Hemorrhage in the Floor of the Mouth During Implant Placement in the Edentulous Mandible: A Case Report

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This report describes a life-threatening hemorrhage in the floor of a patient’s mouth during routine implant placement in the anterior mandible. Airway obstruction caused by hematoma development resulted in acute nasotracheal intubation and subsequent surgical intervention. Surgical, radiographic, and anatomic considerations to prevent severe bleeding are discussed. An extroral submental approach in cases with large sublingual hematomas is recommended. An outpatient should be treated in or close to a hospital where these complications can be dealt with promptly and effectively.

Key words: bleeding, life-threatening, sublingual

Implant placement in the interforaminal region of the edentulous mandible is considered to be a technically uncomplicated procedure. However, some authors have reported life-threatening hemorrhage during or shortly following implant placement in the anterior mandible, caused by lingual perforation of the cortical bone. In this report, a case is presented in which implant placement caused arterial bleeding and subsequent life-threatening airway obstruction.

Report of a Case

A 69-year-old woman was referred to the Department of Oral and Maxillofacial Surgery for the placement of Brånemark implants (Mark II, Nobel Biocare, Göteborg, Sweden) in the interforaminal region of her mandible. About 3 to 4 months earlier, all teeth in the mandible were extracted because of severe periodontitis. The existing mandibular denture was not satisfactory and the patient had requested implants.

The treatment plan included the placement of five implants in the interforaminal region to provide support for a mandibular complete-arch restoration. Radiographic examinations were performed by panoramic radiograph; lateral skull and axial (intra-oral) radiographs were taken in the interforaminal region. These examinations verified the clinical findings of a normal maxillomandibular jaw relationship in the sagittal plane (Fig 1) and a moderately resorbed alveolar crest. In addition, the radiographs revealed mineralized postextraction sockets and extensive sublingual fossae bilaterally (Fig 2).

Surgery was performed under local anesthesia supplemented with oral sedation, 15 mg diazepam (Stesolid, Dumex, Denmark). Approximately 1 hour after sedation, the mandible was anesthetized by mandibular block, bilaterally, and infiltration, buccally and lingually, in the anterior mandible with 10.8 mL of 2% lidocaine with 12.5 mg/mL epinephrine (Xylocain–Adrenalin, Astra, Mölnadal, Sweden). An incision was made in the labial vestibule, and the mental foramina were localized bilaterally. A lingually pedicled mucoperiosteal flap was reflected. The shape of the lingual bone surface was thoroughly investigated by inspection and probing. Preparation and drilling for placement of five implants was
performed. Small perforations of the lingual cortex were made in the canine regions. From the moment of perforation on the left side, bleeding was observed from the periosteal area lingually and through the prepared implant site. Hemostasis was performed by placing a direction indicator, an instrument used in the Brånemark System, into the implant site and by placing a gauze pack between the lingual cortex and the periosteum. Right-side hemorrhage was not initially observed. Although further subperiosteal dissection was performed, no visible bleeding source was detected. Implant placement was completed and cover screws were placed. All implants were bicortically anchored and positioned in the following regions: first premolar on the left side (18-mm-long implant), canine region on the left side (15 mm), incisor region on the right side (15 mm), canine region on the right side (15 mm), and first premolar region on the right side (18 mm). The mucoperiosteal flap was repositioned and sutured with vertical mattress sutures (Vicryl, Ethicon, Germany).

During implant placement, a gradually increasing elevation of the floor of the mouth on the right was seen. The patient was therefore taken to the ENT ward for further observation. Within less than 1 hour, the tongue became pressed against the palate and the posterior pharyngeal wall, and acute airway obstruction was imminent. Nasotracheal intubation was performed with the aid of a flexible fiberoptic laryngoscope. Parenteral bensyl penicillin 3 g × 3, betamethasone (Betapred, Glaxo, England) 4 mg × 3, and tranexamic acid (Cyklokapron, Kabi Pharmacia, Sweden) 1000 mg were prescribed. The patient was observed in the intensive care unit and her condition appeared to be stabilized.

