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Case Report

Intractable emphysema around the mandibular condyle: A case report

Shinichi Tsurusako[a,b,*], Hiroki Sakakura[a,c], Hideharu Hibi[c]

[a] Department of Oral Surgery, Holy Spirit Hospital, 56 Kawanayama-cho, Showa-ku, Nagoya-shi, Aichi, 466-8633, Japan
[b] Department of Dentistry and Oral Surgery, Japan Organization of Occupational Health and Safety, Chubu Rosai Hospital, 1-10-6 Koumei, Minato-ku, Nagoya-shi, Aichi, 455-8530, Japan
[c] Department of Oral and Maxillofacial Surgery, Nagoya University Graduate School of Medicine, 65 Tsurumai-cho, Showa-ku, Nagoya-shi, Aichi, 466-8560, Japan

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ABSTRACT

Subcutaneous emphysema of the face region has been reported to be a complication of dental procedures and trauma. Emphysema is usually self-limiting and is treated conservatively. This report describes a rare case of emphysema around the mandibular condyle, which did not recover naturally for more than 3 months. A 54-year-old man was referred for swelling of the left side of the face. While undergoing manual therapy at an osteopathic clinic, he heard an unusual noise and experienced severe pain in his left temporomandibular joint. Computed tomography of his head revealed massive air around the left condyle and fractures of the left condyle and glenoid fossa. These injuries were thought to have occurred during manual therapy at the osteopathic clinic. He was diagnosed with emphysema around the left side of the condyle and fractures of the left condyle and glenoid fossa. The injury generated an inflow path of air, with the emphysema thought to be caused by the surrounding soft tissue acting as a check valve. Condylar movement produced negative pressure within the joint space, trapping air in the extracapsular soft tissues. Movement of the masticatory muscle while eating may have acted as a pump to increase emphysema. The patient was treated with continuous negative pressure drainage, resulting in disappearance of the emphysema. This technique may be effective in treating subcutaneous emphysema of the face.

1. Introduction

Subcutaneous emphysema of the face region has been reported to be a complication of dental procedures and trauma [1,2]. Tooth extraction using a high speed air drill is the most frequent cause of this condition. Other causes include use of hydrogen peroxide, sneezing, coughing, the Valsalva maneuver, nose blowing, blowing a bugle, cheek bites, fractures, and temporomandibular joint (TMJ) surgery [3]. Subcutaneous emphysema arises when air is forced, under pressure, into the fascial spaces of the tissue. Once air is under the tissue, dissection can occur along the relatively delicate connective tissue joining the adjacent muscle planes, resulting in localized swelling and crepitus.

Emphysema is usually self-limiting and is treated conservatively. Most cases resolve spontaneously within 3–5 days with no complications or morbidity, with complete recovery occurring within 7–10 days [2]. Intractable emphysema of the face region has not been previously reported. We describe a rare case of intractable emphysema around the mandibular condyle.

2. Case report

A 54-year-old man was referred to an osteopathic clinic with a complaint of crepitus sound of the left TMJ. During manual therapy at this clinic, he heard an unusual noise and experienced severe pain in his left TMJ. Subsequently, his left cheek became swollen, with the swelling increasing during meals and occasionally causing paresthesia of the left inferior alveolar nerve.

The swelling did not recede for 2 months, and the patient was referred to a hospital otolaryngology department. There were no problems with his left ear. Fine needle aspiration cytology of the left parotid gland was negative. Computed tomography (CT) of his head revealed air around the left condyle (Fig. 1A), and he was diagnosed with emphysema around the left side of the condyle.

Two months later, he was referred to the Department of Oral Surgery at our hospital. Examination showed a 5 × 5 cm area of swelling extending into the preauricular region, and crepitus sound was palpable. He had a maximum interincisal opening of 42 mm. There was no evidence of malocclusion or infection, and his medical history was

* Corresponding author at: Department of Dentistry and Oral Surgery, Japan Organization of Occupational Health and Safety, Chubu Rosai Hospital, 1-10-6 Koumei, Minato-ku, Nagoya-shi, Aichi, 455-8530, Japan.
E-mail address: tsurusako.dos@chubuh.johas.go.jp (S. Tsurusako).

