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Case Report

Mandibular fracture 2 weeks after third molar extraction

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Abstract – This case report describes mandibular fracture after the surgical extraction of fully erupted lower third molar of a 53-year-old healthy male patient. The fracture occurred 15 days after the extraction while chewing. The fracture line extended from the apex of the mesiobuccal root socket to the inferior border of the mandible. Follow-up of the patient was agreed as the patient was not willing to carry on further treatment. Bony union was observed radiologically 3 months later.

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Fracture of the mandible during removal of third molar is unusual; fracture after removal is even rarer. Libersa et al. reported that 150 maxillofacial surgeons experienced 37 fractures of the mandible out of 750 000 third molar extractions (1). Of the described 27 incidences, 17 occurred intraoperatively and 10 occurred postoperatively. In another study, 28 fractures of the mandible after an estimated 611 000 impacted third molar removals, with an incidence of 0.0046% was stated (2).

The mandibular fractures reported in the literature were related to surgical removal of either partially or fully impacted third molars (1–5). To the knowledge of the authors, there is no report of mandibular fracture following extraction of the fully erupted third molars. In this case report, fracture of preangular region of the mandible 15 days after the extraction of fully erupted third molar is presented.

Case report

A 53-year-old fit and healthy Caucasian male patient referred to our department complaining of pain in the region of the lower-right third molar. The nature of pain was suggestive of pulpitis. The affected tooth was bridge abutment which extended to the canine. When the restoration was removed, secondary caries was revealed. Extraction of the tooth was needed due to non-restorable, extensive destruction of the crown. Figure 1 shows the fully erupted right mandibular third molar in connection with crown and bridge restoration.

Extraction of the tooth was undertaken under local anesthesia by a junior resident. During the extraction with third molar forceps the mesiobuccal root was fractured and surgical removal was ensued. Following flap reflection, the buccal bone surrounding the mesiobuccal root was removed using a handpiece and a round burr. The fractured root was localized and removed with the use of an elevator. A course of oral antibiotics, non-steroidal anti-inflammatory analgesics and an antimicrobial mouthwash was prescribed for 1 week. Standard postoperative precautions were given and the patient was discharged. When the patient was seen 1 week later, the healing was uneventful; there was no sign of inflammation apart from mild aching pain.

Seventeen days after the extraction, the patient returned to our department stating that he heard a cracking sound while chewing bread crust on the extraction site 2 days earlier. He also had oozing bleeding and mild pain. On clinical examination, no sign of fracture such as ecchymosis, swelling, step deformity, malocclusion or paraesthesia of the lower lip was detected. Although mobility of the segments was not detected, some degree of flexibility was felt.

Fig. 1. Orthopantomograph (OPG) taken before extraction showing fully erupted right mandibular third molar in connection with crown and bridge restoration.

Due to a technical problem, an orthopantomograph (OPG) could not be taken on the day of clinical examination. Fracture line could not be detected on the occlusal or lateral oblique graphy. However, with the suspicion of possible fracture, a course of antibiotics was prescribed. The patient was advised a soft diet and follow-up.

OPG taken a week later revealed non-displaced fracture with the fracture line extending from the apex of the mesiobuccal root socket to the inferior border of the mandible (Fig. 2). Possible treatment options, i.e. intermaxillary fixation or open reduction, were given in detail. However, the patient was not willing to carry on further treatment. Follow-up visits of the patient were symptom free and no displacement of the segments or disruption on occlusion was noted. Bony union was radiologically observed 3 months later (Fig. 3).

The space occupied by the roots of teeth in the mandible height was determined by measuring the height of the mandible (perpendicular line drawn from the superior border of the mandible crossing the roots of the tooth to the inferior border of the mandible) and the height of the roots occupied in the bone (distance from the apex of the root to the superior border of the mandible). The roots occupied 40% of the total mandibular height with

Fig. 2. Orthopantomograph (OPG) demonstrating a non-displaced mandibular fracture in the preangular region. The fracture line on the lingual and buccal cortex was superimposed on radiography.

Fig. 3. Orthopantomograph (OPG) demonstrating complete healing of the fracture site.

20 mm of total mandibular bone height and 8 mm of height of the roots.

Discussion

When the strength of the bone is diminished the resistance of the mandible to external forces decreases and minimal trauma may result in fracture. The strength of the mandible may be impaired in relation to the surgical removal of lower third molars due to the space created following removal and substantial amount of bone removed in order to extract the teeth.

Fully impacted third molars occupy more space in the bone and significant amount of bone may need to be removed during surgical extraction. Hence fracture of the mandible occurs more commonly following removal of fully impacted third molars compared to partially impacted molars (2–4). The patient presented in this report had fully erupted third molar. A number of factors may have contributed to the fracture in our patient. The roots of the tooth occupied 40% of the mandibular height and some amount of bone removed during the surgical extraction of the mesiobuccal root may have further reduced the strength of the bone. In addition, the patient utilized the extraction side while chewing which concentrated occlusal forces in this region as he had no opposing maxillary teeth on the other side of the jaw. Furthermore, the patient had long partial edentulousness on both sides of the mandible. Teeth situated in the alveolar socket absorb masticatory forces and in the absence of teeth, force is exerted directly on the bone.

Postoperative fracture of the mandible occurs usually in the second week after removal of third molars and during chewing with a typical crackling sound (1–5). In our case, the mandible was fractured on the fifteenth postoperative day. In the second week, healing of the soft tissue takes place but the socket is not filled with bone yet. In addition, patients do not avoid the extraction site during chewing in this period anymore as the discomfort related to the surgical removal subsides. The

masticatory forces may then be sufficient to cause fracture in the susceptible bone but not too strong to cause displacement of the segments as in our case. Mandibular fracture following third molar removal is more common in males over 30–40 years of age (1–5). The occlusal forces exerted on the bone may be greater in males due to the stronger masticatory muscles.

Before extraction of the lower third molars the risk factors for potential mandibular fracture should be evaluated. The risk factors may include male patients over 40 years of age, insufficient distance from the apex of the socket to the inferior border of the mandible, edentulousness and any local pathology or systemic disease which may impair bone strength. In the presence of these risk factors, the first 3 weeks is critical for fracture and the patients should be informed about the likelihood of fracture preoperatively and soft diet for 3 weeks should be advised postoperatively.

Once the fracture of the mandible occurs, the standard management of fracture is reduction and fixation using either intermaxillary fixation or internal fixation. Our patient was not willing to undergo further treatment. Due to the absence of displacement and mobility of the fracture site, a close follow-up and soft diet was advised. Nevertheless, complete healing was observed 3 months after fracture.

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