Acute Airway Obstruction Secondary to Lingual Hematoma after Lower Third Molar Extraction: A Case Report

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Few dental procedures are potentially life-threatening. Note, however, that a dental extraction can result in preventable death. Severe post-extraction bleeding can occur, which may give rise to an alarming situation if there is any delay in detecting and managing the problem. The most immediate danger for a healthy patient with severe post-extraction hemorrhage is airway compromise. Acute airway obstruction from post-extraction hematoma is relatively uncommon, but it may occur with fatal consequences if there is any reluctance to maintain the airway clearance. Therefore, dentists and oral and maxillofacial surgeons should have clear understanding of the problem and measures to control it. Active bleeding that is not controlled by local measures in a dental office should be referred to the nearest hospital emergency department as soon as possible for appropriate management.

Key Words: Airway obstruction; Extraction; Hemorrhage; Lingual hematoma; Third molar tooth

Introduction

The simple extraction of third molars has become a common surgical procedure performed at dental clinics. In addition, bleeding from tooth extraction is considered to be one of the obvious complications. Note, however, that acute airway obstruction from post-extraction hematoma is a rare but potentially fatal complication of an extraction, particularly associated with lower third molars. After extraction, severe pre-operative and post-operative bleeding may occur, which will necessitate emergency management. This paper reports a case of acute airway obstruction that occurred as a result of massive hematoma in the floor of the mouth after extracting the lower third molar.

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Case Report

A 72-year-old male with acute airway obstruction—after having the third molar extracted—was referred to the department of oral and maxillofacial surgery from the emergency department (ED). On the day of the referral, he had his left mandibular third molar extracted at a local dental clinic under local anesthesia at 10 o’clock in the morning and returned home. Three hours later, he developed intraoral swelling and revisited the local dental clinic. Gradually, the condition worsened; 4 hours after the extraction, he was referred to the ED of Chonnam National University Hospital. The examination at the ED revealed tongue elevation, mouth-opening limitation, and swelling of both submandibular and sublingual spaces (Fig. 1).

The patient was found to be hypertensive (blood pressure: 170/90 mmHg) and mildly hypoxic (oxygen saturation: 90%), and his heart rate was 86 beats/min. The patient’s medical history revealed only hypertension, and he has been taking one tablet of calcium channel blocker for 10 years. Both submandibular and sublingual swellings were outstanding, extending into the anterior neck just like Ludwig’s angina. The patient also complained of dysphagia. The tongue shifted to the right side due to massive sublingual swelling on the left mouth floor and had the appearance of a double tongue. The patient had no history of bleeding.

Fig. 1. (A) Prominent swelling on both submandibular and sublingual areas. (B) Double tongue appearance with mouth floor hematoma.

Fig. 2. (A) Intra-operative findings: removal of hematoma and granulation tissue from the extraction socket. (B) Removed hematoma from the extracted socket.
disorder, and the results of all blood laboratory tests were within normal range. The prothrombin time (PT), activated partial thromboplastin time (aPTT), international normalized ratio, platelet, red blood cell (RBC), and hemoglobin (Hb) were 11.8 seconds, 28.1 seconds, $1.06,331 \times 10^3$/mm$^3$, $4.23 \times 10^6$/mm$^3$, and $14.70$ g/dl, respectively. To secure the airway, the patient was transferred to the operating room where he was intubated with a fiberoptic technique initially without sedation, but it was hard for the anesthesiologist to keep trying intubation due to airway compromise. There was no choice but to perform tracheostomy under sedation. The hematoma was removed by an incision of the extraction socket with no. 15 blade, surgical curettage of the socket, and stay suturing of thoracic catheter for the drainage (Fig. 2). The hematoma resulted in deviation of the oropharynx and upper airway constriction at the level of the oropharynx and the narrowest point measuring $0.4 \times 1.1$ cm (Fig. 3A, 3B). The follow-up computed tomography confirmed that the hematoma was no longer expanding (Fig. 3C). Two days later, the tube was extubated, and he recovered uneventfully 1 week later.

Discussion

Extraction of the third molar is the most common surgical procedure performed by oral and maxillofacial surgeons, and severe complications are relatively rare. The complication rate associated with the removal of the third molar varies from 7% to 10%, with the risk of hemorrhage ranging from 0.2% to 1.4%\(^3\). Other complications include post-operative infections (0.06% to 4.3%), nerve injury (7.1% to 90.02%), alveolar osteitis, or dry socket (1% to 30%) and oro-antral fistula (0.06%). Complications such as temporomandibular joint dysfunction and jaw fractures occur in less than 0.01% of cases\(^4\).

