

Case report

## Reversible vision loss following nonsurgical filler rhinoplasty

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**Abstract:** The increase in the frequency and popularity of aesthetic filler injections is accompanied by a high risk of complications, including ophthalmological sequelae. Of these, loss of vision is considered the most dangerous and, in most cases, irreversible. We present a case report of a patient who experienced acute vision loss due to suspected partial occlusion of the ophthalmic artery following nonsurgical rhinoplasty with hyaluronic acid filler injection. It differs from others in that treatment in the form of a combination of multiple subcutaneous hyaluronidase injections into the periocular region, a single retrobulbar injection of hyaluronidase, and hyperbaric oxygen therapy led to a significant recovery of ophthalmic symptoms with only residual visual field defects remaining.

**Keywords:** hyaluronic acid filler, vision loss, blindness, hyaluronidase, hyperbaric oxygen.

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### Introduction

Injectable fillers, in particular those containing hyaluronic acid (HA), remain a trending alternative to surgery for many patients seeking aesthetic correction. However, more and more volumization procedures are performed by non-specialists without sufficient knowledge of facial anatomy, using cheap (including unregistered) fillers in the absence of indications. This is associated with a growing number of complications, including vascular problems, such as skin necrosis, blindness, and cerebral embolism. To date, approximately 200 cases of vision loss caused by the injection of aesthetic fillers have been published, whereas improvement in vision by various methods of treatment was achieved in only a few of them [1, 2]. To the best of our knowledge, this is the first case of reversible eye injury after nonsurgical rhinoplasty with a favorable treatment outcome described in a patient from Russia.

### Case report

A 40-year-old patient admitted to our oculoplasty unit 1 day after a HA filler injection (Juvéderm Voluma, Allergan, CA, USA) into the nasal dorsum with a subsequent vision loss. She reported several previous successful injections in the same place a few years earlier without any side effects. However, the day before admission, during the injection, she developed sudden periocular pain on the left side, drooping of the left upper eyelid, and loss of vision. According to the provided data, the cosmetologist immediately performed a series of periorbital subcutaneous injections of hyaluronidase (1000 IU), eye massage without immediate effect, and referred the patient to our department.

When examined 12 hours after the procedure, the skin at the injection site was reticulated with an erythematous discoloration,

and a few pustular rashes were seen on the nasal dorsum. The patient had periocular ecchymosis, signs of *nervus oculomotorius* neuropathy: ptosis of the left eyelid, exotropia, pupillary dilation, and ocular motility restriction in all gazes. A relative afferent pupillary defect (RAPD) was also detectable (Figure 1A). The best corrected visual acuity in her left eye was 0.05, while it was 1.0 in her right eye. Examination of the anterior segment of the eye and fundus revealed no pathology of the vessels and optic nerve. Optical coherence tomography (OCT) of the macula and optic disc showed no abnormalities with a slight decrease in the thickness of the retinal nerve fiber layer (RNFL) in the superior quadrants. Automated perimetry (Octopus, Haag-Streit, USA) revealed an inferior altitudinal defect on the left eye (Figure 2A). Ishihara test for color blindness was documented as 3/20. At the time of admission, fluorescein angiography was not performed. The patient underwent a single retrobulbar injection of hyaluronidase (1500 IU) and 14 two-hour sessions of hyperbaric oxygen therapy at 253 kPa. Ocular signs gradually improved with complete recovery of skin, ocular motility, and ptotic symptoms 1 month after the onset of treatment (Figure 1B). A significant recovery of visual acuity up to 1.0 was registered in the absence of RAPD. The visual field defect decreased slightly immediately after treatment, but did not change over the next 3 months (Figure 2B).

### Discussion

According to a recent review, the incidence of ischemic complications from fillers is estimated at up to 3 per 1000 injections [3]. Due to the extensive network of vascular anastomoses, the periocular region is prone to vascular disorders. The region of the glabella and nasal dorsum are the most dangerous areas in terms of the risk of vascular occlusion by filler particles [4].

