

APPEARANCE OF FRACTURE CAUSED BY EMPHYSEMA

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ABSTRACT

A case presenting radiographic appearance of a fracture line associated with emphysema which occurred in the removal of a mandibular third molar is reported.

The cause of the fracture line in the radiograph is discussed together with the benefit of CT in diagnosis.

Introduction

Emphysemas are seen frequently during and following removal of mandibular third molars when using the high-speed air turbine drills. Facial fractures may be another complication. Emphysema may extend into the cheek, neck, and breast, and evidence as air bubbles. Emphysema occurring during removal of a mandibular third molar produced a fracture line from the molar to the mandibular angle with unusual radiographic features. The purpose of this case report is to demonstrate that different projections of radiographs, or CT, are valuable in the diagnosis of possible fracture which was actually a manifestation of emphysema.

Case Report

A 62-year-old man presented to our hospital with a swelling of the right submandibular region. The patient had a history of pericoronitis of the lower right third molar which was horizontally impacted with bone overlying the tooth. Removal of the lower right third molar was made after the infection was treated. The incision was carried from the anterior border of the ascending ramus of the mandible to the distal aspect of the lower right second molar and extended toward the buccal sulcus at the second molar. The buccal flap was raised and bone

removal was carried out. When the crown was sectioned from roots of the tooth by use of the high-speed turbine bur a swelling occurred and involved the cheek. Crackling sound on auscultation and crepitus on palpation could be detected in the region. Orthopantomogram and lateral radiograph were taken and revealed a linear shadow from the third molar, and from the apex of the second molar, respectively, to the mandibular angle (Figs. 1a & 2a). On clinical examination, however, the bone surface was intact with no sign of displacement. Three days later there was no evidence of fracture lines from mandibular molars to mandibular angle in new radiographs (Figs. 1b & 2b). Moreover, a CT was taken, and it showed no fracture of the mandible. Although emphysema persisted in the buccal aspect of the mandibular third molar, air was not found at the lower border of the mandible (Fig. 3). Spontaneous healing of the emphy-

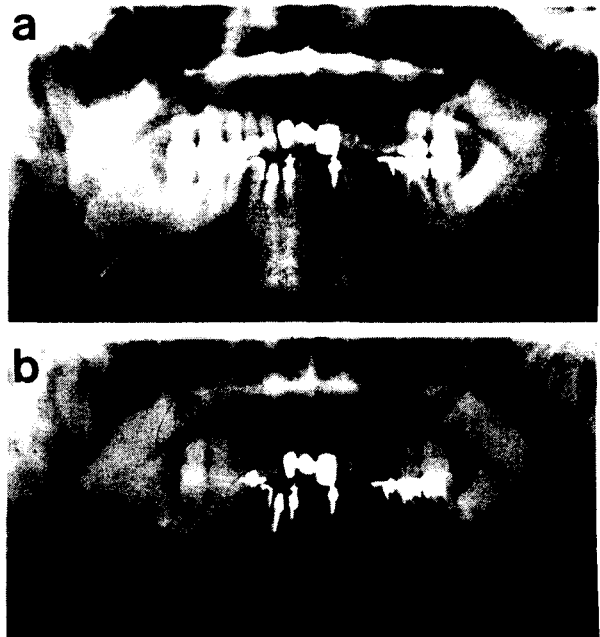


Figure 1. Orthopantomogram showing fracture line extending from the third molar to the mandibular angle (a), but fracture line is not evident 3 days later (b).

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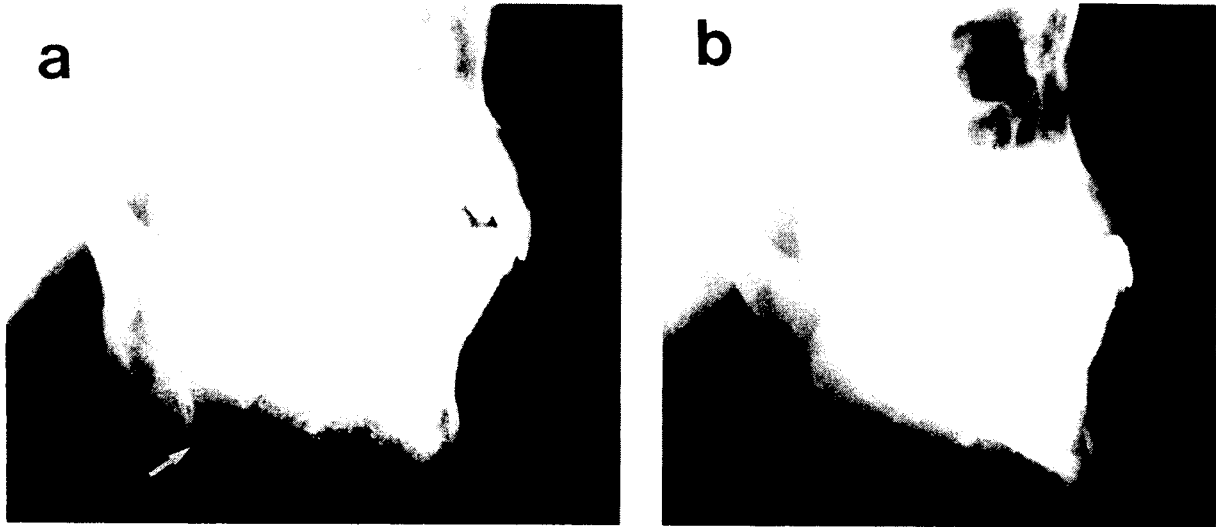


Figure 2. Lateral radiograph showing fracture line extending from the apex of the second molar to the mandibular angle (a), but fracture line is not evident 3 days later (b).

sema occurred within 7 days. The patient continued to be symptom-free and removal of the remaining crown was performed 3 weeks later.

