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Case Report

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Various Ischemic Events Following Facial Autologous Fat Injection: A Case Report

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ABSTRACT

Facial rejuvenation and augmentation with autologous fat injection are common and effective techniques worldwide. This procedure has few complications and is usually used for soft-tissue augmentation. Although this procedure is considered safe, many patients have experienced different complications such as visual loss, stroke, or skin necrosis after these procedures. Herein, a case of embolic stroke along with blindness and facial necrosis due to facial filler injection is described. In this case, a patient developed decreased level of consciousness, left hemiparesis, and blindness that was finally diagnosed based on imaging as embolic stroke following facial autologous fat injection. The symptoms improved partially and gradually by conservative treatment and the patient was discharged with some sequels.

Introduction

Facial rejuvenation and augmentation with autologous fat injection are common and effective techniques worldwide [1]. This procedure has few complications and is usually used for soft-tissue augmentation [2]. Although this procedure is considered safe, many patients have experienced visual loss or stroke after these procedures [3]. Other complications include asymmetry, skin irregularity, prolonged edema, graft hypertrophy, fat necrosis, infection, erythema, telangiectasia, activation of acne, granuloma formation, soft tissue necrosis due to vascular obstruction, and anaphylaxis [4, 5].

Although there are many reports of embolic stroke, blindness, and facial necrosis following autologous fat injection; the occurrence of these complications following cheek injection of autologous fat has been rarely reported. Herein, a patient is described who developed decreased level of consciousness, left

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hemiparesis, blindness and facial necrosis that was finally diagnosed based on imaging as embolic stroke following facial autologous fat injection. Although the appearance of concomitant blindness and embolic stroke in this setting has been reported many times, there are not as many reports on skin necrosis in addition to the mentioned problems. In this case the signs and symptoms improved partially and gradually by conservative treatment and the patient was discharged with some sequels.

Case Presentation

A 32-year-old female patient was brought to the emergency department by EMS with the chief complaint of decreased level of consciousness. The symptoms had started 5 hours before admission with sudden non-bloody vomit and a few hours later she had developed some degrees of loss of consciousness and fecal incontinence. She was referred to the emergency department following the call to the ambulance by her relatives. In the initial examination, the vital signs were as follows: blood pressure of 117/58 mmHg, fluctuations in heart rate as tachycardia and bradycardia, normal arterial oxygen saturation (95% without auxiliary oxygen), and normal finger stick blood glucose. The physician found a decreased level of consciousness to the extent of withdrawal in response to painful stimulation, and left hemiparesis. In further investigation, she had had an autologous fat injection in the past 8 hours, which was shown through the evidence of fat aspiration from the right outer thigh area and fat injection in the right cheek. Further evaluation showed that the color of skin on the right side of the face was a bit darker than the left side (Figure 1), which gradually became darker and more cyanotic during the first few hours of being in the emergency department (Figure 2) and advanced to right-sided forehead skin necrosis in the next few days of admission (Figure 3).

The plantar reflex was upward on the left side and downward on the right. Sensory examinations could not be performed due to decreased level of consciousness. The right pupil was medium-sized and non-reactive to light, while the left pupil was medium-sized and reactive to light. There was also a Marcus Gunn pupil in the right eye. In initial laboratory assessments, serum and urine drug screens were negative. There were mild leukocytosis, thrombocytosis, and mild anemia along with raised ESR and CRP. In arterial blood gas analysis, metabolic alkalosis was revealed. In the electrocardiogram, bradycardia was the predominant finding and cardiac monitoring revealed intermittent tachycardia and bradycardia. In the spiral CT scan of the brain without contrast, there wasn't any obvious evidence of hemorrhage, ischemia, or mass effect. The spiral chest CT scan didn't show any notable finding except for mild aspiration. In brain MRI without contrast,

Fig. 1. Subtle cyanosis on the right side of the face upon presentation to the ED.

Fig. 2. Obvious cyanosis on the right side of forehead a few hours after presentation to the ED.

Fig. 3. Right-sided forehead skin necrosis in the next few days of admission.

