Life-Threatening Sublingual Hematoma after Mandibular Implant Placement - A Case Report

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Abstract

Rationale: Sublingual hematoma is a potentially lethal complication following mandibular implant placement. Due to the scarce cases reported, the management is controversial. In this article, a case is discussed focusing on the different treatment options to establish an orientative guideline. Patient Concerns: A patient with sublingual hematoma following implant surgery was urgently referred. Despite no active bleeding, breathing difficulty due to oropharyngeal obstruction and oxygen saturation decrease were present. Diagnosis: Stable sublingual hematoma with respiratory distress, based on clinical findings and observation. Treatment: Under local anaesthesia, percutaneous tracheostomy without previous intubation was performed for airway preservation. No surgical approach for the hematoma was made. Outcomes: Uneventful recovery with spontaneous resolution of the hematoma in few days. Takeaway Lessons: Anatomic knowledge of this area and proper surgical planning are required to avoid this complication. Regarding management, airway preservation is mandatory. Surgical approach for the bleeding source will depend on hematoma progression.

Keywords: Dental implant, floor of the mouth, haemorrhage

INTRODUCTION

In the last decades, implantology has become widely practiced and predictable. However, the possibility of inherent complications remains. Although rare, hematoma in the floor of the mouth is one of the worst due to its lethal potential.

Several cases have been reported during or after implant placement in the interforaminal mandible\(^1\)\(^{-}\)\(^6\) due to lingual cortex perforation by involuntary drilling, poor planification, or excessive implant angulation. Intraosseous arterial injury may also overcome with long implants in atrophic mandibles.

The haemorrhage latency period may range from prompt apparition to several hours, depending on factors such as tamponade attempts, vasoconstrictors, vessel type, or the damage mechanism.\(^3\)\(^,\)\(^7\)\(^,\)\(^8\)

It can auto-stabilize or progress pulling the tongue against the oropharynx. A dissecting course to other spaces or even down to the mediastinum is also possible.

Any of these scenarios involves airway obstruction threat and requires observation and quick management in a properly equipped clinic. Given the scarce reported cases, there is no management protocol, which otherwise would be desirable for a potentially lethal complication. This article is intended to contribute to this issue and to help the clinician make a decision if this complication overcomes.

CASE REPORT

Patient information

A 59-year-old male was urgently transferred from a dental clinic to the maxillofacial service at the referral hospital. Four implants had been placed in the mandible under local anaesthesia plus sedation. During implant site preparation on the right side, lingual cortex perforation was noticed without apparent implication, allowing to accomplish the procedure. Life-threatening sublingual hematoma was performed for airway preservation. No surgical approach for the hematoma was made. Uneventful recovery with spontaneous resolution of the hematoma in few days. Anatomic knowledge of this area and proper surgical planning are required to avoid this complication. Regarding management, airway preservation is mandatory. Surgical approach for the bleeding source will depend on hematoma progression.

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However, in some minutes, hematoma in the floor of the mouth appeared and progressed despite tamponade attempts.

**Clinical findings**

The patient showed general discomfort, sweat, hoarse voice and anxiety, and referred oral swelling, dysphagia and breathing difficulty.

Intraoral exploration revealed a prominent, but apparently stable 5 × 4 cm hematoma in the floor of the mouth, pushing the tongue against the pharynx and palate, causing subtotal oropharyngeal obstruction [Figure 1]. Right submandibular swelling was present.

**Diagnostic assessment**

The diagnosis was based on clinical exploration and monitorization, which showed an oxygen saturation of 91% and a heart rate of 104 beats per minute with tachypnea rate of 26. The hemoglobin level was 15.7 g/dl.

**Therapeutic intervention**

The patient was transferred to the intensive care unit, where percutaneous tracheostomy under local anaesthesia without intubation was performed. Given that hematoma growth had ceased, neither surgical approach for hemostasis nor drainage was made.

Computed tomography (CT) scan [Figure 2] showed diffuse density increase in the floor of the mouth, without any blood collection nor active bleeding.

After tracheostomy, oxygen saturation increased to 97% and the heart and breath rate normalized (80 bpm and 18 bpm, respectively).

Hematoma volume decreased gradually during the following days and the tracheostomy tube was removed on the 3rd postoperative day. The patient was discharged a day later.

