NON-SYNDROMIC MULTIPLE PERMANENT IMPACTED SUPERNUMERARY TEETH: A RETROSPECTIVE STUDY

ABSTRACT

Background and Aim : The objective of this study was to evaluate the prevalence of non-syndromic supernumerary teeth, to classify them, to identify the related complications, and to determine the type of the treatment for them.

Subjects and Methods : This retrospective study used 7,753 panoramic radiographs of patients who presented themselves at Oral and Maxillofacial Surgery Department from January 2000 to December 2009. Multiple supernumerary teeth on both jaws on panoramic radiographs were included in this study. The prevalence of supernumerary teeth was determined, and they were classified by morphology. Both panoramic radiographs and patient records for associated pathologies such as cyst formation, root resorption, and effect on dentition were evaluated.

Results : In adult 4 patients (3 males and 1 female), a minimum of 5 and a maximum of 8 supernumerary teeth were found. The mean patient age was 19.75±2.06 years (range 17–22 years). A total of 25 supernumerary teeth were found, and all were impacted. None of the patients exhibited any associated syndrome. All patients were normal in height, weight, and physical development for their ages. The most frequent locations were the mandible and premolar–molar region. The morphology of the most common supernumerary teeth was tuberculate (15 supernumerary teeth), and followed by 2 circular-oval, 2 conical, and 1 incisiform. While the odontoma and some supernumerary teeth associated with permanent impacted teeth were extracted, the others were followed up.

Conclusion : Multiple supernumerary teeth rarely occur outside associated syndromes, and in this study, their prevalence was found to be 0.052%.

Key words: Impacted, Non-syndromic, Prevalence, Supernumerary Teeth
INTRODUCTION

Supernumerary teeth (ST) or hyperdontia is additional tooth, teeth or tooth like structures that either have erupted or remain unerupted in addition to the 20 deciduous and 32 permanent teeth.1–5 ST can be single or multiple, unilateral or bilateral, and seen in one or both jaws. They can develop in any region of the dental arch; however, they are located mostly in the anterior maxillary region.1–5 ST may erupt normally, stay impacted, appear inverted, or take an abnormal route of eruption.2,4

ST can be classified by their location in the dental arch: mesiodens, paramolar, and distomolar.6 According to their morphological forms, they have been divided into conical, barrel-shaped, or tuberculate, supplemental, odontoma, and incisiform.6,7 A supernumerary tooth may have no effect on dentition, or it may cause crowding, diastema, cyst formation, resorption, displacement or rotation of adjacent teeth, or it may delay or prevent eruption of permanent teeth.7

Multiple ST rarely occurs without being associated with syndromes. The condition is infrequent and normally asymptomatic. The diagnosis is usually made as a result of a casual finding during routine panoramic X-ray studies. Prophylactic surgical removal of the ST, with resolution of complications, is generally the treatment of choice.6 The aim of this study was to evaluate the prevalence of non-syndromic supernumerary teeth, to classify them, to identify the related complications, and to determine the type of the treatment for them.

SUBJECTS AND METHODS

Panoramic radiographs and clinical records of 7753 (4573 female, 3180 male) patients referred to the Oral and Maxillofacial Surgery Department from January 2000 to December 2009 were evaluated. Multiple ST on both jaws on panoramic radiographs was evaluated. Patient dates were reviewed on panoramic radiographs. Multiple ST was classified by morphology, and their prevalence was determined. We examined ST on both panoramic radiographs and patients records to identify any associated pathology such as cyst formation, root resorption, effect on dentition such as crowding, diastema, displacement or rotation of adjacent teeth, and delay or prevention of eruption of permanent teeth.

RESULTS

A total of 4 adult patients (3 males and 1 female) presented multiple ST, showing a prevalence of 0.052%. The mean patient age was 19.75 ± 2.06 years (range 17-22 years). The presentations ranged from a minimum of 5 ST (case 2) to a maximum of 8 (case 3). The total number of ST was 25, with an average of 6.25 per patient. None was associated with any syndrome. The most frequent location was in the mandible (60%), with the remaining 40% in the maxilla. ST were most frequent in the premolar-molar region (92%). There were only 2 ST in the anterior region and were not ST in the rest of dental series. All ST were impacted. The morphology of ST is shown in Table 1. There were 3 heteromorphic ST. One of them was odontoma (Case 1). The morphology of the most common ST was tuberculate (15 ST), and followed by 2 circular-oval, 2 conical, and 1 incisiform ST. The morphology of 2 ST was not determined due to the localization, position, and X-ray (Case 3). The circular-oval observation could have been derived from the bucco-lingual position of ST (Cases 1 and 4).