Discussion

Facial emphysema arises from compressed free air by use of the air syringe or high-speed turbine bur, and by immediate postsurgical

complication of sneezing or blowing the nose.¹ Air may pass through the extraction socket or the preparation of the buccal flap and enter the subcutaneous tissues. The most frequent forms in radiographs of emphysema are irregular and multilocular in appearance. The roentgenographic findings of emphysema here differed from those normally seen in removal of a tooth

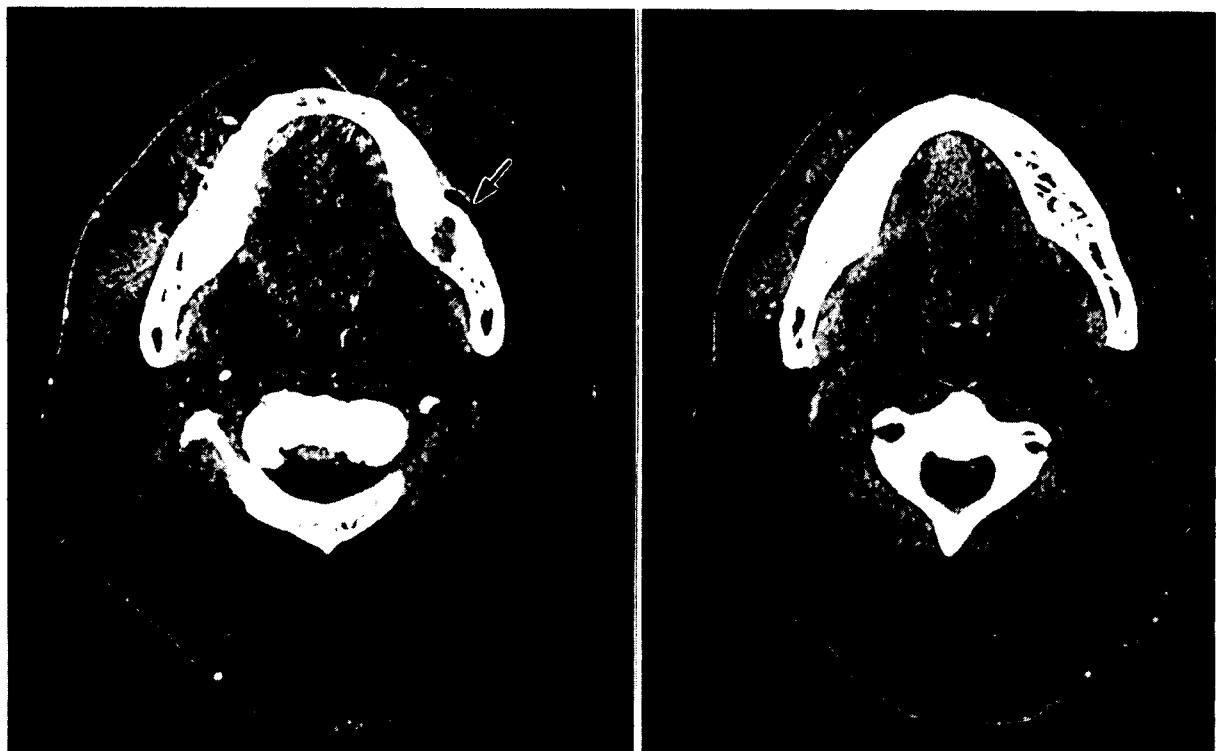


Figure 3. Three days later: CT showing emphysema at the lateral aspect of mandibular body, but no emphysema nearby the lower border of mandible.

or in root canal treatment. Flood² showed that free air in the mediastinum seen as a thin radiolucent line appears on the postero-anterior projection as a rounded pocket of air due to the surface tension between the pleura and the diaphragm. Possible explanations of fracture line appearance are that the use of the turbine bur allows air to migrate between the masseter and fascia through the periosteum detached from the underlying bone, the air to remain and dissect via the fascial planes as described by Kullaa-Mikkonen and Mikkonen,³ and that air spreads around the bone surface but does not widely infiltrate the subcutaneous tissue. Subcutaneous emphysema limited to a narrow area might be masked by the bone in those radiographs. The phenomenon that the fracture line was not evident in the orthopantomogram and lateral radiograph 3 days later may be explained by the finding that there was no emphysema near the lower border of the mandible in spite of its presence at the lateral aspect of the mandibular body in the CT. This finding may show reduction of emphysema in the period of 3 days. However,

it had caused evidence of a fracture revealed as a thin radiolucent line, which could have led to incorrect diagnosis of mandibular fracture following removal of an impacted third molar.

It is well known that emphysema is seen associated with fractures of facial bones. Although mandibular fractures are commonly diagnosed by conventional radiographs, and the use of CT is limited in those patients,⁴ one should be alert to possible misdiagnosis as in the present case when emphysema caused a false fracture line in the routine radiograph. It is important to identify the presence of emphysema by use of careful radiographic monitoring, i.e., different projections, and/or CT if there are possible emphysemas. Those may give evidence to suggest true or false fracture.

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