Radiographic Assessment of the Incidence of Supernumerary teeth in a population of 1683 patients (Preliminary study)

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Abstract: The purpose of the present study was to investigate the incidence of the supernumerary teeth among Palestinian according to sex, location and morphology. This retrospective study was carried out using 1683 panoramic radiographs (719 males, 964 females) aged seven and older. The supernumerary teeth were observed in 11 (0.65%) panoramic (4 males, 7 females) with (1:1.75) male female ratio. two cases of them showed bilaterally hyperdontia. The premolar was found to be the most common supernumerary, followed by mesiodens and distomolar. The incidence of supernumerary teeth was found to be 0.77%, and we demonstrate that parapremolar the most common in the mandible.

INTRODUCTION

Supernumerary teeth (Hyperdontia) is the condition of having extra teeth that develop in addition to twenty deciduous, and thirty two permanent.(Rallan, Rallan et al. 2013) The etiology of supernumerary teeth is not well known. Supernumerary can occur anywhere in the dental arch as a result of a rare alteration in odontogenisis. Many theories exist for hyperdontia, One theory states that hyperdontia is formed as a result of a dichotomy of the tooth bud is split to create two teeth. The second is the hyperactivity theory, most accepted worldwide, which proposes that hyperdontia is initiated as a result of local, independent, conditioned hyperactivity of the dental lamina. Furthermore, Heredity plays an important role in the occurrence of hyperdontia, but does not follow a simple Mendelian pattern. A familial tendency and linked to the X chromosome. (Brook 1984; Liu 1995)

Above all, cleidocranial dysplasia, cleft lip/palate and other syndromes are associated with multiple supernumerary teeth, where develop but fail to erupt. Supernumeraries complications like crowding, delayed eruption, dilacerations, rotation, malalignment, or displacement of permanent tooth, impaction, abnormal diastema, cystic lesions, ectopic eruption, root resorption of adjacent teeth. As a consequence an early diagnosis allows an early intervention leading to better prognosis.(Sharma and Singh 2012).

Supernumerary teeth may occur in primary and permanent dentition, singly, multiply, unilaterally or bilaterally, and in one or both jaws. classified based either on their location in the dental arches or on their morphology.(Scheiner and Sampson 1997).

The prevalence of hyperdontia ranges from 0.5%-3.8% in permanent dentition and from 0.3%-1.9% in Deciduous. (Arikan, Ozgul et al. 2013) The sex distribution of supernumerary teeth in primary dentition appears equal, whereas supernumeraries in permanent dentition occur more frequently in boys than girls.

This is the first article to explore the incidence of hyperdontia in Palestine. No other articles were conducted and published which deal with hyperdontia. This article will add more knowledge to the epidemiologic studies done in Palestine, to determine the prevalence of hyperdontia in Palestine, according to sex, location (mesiodens, paramolar, and distomolar), number and morphology (supplemental or rudimentary including conical, tuberculate, and molariform types) in order to find possible correlations between these variables.

MATERIALS AND METHODS

In this retrospective study, one thousand six hundred eighty- three panoramic radiographs of Palestinian patients (719 males, 964 females) aged seven years and older, who attended to a private center specialized in medical and dental radiography (Jenin diagnostic X-Ray center) from September 2013 and February 2014 taken by a single operator using a digital panoramic machine (Kodak 9100, Germany) at 70 KVp, 10 MA for 14.3 seconds. All panoramic were reviewed by the same professional using radiant DICOM viewer to determine the prevalence of hyperdontia in the sample, their location and morphology. Data was analyzed using a Pearson chi-square ($\chi 2$) test, performed using the Statistical Package for the Social Sciences (version 14.0; SPSS).

The dentition is divided into sextants, all teeth in each sextant were assessed according to Classification based on the form and location of extra tooth or teeth.(Shah, Gill et al. 2008) Cases with poor quality radiographs are excluded.

