Supernumerary Molars: Fourth or Distomolars. Clinical Study and Review of the Literature

SUMMARY

Supernumerary teeth are the teeth that exceed when compared with the number of the teeth of a normal dentition. They appear more frequently in men than in women with a ratio 2:1, respectively. Several theories had been suggested to explain this phenomenon with the “dental lamina hyperactivity theory” to be the most accepted. Supernumerary molars (fourth molars or distomolars) usually are impacted and in this way they cause the impaction of third molars. They can be associated with complications or stay asymptomatic. The golden standard for the diagnosis of supernumerary teeth is the dental panoramic tomography. Treatment involves the removal of supernumerary teeth (together with third molars) because of the complications that their presence can cause. This article reports 6 cases of supernumerary fourth molars in patients who referred to our clinic.

Keywords: Distomolars; Fourth Molars; Supernumerary Teeth

Introduction

Supernumerary teeth are the teeth which are in excess when compared with the number of teeth in a normal dentition. Their prevalence ranges between 0.1-3.8% in the permanent dentition and 0.3-0.8% in the primary dentition1,2,4. Supernumerary teeth occur more often in males than females and the reported ratio is almost 2-3:1 respectively3,4,10. They appear almost 8-10 times more frequently in the maxilla than in the mandible1,2,14.

The aetiology of supernumerary teeth still remains unclear. Both genetic and environmental factors seem to affect their appearance in the oral cavity5. Moreover supernumerary teeth appear in several syndromes and developmental anomalies:

1. Cleidocranial dysostosis (Figs. 1 and 2) - partly or completely missing of clavicles, hypoplasia of the midface, delayed closure of sutures and fontanelles of the skull9;
2. Gardner’s syndrome - multiple adenomatous polyposis of the large intestine, multiple osteomas of facial bones, cutaneous epidermoid cysts10;
3. Cleft lip and palate13;

Several theories have been suggested to explain the development of supernumerary teeth:

1. Atavism theory - according to this theory, supernumerary teeth are the result of phylogenetic reversion to an extinct primitive dentition1;
2. The “dental lamina hyperactivity” theory suggests that supernumerary teeth are formed as a result of local and independent hyperactivity of dental lamina. A supplemental form could develop through the lingual extension of a tooth bud, though the rudimentary form could develop through the proliferation of dental lamina’s epithelial remnants. This is the most accepted theory2,6;
3. The dichotomy theory - according to this theory, the tooth bud is separated into 2 equal or different size parts. These 2 parts develop 2 equal teeth or 1 normal and 1 dysmorphic tooth. This theory has been rejected6;
4. Heredity-genetic and environmental factors - heredity could be associated with the development of supernumerary teeth because there have been reported cases in which there was familial occurrence of supernumerary teeth2,7,8,19.
Fourth molars or distomolars are placed behind the third molars. The fourth molars, which are found in the maxilla, have conical shape because they are not completely developed\textsuperscript{1,2,19,3}. They are smaller in comparison to the fourth molars in the mandible, which are often similar to the third molars\textsuperscript{1,2}. They appear more frequently in the maxilla than in the mandible\textsuperscript{14}. Fourth molars usually stay impacted, but they can also erupt normally. The simultaneous presence of 4 impacted fourth molars in every quarter is a very rare phenomenon\textsuperscript{2,15}.

Detailed medical and dental histories are very important for the diagnosis of supernumerary teeth. The diagnosis of fourth molars is often done by chance after radiographic examination of the corresponding area\textsuperscript{2}, especially in conditions where they stay impacted and asymptomatic\textsuperscript{17}. In case they stay impacted, radiographic examination is necessary for the localization of the supernumerary teeth. The golden standard for the diagnosis of supernumerary teeth is the dental panoramic tomography. Both periapical and occlusal radiographs give useful information. The occlusal radiographs give extra information for the location of the supernumerary tooth. Radiographic examination of all the quarters is obligatory when 1 fourth molar is detected because the bilateral existence of supernumerary molars is frequent. In some cases of surgical extraction of fourth molars, Clark’s rule can be used as a supplemental tool for their localization (this technique uses 2 radiographs of the same area with different angulations). The anatomic morphology of the adjacent area can restrict the radiographic examination with periapical radiographs. In these cases, dental scan solves the problem of anatomic limitations.

Fourth molars usually stay impacted and in this way they cause the impaction of the corresponding third molar. They can stay asymptomatic but also can cause clinical complications (Tab. 1).