Laboratory tests showed normal values in hemoglobin and hematocrit (13.4 g/dL and 40%, respectively). Three hours later, the size of the hematoma had visibly increased. Radiographs of the thorax showed deviation of the trachea to the left in the upper mediastinum and to the right at the level of the aortic arch (Fig 3), indicating a dissecting hematoma. The decision was made to operate. An extraoral, submental approach was decided upon because the extensive swelling of the tongue and floor of the mouth made an intraoral approach impossible. Under general anesthesia, a horizontal incision was made just beneath the lower edge of the mandible in the symphyseal region about 6 cm long down to and through the periosteum, which was reflected. A massive hematoma was evacuated, leaving a cavity reaching posteriorly to the molar region, superior to the tongue, and inferior through the floor of the mouth and down to the right of the hypopharynx. The anterior area of the mandible was inspected, and a cortical bone perforation was found lingual and inferior to the right canine region. The active bleeding source was found 4 cm posterior to the mandible. An extension of the incision was made on the right side to achieve better access, and ligation of the severed and retracted artery was performed. Suction drainage was applied and the wound was sutured in layers.

The postoperative course was uneventful, and extubation was performed after 24 hours. Hemoglobin and hematocrit values were checked daily; the lowest rates recorded were 1.06 g/dL and 30%, respectively. After 4 days, the patient was in good condition and discharged from the hospital.

Discussion
Extensive hemorrhage in the floor of the mouth may cause acute airway obstruction. Because of this danger, securing and maintaining an adequate airway should be given highest priority. When an adequate airway has been attained, one can wait and see whether the hemorrhage will cease on its own, or reoperate to find the bleeding source.

Experience from similar cases indicates that most hemorrhage in the floor of the mouth stops spontaneously after a few minutes because of the pressure from the adjacent soft tissue. Hence, our initial
decision was to let the hemorrhage cease on its own. However, because the submental and submandibular swelling did not stop and radiographs of the thorax indicated dissecting hematoma, a decision to ligate the artery was made. To control hemorrhage, some authors recommend an intraoral approach, but because of the massive intraoral swelling, this approach was deemed impossible. Through the submental incision, the bleeding artery was visualized and ligation was easy to perform.

Bleeding in the floor of the mouth could originate from the lingual artery, the facial artery, or one of their branches. Bavitz et al suggest that the submental artery or its parent facial artery should be ligated first, whereas others report ligation of the lingual artery with good results. If there is an inability to identify the arterial branch involved, angiography may be the diagnostic and/or therapeutic choice.

Long implants and bicortical anchorage are recommended to obtain primary stability during the initial healing period so as not to jeopardize osseointegration. This is particularly important when a thin layer of cortical bone surrounds a core of low-density trabecular bone. When striving to achieve bicortical anchorage, there is always a risk of perforating the inferior cortical bone. Unquestionably, perforation of the lingual cortex should be avoided because of the subsequent risk of life-threatening hemorrhage. To make the implant-supported prosthesis esthetically and biomechanically optimal, it may be desirable to tilt the implants buccally when there is a postnormal relation of the mandible to the maxilla in the sagittal plane. In cases with extensive sublingual fossae, tilting will limit the implant length to avoid perforation of the lingual cortex. An accurate preoperative radiographic examination and careful lingual dissection are mandatory in these cases. In the case presented here, lingual perforation occurred in spite of these measures.

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Footnotes
FIGURES

Figure 1

Fig. 1 Preoperative lateral radiograph of the skull showing a postnormal mandible.

Figure 2

Fig. 2 Occlusal radiograph of the anterior mandible. Note the extensive sublingual fossae.
Figure 3

Fig. 3 Bedside radiograph, frontal projection of thorax after intubation. A pronounced deviation of the trachea is indicated by the endotracheal tube (arrows point to distal end of tube). A deviation of the upper esophagus is indicated by the gastric tube (the thin white line indicated by the thick arrow at the level of the lower esophagus).

Hemorrhage in the Floor of the Mouth During Implant Placement in the Eden


