



RESEARCH ARTICLE

MESIODENS: ETIOLOGY, DIAGNOSIS AND MANAGEMENT OF A COMMON SUPERNUMERARY TOOTH: A LITERATURE REVIEW

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ABSTRACT

**Background:** The presence of supernumerary teeth, between the two central incisors, known under the term mesiodens, is one of the most common developmental problems in children. Their presence may give rise to a variety of clinical problems. Detection of supernumerary teeth is best achieved by thorough clinical and radiographic examination. Supernumerary teeth may be encountered by the general dental practitioner as a chance finding on a radiograph or as the cause of an impacted central incisor.

**Design:** This article presents an overview of the clinical problems associated with supernumerary teeth and includes a discussion of the classification, diagnosis, and management of this difficult clinical entity.

**Conclusion:** The most common supernumerary tooth, which appears in the maxillary midline, is mesiodens. Their diagnosis and management should form part of a comprehensive treatment plan. Treatment depends on the type and position of the supernumerary tooth and on its effect on adjacent teeth. The article throws a light on various modalities for investigation and treatment of supernumerary teeth, which is important for an early intervention in children to avoid major complications.

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INTRODUCTION

By definition, supernumerary teeth are extra teeth in comparison to normal dentition. It is more common in the central region of the upper or lower jaw; however, its occurrence in the mandible is rare. The most common type of supernumerary teeth according to Alberti *et al.* (2006) in 1,577 children was the mesiodens representing 83% of the 0.38% of supernumerary teeth; the proportion of males: females was 2: 1, the most common age was 9 years old and the most common location maxilla in its previous zone. Mesiodens named for Bolk (1917) features appear in the midline distal jaw between 11 and distal 21, representing 80% of all supernumerary teeth. Its orientation can occur at all levels of space and erupt only 25% of cases usually interincisal mouth and via palatal level, in 75% of cases occur retained without rash (Escoda *et al.*, 2004).

Etiology

There are several theories to explain what time or what embryological formation is generated: For hyperactivity of embryonic epithelial cells, tooth germ cells are equal, but some can differentiate into invaginations that would result in new dental tissues, either from the dental lamina, either at the time that the tooth bud is separated from the dental lamina, being attached to this by the dentis gubernaculum, from this new tooth buds may originate either by over activity of the outer layer sheath Hertwing or from epithelial remains of Malassez. For split the dental follicle, the theory of dichotomy, some factors such as trauma, evolutionary mutations, can cause accidental follicle division into two or more fragments, according to the theory of atavism, with few defenders, it is mesiodens the third incisor primates would be a phylogenetic reversal (Fleury *et al.*, 1984). Supernumerary teeth may be associated with some syndromes, such as Fabry's syndrome, cherubism, Apert syndrome, cleidocranial dysplasia or Crouzon disease, cleft lip, cleft palate, Gardner syndrome and other as hereditary fibromatosis, associated with hearing loss and supernumerary teeth (Jensen, 1990) however, the

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appearance of a mesiodens can occur in individuals with no syndrome.

### Prevalence

Fernandez *et al.* found that the prevalence of supernumerary teeth is between 0.5 and 3.8% in the permanent dentition and between 0.35 and 0.6% in the temporary dentition. The most frequent group was the mesiodens (46.9%) (Fernández Montenegro *et al.*, 2006). Its frequency in the Caucasian population varies between 0.15 and 1% predominance of males in a 2 to 1 in the permanent dentition (Backman, 2001; Alencar *et al.*, 2005).

### Types of Mesiodentes

Mesiodens show great variety in size (Primosch, 1981; Yoon *et al.*, 2008; Contreras *et al.*, 1995) and forms (Ranalli *et al.*, 1988; Carver, 1990; Canut, 1998; Howe, 1987; Chadwick, 1993). They can imitate the way of normal teeth (eumorphic), or have an unusual morphology (heteromorphic) as:

Conical or peg teeth: size smaller than normal teeth, with conical crown and a rudimentary whole root. It is the most common form. Tuberculate tooth: smaller than normal tooth crown and root tubers is unique, incomplete, thick and curved. Infundibular tooth: tooth similar to normal size but with invaginations inward at the crown, giving it look like a funnel. Molariform tooth: shaped molar or premolar and incomplete root formation. Delayed eruption of a permanent tooth more than six months and the dental mal-positioning can be the first clinical manifestation of a supernumerary tooth (Berrone *et al.*, 1989).

### Complications

Inclusion of permanent teeth: often cause deformation of the buccal or lingual / palatal surface of alveolar process, with the prolongation of the presence of primary teeth. It is the most common complication (Yoon *et al.*, 2008; Contreras *et al.*, 1995; Ranalli *et al.*, 1988; Carver *et al.*, 1990; Laskin, 1988; Henry, 1989; Zuolanck, 1985).

**Dental Mal-Positioning:** In the incisal region, crowding or malposition we will investigate the existence of a mesiodens. The most common is the torsoversión and lip movement (Kessler, 1989; Henry, 1989).

**Diastema:** The presence of diastema advisable to perform a radiographic examination to rule out mesiodens included, in which case it should be removed when the patient is still in the growth phase and may close the interproximal space without orthodontic treatment (Yoon *et al.*, 2008; Contreras *et al.*, 1995; Ranalli *et al.*, 1988; Carver *et al.*, 1990; Laskin, 1988; Bassigny, 1990; Nik-Hussein, 1990; Huang *et al.*, 1992; Gregg, 1991; Thoma *et al.*, 1981).

**Abnormal Eruptions:** Can erupt into atypical locations away from the dental arch, such as the eruption into the nostrils and into the maxillary sinus, leading to a private clinic in pain, airway obstruction and infection (Primosch, 1981; Escoda *et al.*, 2004; Wood, 1987; Laskin, 1988; Sinha *et al.*, 1994).

