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Case Presentation

Brain and Beauty. Facial Filler Injection Brain Complications: A Case Report

Jacobo Lester[1*], Enrique Kleriga[2], Jesús Carlos Bustamante[2], Javier Zamarripa-Molina[3], Carla García-Moreno[4]

[1]Neurology. Hospital Angeles Lomas. Huixquilucan, Estado de México. México

[2]Neurosurgery. Instituto Mexicano de Neurociencias, Hospital Angeles Lomas. Huixquilucan, Estado de México. México

[3]Ophthalmology. Hospital Angeles Lomas. Huixquilucan, Estado de México. México

[4]Radiology/Magnetic Resonance Department. Hospital Angeles Lomas. Huixquilucan, Estado de México. México

[*]**Corresponding author:** Jacobo Lester, Neurology. Hospital Angeles Lomas. Huixquilucan, Estado de México. México

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Abstract

Introduction: Hyaluronic acid is a facial filler. Its application is considered safe but has some adverse complications that may be serious and irreversible. Complications may occur when this material gains access into the blood vessels with their occlusion, causing sudden deficits. The administration of hyaluronidase could be useful in reducing some of these adverse effects. **Case Presentation:** This is a case report of a woman who was infiltrated with hyaluronic acid at the dorsum of the nose, suddenly developed pain, right eye visual loss, ptosis and total ophthalmoplegia. A few minutes later, hyaluronidase was applied at the dorsum of the nose and retrobulbar. Later, dermal lesions appeared, and cerebral ischemic changes were documented on magnetic resonance imaging. The dermal lesions improved in a couple of weeks. The visual loss persisted to shadow perception. **Conclusion:** Fillers injected at the dorsum of the nose may gain access to the nasal blood vessels to the retinal artery, and by reverse flow to the carotid artery to the brain blood vessels. This may cause ischemic brain lesions. As in this case, it causes retinal, dermal, and cerebral ischemic lesions. In our case, hyaluronidase was administered within the accepted dose and time. The patient remained with some irreversible sequelae. We believe the material was fragmented, instead of dissolved and this may have caused multiple small brain lesions. The patient did not have a detectable neurological deficit because they did not affect eloquent areas. To our knowledge, this type of brain complication has not been reported.

Keywords: Facial filler; Brain; Complications.

Introduction

Facial fillers are used as volume replacement and tissue enhancement. The most frequently used is hyaluronic acid followed by autologous fat [1]. They are generally considered safe procedures, however, there are sudden and transient local adverse effects at the injection site such as inflammation, sensory changes, pain, bruising or bleeding, erythema, scarring, granuloma formation, skin hyper or hypopigmentation, infection, abscess formation, herpetic outbreaks, and nodular masses [2]. There are also infrequent complications, like arterial occlusions resulting in skin necrosis, ophthalmoplegia, loss of vision in one or both eyes and Acute Ischemic Stroke (AIS) [3,4]. When they happen, they are usually severe and are often irreversible. All of them occurs when the filling material is delivered in contact with a vessel wall and travels from distal to proximal arteries, causing sudden clinical manifestations [4]. Hyaluronidase can be used to reduce these types of complications by dissolving hyaluronic acid, although this is not always effective.

Case Presentation

This is the case of an adult woman, with an unremarkable previous history. The patient was undergoing a cosmetic injection of 0.5 ml Hyaluronic Acid (HA) to her nasal dorsum. The patient reported right eye blurred vision, ptosis, and frontal headache. The procedure was immediately stopped, the plastic surgeon prepared 1000 U of hyaluronidase dissolved in 0.8 ml of 0.9%

saline solution with 0.2 ml of lidocaine and applied it to the nasal dorsum in the path of the previous application of hyaluronic acid with a cannula. After 15 minutes an ophthalmologist specialized in retina arrived and found that the right eye did not perceive light, funduscopic examination was consistent with an ischemic retina, clear vitreous with yellowish coloration; complete eyelid ptosis, limited eye movements, mydriasis with no pupillary response, and determined that the patient had an ophthalmic artery occlusion.

Another 1 ml (1000 IU) of hyaluronidase was applied, this time, in the right retrobulbar cavity. The patient presented clinical data on arterial hypotension and was transferred to the Emergency Room (ER).

Upon arrival at the ER, she had an amaurosis of the right eye. On funduscopic the right eye papilla was not visible, retinal arteries ere not observed. Right pupil with a diameter of 6 mm, irregular with no response to light. Right eye movements were limited. Right corneal reflex absent. Mild right central facial palsy that reversed in less than one hour. No weakness was detected, with generalized hyperreflexia, bilateral flexor plantar response. Left eye examination within normal limits, as well as the rest of the neurological examination. Magnetic resonance imaging (MRI) revealed small acute bilateral ischemic lesions in different brain territories predominantly in the right cerebral hemisphere. No lesions were found in the cavernous sinuses, no venous thrombosis, granulomatous lesions, signs of a carotid-cavernous fistula, or any other finding (Figures 1,2).

