

Non-syndromic Supernumerary Premolars, a Literature Review and a Report of Two Cases

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Abstract

A parapremolar is a supernumerary tooth that is located in the premolar region. They appear more frequently in the mandible than in the maxilla. Several theories have been suggested to explain this phenomenon, with the “dental lamina hyperactivity theory” found to be the most accepted. Supernumerary premolars are usually impacted. They can be associated with complications or stay asymptomatic. Radiographic identification is very important for the detection of asymptomatic impacted parapremolars. Treatment involves the removal of the supernumerary tooth because of the complications that its presence may cause or to keep it under observational management. This article presents a review of supernumerary premolars and reports two cases of patients who attended the dental clinics of the Faculty of Dentistry at the Arab American University in Palestine.

Keywords: Hyperdontia, non-syndromic, parapremolars, supernumerary

INTRODUCTION

Developmental dental anomalies are deviations from the normal presentation of teeth. These anomalies not only affect the aesthetic appearance of teeth but also pose difficulties during dental treatments and sometimes are the cause of other dental problems. They can be anomalies of size, number, morphology, structure, and position.^[1] The developmental anomalies in the number of teeth include hypodontia, anodontia, and hyperdontia.

Hyperdontia (supernumerary teeth) is a developmental anomaly in which teeth additional to the normal series can be found unilaterally or bilaterally in almost any region of the dental arch.^[2] Supernumerary teeth are more frequently reported in the permanent dentition than in the primary dentition with more frequency in the maxilla than in the mandible. With methodological issues as well as population differences, figures vary but their prevalence varies between 0.05% and 2.8%.^[3]

Most supernumerary teeth are idiopathic. Patients are frequently affected by a single supernumerary (76%–86%), less by double supernumeraries (12%–23%), and rarely by multiple supernumeraries (<1%).^[4,5] In cases

of hyperdontia with one to four supernumerary teeth, the supernumerary teeth are usually localized in the upper anterior and molar region, whereas in cases of multiple supernumerary teeth (i.e., five or more), they are seen in the lower jaw and generally in the premolar region.^[5] Most cases of multiple supernumerary teeth are found in association with syndromes such as cleidocranial dysplasia, familial adenomatous polyposis, trichorhinophalangeal syndrome type I, Rubinstein–Taybi syndrome, Nance–Horan syndrome, Opitz BBB/G syndrome, oculofaciocardiodental syndrome, and autosomal-dominant Robinow syndrome.^[6]

The etiology of supernumerary teeth is unclear. Several theories have been postulated to explain their occurrence; these include the atavism theory, dichotomy theory, and dental lamina hyperactivity theory.^[7,8] However, a combination of environmental and genetic factors has been also proposed.^[9]

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Supernumerary teeth can be asymptomatic for years or may cause complications such as impaction, delayed eruption of neighboring teeth, crowding, midline diastema, cystic formation, and root resorption of adjacent teeth.^[10] Hence, early diagnosis, evaluation, and appropriate treatment of supernumerary teeth are essential to avoid unnecessary complications. The aim of this article was to present a review on supernumerary premolars and to report two different cases and their possible treatment options.

CASE REPORT 1

A 35-year-old man reported to the department of conservative dentistry and prosthodontics with the chief complaint of pain and food lodgment in the lower posterior region on the right side for few months. The patient did not present any significant medical, familial, or dental history. Extraoral examination did not show any abnormalities. Intraoral examination showed fair oral hygiene with decayed right lower second premolar and a fractured first molar on the same side. It also revealed one supernumerary premolar on the left side of the mandibular arch [Figure 1]. The parapremolar was present palatal to the permanent first and second premolar and was identical in morphology, hence was considered as supplemental supernumerary tooth. A panoramic X-ray was advised to evaluate the complete dentition. The X-ray did not reveal any other impacted or supernumerary teeth [Figure 2]. The patient was informed



Figure 1: Intraoral examination revealing one supernumerary premolar on the left side of the mandibular arch



Figure 2: A panoramic X-ray with complete dentition

about the presence of additional tooth and was educated about the difficulties associated in maintaining the oral hygiene and was advised for the extraction of the tooth. Unfortunately, he refused to extract the supernumerary tooth. However, he was cautioned about the consequences and advised to report if symptomatic, and oral hygiene measures were instituted.