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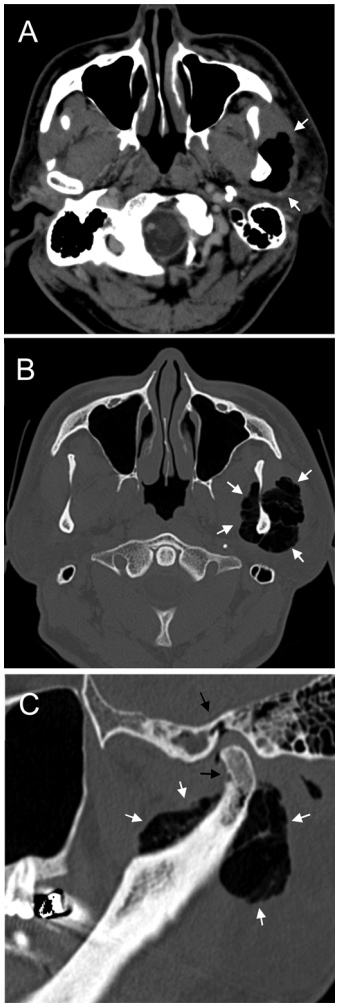

Fig. 1. (A) Axial CT of the head of the patient showing a massive amount of air (approximately −1000 Hounsfield units) around the left condyle (white arrows). (B, C) Axial (B) and sagittal (C) images three months later showing an increased amount of air around the left condyle (white arrows), along with fractures of the left condyle and glenoid fossa (black arrows).

unremarkable. He did not have osteoporosis. He was returned to his otologist for conservative management.

One month later, the swelling had increased and he experienced severe pain in the region of the left inferior alveolar nerve. CT of his head revealed massive air around the left condyle (Fig. 1B, C) and fractures of the left condyle and glenoid fossa (Fig. 1C). He was diagnosed with emphysema around the left side of the condyle, accompanied by old fractures of the left condyle and glenoid fossa. The injury was thought to have occurred during manual therapy at the osteopathic clinic. Indices of inflammation were not elevated. The patient was admitted to hospital and underwent surgical drainage using an intraoral approach. After sedation and administration of a local anesthetic, an incision was made directly over the external oblique ridge, and the tissue along the medial aspect of the mandible was elevated to expose the oblique ridge, ramus, coronoid process, mandibular notch, lingua, and sub condylar area (Fig. 2A). Pathological examination of the surgically removed specimens showed no abnormalities or bacteria, including no infection by anaerobic bacteria. A pressure dressing was placed around the cheek. The swelling and crepitus had disappeared. He was subjected to continuous suction drainage at 100–125 mm Hg for 3 days. The patient was discharged on day 6 and was subsequently followed-up as an outpatient. During follow-up, no additional signs of emphysema were evident. CT 14 months after the operation showed