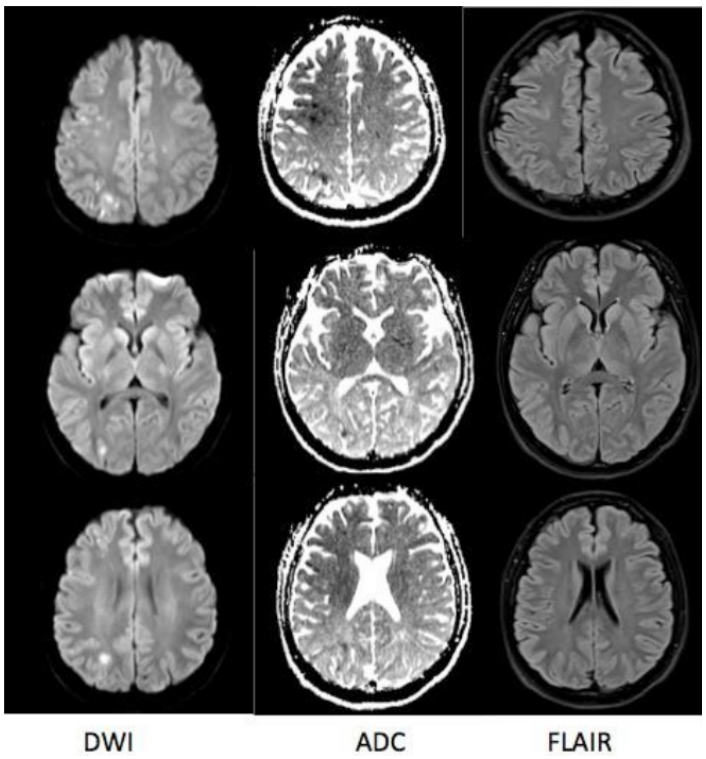

Figure 1 : Magnetic resonance imaging.

MRI was done at 3.0T minutes after the injection of hyaluronic acid. Multiple hyperacute emboli are depicted at the frontal lobes (more on the right side), parietal and occipital right lobes. They show high signals in the Diffusion-Weight Images (DWI) (b=1,000 s/mm^2) and low signals in the Apparent Diffusion Coefficient images (ADC). There are no changes in the Fluid Attenuated Inversion Recovery Images (FLAIR).

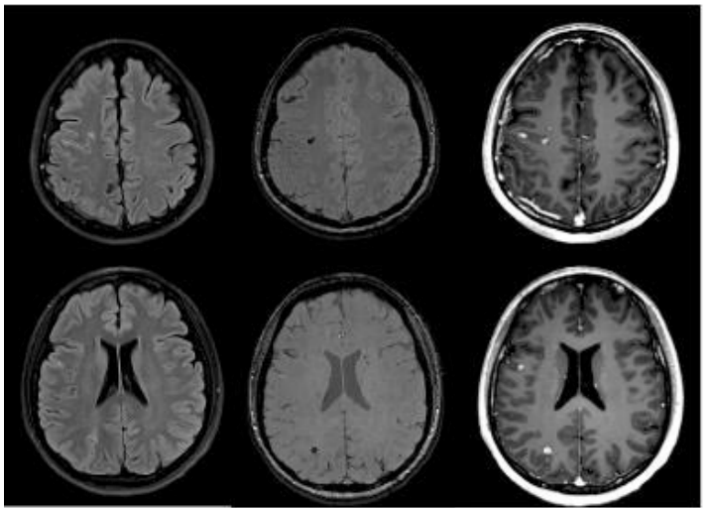

Figure 2: Magnetic resonance imaging.

MRI performed 10 days after the injection of hyaluronic acid. Emboli are now seen on FLAIR images as hyperintense lesions. Some of them have microhemorrhage depicted as hypointense on the Susceptibility Weighted Images (SWI). They present enhancement with gadolinium.

Electrocardiogram with bradycardia of 50 beats per minute, transesophageal echocardiogram, carotid Doppler ultrasound and chest X ray, within normal limits. The diagnostic impression was that of acute and small cerebral infarcts in several territories secondary to the facial filler. Acetylsalicylic Acid (ASA) 100 mg every 24 hours was given. After three days, she presented facial skin lesions such as cutaneous reticular mottling in different areas of the frontal and lateral region of the nose that reversed in one month.

Two weeks later, she showed right corneal opacity, the right eye began to move vertically, the right corneal reflex still absent (Figure 3).

Figure 3: Two weeks later. Corneal opacity that reversed in one month.

One month later, her eye examination revealed that she was already seeing gray tones and had limitation to eye convergence. At twelve months follow-up, the patient remains with shadows perception in the right eye and a complete recovery in the rest of the symptoms and signs.