Supernumeraries shapes:

- Conical-shaped supernumerary teeth usually appear as a mesiodens, meaning they are associated with the central incisors. They may cause displacement of the maxillary central incisors (Fig.1).
- Tuberculate supernumerary teeth resemble the shape of a barrel and they are mostly invaginated. They have abnormal roots and they seldom erupt. They are located on the palatal area of the central incisors and sometimes, its presence delays the eruption of the incisors.
- Supplemental supernumerary teeth are the most common in primary dentition. They almost always erupt. They appear along with the continuity of the alveolar line. The most common location is lateral incisors.
- Odontome or composite odontoma is the category which is not widely accepted by dentists as a classification of supernumerary teeth because the term depicts a tumor. The mass consists of different types of tissues. There are two subcategories. The first one is complex composite odontoma wherein the dental tissue is not organized. The second one is

compound composite odontoma which externally resembles a normal tooth.

- Molariform supernumerary teeth have a complete root and they resemble the shape of premolars.

Supernumeraries locations:

- Mesiodens supernumerary teeth are located on palatal to the permanent incisors, with only a few lying in the line of the arch or labially. The mesiodens is usually small and short, with a triangular or conical crown.
- Paramolar supernumeraries are usually rudimentary, situated buccally or lingually/palatally to one of the molars or in the interproximal space buccal to the second and third molar.
- Parapremolar is a supernumerary that forms in the premolar region and resembles a premolar (Fig.2).
- Distomolar supernumeraries are located on the distal aspect of the third molar, and usually rudimentary. It rarely delays the eruption of associated teeth.

RESULTS

Total number of OPGs examined was 1683 including 719 males (42.7%) and 964 females (57.3%), the age of the study group is seven years and older, hyperdontia rate was found to be (0.77%) among all panoramas. Eleven of the radiographs presented supernumerary teeth, single supernumerary tooth showed in nine cases, the remaining showed two supernumeraries each. The most predominant supernumeraries located in the premolar area of the mandible. Out of the eleven OPGs, seven (63.6%) related to female patients, the others for males (36.4%), with a male-to-female ratio of (1:1.75).

Figure 1: Conical Supernumerary Tooth.

Figure 2: Molariform Supernumerary Teeth.

In this study, the majority of supernumerary teeth is molariform in shape and parapremolar in location. Distributed two of them bilaterally unerupted parapremolar, the rest unilaterally unerupted parapremolar (Fig.3). In these cases the extra-tooth fails to erupt because there is not enough room for them, they may align buccally or lingually/palatally, the bulkiness of them palpated. As shown in (Table 1)

Figure 3: Panoramic X-Ray showing bilateral developing parapremolar.

Table 1: Distribution of the supernumerary teeth according to gender and location.

Supernumerary location		**Distomolar**	**Paramolar**	**Parapremolar**	**Mesiodens**
Gender	**Males**	0	0	3 cases (23.08%)	2 cases (15.38%)
	Females	1 case (7.69%)	0	7 cases (53.85%)	0

One of the cases has two mesiodens , conical shaped supernumerary teeth in Medline of maxilla (Fig.4). Moreover, distomolar showed in one of the panoramas situated distal to upper right third molar (Fig.5). the occurrence of the hyperdontia in the mandible was (69.2%) while the maxilla (30.8%).

Figure 4: Radiographic appearance of the bilateral conical mesiodens.

