Injection of dermal fillers for facial rejuvenation is a minimally invasive procedure frequently used in cosmetic procedures. Different types of dermal fillers injected include autologous fat, collagen, hyaluronic acid, polylactic acid, calcium hydroxylapatite, and polymethylmethacrylate. Complications from these procedures are rare but have been reported to include blindness, cerebral ischemic events, and even death. We describe 3 patients who presented with sudden loss of vision after injection of 3 different dermal fillers into the forehead area. In all 3, occlusions in the distal ophthalmic artery distribution were subsequently diagnosed.

Report of Cases

Patient 1
A healthy man in his late 30s presented 3 weeks after he noticed superior field visual loss in his left eye the day after an injection of a hyaluronic acid filler injection to his forehead. At the initial visit, his visual acuity was 20/20 OD and 20/30 OS. Dilated fundus examination of the left eye revealed retinal edema and whitening in the inferotemporal macula consistent with a branch retinal artery occlusion. The whitening extended to the fovea, and a partial cherry-red spot was seen in the central macula, along with scattered intraretinal hemorrhage (Figure 1A). Fluorescein angiography demonstrated blockage of the inferior branches of the retinal circulation in the left eye and areas of patchy choroidal nonperfusion (Figure 1B).

One year later, the patient continued to experience a superior visual field defect in the left eye. His visual acuity was 20/25 OS. Optical coherence tomography demonstrated selective retinal thinning of the inferior macula (Figure 1C).

Patient 2
A healthy woman in her early 60s presented the same day she experienced severe loss of vision, which occurred immediately after autologous fat injection into the high part of her forehead; the needle marks were visible just below the hairline. Her visual acuity was no light perception OD and 20/40 OS. Dilated fundus examination of the right eye revealed diffuse whitening of the retina, as well as lipid-filled arterioles (Figure 2A). Fluorescein angiography demonstrated patchy choroidal filling and incomplete filling of the retinal arterioles in the later frames (Figure 2B and C). A complete blood cell count was obtained, with differential count, erythrocyte sedimentation rate, and C-reactive protein level; all values were within normal limits. Carotid Doppler ultrasonography and cardiac echocardiography revealed no abnormalities.

Patient 3
A healthy woman in her mid-40s presented to the clinic after having received an injection of bovine collagen and polymethylmethacrylate microspheres (Artefill; Suneva) to her forehead creases that morning. After the injection was complete, she opened her eyes and could not see with her right eye. Her visual acuity was no light perception OD and 20/20 OS. A right afferent pupillary defect was demonstrated. Dilated fundus examination showed a
cherry-red spot and retinal edema, in keeping with a central retinal artery occlusion (Figure 3A). Fluorescein angiography demonstrated delayed filling of some of the proximal arteries in the right eye, but the filling was patchy (Figure 3B and C).

Because this was an acute presentation, we performed anterior chamber paracentesis and removed 0.1 mL of aqueous to rapidly lower the intraocular pressure. In the clinic, the patient received a liter of normal saline solution intravenously and underwent ocular massage; she was then transferred to receive hyperbaric oxygen therapy. Two days later, her right pupil was minimally reactive to light and her visual acuity was faint light perception OD.

Discussion

Owing to the rich extensive anastomotic network between the internal and external carotid circulations in and around the ocular

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Figure 1. Early and Late Imaging Findings After Injection of a Hyaluronic Acid Filler to the Forehead in Patient 1

A, Color fundus photograph of the left eye demonstrates a partial cherry-red spot in the central macula and scattered intraretinal hemorrhage. B, Fluorescein angiography (FA) of the left eye demonstrates blockage of the inferior branches of the retinal arteries and patchy choroidal nonperfusion. ICG indicates indocyanine green. C, Ocular coherence tomography of the left eye, 1 year later, demonstrates retinal thinning starting just below the fovea. ILM indicates internal limiting membrane; RPE, retinal pigment epithelium.

Figure 2. Imaging Findings the Same Day as Injection of Autologous Fat to the Forehead in Patient 2

A, Color fundus photograph of the right eye reveals diffuse retinal whitening and lipid filled arterioles. B, Fluorescein angiography of the right eye in an early frame demonstrates delayed patchy choroidal filling. C, Later frame of the fluorescein angiogram demonstrates incomplete filling of the retinal arteries and patchy choroidal filling.
Injecting a foreign material into the ocular circulation can lead to occlusion of the retinal arteries, causing sudden vision loss. This can occur from the injection of nonocular fillers, such as hyaluronic acid-based fillers. These fillers, when injected at high pressure, can flow retrogradely into the ophthalmic artery from the external carotid circulation. The risk of this complication is higher when fillers are injected into areas with rich anastomoses, such as the periocular region. In one case, a patient developed choroidal filling and some delayed proximal filling of the arteries on the disc. The imaging findings demonstrated incomplete filling of the arteries on the disc. C, Later frame of the fluorescein angiogram demonstrates incomplete filling of proximal arteries only.

In the setting of sudden vision loss, one must consider the possibility of vasculitis (and giant cell arthritis in older patients) and carotid and cardiac embolic sources. A recent injection of a nonocular filler can be identified as the cause in these cases. Therefore, when injecting facial fillers, it is important to consider the location of the injection and respect the rich anastomotic vascular supply of the periocular region.

**References**


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