatment from all possible points of view, until now there is no optimal filler material that meets all the properties and characteristics necessary to be so. What exists are specific parameters that must be respected when using a product, in addition to verifying the absolute and relative contraindications for the application of fillers. In case of doubt due to previous fillings, it is essential to request imaging studies, ultrasounds or resonance to rule out which previous product we find and with it possible complications and if necessary histopathological study. In areas where greater volume is required such as cheekbones and in bioplasty or volumizing techniques, it is more appropriate to use Perlane®, Juvederm Ultra Plus®, or sub Q, taking into account a correct application to avoid exaggerated (superficial) corrections or that the product is moved (applied by deep subcutaneous or supraperiosteal injection). The use of a cannula can avoid the risk of bruising and damage to anatomical structures. In the case of intravascular injection, it is necessary to apply hyaluronidase, so when using this product it is always necessary to have it in our office.

FIGURE 1: GRANULOMA DUE TO HYALURONIC ACID

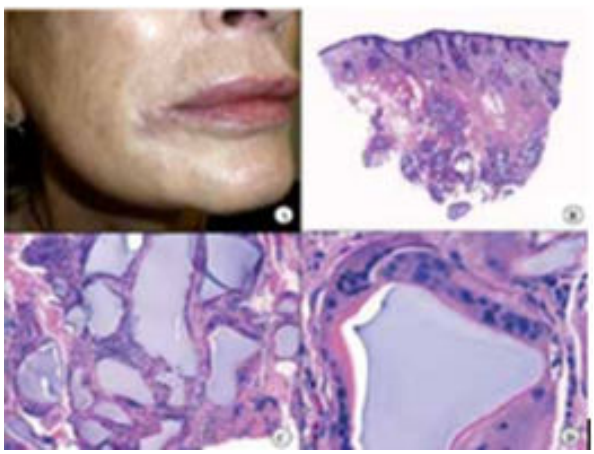

Figure 1: Hyaluronic acid granuloma. A) Granulomatous reaction after injection of hyaluronic acid in the right corner of the mouth. B) Panoramic image in which a basophilic material is observed at different levels of the dermis. C) At higher magnification, basophilic material surrounded by histiocytes and multinucleated giant cells is observed. D) Detail of hyaluronic acid (H-E, B × 10, C × 200, D × 400).

FIGURE 2: PERIOCULAR EDEMA

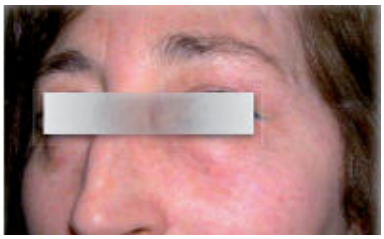

Figure 2: Periocular edema. It can be caused by improper placement or crosslinking of Hyaluronic Acid. Evolution of abscess in cheekbone after Restylane implant

FIGURE 3: ABSCESS IN PUMULUS

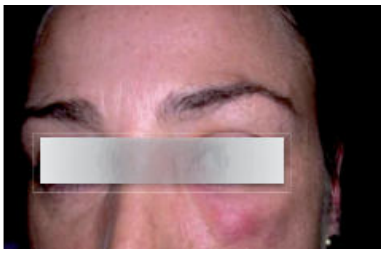

Figure 3: Evolution of abscess in cheekbone after Restylane implant

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