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RESEARCH ARTICLE

A retrospective study on demographics and characteristics of the supernumerary teeth in western-central anatolian region

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ABSTRACT

Objectives: Supernumerary teeth (ST) are impacted or erupted redundant teeth on normal primary or permanent dentition. The prevalence and type of ST may vary due to geography and ethnicity. In this study, demographics and characteristics of surgically operated supernumerary teeth in an institution in Western-Central Anatolia were evaluated.

Materials and Methods: Computerized tomography or panoramic radiography images and clinical data of 67 supernumerary teeth that were surgically operated in a 1-year period was retrieved from archives and data regarding localization, age, type of ST were recorded.

Results: The mean age was 15.89. Twenty-three (34.4%) of 67 ST were erupted and 44 (65.6%) of them were impacted. Four types of supernumerary teeth were identified. The most common form was conical form.(44.7%) Twenty-five (37.3%) ST were removed with related cyst enucleation. The most common localization was mandibular premolar region. (53.7%)

Conclusions: All acquired data was consistent with the previous literature findings. Computerized tomography may be useful in the surgery of multiple ST cases.

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INTRODUCTION

Supernumerary teeth (ST) are unexpected additional teeth that are seen in normal dentition as erupted or impacted and may be located on all quadrants of mandible and maxilla. ST are observed in both primary and permanent dentition.[1,2] Erupted or impacted ST generally have disfigured forms and undesirable positions in dental arch causing diastemas, adjacent tooth resorptions, impaction of adjacent permanent teeth, crowding and cyst or tumors.[3]

The prevalance of ST was reported between 0.15%-1.9%.[4] Patients with single or multiple ST are often asymptomatic. Diagnosis is incidental in most cases and there is no need for surgical removal.[5] However, in several cases, ST should be removed to prevent future problems in dental arch.[6,7]

Patients with several syndromes that affect maxillofacial region or orthodontic-skeletal anomalies may have ST.[8] They may be present in 4 morphological forms which are conical, tuberculate, supplemental and odontoma. ST may be impacted or erupted on dental arches and associated with several dental patologies such as dental cysts and chronic apical paradontitis. The etiology of ST has not been clearly defined up to date. However, it is suggested that genetic factors may play a pivotal role.[9,10]

In this study, the demographics and characteristics of 67 ST that are treated with surgical excision in a 1-year period were retrospectively evaluated.

MATERIALS AND METHODS

The clinical and radiographic data of sixty-one patients who were diagnosed and operated with a diagnosis of supernumerary tooth in a 1-year period in Eskişehir Osmangazi University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery was retrieved from the archives and evaluated. The inclusion criteria of the study were complete radiographical (orthopantomography or computerized tomography) and clinical data before surgical operation. Therefore, 6 patients were excluded from the study due to the unavailable archival data. Panoramic radiographs and computerized tomographic sections of remaining 55 patients were evaluated. All patients were operated with routine surgical technique under local anesthesia (Figures 1-3).

RESULTS

Twenty-seven (49.1%) of 55 patients were female and 28 (50.9%) were male. The mean age was 15.89. There were 67 ST in 55 patients that were operated in a 1-year period. Forty four (65.6%) of 67 supernumerary teeth were impacted and 23 (34.4%) of them were erupted. The clinical data regarding the distribution of the localization and type of ST is shown in Table 1. Computerized tomography was mostly needed to decide the exact position of the impacted multiple ST. The majority of ST were malformed conical teeth with

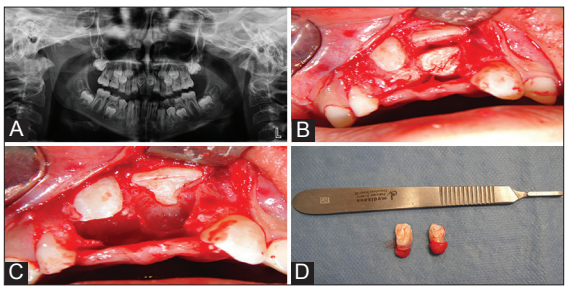

Figure 1. A: Impacted tuberculate type supernumerary teeth are observed on the panoramic radiograph on maxillary anterior region B: Supernumerary teeth are palatally located. C: Intraoperative appearance after removal of supernumerary teeth. D: Appearance of supernumerary teeth after removal