All patients were normal in height, weight, and physical development for their age. Physical and extra-oral examinations revealed no additional abnormalities; thus, diagnoses of cleidocranial dysostosis, Gardner’s syndrome, ectodermal dysplasia, and Apert’s syndrome were excluded. Family, medical, and dental histories were non-contributory to this condition. There was also no history of trauma to the teeth or jaws.

Case 1: A 17-year-old male was referred with a complaint of sensitive teeth in the anterior mandibular region. Intraoral examination revealed that both mandibular and maxillary permanent canines were not present and some primary canines were still in the arch. Radiographic examination revealed many impacted ST in different regions of the maxilla and mandible. There were 2 tooth-like structures, one the anterior mandibular region and the other under the upper left first premolar. There was a tooth-like structure (odontoma) in the right mandibular premolar region. These structures were evaluated as ST, and 3 of these ST were classified as heteromorphic. Many impacted permanent teeth were found (both mandibular canines, left maxillary canine, right mandibular second premolar) besides wisdom teeth. There were still some primary teeth (all the primary canines and right mandibular second primary molar). The right second permanent premolar was impacted because of the odontoma and the right second primary molar. The right mandibular incisor tooth was rotated (Figure 1). It was determined from patient’s records that all ST had been extracted.
Case 2: A 20-year-old male patient was referred to our clinic with a complaint about his mandibular third molars. Radiographic examination showed multiple permanent impacted ST in the premolar region of all quadrants of the mandible and maxilla. There was an inverted supernumerary tooth between the upper right canine and first premolar. There was no impacted permanent tooth except for wisdom teeth and 5 impacted ST, 3 of which were tuberculate, 1 conical and 1 incisiform. ST were not associated with any pathology and had no effect on dentition such as crowding, diastema, cyst formation, displacement or rotation of adjacent teeth, or delay or prevention of eruption of permanent teeth (Figure 2). It was determined from patient’s records that all ST had been followed up.

Case 3: The third case was a 22-year-old female patient suffering because of her wisdom teeth. Clinical examination revealed unerupted maxillary permanent incisors and canines. Consequently, there was confusion and open bite in the anterior maxillary region. In a radiographic examination, 7 unerupted (except the third molars) permanent teeth and 8 unerupted ST in the both mandible and maxilla premolar regions were observed. There were many primary teeth. The left mandibular first premolar was impacted horizontally. The morphologies of 2 ST were not classified in this case; the other 6 ST were classified as tuberculate form (Figure 3). It was determined from patient’s records that the

Table 1. The classification according to morphology of supernumerary teeth.

<table>
<thead>
<tr>
<th>MORPHOLOGY</th>
<th>Case 1</th>
<th>Case 2</th>
<th>Case 3</th>
<th>Case 4</th>
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<td>-</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>TOTAL</td>
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<td>5</td>
<td>6</td>
<td>6</td>
<td>23</td>
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</tbody>
</table>

Figure 1. Impacted multiple supernumerary teeth in both maxillary and mandibular regions with unerupted permanent canines in case 1.

Figure 2. Appearance of multiple permanent impacted supernumerary teeth in all quadrants of jaws (case 2).

Figure 3. Panoramic view of case 3 with presence of unerupted multiple permanent supernumerary teeth in both maxillary and mandibular regions.
primary teeth and left mandibular first premolar with ST in right mandibular region had been extracted and the other ST had been followed up.

Case 4: A 20-year-old male patient was referred to our clinic with a chief complaint of sensitive teeth in the left mandibular posterior region. An intraoral examination revealed a left mandibular wisdom tooth partially erupted. Radiographic examination showed multiple impacted ST in both the mandible and maxilla in the premolar region. ST was not associated with any pathology and had no effect on dentition (Figure 4). It was determined from patient’s records that all ST had been followed up.