The causes of post-extraction hemorrhage can be generally classified into 2 groups: systemic and local. Severe post-extraction bleeding can be the result of a range of bleeding disorders, systemic diseases, or unwanted effects of drugs. Platelet disorders, Von Willebrand’s diseases, thrombocytopenic purpura, thrombocytopenia secondary to leukemia, hemophilia, liver disease, hypertension, chronic renal failure, myeloma, systemic lupus erythematosus, and isolated deficiency of clotting factors can cause bleeding disorders\(^5\). Routine hematological tests should be performed before the surgery for patients with history of...
bleeding tendency or just to be on the safe side. These tests include bleeding time of 2.5~9.0 minutes, clotting time of 5~15 minutes, PT of 11~12.5 seconds, aPTT of 30~45 seconds, platelet of 100~450×10^3/mm^3, RBC of 4.5~5.5×10^6/mm^3, and Hb of 13.5~18 g/dl. Some patients with excessive post-operative hemorrhage have undergone previous dental extraction without complications. Note, however, that our patient had no history of bleeding disorder, and the results of all blood tests were within normal range. Thus, the hemorrhage might have been due to local causes in this case.

An incision of the extraction socket revealed destruction of the lingual cortex in the third molar area, which might injure the local vessels on the lingual cortex (Fig. 3B). In elderly patients, fracture of the alveolar bone occurs more frequently during tooth extraction because of the firm adhesion between the roots of the teeth and the alveolar bone. The lingual sides of a mandibular molar site are highly vascularized regions; it is likely to be arterial damage when fracture occurs in this region, leading to massive bleeding. Severe bleeding and formation of large hematoma in the floor of the mouth are the results of vascular trauma. The effect of vasoconstrictive agent in the local anesthesia combined with an injury of the lingual arterio-venous plexus can result in delayed swelling, causing respiratory distress through the obstruction of the upper airways. An explanation for the delayed bleeding may be vasoconstriction caused by the local anesthesia, which can mask the trauma of the lingual arterio-venous plexus. The initial hemostasis of the constricted artery, which should enable the formation of a blood clot, is later lost when the effect of the vasoconstriction diminishes, causing delayed hemorrhage. Bleeding was likely to have continued for a long time. Furthermore, the hypertension likely resulted from the post-extraction pain.

Granulation tissue also contributes to post-operative bleeding and delayed healing. Thus, all granulation tissues should be removed after extracting the tooth for proper bleeding control. An examination of the granulation tissues indicated lack of curettage of the extraction socket, which may be another reason for the post-operative bleeding. Another important finding during the surgical procedure was the very tight suture of the incision, which prevented bleeding through the incision line; this in turn may have also predisposed the patient to the formation of hematoma. It caused severe narrowing of the upper airway, which resulted in respiratory distress. Although fiberoptic technique and endotracheal intubation were tried several times, those failed because of such massive swelling and deviated tracheal pathway; thus, tracheostomy was performed to secure the airway as soon as possible. After an incision of the extraction socket, the hematoma was removed by surgical curettage.

The distolingual area of the mandibular third molar region is the most highly vascularized site, and this should be taken into consideration when third molars are to be removed. Therefore, no undercut should be left around the extraction site, and precaution with stable surgical technique needs to be taken so as not to impose overload on the lingual cortex to prevent fracture on the bone. In addition, the surgeon should identify any fracture on the lingual cortex during intra-operative procedures. After the extraction, granulation tissue must be eliminated completely with curettage, and copious irrigation is required. The bleeding tendency should be checked as well. An ice pack was applied to the patient’s face for 20 minutes during the first two to three days. In this case, blood resulting from lingual bone fracture flowed into the submandibular space rather than the oral cavity. For this reason, the patient may not have noticed the massive bleeding. Therefore, suturing should be done on gingiva approximation without tension. There is a need to pay attention to post-extraction complications, particularly up to half a day after tooth extraction. One should also be alert
for delayed hematomas on the floor of the mouth when patients complain of protruding tongue, hemorrhage, or respiratory distress\(^8\). Moreover, the patient should be instructed to monitor the floor of the mouth for any sign of swelling and tongue elevation and to call the dentist as soon as any breathing, swallowing, or speaking difficulties occur\(^9\). Adequate diagnostic radiographs, knowledge of surgical anatomy, and careful operative procedures are required, including awareness of possible life-threatening emergencies.

**Conflict of Interest**

No potential conflict of interest relevant to this article was reported.

**References**