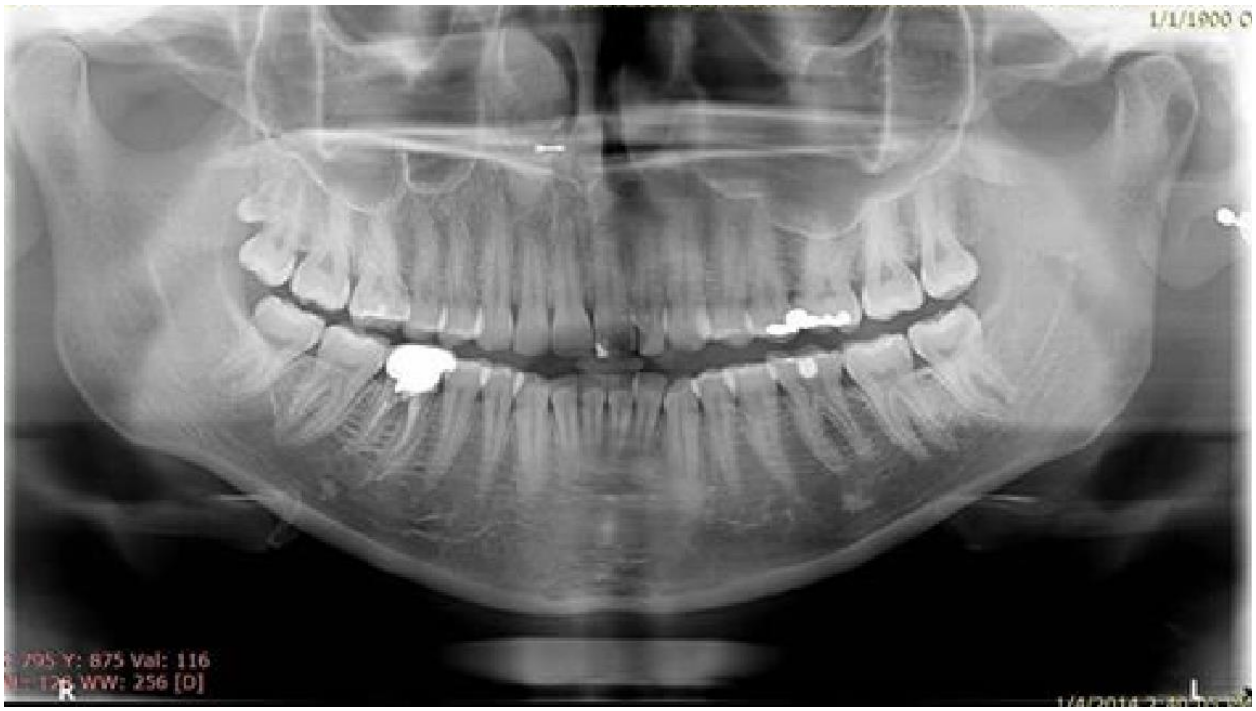

Figure 5: Panoramic radiograph showing ditomolar distal to the upper right third molar.

DISCUSSION

Dental anomalies are craniofacial abnormalities of form, function or position of the teeth. (Afify and Zawawi 2012) The study was based on evaluation of panoramic radiograph of 1683 patients. The differences in sample size, age groups , ethnicity, radiographic techniques as well lead to different reporting of the prevalence of supernumerary teeth. They may be associated with a syndrome or they can be found in non-syndrome patients.

The majority of supernumerary teeth found in this study was located in the premolar area, particularly in the lower arch. (Yusof 1990) in contrast to this, other studies detected that mesiodens was the common type. On the contrary, to the results reported in the literature which postulated that females more significantly affected.(Rajab and Hamdan 2002; Ferres-Padro, Prats-Armengol et al. 2009) Whenever the present study declared that the incidence of the supernumerary teeth in the female is more frequently than male patients. (Demiriz, Durmuslar et al. 2015) This result may be clarified by the presence of surgical extraction history in young ages, and the sample was taken from one private center, which may influence the result rather than randomly gathered all over Palestine. Meanwhile, the supernumerary teeth were reported more commonly in the mandible (69.2%) in contrast to maxilla (30.8%).(Solares and Romero 2004)

For another thing, Tuberculate, Supplemental, Odontome, Paramolar supernumerary is not detected in the study group. The molariform was found to be the most observed shape among the findings followed by the conical shape. (Yusof 1990).

We did not find subjects with multiple supernumerary teeth. The supernumerary teeth may be asymptomatic and diagnosed through an incidental finding of radiographic examinations. The main treatment of hyperdontia is its removal that may solve the underlying complications such as root resorption of an adjacent tooth or may be associated with dentigerous cyst. Timing of removal of supernumerary teeth is debated among the dental professionals as are the treatment method. Early removal is preferable when the supernumerary is causing problems. In all cases the risk and benefit ratio of surgery must be carefully evaluated.(Gupta and Goswami 2012)

CONCLUSION

The incidence of supernumerary teeth among Palestinian people was found to be (0.77%) within the previously reported incidence. In this present study shows that parapremolar in the lower arch is the most popular. Our study may enrich the database of the literature about Supernumerary teeth as well as further clinical studies are required to know the frequency of dental anomalies among Palestinians, which indeed influence the way of management in order to avoid or reduce complications that could occur.

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