DISCUSSION
The prevalence of ST in a population can range from 0.1 to 3.6%. In a Turkish population, the prevalence of ST was found to be 1.2% by Sisman et al.9 in 1,020 patients and Celikoglu et al.10 in 3,491 patients. The prevalence of ST was about 0.3–0.8% in primary dentition and about 1.5–3.5% in permanent dentition. Approximately 80–94% of all ST are found in the anterior region of maxilla. They may rarely be seen (1% of all ST) in the anterior region of the mandible.1,11,12 Rajab and Hamdan12 determined that 90% of ST occurred in the premaxilla, 92.8% of which were in the central incisor region; of these, 25% were located in the midline and the other 10.4% of the supernumeraries were located in the premolar, canine, molar, and lower central incisor regions in 152 cases. The difference between genders was also remarkable. ST were seen 2 times more frequently in males than in females.1,12 Multiple ST rates were found in fewer than 1.0%, and prevalence of non-syndromic multiple ST was 0.049%.8 In this study, we determined their prevalence to be 0.052%. The ratio of male to female was 3:1. The incidence of supernumerary teeth was higher among male patients (3 male patients and 1 female patient).

The cause of ST is not yet completely clear. There are several theories about occurrence of ST; one is that hyperactivity of the dental lamina can result from continued extension of the dental lamina and new germs splitting off the lamina. Another is the dichotomy theory, in which hyperodontia can result from accumulations of remaining epithelium after laceration of the tooth band after it has been activated to form new teeth.13 It has also been said that genetic factors (heredity) play a role.14,15 ST are often associated with certain disorders and syndromes (e.g., cleft palate, cleidocranial dysplasia, Hallermann-Streiff syndrome, Gardner syndrome, Fabry-Anderson’s syndrome, Ehlers-Danlos syndrome).8,16–18 Tumen et al.19 examined 74 patients with ST in the Turkish population and found no syndromes, or systemic or genetic diseases associated with patients. Multiple ST in individuals unrelated to diseases or syndromes are rarely reported.1,12,20,21 In the present study, no syndrome or familial inheritance related to ST was found; in other words, our cases were of non-syndromic patients. Clinical and radiographic examination is the best way to determine ST. Generally, if there are no symptoms, ST can be identified during radiographic examination by coincidence.22,23 The diagnosis is usually made as a result of a causal finding during routine panoramic X-ray studies.8 ST may cause severe clinical problems.24 ST can cause impaction of teeth as a result of narrowing of the dental arch or displacement of permanent teeth buds and formation of dentigerous cyst; therefore, early diagnosis, proper evaluation, and appropriate treatment are essential.4,7,20,22 Surgical and orthodontic approaches may be suggested in the treatment of such clinical problems.24 The literature describes various management options for patients with multiple ST not associated with syndromes. Treatment is partly dependent on the position and clinical manifestations of the supernumerary tooth. Thus, an early diagnosis is very important for deciding among extraction, extraction followed by orthodontic treatment, or simply monitoring or control of the supernumerary teeth, with a view to minimizing the risk of complications secondary to the presence of these teeth. ST can remain clinically silent or cause a complication (prevent the eruption of a permanent tooth or cause crowding, diastema, cyst formation, resorption, etc.).8 If complications arise, immediate intervention should be done. In this situation, surgical extraction of these
impacted ST is indicated. Asymptomatic ST that do not affect the dentition may not operate; however, they should be followed through periodic examinations. In this study, it was determined that 11 permanent teeth except wisdom teeth were impacted. There was 1 rotated tooth (in cases 1 and 3), and some of these teeth were associated with ST. In addition, ST was not affected by teeth in cases 2 and 4. While ST were extracted in some cases (odontoma, crowding etc.), some were followed up.

CONCLUSIONS
Multiple ST can occur with no associated syndrome, and in this study, their prevalence was found to be 0.052%. The diagnosis is usually made as a result of a casual finding during routine panoramic X-ray studies, because generally there are no symptoms. Their etiology was not determined; however, we propose a genetic examination of these patients.

REFERENCES