CASE REPORT 2

A 24-year-old woman attended the department of conservative dentistry and prosthodontics with a complaint of pain in the right side of the upper arch on drinking cold water. The patient's medical, dental, and familial history was noncontributory and there was no sign of any systemic diseases or syndromes. An intraoral examination revealed occlusal caries on the upper right third molar. The intraoral examination revealed the presence of an extra tooth located bilaterally on the palatal side between the maxillary left and right first and second premolars [Figure 3]. A panoramic X-ray was also advised to evaluate the complete dentition. The X-ray did not reveal any other impacted or supernumerary teeth [Figure 4]. The patient was informed of the existing condition and extraction of the supernumerary teeth was advised as maintenance of oral hygiene in this area was



Figure 3: Intraoral examination revealing an extra tooth located bilaterally on the palatal side between the maxillary left and right first and second premolars



Figure 4: A panoramic X-ray with complete dentition

difficult. She was referred to the oral surgery clinics for extraction of her parapremolars.

DISCUSSION

Supernumerary teeth have been classified mainly according to their morphology and location in the dental arch.^[1] On the basis of their location, they may be categorized into four types: mesiodens, paramolar, distomolar, and parapremolars.^[4] According to their morphology, there are two types: rudimentary and supplemental. Supernumerary premolars are “extra” teeth morphologically belonging to the premolar group.^[11] These supernumerary teeth are usually detected in patients older than 12 years of age^[12] and cases of late-developing supernumerary premolars have also been reported in the literature.^[13] Supernumerary premolars can be unilateral, bilateral, single, or multiple. Supernumeraries in the premolar region are usually of the supplemental type.^[12,14,15] However, Küchler *et al.*^[16]

reported that 80% of all supernumerary premolars detected in their study were tuberculated in shape. The prevalence of supernumerary premolars varies between 0.09% and 0.76%,^[17-19] and they are reported to be more common in males than in females.^[19] The literature reports that parapremolars account for 2.27%–37% of all supernumerary teeth detected in different populations [Table 1].

Supernumerary premolars occur more frequently in the mandible than in the maxilla.^[17] Studies show that 57%–90% of all detected supernumerary premolars from various studies were mandibular [Table 1].^[4,14,17,18,20-23] Moreover, they are the most common supernumerary teeth in the mandible.^[20,22,24] Yet, the prevalence of supernumerary teeth occurring in the mandibular premolar region is quite low.^[25] The orientation of a supernumerary premolar might be vertical, mesio-inclined, disto-inclined, and inverted. Arikan *et al.*^[15] reported that of the 16 supernumerary

Table 1: Percentage of supernumerary premolars in the total number of supernumerary teeth reported in different studies

Study	Study sample	No. of patients with supernumerary	No. of supernumerary teeth	Premolars	Percentage of all supernumeraries (%)
Demiriz ^[23] (Turkey)	7,348	123	156	46 Mx = 9 Mn = 37	29.48
Mahabob ^[20] (S. India)	2,216	21	27	8 Mx = 2 Mn = 6	29.62
Chou ^[14] (Taiwan)	6,423	167	248	83 Mx Mn	33.5
Rajab and Hamdan ^[4] (Jordan)	N/A	152	202	13 Mx = 5 Mn = 8	6.43
Schmuckli ^[28] (Switzerland)	3,004	N/A	44	1 Mx = 1 Mn = 0	2.27
Esenlik ^[21] (Turkey)	2,599	69	75	17 Mx = 5 Mn = 12	22.6
Sharma ^[29] (India)	21,824	300	361	13 Mx = N/A Mn = N/A	3.6
Gomes ^[22] (Brazil)	N/A	305	460	37 Mx = 7 Mn = 30	8.04
Perez ^[27] (Peru)	1,754	81	113	36 Mx = N/A Mn = N/A	31.9
Harris ^[18] (USA)	1,700	39	64	21 Mx = N/A Mn = N/A	32.8
Fernández Montenegro ^[12] (Spain)	N/A	102	147	35 Mx = N/A Mn = N/A	23.8
Ledesma-Montes ^[30] (Mexico)	2,241	72	102	38 Mx = N/A Mn = N/A	37.25
Arikan ^[15] (Turkey)	7,551	74	80	15 Mx = 0 Mn = 15	18.75
Singh ^[31] (Nepal)	2,864	46	55	6 Mn = 0 Mx = 6	10.9
Kuchler ^[16] (Brazil)	1,166	27	29	5 Mx = N/A Mn = N/A	17.25
Lagana ^[32] (Italy)	4,706	43	46	4 Mx = 1 Mn = 3	8.69
Celikoglu ^[26] (Turkey)	3,491	42	48	12 Mx = N/A Mn = N/A	25