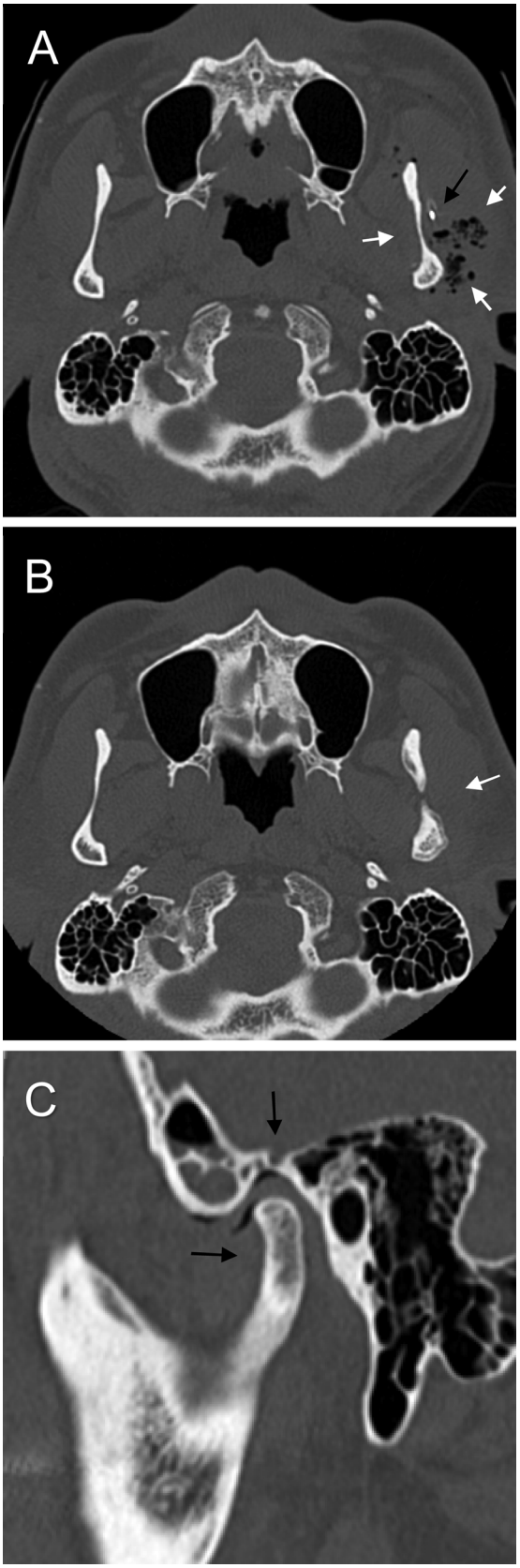

Fig. 2. (A) Postoperative axial CT, following insertion of a drainage tube (black arrow), demonstrating a decreased amount of air (white arrows). (B, C) CT 14 months after the operation showing (B) resolution of the previously observed air around the left condyle (white arrow) and (C) healing of the fracture (black arrow).

healing of the fracture (Fig. 2C). The previously noted air around the left condyle had resolved (Fig. 2B).

3. Discussion

Subcutaneous emphysema arises when air is forced, under pressure, into the fascial spaces of the tissue. Once the air is under the tissue, dissection can occur along the relatively delicate connective tissue joining adjacent muscle planes, resulting in localized swelling and crepitus. Inflow of air in our patient was generated by fractures of the left condyle and glenoid fossa. These injuries were thought to have occurred during manual therapy at an osteopathic clinic. The minimum roof thickness of the glenoid fossa of a normal TMJ is 0.8 mm [4]. The glenoid fossa may be perforated iatrogenically during manual therapy. The rounded condyle creates a superiorly directed force through the floor of the middle cranial fossa, which is also the thinnest part of the glenoid fossa [5]. The factors considered essential to such an injury occurring are a blow to the chin with the mouth open wide, combined with a favorable anatomic configuration of the head of the condyle and the glenoid fossa [6]. The prevalence of condylar fractures in patients with mandibular fractures is 64.8%, whereas the prevalence of glenoid fossa fractures in patients with condylar fractures is 1.4% [7]. Temporal bone fractures are difficult to detect clinically and radiographically, but air in the TMJ revealed by CT in a trauma patient is considered indicative of a temporal bone fracture. Of patients with acute basilar skull fractures, 20.2% are positive on CT for air in the glenoid fossa of the TMJ [8]. These patients may have a congenital foramen of Huschke. Spontaneous TMJ herniation through the foramen of Huschke in the external auditory canal is infrequent, affecting 7% of the population [9]. Moreover, most patients with a fistulous tract are asymptomatic and do not require treatment.

High pressure in the oral cavity can induce subcutaneous emphysema through oral mucosal lacerations. However, a relatively low pressure in the oral cavity, resulting from slight cheek puffing, sneezing or the Valsalva maneuver, can also cause emphysema. In these patients, a valvular-like mechanism could pump air into soft subcutaneous tissue [3,10]. In most patients, subcutaneous emphysema resolves spontaneously within 3–5 days with no complications or morbidity, with complete recovery observed within 7–10 days [2]. To our knowledge, there have been no reports of patients with long-standing emphysema, as in our patient. In this patient, the inflow path of air was generated by fractures of the left condyle and glenoid fossa, with emphysema likely caused by the surrounding soft tissue acting as a check valve. Condylar movement produces negative pressure within the joint space, trapping air within the extracapsular soft tissues. Movement of the masticatory muscle while eating may have acted as a pump to increase emphysema. Resting of the affected part and restricting motion of the lower jaw are likely necessary for the spontaneous resolution of emphysema.

Subcutaneous emphysema may be managed conservatively, with surgical intervention rarely necessary. Continuous negative pressure drainage can increase emphysema, but the maneuver was effective in our patient.

Ethical approval

Not required.

Conflict of interest

None.

Acknowledgment

None.

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