Table 1. Complications associated with the presence of fourth molars

<table>
<thead>
<tr>
<th>Condition</th>
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<tr>
<td>Delayed eruption or non-eruption of third molars. Rarely, they can through the third molars, stop the eruption of second molars\textsuperscript{1}</td>
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<tr>
<td>Displacement of supernumerary tooth itself with lingual, palatal or parietal direction. Moreover they can migrate into the sinus or stay close to sinus floor\textsuperscript{21}</td>
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<tr>
<td>Occlusal problems</td>
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<td>Displacement of permanent teeth (crowding, rotation)</td>
</tr>
<tr>
<td>Subacute pericoronitis, periodontal abscess, fistulas and odontomas\textsuperscript{14}</td>
</tr>
<tr>
<td>Resorption of third molars’ root\textsuperscript{20}</td>
</tr>
<tr>
<td>Cystic formation with prevalence that ranges from 2 to 9%\textsuperscript{6}</td>
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Clinical Study

Case 1
A 32-year-old female patient presented for treatment of class III malocclusion, which was the result of the hereditary disease Cleidocranial dysostosis. The final treatment plan suggested surgical exposure of the impacted teeth for pre-orthodontic treatment and removal except for the third and fourth molars (they were under the third molars) in the maxilla. (Figs. 1 and 2). The patient is now under pre-surgical orthodontic treatment.

Case 2
A 24-year-old male patient with 2 fourth molars in the maxilla and 1 in the mandible (right) is under orthodontic treatment. He was referred for removal of the maxillary third and fourth molars and also the removal of third molars of the mandible (Fig. 3).

Case 3
Radiographic examination for other reason, in a 35-year-old male patient, revealed bilateral existence of fourth molars in the maxilla (Fig. 4). Extraction of the maxillary third and fourth molars and the left mandibular third molar were performed because the patient would be under orthodontic treatment.

Case 4
A 27-year-old female patient was under orthodontic treatment 13 years ago. A scheduled examination by the orthodontist revealed a fourth and fifth molar in the maxilla but also revealed the impaction of the third molars in the mandible (Fig. 5). Extractions of all the third molars, the fourth and the fifth molars suggested.

Figure 5. Third, fourth and fifth molars impacted in the maxilla

Case 5
A 13-year-old male patient had delayed eruption of the right mandibular second molar. The radiographic examination revealed the existence of a third molar’s tooth bud beneath the fourth molar’s tooth bud (Figs. 6 and 7). The orthodontist suggested the extraction of both the third and the fourth molars in order to release the eruption and development of the right mandibular second molar.

Figures 6 and 7. The tooth buds of the third and fourth molars caused the impaction of the second molar
Case 6

A routine radiographic examination, in a 29-year-old female patient, revealed fourth molars both in the maxilla and the mandible (Figs. 8 and 9). Extraction of the fourth and third molars simultaneously was suggested.

Discussion

In case of supernumerary teeth and especially in fourth molars early diagnosis, estimation of the present condition of both the supernumeraries and the adjacent teeth, selection of the most indicated treatment and the best timing are essential. Treatment concerns the removal of the fourth molars because of the possible complications their existence could cause. If they stay asymptomatic they could remain to the dentition under often and continuous monitoring (clinical and radiographic examination every 1 or 2 years). Removal involves simple extraction (if the supernumerary tooth is erupted) or surgical extraction of impacted fourth molars and the adjacent third molars simultaneously. The area in which the fourth molars are located can be reached vestibular, palatally or lingually and depends on the location of supernumerary as it is estimated through the clinical and radiographic findings. Simultaneous extraction of fourth molars in two quarters is possible when the possible difficulties are estimated and the patients agree with this plan.

Case 7

A 25-year-old patient referred to our clinic complained for pain in the posterior left area of the mandible. The radiographic examination revealed a third and a fourth molar impacted in the mandible (Fig. 10). Extraction at the same time was suggested (Fig. 11).
The timing of the surgical extraction of supernumeraries remains controversial because it is impossible to preview the possible complications which a fourth molar could cause. It is also impossible to define the exact time when these complications will take place. The most important factor for the time of the surgical removal is to balance the benefits and the risks which are involved in such surgical procedures. We recommend that it is better the removal to be done in younger people than in older, who probably have more health problems.

The early surgical removal of fourth molars aims at prevention of the possible complications, reduces the surgical movements and because of this, the surgical injury is smaller but also makes simple and easier one possible orthodontic treatment. However, there are also drawbacks in this early surgical removal that are related to: children’s inability to tolerate the surgical procedure, damage of the adjacent tooth, which can cause dysplasia or necrosis (the roots of permanent teeth are not completely developed in young ages). If it is possible to identify such cases, through radiographic examination, it is better to cancel the procedure until the root of the adjacent teeth are completely developed.

Infrequently and accordingly the position of the fourth molar, the surgical procedure could cause: damage to the inferior alveolar nerve and artery, haemorrhage and/or haematoma, perforation of the maxillary sinus, jaw fracture in case the bone is thinned enough and finally paralysis or anaesthesia. Monitoring of the patient follows the surgical removal until the rehabilitation of the occlusion. Orthodontic treatment can be used if it is necessary.

Conclusion

The early diagnosis (radiographic examination) and the proper treatment in every case of supernumerary teeth are essential factors for the prevention and confrontation of the potential complication they could cause.

References


Correspondence and request for offprints to:
Lambros Zouloumis
Aristotle University of Thessaloniki
School of Dentistry
Department of Oral and Maxillofacial Surgery
54124 Thessaloniki
Greece
Email: zouloumi@dent.auth.gr