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Orbital Emphysema After Repair of Orbital Fracture

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Abstract: Orbital emphysema is a rare postoperative complication that can cause diplopia and even visual loss. Therefore, immediate diagnosis and treatment are crucial. In this study, a healthy male patient sustained left facial trauma caused by a fall 2 months ago; orbit emphysema occurred when the patient sneezed on the 5th day after surgery. The patient was treated conservatively with oral antibiotics and oral dexamethasone. Sixth-month follow-up showed no residual lesion.

Key Words: Orbital emphysema, orbital fracture, orbital reconstruction

CLINICAL REPORT

A 47-year-old male patient sustained left facial trauma due to a fall 2 months ago. Clinical examination revealed that the left zygomatic area and left globe appeared to be depressed; the globe movement was slightly limited upon superior gaze, and vertical diplopia was noted. Computed tomography (CT) showed left zygomaticomaxillary complex fracture and left orbital floor fracture (Fig. 1 A-B). After preoperative examination and design, the old left zygomaticomaxillary complex fracture was repositioned

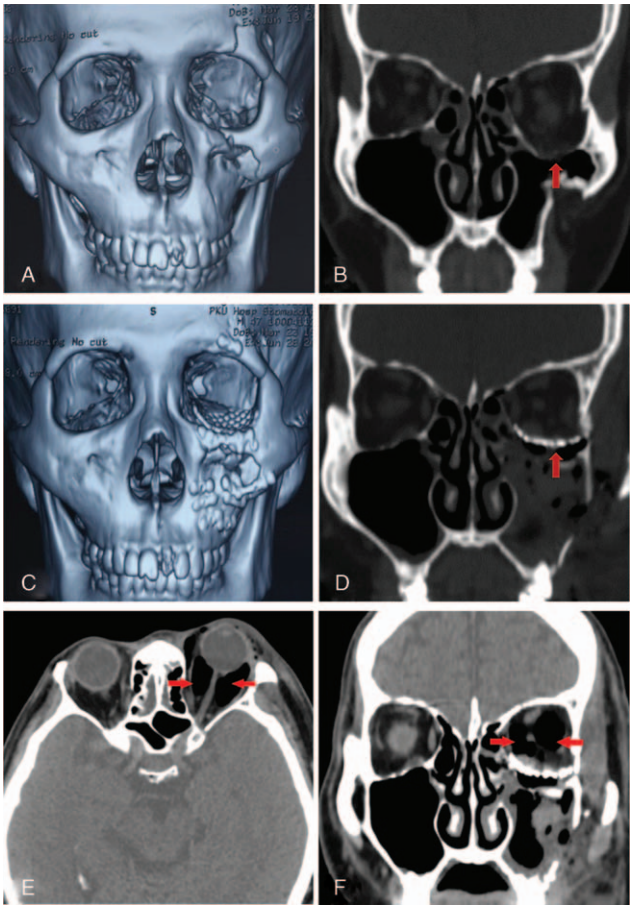

FIGURE 1. (A) Three-dimensional computed tomography (CT) scan showing left zygomaticomaxillary complex fracture and left inferior orbital wall fracture. (B) Coronal CT scan showing left inferior orbital wall fracture (arrow). (C) Three-dimensional CT scan showing osteotomy reduction of the left zygomaticomaxillary complex fracture and reconstruction of the left inferior orbital wall. (D) Coronal CT scan showing orbital floor reconstruction with titanium mesh (arrow). (E) Coronal soft-tissue scan on the 5th operative day showing extensive presence of air in the left orbit region (arrows). (F) Axial soft-tissue scan on the 5th operative day showing extensive presence of air in the left orbit region (arrows).

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and fixed with microplates, and the orbital floor was reconstructed with 3-dimensional preformed titanium mesh (Fig. 1C-D). The above procedures were guided by computer navigation system (BrainLAB, Feldkirchen, Germany). Five days after the operation, the patient experienced sudden swelling of the left periorbital region after an episode of sneezing. Upon examination, the left periorbital region was swollen, and the left eye showed obvious exophthalmos and diplopia. An immediate CT examination was carried out which showed a large amount of air in the left orbital cavity and periorbital soft tissues (Fig. 1E-F). Accordingly, this condition was diagnosed as orbital emphysema. The patient was subsequently referred to an ophthalmologist and was prescribed oral antibiotics and oral dexamethasone. The symptoms improved significantly after 3 days, and disappeared after a week.

