CASE REPORT

INVERTED AND SEVERELY DILACERATED MESIODENS PREVENTING ERUPTION OF CENTRAL INCISOR: A CASE REPORT

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ABSTRACT

A ten year old boy came with a chief complaint of unerupted permanent maxillary right central incisor. Deciduous right central and lateral incisors were retained. Radiographic examination revealed an inverted and dilacerated mesiodens with the root bent over the incisal surface of the right central incisor preventing its eruption. An occlusal radiograph and radiographs using shift cone technique were taken to determine the position of the mesiodens. Extraction of retained deciduous incisors was done, followed by surgical removal of mesiodens to allow unhindered eruption of the central incisor.

Key words: Tooth, Supernumerary, Unerupted

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INTRODUCTION

Supernumerary teeth, or hyperdontia, refer to the teeth that form in addition to the normal dental formula.[1, 2] They may occur in any region of the dental arch, in the maxilla or in the mandible, singly or in multiples, unilaterally or bilaterally, erupted or unerupted. They can be associated with a syndrome or they can be found in non-syndromic patients.[3,4]

The reported prevalence of supernumerary teeth ranges from 0.2% to 0.8% in the deciduous dentition, and ranges from 0.5% to 5.3% in the permanent dentition with geographic variations.[4,5] The incidence of supernumerary teeth is usually higher in males than in females. The reported male to female ratio was between 1.18:1 to4.5:1.[4,6] The most common supernumerary teeth are mesiodens, which occur between the maxillary central incisors.[7] More rarely, they can be located in the premolarand distomolar regions, and appear as supernumerary premolars or supernumerary fourth and fifth molars.[8]Supernumerary premolars constitute proximately 10% of the total supernumerary cases, and almost 75% of those are in the mandible.[9,10] It was reported that 76%–86% non-syndromic cases have only one supernumerary tooth, and 12%–23% cases have two supernumerary teeth.[3,6] Only 1% of non-syndromic cases have multiple supernumerary teeth, which occur most frequentlyin the mandibular premolar area, followed by the molar and the anterior regions, respectively.[3,11,12] Supernumerary teeth in the deciduous dentition are usually normal or conical shaped, whereas supernumerary teeth in the permanent dentition can exhibit various shapes. They may have normal morphology or may be rudimentary and miniature with little or no resemblance to the other teeth. Based on their morphology, supernumerary teeth are classified into four types, including conical type, tuberculate type, supplemental teeth, and odontomas.[13] The most common supernumerary teeth are small conical peg-shaped with root development at the similar stage or ahead of that of adjacent teeth. They usually develop in the anterior maxilla as mesiodens. Tuberculate supernumerary teeth are large barrel shaped with multiple cusps or tubercles. Their root development is delayed compared to that of adjacent teeth. They are mostly found unerupted in the palatal aspect of the maxillary central incisors, and this can cause the impaction of permanent maxillary incisors.[14,15]Supplemental teeth are duplications of teeth in the normal dentition with essentially normal size and shape, and they are usually found at the end of a tooth series. The most common supplemental tooth is the permanent maxillary lateral incisor, but supplemental premolars and molars were also reported. The majority of supernumerary teeth found in the primary dentition are of the supplemental type. They usually erupt with normal morphology and alignment, and often appear as a supplemental lateral upper incisor.[4,13] This may cause underreported and low prevalence of supernumerary teeth in the primary dentition.[2] There are special cases exhibiting permanent supernumerary teeth developing as supplemental teeth and forming after the permanent teeth. These are thought to represent a third dentition, best known as manifestations of cleidocranialdysplasia. Odontoma was listed as the fourth category of supernumerary teeth.[13] Some supernumerary teeth are just impacted in the jaw with no obvious adverse effects. They were usually identified incidentally during radiographic examinations for some other reasons.[10,11,12] However, the development of some supernumerary teeth can cause a broad range of complications, including retained or delayed eruption of permanent teeth, diastemas, displacement, rotation, crowding, root resorption, periodontal lesions, or pulp necrosis of adjacent teeth. They can also cause dentigerous (odontogenic) cyst, and the presence of unerupted supernumerary teeth may compromise tooth implantation as well as alveolar bone grafting in patients with cleft palate.[3,4,7,13,15,16]