Discussion

Quick injections may result in more local facial fillers and increase the possibility to reach deeper arteries with more pressure. It is not possible to monitor the pressure applied and the injection velocity by the applicator [1]. It has been postulated that pressures lower than 0.3 ml/minute and a volume less than 0.5 ml, may prevent the embolization with the facial filler [5]. In our patient these rules were applied and despite that our patient developed severe complications.

There are different articles with different points of view between the injection site and the risk of embolization of the facial filler. Some mention the glabella and the forehead [6] while others mention the back of the nose [1], but in both sites the dorsal nasal artery is near and may be embolized [3], causing blindness in one or both eyes, usually irreversible and may also cause AIS [1,7].

It is proposed that during the application of a facial filler, if there is a high pressure, a reverse flow may be conditioned in the retinal artery, moving as a column proximal to the origin of the ophthalmic artery, although the material may also reach the Internal Carotid Artery (ICA) and from there to the cerebral circulation [1].

When patients manifest acute pain, ophthalmoplegia, horizontal strabismus, ptosis, corneal edema, dermal necrosis, and phthisis bulbi, as in our case, it indicates retinal artery occlusion and you should try to lower the intraocular pressure by placing the patient in a supine position, perform eye massage, apply local timolol and acetazolamide, including 20% mannitol and nitroglycerin if necessary [7].

The use of retrobulbar hyaluronidase 2 to 4 ml (150 to 200 U/ml) with a cannula is essential and should be performed by an experienced ophthalmologist. It is suggested that this is done within the first 60 to 90 minutes to try dissolve the HA before there is an irreparable visual loss [8], while in other publications they mention that they carried out this procedure after at least 3 hours [1] with doses between 1000 and 9000 IU, and others, even between 3 and 24 hours later, referring to certain utility [3,9].

In our patient, hyaluronidase 1000 IU was applied to the nasal dorsum after 5 minutes and retrobulbar 1000 IU was applied in the first 15 minutes. In the acute phase, the patient presented blindness and 3 months later she already saw shadows with the affected eye. When the embolus reaches the ICA, it can cause AIS in the defined territory where the embolus becomes lodged, like in this case. The cerebral MRI documented multiple acute small vessel ischemic areas that fortunately did not leave any detectable neurological sequelae. We used ASA for the AIS, not so much for the retina. Even though the success of this treatment has not been proven to be successful [9], neither have been anticoagulants, steroids, nor hyperbaric oxygen [3].

After 12-month of follow-up, there are not any neurological or dermal sequelae; however, there are the visual sequelae in the right eye. It should be noted that this complication occurred in a hospital setting, where specialists were available to treat it.

Conclusion

This case is important for professionals that perform these types of infiltrations. They should be aware that complications may happen. These aesthetic procedures are very frequent, complications are not uncommon and underreported. In this case hyaluronidase probably partially fragmented the HA, causing multiple emboli that found their way to the brain.

It is a priority to emphasize that these complications may occur at any moment, and we must know how to act to try to reduce permanent consequences in our patients.

Ethics Considerations

Ethical approval is not required for this study in accordance with local guidelines as it is the report of a single clinical case, it is not a clinical protocol. Written informed consent was obtained from the patient for publication of the details of his medical case and accompanying images. This consent was obtained retrospectively.

Conflicts of Interest

Presented as a poster at the 26th World Congress of Neurology. Montreal, Canada. October 15-19, 2023.

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References

1. Sito G, Manzoni V, Sommariva R (2003) "Vascular Complications after Facial Filler Injection: A Literature Review and Meta-analysis". J Clin Aesthet Dermatol 12: E-65-E72.

2. Bachmann F, Erdmann R, Hartmann, et al. (2009) "The spectrum of adverse reactions after treatment with injectable fillers in the glabellar region: Results from the injectable filler safety study". Dermatologic Surg 35: 1629–1634.

3. Lazzeri D, Agostini T, Figus M, et al. (2012) "Blindness following cosmetic injections of the face". Plast Reconstr Surg 129: 995–1012.

4. Chen YY, Wang WY, Li JP, et al. (2014) "Fundus artery occlusion caused by cosmetic facial injections". Chin Med J 127: 1434–1437.

5. Logau RG, Kane MAC (2008) "Effect of injection techniques on the rate of local adverse events in patients implanted with nonanimal hyaluronic acid gel dermal fillers". Dermatologic Surg 34: S105–S109.

6. Weinberg MJ, Solish N (2009) "Complications of hyaluronic acid fillers". Facial Plast Surg 25: 324–328.

7. Loh KTD, Chua JJ, Lee HM, et al. (2016) "Prevention and Management of Vision Loss Relating to Facial Filler Injections". Singapore Med J 57: 438-443.

8. Carruthers JD, Fagien S, Rohrich RJ, et al. (2014) "Blindness caused by cosmetic filler injection: A review of cause and therapy". Plast Reconstr Surg134: 1197-201.

9. Wang HC, Yu N, Wang X, et al. (2022) "Cerebral Embolism as a result of facial filler injections: A literature review". Aesthet Surg J 42: NP162-NP175