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CASE REPORT

Maxillary paramolar: report of a case and literature review

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Abstract Supernumerary teeth are the teeth which are more in number in addition to the normal number found in either primary or permanent dentition. Paramolar is a supernumerary structure occurring buccally or lingually near the molars and it may be caused by combination of genetic and environmental factors. Reports of this unique entity are rarely found in the literature. The present article reports a case of paramolar in the maxillary molar region in an 11-year-old female patient and also reviews the literature about paramolar.

Introduction

Teeth which exceed the normal 32 number of permanent teeth in the oral cavity are called supernumerary teeth. These teeth have a striking predilection for maxilla over the mandible and they are more frequently found in males compared to females in a ratio of 2:1 (Munshi and Munshi, 2001). Supernumerary teeth may occur singly, bilaterally or even in multiples. The prevalence of these teeth has been recorded to be greater in the permanent dentition (1.5-3.5%) as compared to primary dentition (0.2-0.8%) (Winter, 1999). Supernumerary teeth are situated especially in the premaxillary region (90%), with 93% of them in central incisor region, with 25% of those located in the midline. Of the remaining 10%, about 4% and 1.5% are located in the mandibular premolar and maxillary canine regions, respectively (Rajab and Hamdan, 2002).

They can be erupted or unerupted and remain in the bone. Unerupted and impacted supernumerary teeth are discovered during routine radiographic examinations (Srivatsan and Aravindha Babu, 2007). Sometimes supernumerary teeth are found to be associated with some systemic diseases or syndromes like Gardner's syndrome, cleidocranial dysplasia (Bruning *et al*., 1957) and in patients with cleft lip and palate (Soames and Southam, 1993).

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In general, supernumerary teeth may be classified according to their location and form i.e. size and shape. According to the location, supernumerary teeth are classified into mesiodens, paramolar and distomolar. Mesiodens is a typical conical supernumerary tooth, situated between the maxillary central incisors. Paramolar is a supernumerary molar usually small and rudimentary, situated buccally or palatally to one of the maxillary molars or in the interproximal space buccal to the second and third molars (Dubuk *et al*., 1996) and distomolar is a supernumerary tooth which is located distal to the third molar (Kakolewska-Maczynska and Zyszko, 1990). According to form, supernumerary teeth are categorized into conical, supplemental, tuberculate and odontomas. Conical supernumeraries are small peg shaped (coniform) tooth with normal roots, supplemental supernumeraries resemble adjacent non affected teeth, odontomas are supernumerary teeth having no regular shape whereas tuberculate is multicusped, and short barrel shaped teeth with apparently normal or invaginated crown but with a rudimentary root (Mitchell, 1989). Based on shape, they are classified as supplemental (or eumorphic) referring to supernumerary teeth of normal size and shape, and rudimentary (or dysmorphic), teeth of abnormal shape and smaller size, including conical, tuberculate and molariform types (Primosch, 1981).

In maxilla, supernumeraries are found mostly between the central incisors

(mesiodens) (Munshi and Munshi 2001). Occurrence of supernumerary teeth in the molar region is extremely low. However, Grimanis *et al.* (1991) conducted a survey on supernumerary molars and reported that supernumerary molars occurred more frequently in the maxilla (79.7%), often were impacted (88.7%), and 23.9% of them were found bilaterally. Supernumerary teeth which occur in the molar region are divided into two types: paramolar and distomolars. Extensive literature review in Medline revealed very few reports of paramolars (Dubuk *et al.*, 1996; Kakolewska-Maczynska and Zyszko, 1990; Masztalerz, 1968; McVaney and Kalkwarf, 1976; Kim *et al.*, 1973; Srivastava and Singh, 1979; Kumasaka *et al.*, 1988; Loh and Yeo, 1993; Ballal *et al.*, 2007; Scheiner and Sampson, 1997; Rao and Chidzonga, 2001). Among these cases, most of the reports showed occurrence of paramolar entity in the mandible (Table 1). Reports of paramolar in the maxilla are very few. Recently a case reported by Hou *et al.* (1995) showed bilateral ectopic occurrence of paramolar in the maxillary molar region contributing to the development of localized periodontitis in the molar region (Hou *et al.*, 1995).