The term 'dilaceration' refers to an angulation or a sharp bend or curve, in the root or crown of a formed tooth (Latin: *dilacero* = tear up).[17] The term was first used by Tomes and referred to as the 'forcible separation of the cap of the developed dentine from the pulp in which the development of dentine is still progressing.[18] The condition is thought to be due to trauma during the period in which the tooth is forming, with the result that the position of the calcified portion of the tooth is changed and the remainder of the tooth is formed at an angulation. The curve or bend can be anywhere along the length of the tooth, sometimes at the cervical portion, at other

times midway along the root or even just at the apex of the root, depending on the extent of root formed at the time of injury. Presented here is a rare case of severe dilaceration of an impacted, inverted supernumerary toothpreventing eruption of permanent central incisor.

CASE REPORT

A 10 years old boy came to the department of Pedodontics And Preventive Dentistry, Government Dental College And Research Institute Bangalore, with a chief complaint of unerupted permanent maxillary right central incisor [Figure 1].

On clinical examination right deciduous central and lateral incisors were found to be retained and left lateral incisor had preshedding mobility. Intra oral periapical radiograph revealed impacted right central incisor and an inverted and dilacerated mesiodens in the midline [Figure 2]. An occlusal radiograph and two intra oral periapical radiographs using SLOB rule were taken to determine the position of mesiodens[Figure 3,4]. As can be appreciated by the radiographs [figure4] when the tube head was shifted distally, mesiodens also shifted distally which suggests that mesiodens was palatally placed.

Maxillary occlusal radiograph clearly reveals the presence of mesiodens with severe dilacerations of almost 90^0 at the middle third of the root. Though the crown of the supernumerary was inverted, the long axis of the crown was parallel to the long axis of the unerupted permanent central incisor, however, with 90^0dilaceration, the dilacerated root was bent over the incisal edge of the unerupted tooth, hindering the eruption of permanent central incisor [Figure 3].

There was no relevant medical and family history and the child was otherwise healthy and not associated with any syndrome.

After a detailed examination, the decision was made to extract the retained deciduous incisors followed by extraction of mesiodens under local anaesthesia.

Nasopalatine nerve block and infraorbital nerve blocks on both sides were given. A full thickness palatal flap from canine to canine was raised.Right central incisor was visible after flap was elevated.Palatal bone was removed using airotorhandpiece under continuous saline irrigation. Periosteal elevator was used to elevate the tooth once the crown of the tooth was visible. Since the tooth was dilacerated extensive bone removal was required. Once the tooth was mobile in its socket it was extracted using extraction forceps [Figure 5]. Tooth was severly dilacerated and was approximated 1.4cm in size [Figure 6]. Surgical site was irrigated with 1% betadine and normal saline. Sutures were placed and patient was recalled after 5 days.

After 5 days sutures were removed. Surgical site was irrigated with normal saline and 1% betadine. Incisal tip of permanent right central incisor was visible as the tooth started erupting within this short time period.

