Subspinal osteotomy for simple extraction of deeply impacted supernumerary tooth in the anterior maxilla

Noriaki Aoki a,∗, Toshinori Iwai b, Hiromasa Endo a, Junichi Baba a, Iwai Tohnai b

a Department of Oral and Maxillofacial Surgery, Saiseikai Yokohama City Hospital, Japan
b Department of Oral and Maxillofacial Surgery, Yokohama City University Graduate School of Medicine, Japan

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1. Introduction

Oral and maxillofacial surgeons sometimes encounter supernumerary teeth, and the most common location of supernumerary teeth is the anterior maxillary region. These teeth are more prevalent among men than women in a proportion of 2:1 [1]. The incidence of supernumerary teeth is 0.3–0.8% in deciduous dentition and 1.5–3.5% in permanent dentition [1]. Impacted supernumerary teeth of the anterior maxilla are commonly removed in conventional labial or palatal approach. However, deeply impacted supernumerary tooth of the anterior maxilla cannot be removed simply for excessive bone removal and possibility of adjacent roots injury. Therefore, we describe subspinal osteotomy for simple extraction of deeply impacted supernumerary tooth in the anterior maxilla. Subspinal osteotomy for removal of deeply impacted supernumerary tooth can allow good surgical field, minimum bone removal, simple extraction, and reduced risk of adjacent structures injury.

2. Patients and methods

This study included six patients with deeply impacted supernumerary tooth in the anterior maxilla (Table 1). The supernumerary teeth were examined with computed tomography (CT) (Fig. 1). The tooth size, its direction (three-dimensional position), as well as its distance from the adjacent teeth and other close critical anatomical structures, were assessed preoperatively. Because teeth extraction in conventional labial or palatal approach was very challenging and invasive for excessive bone removal, all patients underwent tooth extraction with subspinal osteotomy under general anesthesia (Fig. 2). After a circum vestibular incision from canine to canine, V-shaped around the upper lip frenulum, a mucoperiosteal flap was raised from the labial aspect of the maxillary anterior teeth toward the piriform. The piriform rim was identified, and then 1-mm-diameter round bar or piezosurgery® was used to make a V-shaped groove below the anterior nasal spine. Subspinal osteotomy using a small chisel was performed without subperiosteal dissection of the nasal mucosa to expose the impacted supernumerary tooth (Fig. 3). After subspinal osteotomy, osteotomized bone segment

Table 1

Characteristics of patients who underwent extraction of deeply impacted supernumerary tooth in the anterior maxilla with subspinal osteotomy.

<table>
<thead>
<tr>
<th>Case no.</th>
<th>Age</th>
<th>Sex</th>
<th>Operation time (min)</th>
<th>Symptom</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8</td>
<td>M</td>
<td>25</td>
<td>Uncomfortable feeling</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td>F</td>
<td>20</td>
<td>Uncomfortable feeling</td>
</tr>
<tr>
<td>3</td>
<td>9</td>
<td>M</td>
<td>15</td>
<td>Teeth malalignment</td>
</tr>
<tr>
<td>4</td>
<td>12</td>
<td>M</td>
<td>18</td>
<td>Teeth malalignment</td>
</tr>
<tr>
<td>5</td>
<td>20</td>
<td>M</td>
<td>20</td>
<td>Teeth malalignment</td>
</tr>
<tr>
<td>6</td>
<td>28</td>
<td>F</td>
<td>25</td>
<td>Teeth malalignment</td>
</tr>
</tbody>
</table>

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was raised superiorly and the impacted supernumerary tooth was exposed partially. The bone around the supernumerary tooth was removed carefully without injury of adjacent structures such as central incisor roots, and then the tooth was removed simply under good visualization (Fig. 4). The osteotomized subspinal bone segment was gently reduced to its original position after the tooth removal, and mucoperiosteal flap was sutured with an absorbable material.

3. Results

The deeply impacted supernumerary teeth of the anterior maxilla were removed completely using subspinal osteotomy in all cases. Mean operation time was 20.5 min (Table 1). There were no complications such as injury of adjacent roots.

4. Discussion

Supernumerary teeth often show signs of their presence, such as delay or failure of permanent tooth eruption, displacement or rotation of permanent teeth, dental crowding, incomplete space closure during orthodontic treatment, delayed root development of permanent teeth, root resorption of adjacent permanent teeth, or cyst formation. When the supernumerary tooth has symptomatic or above signs, the tooth was commonly removed in a labial or palatal approach. However, the surgical approach should consider injury of nearby structures, such as the roots of the adjacent permanent teeth and the nasopalatine nerve [2]. Conventional labial or palatal approach for deeply impacted supernumerary tooth requires excessive bone removal and has possibility of adjacent structures injury under poor visualization. Endoscopic removal of supernumerary intranasal tooth was reported as minimally invasive approach [3]. However, endoscopic removal cannot be performed when the supernumerary tooth is deeply impacted in the maxilla without tooth exposure in the nasal floor. Therefore, a novel approach is required for simple and safe removal of the deeply impacted supernumerary tooth.

As a minimally invasive approach for deeply impacted supernumerary teeth of the anterior maxilla, we performed subnasal osteotomy which was reported to avoid nasal profile changes after Le Fort I osteotomy by Mommaerts et al. [4]. This subnasal osteotomy preserves the perinasal musculature insertion and does
Fig. 4. Extraction of deeply impacted supernumerary tooth of the anterior maxilla after subnasal osteotomy.

not require bone fixation. Subspinal osteotomy for removal of deeply impacted supernumerary tooth can allow good surgical field, minimum bone removal, simple extraction, and reduce risk of adjacent structures injury. This subspinal osteotomy should be applied, when both labial and palatal approaches are challenging as Fig. 1 and conventional approaches require excessive bone removal for tooth extraction. Even if distance between adjacent teeth and deeply impacted supernumerary tooth was 1 mm or less, subspinal osteotomy allows safe access from above the deeply impacted supernumerary tooth and the complete removal without adjacent teeth injury. However, the positional relationship between deeply impacted supernumerary tooth of the anterior maxilla and adjacent structures should be assessed preoperatively by CT including 3D images.

5. Conclusion

Subspinal osteotomy for removal of deeply impacted supernumerary tooth in the anterior maxilla can allow good surgical field, minimum bone removal, simple extraction, and reduced risk of adjacent structures injury. This technique should be applied, when both labial and palatal approaches are challenging.

References