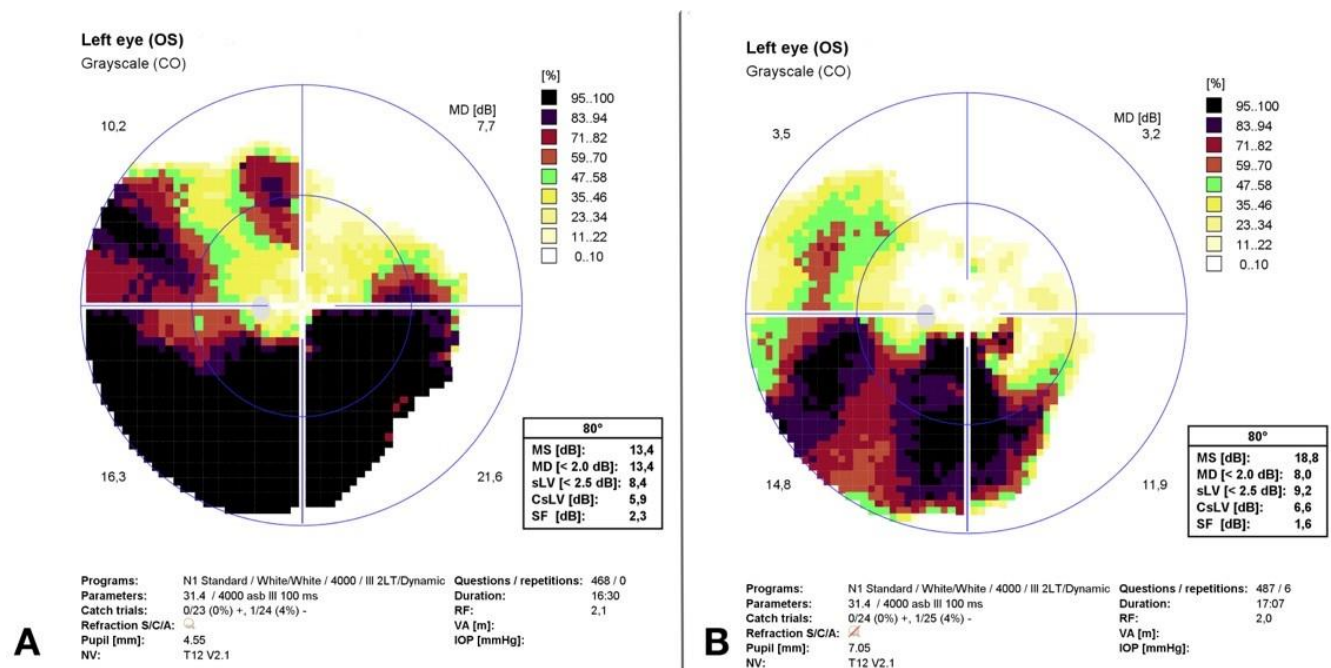
Patients usually exhibit some blanching of the skin followed by livedo reticularis due to obstructed capillaries. Within seconds of filler injection, there is a sharp decrease or complete loss of vision, although partial loss of vision or visual field defects were also described. Other observed ocular signs typically include ptosis of the upper eyelid, strabismus and motility restriction, and pupillary defects. Ptosis and ophthalmoplegia usually resolve with time, in contrast to the loss of vision, which persists due to irreversible damage to the retina occurring within 1.5 hours [3]. Hence, once the complication is detected, prompt treatment is required, but there is still no effective strategy to achieve a good result.



**Figure 1. Primary position.** A – 1 day after the hyaluronic acid filler rhinoplasty: nasal dorsum ecchymosis, livedo reticularis, pustular changes; ptosis of the left eyelid, exotropia, hyposphagma. B – 1 month after the treatment; minor changes in nasal dorsum skin; full recovery of ocular signs.

Most of the recommendations focus on preventive care, such as vascular anatomy awareness and gradual retrograde injection using cannulas instead of needles [2]. Currently available treatment options include: high-dose hyaluronidase injections (both periocular and retrobulbar), intra-arterial thrombolysis in combination with intra-arterial hyaluronidase injection, traditional systemic thrombolytic therapy, eye massage, anterior chamber paracentesis, and hyperbaric oxygen therapy [3, 4]. Of these, intra-arterial thrombolysis in combination with intra-arterial injection of hyaluronidase seems the most effective, but this method requires appropriate specialists and equipment [5]. Regarding local hyaluronidase injection, that is considered as a first-choice option to dissolve the filler, a recently published consensus guidance for the treatment of hyaluronic acid aesthetic interventional induced visual loss (AIIVL) suggests that retrobulbar hyaluronidase injection is not effective in case of complete obstruction of the central retinal artery and is associated with additional risks to the patients in case being performed by an inexperienced person [6].

Several recently published case reports described reversible changes in vision after various treatment strategies [7-9]. The cosmetologist tried to use all available first aid methods for our patient, except for the retrobulbar injection of hyaluronidase, and referred her to a specialist for further treatment. Presumably, one of the possible reasons for the disastrous experience in this case could be a previous revision nonsurgical filler rhinoplasty. On examination, we found no visible retinal changes indicative of possible posterior ischemic neuropathy, as in the case of Siti et al. [7]. However, ptosis, exotropia, and ophthalmoplegia, characteristic of the third cranial nerve lesions, were detected. Still, we administered retrobulbar hyaluronidase injection and performed hyperbaric oxygen therapy in compliance with a previously published algorithm [10]. Consequently, the patient recovered almost completely, with the exception of visual field defects.



**Figure 2. Automated perimetry (Octopus, Haag-Streit, USA).** A – An altitudinal visual field defect 1 day after the hyaluronic acid filler rhinoplasty. B – 3 months after the treatment; slight reduction in visual field defect.

### Conclusion

We describe a case of recovery from partial occlusion of the ophthalmic artery secondary to a probable intra-arterial injection of a HA-based filler. The patient underwent combination therapy, including immediate subcutaneous injections of hyaluronidase into the periorbital region and retrobulbar injection of hyaluronidase 12 hours later, followed by a 14-day course of hyperbaric oxygen therapy. It is worth noting that a favorable outcome in this case could be the result of specialist awareness, immediate action and good luck.

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