**Follow-up and outcomes**

The follow-up (1 year) was uneventful. The hematoma resolved during the second week, and the tracheostomy wound healed spontaneously. No implant removal was necessary [Figure 3].

**DISCUSSION**

Since few case reports preclude to elicit solid guidelines about this rare and unpredictable complication, decisions fall on the clinicians’ criterium in a specific context, which is based on the patient’s clinical status and hematoma expansion rate, together with objective signs like oxygen saturation and radiological tests.

According to the reviewed cases, an algorithm is presented [Figure 4]. However, certain variability can be noted in the literature. In stable hematomas, some authors take observational measures and others perform intubation and/or tracheostomy.[2,6,9] In our patient, our own proposed guidelines were not strictly followed, and tracheostomy decision was influenced by the absence of a head and neck surgeon on duty at the hospital. Given the case of a nonprogressive hematoma, a Guedel pattern airway or a laryngeal mask would have achieved normal oxygenation but, in case of bleeding reactivation, emergency tracheostomy would have been necessary. To avoid this, elective tracheostomy without intubation was preferred based on difficult intubation predictors like Mallampati class IV and oropharynx obstruction.[10] By sequential exchange of tubes through an internal guide, percutaneous tracheostomy allows for rapid and reliable tracheal access with minor morbidity, under local anesthesia if required. Open tracheostomy without intubation may be a challenging and time-consuming procedure in certain necks, especially under local anesthesia.[3]

Obviously, if evident hematoma progression, invasive techniques for airway preservation and hemostasis are imperative.[3-5]

The usefulness of surgical drainage is controversial.[10,4] Lax tissues in the floor of the mouth lead to a diffuse hematoma instead of a localized evacuable collection, as described in our CT scan. Most haemorrhage episodes are self-limited because of the pressure from the adjacent tissues. Drainage may ruin this self-tamponade action and can aggravate the haemorrhage.[11,4,7] In our patient, drainage was discarded at the admission as there was no secured airway.

In this regard, some anatomic considerations are worth to mention. The sublingual artery, branch of the lingual artery, is the main blood supplier to the floor of the mouth. Both arteries join and give off a single vessel that enters the mandible through the lingual foramen. Lateral canals may also be present.[6] Recent studies have described anatomical variants that are intrinsically related with this complication. The submental artery (branch of the facial artery) frequently gives off a branch that reaches the floor of the mouth and sometimes is the only vascular source to the area.[7] Moreover, arteries in the sublingual space may course parallel to the occlusal plane and lateral to the sublingual gland,[8] in contrast to the majority of cases in which these arteries are located medially; transection of a parallel vessel is more prone to occur than a single vessel entering perpendicularly into the bone.

An extraoral approach is recommended if decision is to ligate the bleeding vessel, as tissue distortion makes intraoral access challenging and dangerous. Depending on the context, an approach by mucoperiosteal lingual mandibular flap can be successful.[11] A probe guide through the implant hole may help find the perforation point.[3,5]

The bleeding source should be identified radiologically.[2] However, if time not available, anatomic variations must be considered, as direct “blind” ligation of the lingual artery may be unsuccessful if the submental artery is involved.[7] External carotid artery ligation may be necessary in uncontrollable cases.[3] Alternatively, angiography-guided embolization may be the first-choice option or if surgical efforts fail.
All authors address the importance of prevention. Thorough anatomical knowledge of the area and radiological planning is essential, together with simultaneous inside-and-outside finger palpation to assess the mandibular thickness and sublingual fossa location, helping to choose the implant diameter and position. It also helps to estimate the thickness of the floor of the mouth and the vertical location of the sublingual artery.

Intraoperatively, lingual subperiosteal dissection is advised for bone evaluation and soft-tissue protection in atrophic mandibles. The implantologist should notice any cortex perforation and focus on it, taking immediate measures to avoid a critical scenario. Ligation suture is the first-choice maneuver if serious bleeding overcomes, which requires skills and rapid execution before tissue distortion is present. In contrast, it may be difficult if the vessel is retracted, and several failing attempts may lead to additional damage.

**Conclusions**

Proper surgical planning is required to avoid this complication. Measures must be performed immediately after lingual cortex perforation to prevent bleeding and hematoma formation. If present, airway preservation is mandatory. The surgical approach for the bleeding source will depend on hematoma progression.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understand that name and...
initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**
There are no conflicts of interest.

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