The case presented here describes the occurrence of a paramolar in the maxilla of a pediatric patient.

Table 1 Reported cases of Paramolar tooth

Author	Paramolar type
Ballal *et al.*, 2007	Mandibular
Dubuk *et al.*, 1996	Mandibular
Hou *et al.*, 1995	Maxillary
Kakolewska-Maczynska and Zyszko, 1990	Mandibular
Kim *et al.*, 1973	Mandibular
Kumasaka *et al.*, 1988	Mandibular
Loh and Yeo, 1993	Mandibular
Masztalerz, 1968	Mandibular
McVaney and Kalkwarf, 1976	Mandibular
Shimizu *et al.*, 2007	Mandibular
Srivastava and Singh, 1979	Mandibular
Present case	Maxillary

Case report

An 11-year-old female patient attended for routine checkup. On intraoral examination, an extra tooth was found on buccal side between the maxillary right first and second molars (Figure 1). This extra tooth had crown with single cusp with some grooves and was smaller in size compared to the adjacent normal molars (Figure 1). No other relevant findings were detected in the mouth. Occlusal radiograph taken revealed the presence of supernumerary structure with a single root (Figure 2). The root of this supernumerary tooth was conical in shape with a single root canal. The length of the root was shorter compared to the normal molars and it was not completely formed. Patient's medical and family history was not relevant and there were no signs of any systemic disease or syndromic features. The supernumerary structure was diagnosed as a paramolar (Ballal *et al.*, 2007). Patient was informed about the extra tooth and its possible complications like food lodgement, difficulty with proper cleaning and occurrence of dental caries and advised for its extraction. However, the patient did not return for the treatment.

Figure 1 Intraoral photograph showing an extra tooth placed buccally and in the embrasure of permanent maxillary right first and second molars (arrow) (above). Tooth is smaller than the adjacent molars with a single cusp (arrow) (below).

Figure 2 Occlusal view showing paramolar (arrow) with incompletely formed root.

Discussion

The occurrence of paramolar is a relatively uncommon dental finding. The exact etiology of this anomaly is unknown. Various factors have been proposed as etiologic factors for development of this anomaly (Scheiner and Sampson, 1997; Rao and Chidzonga, 2001). According to the theory of phylogenetic reversion or atavism in past centuries, dental arches gradually reduced their dimensions, losing off some teeth, causing greater development of the neurocranium than the splanchnocranium (Scheiner and Sampson, 1997; Rao and Chidzonga, 2001), so the supernumerary teeth like 'paramolars' are referred as phylogenetic throwback. Another theory suggests that, due to hyperactivity of the primary dental lamina, supernumerary teeth such as paramolars are formed (Scheiner and Sampson, 1997; Rao and Chidzonga, 2001). The third theory hypothesized that some malformations of the dental germ, caused by traumatic factors occurring before the eruption of teeth can be the cause of anomalies in excess of teeth such as paramolar (Rao and Chidzonga, 2001). The most accredited theory sustains that teeth in excess of the normal number are of genetic nature and this would also explain the presence of supernumerary teeth in the relatives of subjects affected with this dental anomaly (Rao and Chidzonga, 2001; Gallas and Garcia, 2000). But no such relationship was noticed in any members of the family of the present case.

Countable numbers of paramolar anomalies are reported in the permanent dentition (Dubuk *et al*., 1996; Kakolewska-Maczynska and Zyszko, 1990; Masztalerz, 1968; McVaney and Kalkwarf, 1976; Kim *et al*., 1973; Srivastava and Singh, 1979; Kumasaka *et al*., 1988; Loh and Yeo, 1993; Ballal *et al*., 2007). Incidence of paramolar in the primary dentition is extremely rare. Only one case of paramolar in primary mandibular molar region has been reported (Shimizu *et al*., 2007). Predominantly, paramolar occurs singly (Dubuk *et al*., 1996; Kakolewska-Maczynska and Zyszko, 1990; Masztalerz, 1968; McVaney and Kalkwarf, 1976; Srivastava and Singh, 1979; Kumasaka *et al*., 1988; Loh and Yeo, 1993; Ballal *et al.* 2007). Only two cases of bilateral presentation of paramolar, one in the mandible (Kim *et al*., 1973) and the other in the maxilla (Hou *et al*., 1995) have been reported. Fusion of the paramolar with their normal counterpart is also a rare finding. There were also reports on an endodontic management of paramolar tooth fused to its normal counterpart (Ballal *et al*., 2007) and paramolar with bifid crown (Loh and Yeo, 1993).