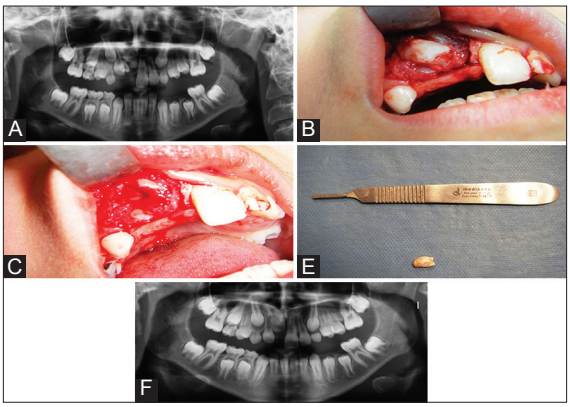

Figure 2. A: Supernumerary tooth is located between impacted upper right lateral and central incisors. B: Intra-operative appearance of the surgical site before removal. C: Intra-operative appearance of bone cavity after removal of the supernumerary teeth. D: Postoperative appearance of removed tuberculate type supernumerary tooth. E: Right upper lateral incisor tooth erupted in 3-months post-operative period after surgical removal of supernumerary tooth

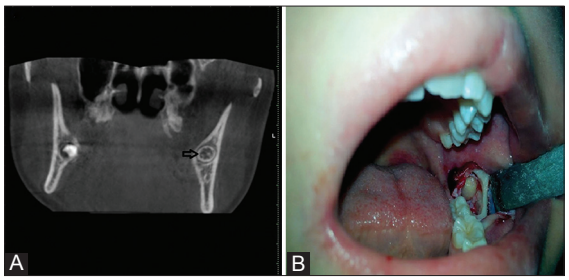

Figure 3. A: Distomolar supernumerary tooth can be seen on left mandible on coronal section image of computerized tomography. (arrow) B: Intraoperative appearance of the surgical site

no resemblance with the conventional teeth.(Figure 4) One (1.4%) of the ST was distomolar (Figure 5). One case (1.4%) was paramolar and five cases (7.4%) were mesiodens. In 25 (37.3%) cases, there were cyst formations around the supernumerary teeth. Twenty patients whose dentition were affected with the presence of supernumerary teeth were underwent in the orthodontic treatment. (Figure 6)

Figure 4. Erupted conical supernumerary teeth caused migration of upper incisors.

Figure 5. Distomolar microdont can be seen on right upper region on panoramic radiography (arrow)

35 patients were on follow-up period with 6-month intervals. The remaining patients were lost to follow-up.

DISCUSSION

The etiology of ST is not yet clear, however, several theories such as evolutionary throwback and dichotomy theory were postulated for the explanation of the occurrence of ST.[11-16] The most accepted theory for the development of the ST is independent, localized dental lamina hyperactivity theory.[12,15,17-19] This theory suggests that the pressure of normal dentition induces proliferation of the epithelial remnants of dental lamina and a rudimentary tooth develops. Hereditary and environmental factors are also considered to have important roles in the etiology of ST.[10, 20-24]

Although different gender ratios have been reported, there seems to be a slightly

Table 1. Distribution of supernumerary teeth according to type and localization

	Maxilla (%)			Mandible (%)			Total (%)
	Anterior region	Premolar region	Posterior region	Anterior region	Premolar region	Posterior region	
Supplemental	3 (4.4)	2 (2.9)		1 (1.4)	7 (10.4)		13 (19.4)
Conical	2 (2.9)	3 (4.4)		2 (2.9)	21 (31.3)	2 (2.9)	30 (44.7)
Tuberculate	4 (5.9)	5 (7.4)	1 (1.4)		6 (8.9)	3 (4.4)	19 (28.3)
Odontoma	1 (1.4)	1 (1.4)	1 (1.4)		2 (2.9)		5 (7.4)
Total	10 (14.9)	11 (16.4)	2 (2.9)	3 (4.4)	36 (53.7)		67