**Pulp Pathology:** Forming a cavity, or the existence of a root resorption, they can induce the full range of pulp pathology (Stafne, 1987; Bassigny, 1990).

**Cyst Formation:** The follicle of an enclosed tooth can be the source of a dentigerous or follicular cyst, up to 6% of cases (Stafne, 1987). The dentigerous cyst can become infected, suffer histological changes, or even become an ameloblastoma or intracystic carcinoma (Kessler, 1989; Zuolanck, 1985; Archer, 1975; Kruger, 1984).

**Rhizolysis and Periodontal Lesions:** Compression on the roots of adjacent teeth retained by the supernumerary tooth (Escoda *et al.*, 2004; Primosch, 1981; Yoon *et al.*, 2008; Kessler, 1989; Henry, 1989; Nik-Hussein, 1990). Functional And Aesthetic Problems: Caused by malposition involved mesiodens.

### Early Diagnosis

**Clinical examination:** Mesiodens diagnosis is based on clinical and radiographic findings.

By inspection, we can see that erupted mesiodens those found in the oral cavity; also do a presumptive diagnosis in cases where we observe a delay in the eruption of the maxillary central incisors, bad position of teeth, diastema etc. Palpation inform us about the situation and whether there mesiodens accessible to the touch (Escoda *et al.*, 2004; Carton, 1987) pericoronal cysts.

**Radiological examination:** It provides data on the shape, number, location and relations with adjacent structures. To find the location of the supernumerary tooth occlusal radiographs and periapical radiographs with different horizontal angles (Ranalli *et al.*, 1988; Kessler, 1989; Huang *et al.*, 1992; Tatel, 2003; Deplagne, 1984; Hurst, 1991) are used. It is also necessary to rule out a panoramic radiography supernumerary teeth without clinical signs, as most of supernumerary teeth are asymptomatic (Jensen, 1990). When in doubt you can make a Cone Beam CT, showing the exact location in the 3 planes.

**Differential diagnosis:** Heteromorphic supernumerary teeth should preferably be differentiated from odontoma. Both may even coexist, as in Gardner's syndrome. The compound odontoma frequently located between the anterior teeth (Zuolanck, 1985; Archer, 1975; Kruger, 1984). Supernumerary teeth may also be confused with other injuries that occur with radiopacity, as cementomas, cysts, tumors (cementoblastoma, adenomatoid odontogenic tumor) and retained deciduous teeth (Gallas, 2000; Contreras, 2007).

### Management

The management of supernumerary teeth depends on the type and tooth position. Mesiodens removal is often indicated in certain situations, such as delayed eruption, displacement of adjacent organs or orthodontic interference (Russell, 2003). Early extraction mesiodens has a better prognosis (Cawson, 1984). In the primary dentition it is usually not indicated mesiodens extraction for the high risk of displacing or damaging the development of the permanent incisors. In the mixed dentition, there are two trends in the treatment best suited to perform the extraction time: early removal (before the radicular formation of permanent incisors) and late (after completion of the root formation) (Canut, 1998). Its removal allows early, in most cases, the spontaneous eruption of the incisors affected, preventing associated complications and other more complex subsequent treatments.

The inverted teeth can migrate and this makes it advisable to develop cysts extraction invested mesiodens is essential extracting tuberos forms early for the central incisor erupts in an acceptable time, and causing much more frequently than the delay in conical eruption of the incisors. However, unless a conical mesiodens cause malposition, central incisor crowding or other problems, you can be left in place as it is located above and away from the erupted teeth<sup>(44)</sup> (Högström, 1987). There are two streams to the moment of extraction of a mesiodens:

**Early Tooth Extraction:** Performed before 6 years. Its aim is to prevent future orthodontic problems and the need for complicated surgical procedures. It has a better prognosis than the extraction late. Its disadvantages are the risk of damaging the roots of the permanent incisors, psychological difficulties for the child to tolerate surgery, and finally that this surgery may ultimately prove unnecessary, because sometimes just erupting without affecting the permanent teeth.

**Late Tooth Extraction:** Performed at 8-10 years after complete root formation of permanent incisors. The risk of damaging the apex of permanent teeth is less than making early extraction, at this time the child is better prepared to face surgery. Thus authors like Koch *et al.* (1986), advised late only perform extraction and extraction in early symptomatic cases of supernumerary teeth. The drawback is the increased risk of lack of space, requiring more aggressive in that case and complicated orthodontic and surgical treatment. Most permanent incisors included because of a mesiodens, approximately 75% erupt spontaneously after the supernumerary tooth is extracted (Primosch, 1981; Tatel, 2003). Then we must control the eruption of the central incisors erupted not waiting at least six months, and checking that there is sufficient space in the dental arch so that they can be located (Primosch, 1981; Ochoa Grijalba, 1993). If we find that there is no spontaneous eruption of the incisors we perform surgical exposure of them (Howe, 1987; Thoma *et al.*, 1973) and orthodontic traction using brackets attached directly to the labial surface of the incisor (Hernández, 2009).

## Conclusion

The treatment of choice is extraction supernumerary, this will depend on their morphology, position, the potential effect on teeth and surrounding structures, and patient age. Delayed, ectopic or asymmetric eruption of the central incisors should alert the clinician to the possibility of a mesiodens. The clinician should obtain accurate radiographs including panoramic, periapical and occlusal views. Early diagnosis of a mesiodens minimizes the treatment required and prevents development of associated problems. Extraction of the mesiodens in the early mixed dentition stage may facilitate spontaneous eruption and alignment of incisors, while minimizing intervention, space loss and midline shift. Should the incisors not erupt spontaneously, further surgical and orthodontic treatment may be required.

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