In differential diagnosis, other structures which occur in the maxillary molar region like paramolar tubercle and fused supernumerary tooth (Ferreira-Junior *et al*., 2009) should be ruled out. Paramolar tubercle is also known as "parastyle" and "paramolar cusp" (Scott and Turner, 2000). This trait is a cingulum derivative expressed on the buccal surface of the mesiobuccal cusp (paracone) of the upper molars. In rare instances, it is expressed on the distobuccal cusp (metacone) of the upper molars and the buccal surfaces of the upper premolars. Dahlberg (1945) suggested that paramolar cusp is a term applied to "any stylar or anomalous cusps, supernumerary inclusion or eminence occurring on the buccal surfaces of both upper and lower premolars and molars. Its significance is unknown but it is reported that as paramolar tubercles arise from the buccal cingulum, these structures in human dentition probably represent the remnants of the cingulum of mammals and the lower primates.

Supernumerary teeth can cause numerous complications. The presence of paramolar can leads variety of clinical problems such as crowding, due to insufficient space for the eruption of other teeth; malocclusion due to a diminution of the space in the dental arch when the paramolar erupts; retention or ectopic eruptions of adjacent teeth which are still not erupted; delayed eruption or displacement of adjacent teeth; periodontal disease and caries, if the paramolar presence causes

interferences with oral hygiene procedures (Hou *et al*., 1995); traumatic bite, due to its buccal position they may cause laceration to the buccal mucosa; pulp necrosis and root resorption of the adjacent teeth, due to the pressure exerted by the paramolar tooth (Dubuk *et al*., 1996); formation of diastema, between the molars; interference with orthodontic treatment; follicular cyst, due to the degeneration of the follicular sacs; neoplasm (Scheiner and Sampson, 1997); pain in the molar area and neuralgia of the trigeminal nerve, when the paramolar compresses the nerve (Vennarini *et al*., 1993).

Although these complications do not occur frequently, there is a need for early diagnosis, which will allow for the prevention of such complications. As most paramolar teeth are impacted, in the absence of symptoms or clinical manifestations the best screening is radiographic investigation.

Although radiographs play an important role in assessment of both the location and the typing of supernumerary teeth, the rarity, with which paramolar entity occurs, along with its complex characteristics, often makes it difficult to diagnose on radiographs. In general, periapical, occlusal, and or panoramic radiographs are sufficient for providing the information about supernumeraries required by the clinician. These modalities, however, do not provide detailed information concerning the 3-dimensional relationship between supernumerary or ectopically impacted teeth and adjacent structures. The presence of impacted paramolar on occlusal radiograph was once reported, but the same was not evident on periapical radiograph (McVaney and Kalkwarf, 1976). As the paramolar is seen on buccal or lingual to the arch, overlapping of this structure with the normal molars occurs, which may result in misdiagnosis of this structure. It was suggested that unerupted distomolar teeth are easily found with pantomographic x-ray pictures, while the exact localization of unerupted paramolars requires additional radiographs (Dojs and Roicka, 2007).

The accurate means of radiographic localization of supernumerary teeth using conventional radiographs currently in use is the tube shift technique (the parallax method, Clark's rule, buccal object rule). When parallax method was first introduced, it used 2 periapical films with a shift of the tube in the horizontal plane for the localization of impacted supernumerary teeth (Clark, 1910). This method is still the preferred choice today because of its simplicity. The technique was later adapted to shift the tube in the vertical plane (Richards, 1952). The acronym SLOB can assist in interpreting the principle of tube shift: Same: Lingual, Opposite: Buccal (same direction of movement of the image of the impacted tooth as the tube moves then the tooth is lingual, opposite direction of movement to the tube then the tooth is buccal) (Goaz and White, 1994).