DISCUSSION

Orbital emphysema is not uncommon, with an incidence of about 7%,[1] and it mostly occurs associated with orbital fractures.[1,2] However, there are few reports of orbital emphysema after orbital fracture reconstruction.[3] Anatomically, the orbital medial wall and inferior wall are very thin and understandably prone to fractures, in that, they become channels of air diffusion. To elaborate, orbital emphysema facilitates the passage of air through the fracture defect of the medial or inferior orbital wall, such that the air enters the soft tissue around the orbit. García de Marcos et al[4] has reported orbital emphysema caused by nose blowing in patients without any history of trauma. Furthermore, the orbital wall becomes thinner with age.[5] Age-related changes of the orbital wall may also increase the likelihood of orbital emphysema.

Dobler et al[6] believed that a diagnosis of orbital emphysema must fulfill the following 5 conditions: an orbital fracture must be present; the sinus mucosa must be ruptured at the site of the orbital fracture, so that air can enter the orbit through the sinus; the intra sinus pressure must be higher than the intra orbital pressure, so that a pressure gradient exists across the orbit; a 1-way valve must exist at the fracture site, so that the pressurized air remains in the orbit; and an intact septum must be present. The cause of orbital emphysema in this patient was the increased pressure in his nasal cavity and maxillary sinus following sneezing. Excessive pressure forced the air to move from the defective part of the left orbital floor into the left orbit. Given the existence of 1-way valves and an unlikely escape route for the trapped air, the patient presented with exophthalmos, diplopia, and facial swelling.

The main clinical signs of orbital emphysema are exophthalmos, diplopia, ecchymosis, and swelling of the periorbital soft tissue. Habal et al[2] reported a patient with orbital emphysema that had spread into the mediastinum. Scanning examination has high diagnostic value in orbital emphysema. The CT showed typical periorbital and intraorbital air density in the soft tissues. It is not common for patients with orbital fractures to develop orbital emphysema after operation. If postoperative patients experience such symptoms after sneezing or blowing their nose, doctors should be alert to the likely development of orbital emphysema. Prompt diagnosis and subsequent treatment are very important.

The therapeutic method of orbital emphysema is mainly conservative treatment.[1] However, it is necessary to detect the intraorbital pressure in time. If the intraorbital pressure is too high, it may cause visual impairment. If necessary, surgical incision should be performed to reduce the intraorbital pressure. Infection is considered a potential complication of orbital emphysema. Nasal and maxillary sinus secretions may enter the orbit together with air, which may potentially cause internal orbital tissue infection. Therefore, it is necessary to use antibiotics routinely to prevent the occurrence of intraorbital infection. According to the severity of orbital emphysema, Hunts et al[7] divided it into the following 4 stages: Stage I, orbital emphysema is limited to imaging diagnosis, and its clinical symptoms are not obvious; Stage II, the globe is displaced vertically or horizontally, sometimes resulting in diplopia; Stage III, with the increase of intraorbital pressure, the small blood vessels around the retina are 1st compressed and there is reducible diplopia; and Stage IV, one of the most obvious symptoms is that the intraorbital air mass exceeds intraocular pressures of 60 to 70 mm Hg, along with central retinal artery occlusion. As a complication of orbital fracture, orbital emphysema is self-limiting. Some authors believe that self-absorption usually occurs in about 2 weeks.[8] In this study, the orbital emphysema was in stage II. After 1 week of treatment, the orbital emphysema was completely resolved, the position of the globe returned to normal, and diplopia disappeared.

Prevention is better than treatment. This case showed that the defect site of medial orbital wall or inferior orbital fracture is still a potential pathway for the occurrence of orbital emphysema after orbital fracture reconstruction, which may not resolve rapidly after orbital repair. Orbit emphysema likley occurs when the balance of pressure inside and outside the orbit is disturbed. Therefore, patients after orbital fracture surgery must avoid evelations of orbital pressures.

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Cutaneous Bone Formation Associated With Melanocytic Nevus

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Aim: Cutaneous bone formation is an uncommon lesion of the skin. It may be primary or secondary. Secondary lesions are mostly associated with melanocytic nevi. Although many different theories have been proposed to explain the etiology, extraskeletal bone formation is complex and poorly understood phenomenon.

Here the authors report a series of melanocytic nevi with cutaneous bone formation and the authors described morphologic and clinicopathologic features such as age, sex, location, focus number and size of the lesion.

Material and Method: Through a single center, this retrospective study presents total number of 20 patients with melanocytic nevus with or without osseous metaplasia. Histologic and