Mesiodens: Etiology, Diagnosis and Treatment: A Literature Review

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Introduction

Or hyperdontia supernumerary teeth is the increased number of normal dental formula, twenty deciduous and permanent thirty-two [1-5]. The most common type of supernumerary teeth according to Alberti et al. [6] 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 [7] features appear in the midline distal jaw between 11 and distal 21, representing 80% of all supernumerary teeth.

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. It represents 50-80% of supernumerary, with its higher frequency in the maxilla and men 2:1. Most of the mesiodens have a single root, it has conical crowns or triangle, is heteromorphic. The etiology of mesiodens is unclear; the best theory is hyperactivity of the dental lamina. These teeth can cause different disorders such as malposition of adjacent teeth, anomalous eruption, and delayed eruption of permanent maxillary central incisor interincisal diastema and cyst formation.

Objective

The aim of this work was to make a literature review of the different oral aspects involving mesiodens.

Material and methods

To make the literature review, we used different database for finding articles related to mesiodens. Of the total of articles we founded, those which did not fulfill the inclusion criteria were discarded.

Conclusions

Mesiodens is the most common supernumerary tooth observed more in men than in women 2:1. It can cause pathological conditions so an early diagnosis with panoramic radiography, complete with occlusal or periapical at different angles, besides a clinical diagnosis is recommended. 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.

Keywords: Diagnosis; Etiology; Mesiodens; Supernumerary Teeth; Treatment

Abstract

Background

Epidemiology

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%) [11].

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 overactivity 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 [9].

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 [10] however, the appearance of a mesiodens can occur in individuals with no syndrome.

Epidemiology

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Its frequency in the Caucasian population varies between 0.15 and 1% predominance of males in a 2 to 1 in the permanent dentition [12,13].

When the rash is done through the nasal floor completely, they are called “nasal prongs” manifesting itself as a local tumor that causes nasal deformity, with airway obstruction, headache or other facial pain, epistaxis, rhinorrhea and purulent rhinitis erupts with speed and is quickly visible, also it has great mobility and is easily removable [14-16].

**Clinic**

Mesiodens show great variety in size [2,17,18] and forms [1,19,20-22]. 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 [23].

**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 [1,24,19,25,16-18,26,31].

**Dental Mal-Positioning**: In the incisal region, crowding or malposition we will investigate the existence of a mesiodens. The most common is the torsiversión and lip movement [25,26].

**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 [1,16,17,19,24,27,28,32,33].

**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 [2,8,15,24,34].

**Pulp Pathology**: Forming a cavity, or the existence of a root resorption, they can induce the full range of pulp pathology [2,8].

**Cyst Formation**: The follicle of an enclosed tooth can be the source of a dentigerous or follicular cyst, up to 6% of cases [3]. The dentigerous cyst can become infected, suffer histological changes, or even become an ameloblastoma or intracystic carcinoma [25,29-31].

**Rhizolysis and Periodontal Lesions**: Compression on the roots of adjacent teeth retained by the supernumerary tooth [2,8,14,17,25,26].

**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 [8,35] 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 occusal radiographs and periapical radiographs with different horizontal angles [1,32,36,25,37-40] are used. It is also necessary to rule out a panoramic radiography supernumerary teeth without clinical signs, as most of supernumerary teeth are asymptomatic [10]. When in doubt you can take 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 [29-31]. 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 [41,42].

**Treatment**

The inverted teeth can migrate and this makes it advisable to develop cysts extraction invested mesiodens is essential extracting tuberous 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 [43].

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. [44], 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 supernumery tooth is extracted [2,36]. 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 [2,45].

If we find that there is no spontaneous eruption of the incisors we perform surgical exposure of them [16,21] and orthodontic traction using brackets attached directly to the labial surface of the incisor [46].

Objective

The aim of this review was to conduct a comprehensive literature review of the existing literature on the etiology, epidemiology, symptoms, diagnosis and treatment of mesiodens.

Method and Results

The database used for making the literature review included PubMed, LILACS, EMBASE, Google Scholar, MedLinePlus, Cochrane and Dialnet. The key words used for making the search at the different database were “Mesiodens” OR “supernumerary teeth” [All Fields] AND “treatment” OR, “etiology” OR “clinic” OR “orthodontic treatment” OR “management” OR, “prevalence” OR, the following keywords were used “case” OR “orthodontic” OR “radiographic” OR “extraction” OR “radiographic” OR “review” [All Fields].