In recent years, the CBCT (cone beam computerized tomography) has innovated the concept of dentistry imaging, allowing three- dimensional reconstruction of a patient's face and skull. The new generation equipments permit the visualization of soft and hard tissues, surpassing conventional images in relation to the linear measurements of maxilla, location and extension of dental resorptions, radicular position, and presence of radicular fractures and diagnosis of bone lesions. These equipments therefore allow a general view of the maxilla-mandibular complex. Besides these advantages, the CBCT utilizes a conical beam system of X-rays which exposes the patient to a single circular movement, and then to a smaller radiation level with faster acquisition of images and lower costs (Schmitt, 2006). Hence it is an important new diagnostic hardware to provide necessary information for the surgical planning and to protect patients against unnecessary risks (Dodson, 2005). The CBCT permits the execution of three-dimensional reconstructions in providing the information on axial, sagittal and coronal planes (Dodson, 2005, Ferreira-Junior *et al.,* 2009). In addition, it clearly shows the anatomical relation of the inferior alveolar canal with the third molar, the pattern and the morphology of non-erupted or supernumerary teeth, as well as their relation to adjacent teeth and maxillary sinus (Kim *et al*., 2003; Bayrak *et al*., 2005, Ferreira-Junior *et al.,* 2009). However, the conventional equipment of computed tomography was not originally developed for dental use, for several reasons such as the high costs borne by patients, the need of space, the long exposition time and the high radiation level (Kim *et al*., 2003; Bayrak *et al*., 2005).

Ballal *et al.* (2007) have also reported that the use of high-end diagnostic imaging modalities such as spiral computed tomography can help the clinician in making a confirmatory diagnosis regarding

paramolar as well as to determine the treatment plan before undertaking the actual treatment.

The most common treatment for paramolar is extraction in order to prevent the complications. However, other treatment modality for unerupted supernumerary teeth is to leave the tooth as it is and use a wait and watch approach. If any clinical problems or complications occur such as cyst formation, crowding, ectopic eruption of adjacent teeth the tooth should be immediately extracted.

Conclusion

Occurrence of paramolar, a supernumerary structure is a rare phenomenon and rarely reported in children and characterized by rudimentary crown morphology.

References

Ballal S, Sachdeva GS and Kandaswamy D (2007). Endodontic management of a fused mandibular second molar and paramolar with the aid of spiral computed tomography: a case report. *J Endod*, **33**(10): 1247-1251.

Bayrak S, Dalci K and Sari S (2005). Case report: evaluation of supernumerary teeth with computerized tomography. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*, **100**(4): E65-E69.

Bruning LJ, Dunlop L and Mergele ME (1957). A report of supernumerary teeth in Houston, Texas school children. *J Dent Child*, **24**: 98-105.

Clark CA (1910). A method of ascertaining the relative position of unerupted teeth by means of film radiographs. *Proc R Soc Med*, **3**(Odontol Sect): 87-90.

Dahlberg AA (1945). The paramolar tubercle (Bolk). *Am J Phys Anthropol*, **3**(1): 9-103.

Dodson TB (2005). Role of computerized tomography in management of impacted mandibular third molars. *N Y State Dent J*, **71**(6): 32-35.

Dojs M and Roicka A (2007). The usefulness of pantomographic x-ray pictures in estimating the position of the paramolar and distomolar teeth. *Ann Acad Med Stetin*, **53**(1): 83-85.

Dubuk AN, Selvig KA, Tellefsen G and Wikesjö UM (1996). Atypically located paramolar. Report of a rare case. *Eur J Oral Sci*, **104**(2): 138-140.

Ferreira-Junior O, de Ávila LD, da Silva Sampieri MB, Dias-Ribeiro E, Chen WL, Fan S (2009). Impacted lower third molar fused with a supernumerary tooth – Diagnosis and treatment planning using cone-beam computed tomography. *Int J Oral Sci*, **1**(4): 224-228.

Gallas MM and García A (2000). Retention of permanent incisors by mesiodens: a family affair. *Br Dent J*, **188**(2): 63-64.

Goaz PW and White SC (1994). *Oral Radiology: Principles and Interpretation*. 3rd edn. St Louis: Mosby, pp. 103.