Mx = Maxillary; Mn = Mandibular; N/A = Not Available

premolars detected in their study population ($n = 7551$), 10 (62.5%) were vertically oriented. Bilateral cases are more common than unilateral ones.^[17,25] Mandibular bilateral cases are more common than maxillary cases.^[17,25] Kaya *et al.*^[17] reported that 75% ($n = 20$) of the unilateral cases of supernumerary premolars were on the right side.

In studies investigating supernumerary teeth, premolars were the second most common supernumerary teeth after mesiodens. Celikoglu *et al.*^[26] showed that the most commonly found supernumerary teeth were mesiodens, followed by premolars, lateral incisors, and distomolars. The mesiodens were the most frequent type of supernumerary teeth followed by supernumerary premolars, then by distomolars.^[12] Harris and Clark^[18] reported premolars as the second most common supernumerary teeth after distomolars. Pérez *et al.*^[27] and Rajab and Hamdan^[4] reported that premolars were the second most frequent type of supernumerary teeth after those located in the anterior premaxilla. Nevertheless, other studies reported that premolars ranked third in the order of frequency.^[24] Esenlik *et al.*^[21] found that mesiodentes were the most frequently seen supernumerary teeth followed by maxillary lateral incisor, mandibular premolar, maxillary canine, and maxillary premolars. Mahabob^[20] reported premolars as the third most occurring supernumerary premolars after mesiodens and distomolars.

Ethnic background is an important factor in these varying findings.^[18,27] Generalities in the literature founded on well-studied ethnic groups should not be extrapolated on other ethnic groups without evidence.^[18]

Supernumerary premolars usually remain unerupted and asymptomatic.^[12,15,25] Thus, they are usually discovered during routine radiographic exam. Many operators consider panoramic X-rays to be an important tool for identifying supernumerary teeth. Several investigators have used panoramic radiographs for identifying supernumerary teeth in both surveys and epidemiological studies from which they report their prevalence.^[14,27,32] However, in the two cases reported in this study, the panoramic X-rays failed to identify the presence of supernumerary premolars though they were clinically present. Panoramic radiographs alone have been reported unreliable for identifying supernumerary teeth and that approximately 50% of the supernumerary teeth could go unnoticed on panoramic radiographs.^[3] Clinical examination plus some types of radiograph(s) are essential if the practitioner identifies or just suspects the presence of a supernumerary tooth.^[3] Additional radiographs (occlusal and/or periapical radiographs and computed tomography scan) are useful when an attempt is made to further investigate the presence of supernumerary teeth and thus confirm the diagnosis.

Supernumerary premolars can be either erupted or unerupted. Erupted supernumerary premolars should be

extracted except in cases where the supernumeraries need to be retained. Unerupted supernumerary premolars can be categorized as those associated with complications and those not associated with complications.^[1] Those not associated with complications should be kept under periodic observation. If the unerupted supernumerary premolar is associated with complications or when it hinders the eruption of or gives rise to malpositioning of permanent teeth, then it should be surgically removed as soon as possible.^[33-35] The timing of surgical removal of supernumerary premolar is as much debated among clinicians as are treatment methods. Surgical removal can be delayed in cases where the supernumerary tooth is close to the apices of the developing permanent teeth or where the formation of the supernumerary teeth is in the initial stages resulting in chances of recurrence.^[1,22,36] Supernumerary premolars must be preferentially removed at certain stages—namely, fully developed crown with root under formation and fully developed crown—as at these stages, surgery will be easier.

In general, the early diagnosis of supernumerary premolars allows optimal patient management and treatment planning and can reduce complications and complexities of the planned treatment.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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