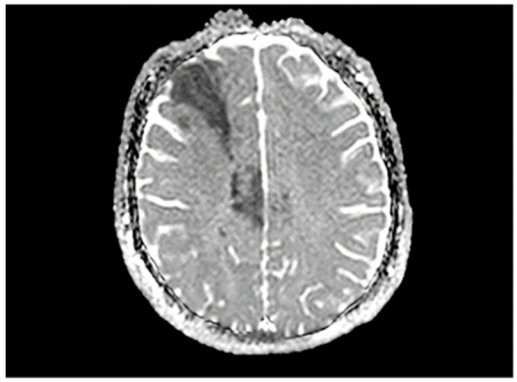

Fig. 4. Restriction on ADC map in parasagittal frontoparietal lobe.

there was a T2/ FLAIR high signal area with restriction on ADC map in cortex and subcortical white matter, parasagittal frontoparietal lobe (Figure 4) and some foci in corpus callosum and head of caudate in favor of acute embolic infarct. The spiral CT angiography of the neck showed a normal pattern in cervical arteries without any evidence of filling defects, vascular cutoff, or aneurysmal expansion. According to the recent evidence of injection of filler compounds and the occurrence of facial necrosis along with clinical evidence of decreased level of consciousness and also evidence of an ischemic stroke, the patient's final diagnosis of embolic ischemic stroke following facial filler injection was proposed. Therefore, the patient was admitted to the ICU ward and scheduled for anticoagulant therapy, anti-platelet therapy followed by cardiovascular, hematological, dermatological, and neurological consultations. The consultants also administered dexamethasone for neurologic manifestation and topical nitroglycerine for skin necrosis. Following the mentioned treatments, there was a relative improvement in the state of consciousness, vision, sensorimotor symptoms, speech, and skin necrosis but she had one-sided blindness and finally she was discharged with some degrees of hemiparesis.

Discussion

Facial filler injection is now widely used as a minimally invasive facial cosmetic technique with usually low morbidity and sequels. The use of these materials is frequently safe with a short recovery time and favorable cosmetic outcome. Some mild temporary adverse events, including redness, swelling, mild

surface deformity, or even infection, may be reported, which are all self-limited without permanent effect. However, in some rare reports, the use of such synthetic facial injections led to severe adverse events such as vascular complications in the skin leading to facial necrosis, reversible or even irreversible blindness, and cerebral embolism leading to ischemic stroke and even death [6, 7]. It is obvious that the severity of neurological symptoms can depend on the type of filler used, the depth of injection, the vessels involved, and the severity of the vascular obstruction. However, the occurrence of hemiplegia and consciousness disorders seems to be prominent [8]. Also, cerebral embolism may be associated with immediate blindness or even delayed blindness, which in turn was related to the mechanism of emboli entering the internal carotid or ophthalmic blood vessels [9]. In such cases, vision loss and blindness can be the result of injecting filler material into the facial vessel followed by the terminal branch of the ophthalmic artery that results in subsequent retrograde embolism and obstruction of certain cerebral vessels [10]. However, according to the literature, considering different treatment protocols including embolectomy, thrombolysis, decompressive craniectomy, antiplatelet/anticoagulant therapy, and symptomatic and nutritional treatment may lead to a favorable outcome.

A limited number of similar cases have been reported in recent years. In a meta-analysis by Sito et al in 2019, 30 studies including 93 cases of vascular complications due to filler injection were described. In their analysis, vascular complications were reported in 61% following filler injection that led to adverse sequels in 72% of them [11]. In another systematic review by Wang in 2022, 43 cases of filler-induced cerebral embolism were enrolled from 35 studies. 43.3% presented with neurologic symptoms such as loss of consciousness and hemiplegia and even cerebral hemorrhage after embolism. In their report, half of the patients recovered or exhibited improved neurologic manifestations but not visual loss, but five patients died [12].

Our case was important in several aspects. In most cases of facial fat injection that had been reported previously, severe complications had occurred following injection into the glabella or forehead; in our case, the injection was done directly in front of the tragus. We could significantly alleviate skin necrosis by our consultant physicians' proper management. Despite severe clinical manifestations at the time of arrival, progress in the patient's clinical condition, such as partial improvement of motor symptoms and speech and complete improvement of the level of consciousness were observed following prompt and timely medical treatment so that the patient was discharged with an acceptable condition. This is while the occurrence of death in such patients is not far from expected. Finally, it can be recommended that in case of occurrence of any neurological symptoms or changes in visual acuity or decreased level of consciousness following facial fat injection, one should consider the possibility of fat embolism and vascular obstruction.

Ethical Considerations

Compliance with ethical guidelines

There were no ethical considerations to be considered in this article.

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Conflict of Interests

The authors have no conflict of interest to declare.

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