Grimanis GA, Kyriakides AT and Spyropoulos ND (1991). A survey on supernumerary molars. *Quintessence Int*, **22**(12): 989-995.

Hou GL, Lin CC and Tsai CC (1995). Ectopic supernumerary teeth as a predisposing cause in localized periodontitis. Case report. *Aust Dent J*, **40**(4): 226-228.

Kakolewska–Maczyńska J and Zyszko A (1990). Paramolar and distomolar teeth. *Czas Stomatol*, **43**(4): 232-237.

Kim HS, Song YH, Lee YS and Park KM (1973). A case of bilateral paramolar teeth. *Taehan Chikkwa Uisa Hyophoe Chi*, **11**(2): 131-133.

Kim KD, Ruprecht A, Jeon KJ and Park CS (2003). Personal computer-based three-dimensional computed tomographic images of the teeth for evaluating supernumerary or ectopically impacted teeth. *Angle Orthod*, **73**(5): 614-621.

Kumasaka S, Hideshima K, Shinji H, Higasa R, Kubota M and Uchimura N (1988). A case of two impacted paramolar in lower right molar dentition. *Kangawa Shigaku*, **23**(3): 417-423.

Loh FC and Yeo JF (1993). Paramolar with bifid crown. *Oral Surg Oral Med Oral Pathol*, **76**(2): 257-258.

Masztalerz A (1968). Paramolar teeth. *Czas Stomatol*, **21**(2): 249-251.

McVaney TP and Kalkwarf KL (1976). Misdiagnosis of an impacted supernumerary tooth from a panographic radiograph. *Oral Surg Oral Med Oral Pathol*, **41**(5): 678-681.

Mitchell L (1989). Supernumerary teeth. *Dent Update*, **16**: 65-69.

Munshi A and Munshi AK (2001). Midline space closure in the mixed dentition: a case report. *J Indian Soc Pedod Prev Dent*, **19**(2): 57-60.

Primosch RE (1981). Anterior supernumerary teeth – assessment and surgical intervention in children. *Pediatr Dent*, **3**(2): 204-215.

Rajab LD and Hamdan MA (2002). Supernumerary teeth: review of the literature and a survey of 152 cases. *Int J Paediatr Dent*, **12**(4): 244-254.

Rao PV and Chidzonga MM (2001). Supernumerary teeth: Literature review. *Cent Afr J Med*, **47**(1): 22-26.

Richards AG (1952). Roentgenographic localization of the mandibular canal. *J Oral Surg*, **10**: 325-329.

Scheiner MA and Sampson WJ (1997). Supernumerary teeth: A review of literature and four case reports. *Aust Dent J*, **42**(3): 160-165.

Schmitt (2006). Virtual diagnostics using cone beam CT. *Dent Today*, **25**(6): 90-91.

Scott GR and Turner II CG (2000). *The Anthropology Of Modern Human Teeth: Dental Morphology And Its Variation In Recent Human Populations*. Cambridge: Cambridge University Press, pp 53-54.

Shimizu T, Miyamoto M, Arai Y and Maeda T (2007). Supernumerary tooth in the primary molar region: a case report. *J Dent Child (Chic)*, **74**(2): 151-153.

Soames JV and Southam JC (1993). Disorders of development of teeth. In: Soams JV and Southam JC. (eds). *Oral Pathology*, 2nd edn. Oxford: Oxford University Press, pp. 3-15.

Srivatsan P and Aravindha Babu N (2007). Mesiodens with an unusual morphology and multiple impacted supernumerary teeth in a non-syndromic patient. *Ind J Dent Res*, **18**(3): 138-140.

Srivastava RP and Singh G (1979). Mandibular paramolar. *Uttar Pradesh State Dent J*, **10**(4): 109-111.

Vennarini SA, Venezia A, Mori G and Casa DE' Martinis L (1993). Quarto molare eziopatogenesi ed epidemiologia. Casi clinici. *Dental Cadmos*, **11**: 38-45.

Winter GB (1999). Anomalies of tooth formation and eruption. In: Wellbury RR (ed). *Paediatric Dentistry*. Oxford: Oxford University Press, pp. 255-256.