DISCUSSION

The first report of supernumerary teeth appeared between AD 23 and 79. Most supernumerary teeth are isolated cases, although some may be familial inherited and some may be syndrome associated events.[3] The etiology of supernumerary teeth is still uncertain. A number of theories have been postulated to try to explain their presence, including atavism (evolutionary throwback), tooth germ dichotomy, hyperactivity of the dental lamina, and genetic and environmental factors.[19,20] The atavism or phylogenetic theory suggested that the occurrence of supernumerary teeth is a regression to the extinct ancestral tissues or anthropoids. This theory is based on the phenomena that ancestor mammals have more teeth with three incisors, one canine, four premolars, and three molars in each quadrant of the jaw.[21,22] The teeth of common modern mammals belong to these four tooth families. It is generally thought that during evolution, the total number of teeth per dentition decreased (from polyodonty to oligodonty) and the generations of teeth were also reduced (from polyphyodonty to diphyodonty or monophyodonty); whereas the morphology of teeth became more complex (from homodonty to heterodonty). Over the course of evolution, the teeth in placental mammals tend to disappear in an order that is opposite to the order of their eruption.[23] The tooth germ dichotomy theory proposed that during early tooth development, the dental lamina was divided into two parts of equal or different size, thus giving rise to two teeth with similar size, or one normal tooth and one dysmorphic tooth.[13,24,25]Hovorakova et al. analyzed the develop-

Figure 1. Unerupted permanent right central incisor with retained deciduous incisors

Figure 2. IOPA showing inverted and dilacerated mesiodens

Figure 3. Maxillary occlusal radiograph showing inverted and dilacerated mesiodens hindering eruption of permanent central incisor

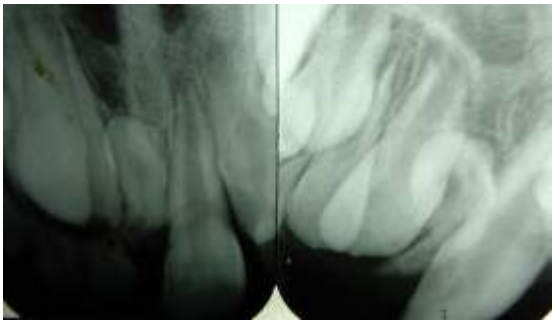

Figure 4. IOPA radiographs taken using SLOB rule to determine position of mesiodens

Figure 5. Empty extraction socket after extraction of mesiodens. Note palatally placed right central incisor.

Figure 6. Dilacerated Mesiodens of 1.4 cm

ment of deciduous upper lateral incisor in human embryos using serial sections and computer-aided 3D reconstructions, and found that deciduous upper lateral incisors originate from the fusion of two dental epithelial thickenings, which were separated by a groove at the formal fusion site of the medial nasal and maxillary processes. Later, these two dental epithelial thickenings fused together and formed a continuous dental lamina, from which the deciduous upper lateral incisor develops.[24] Any disturbance causing cleft or incomplete fusion of the dental epithelial thickenings can result in the formation of supernumerary teeth. This may explain why the supernumerary upper lateral incisor often appears in the deciduous dentition, and in the conditions of cleft palate and cleft lip.[4] Hyperactivity of the dental lamina is another widely accepted theory.[3,1,19,20,24,26,28,29,30] Primary dental lamina (odontogenic band) is the thickening of oral ectoderm forming during the initiation stage of deciduous teeth and it gives rise to the deciduous dentition. During the cap or bell stage of deciduous tooth development, successional dental lamina forms from the lingual or posterior aspect of deciduous tooth enamel organ. It later elongates under the oral epithelium and buds into the jaw mesenchyme forming the successional (permanent) tooth or the posterior molar teeth.[31] Once the crown of the permanent tooth has formed, the dental lamina undergoes programmed cell death and degenerates. Residues of un-degenerated dental lamina epithelial cells may cause eruption cysts,[32] while overproliferation or prolonged survival of dental lamina epithelial cells may cause supernumerary tooth formation.[3,31,32] Heredity is also believed to be an important factor. Supernumerary teeth occur more commonly in the relatives of affected patients than in the general population.[21,33,34,35,36]

In the present case, Impaction of maxillary right central incisor was attributed to the presence of dilacerated mesiodens, and this has been observed in earlier reports.[37]

Conclusions:

Presence of an inverted, impacted, dilacerated mesiodens was associated with abnormal impaction of permanent central incisor. Supernumerary teeth should be extracted as early as possible.

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