The inclusion criteria for the different articles searched for making this research work were: original articles or literature reviews from January 1981 until January 2015 that were written in English, Spanish, Italian, French, German or Portuguese.

Articles which the main topic was not mesiodens it etiology, diagnosis, clinical aspects or treatment were discarded; also articles which we cannot get the full text or articles in which mesiodens or related aspects of it were superficially mentioned along the manuscripts.

After using inclusion and exclusion criteria, we used a total of 55 articles for making a literature review of the different aspects involving mesiodens.

Discussion

Studies have shown that the formation of supernumerary tooth is due to an epithelial overactivity, but there is disagreement as to what training from or what embryological point is generated [9]. Mesiodens may be single or multiply, Hernandez et al. [47] refer cases of double mesiodens in children. Gündüz et al. [48] collected 69 cases of patients who had a mesiodens 53 (76.8%) and 16 patients two (23.1%). Salcido et al. [49] found 36 cases with mesiodens: only 31 (86.1%) and 5 double (13.9%). Ferres Padro et al. [50] they found in 42 cases mesiodens: only 36 (45.6%), 4 double (5.1%) and 2 mesiodens more than three (2.5%). Fernandez et al. [51] performed 145 supernumery extraction in 102 patients. Mesiodens was the most frequent: 46.9% of the patients had. Also it was for Salcido et al. [49], who reviewed to 2,245 patients and found 102 supernumery teeth in 72 patients, 36 of whom presented. Ferrés Padro et al. [50] conducted the extraction of 113 unerupted supernumery teeth in 79 pediatric patients. Mesiodens was the most frequent supernumery teeth (53.2% of patients), with a total amount of 42.

The panoramic radiograph performed as control visit tells us the presence of supernumery teeth without clinical signs exist, since a high percentage are asymptomatic. Studies like those of Fernandez et al. [51] and Gündüz et al. [48], who extracted mesiodens 68 and 85 respectively, show that in 39.7% of cases the first study and 22.3% in the second were asymptomatic.

At other times causes complications. Fernandez et al. [51] found that 51.5% of the 68 had been extracted mesiodens inclusion of permanent teeth, 7.4% and diastema tooth malposition, and in a case of a follicular cyst formation. Gündüz et al. [48] reported that 38.8% of the 85 occurred mesiodens extracted delayed eruption of permanent incisors in interincisal diastema 17.6%, 16.4% change in the position of the permanent incisors erupted and 4.7% resorption of adjacent teeth.

Besides orthopantomography in some cases we must complete the radiological study with a periapical, occlusal, lateral skull X-ray or CT scan to determine the exact location and relationship to adjacent structures, prior to any extraction [38-40].

Mesiodens are 80% of all supernumery teeth according Danalli [1] as a result of the measurement from distal to the distal 11 to 21, while the percentage found by Bolk ranges from 45-66%, with those diagnosed in the midline [7]. In a study of a total of 36 they were diagnosed mesiodens mesiodens in 30 patients (average of 1.2 per patient mesiodens), corresponding to 1.5% of the total sample. Prevalence was similar to that described in studies by Hurlen and Humerfelt [52] (1.4%) and Salcido-Garcia et al. [49] (1.6%), and is very close to the observed average frequency for prevalence values collected (1.6%).

Raymundo et al. [53] anomalies observed in the number of teeth in the permanent dentition in 909 patients aged 6-12. The prevalence of supernumery teeth was 2.2%, mostly located in the anterior area; the mesiodens was the most common supernumery teeth (78.4%).

Gorse et al. [54] 329 surgical procedures performed between 2002 and 2009 for diagnosis of retained parts odontomas supernumeries and found 110 cases of supernumery teeth (57.3%) in the anterior maxilla (87.3%), the range the most common age 6-11 years (82.7%).

The management of supernumery 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 [55]. Early extraction mesiodens has a better prognosis [56].

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) [20]. Its removal allows early, in most cases, the spontaneous eruption of the incisors affected, preventing associated complications and other more complex subsequent treatments.

**Conclusions**

With the limits of this review concerning to mesiodens, we can concluded that: Mesiodens is the most common supernumerary tooth observed more in men than in women 2:1. The most common form of presentation is conoide, erupting only 25% of the time and located palatal to the central incisors. It can cause pathological conditions so an early diagnosis with panoramic radiography, complete with occlusal or periapical at different angles, besides a clinical diagnosis is recommended.

The treatment of choice is extraction supernumery, this will depend on their morphology, position, the potential effect on teeth and surrounding structures, and patient age.

**References**