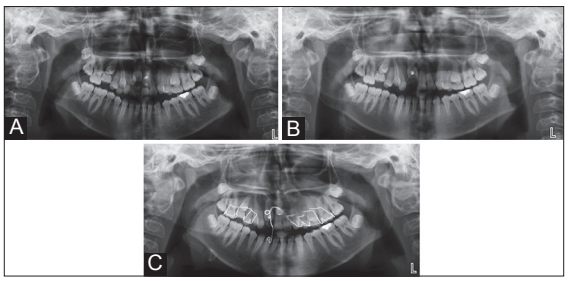

Figure 6. A: Impacted supernumerary tooth prevented the eruption of right upper central incisor of 13-year-old girl. B: Panoramic radiography taken after 2-months postoperative follow-up period. Orthodontic button was cemented on upper right central tooth at the time of the surgical removal of the supernumerary teeth for orthodontic treatment. C: Eruption of right upper central tooth to the original position can be clearly seen on panoramic radiography taken after 7-months postoperative follow-up period

male predominance in the sex distribution for the permanent dentition.[25] In this study, the male/female ratio was 1.03/1 for ST and is consistent with the gender ratios that were reported previously.[1,6,26-28]

There are several classification systems defining the characteristics of supernumerary teeth based on the morphology and localization. Rajab et al.[6] suggested 4 morphological forms of ST, which are conical, tuberculate, supplemental and odontoma. Conical ST generally occur in primary dentition and they are root shaped, small sized tooth-like structures. Conical and tuberculate forms are also called rudimentary supernumerary teeth.[12] Tuberculate type supernumerary teeth possess more than one tubercle and larger than conical form. Supplemental ST are dublicates of permanent teeth, generally upper central incisors or lateral incisors. Although odontomas are considered hamartomatous malformations, thus included in the ST morphological classification by many authors, they are not universally accepted as ST. Conical form is the most common form of ST.[1,6,26,29] In this study, 30 conical ST were identified and this finding is consistent with the literature. ST are also classified by special denominations such as paramolar, distomolar or mesiodens according to the localization. Mesiodens is a special name for ST that are localized as erupted or impacted between two upper central incisors.

The most common localization of ST in both jaws is mandibular premolar region.[6, 30] Multiple supernumeraries occur

in less than 1% of the cases.[29-31] Rajab et al.[6] reported an incidence of 14% multiple ST among all subjects studied. Patients with multiple ST should be thoroughly examined for the existence of an undiagnosed syndrome or genetic disease. In the current study, jaws are divided into 3 parts in order to simplify the localization of occurrence. The predominant site of occurrence was mandibular premolar region (53.7%) and that was consistent with the literature.

Surgical removal of ST may be necessary when they caused or have an inclination to cause displacement, root resorption, cysts, crowding and eruption failures in primary or permanent dental arch. In the present study, all cases were surgically operated under local anesthesia due to the aforementioned problems.

Radiographic evaluation is essential in the diagnosis of impacted supernumerary teeth. Rajab et al.[6] suggested that studies evaluating incidence are not healthy if they are conducted without the use of radiographs. Proper positioning and localization of ST is important before surgery. 2-D radiologic imaging systems such as panoramic radiography and occlusal radiography are frequently used in radiologic evaluation of ST before surgical removal. 2-D imaging modalities are useful and successful in the imaging of single ST. However, determination of the exact position and relationship with adjacent neighboring structures of multiple ST is challenging in 2-D systems. Therefore, 3-D imaging modalities such as cone beam computerized tomography (CBCT) was suggested to overcome the disadvantages of 2-D systems.[15,32,33] Mossaz et al.[1] suggested that CBCT provides data regarding type, position, relation to the adjacent vital structures, and root resorption of adjacent teeth with moderate to high interrater correlation. In the present study, both 2-D and 3-D imaging modalities were used in the pre-operative radiographic evaluation of the ST. CBCT was taken in all cases with multiple ST.

In this study, a retrospective characteristic and demographic evaluation of ST that were surgically removed in a 1-year period in an institution in western-central Anatolia was presented. ST predominantly occurred on mandibular premolar region and were operated due to the orthodontic or pathologic problems. Radiographic examination with 3-D imaging modalities is essential in the management of multiple ST.

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