

A labially positioned mesiodens: case report

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Abstract

This case report describes a labially positioned maxillary midline mesiodens in an 8-year-old male. The clinical and radiographic appearance and therapeutic considerations are presented. The purpose of this article is to alert the clinician to the importance of radiographic localization prior to surgical intervention, because in some instances a labial surgical approach is preferred over the traditional palatal technique. In this case a labial surgical approach was utilized which allowed for greater conservation of alveolar bone and improved access during removal of the mesiodens.

Supernumerary teeth, hyperdontia, are of particular interest to pediatric dentists who commonly make the initial diagnosis. The condition is frequent enough that some feel an anterior occlusal film should be mandatory as part of a child's complete initial examination (Rotberg and Kopel 1984). The prevalence of supernumerary teeth is reported to be from 1 to 3% (Luten 1967; McKibben and Brearley 1971). An increased incidence in children with cleft palate and cleidocranial dysostosis also has been observed (Pinkham 1988).

The vast majority of supernumerary teeth are associated with the permanent dentition and occur predominantly in the premaxillary midline region and are termed mesiodens (Nazif et al. 1983; Rotberg and Kopel 1984). Of these, most are reported to remain unerupted (Tay et al. 1984). Two types of supernumerary teeth exist and are classified as either supplemental (tooth-like) or rudimentary. The etiology of supernumerary teeth is unclear, but the most popular theory involves hyperactivity of the dental lamina (Primosch 1981). A hereditary link and a predilection for males has been suggested (Brunning et al. 1957; Sedano and Gorlin 1969), but has yet to be determined.

Most problems associated with mesiodens are related to altered growth and development in the area. Common sequelae include overretention of primary teeth, impaction or delayed eruption of permanent teeth, dilaceration or abnormal root development, and/

or abnormal crowding or spacing of the anterior teeth. Other less frequent problems are root resorption of adjacent teeth, dentigerous cyst formation, and nasal eruption of inverted supernumerary teeth (Smith et al. 1979; Primosch 1981; Rotberg and Kopel 1984).

Therapeutic Considerations

Treatment of mesiodens centers on several factors and consideration of these variables will determine whether to treat the supernumerary early or to observe the condition. The first factor is the child's age. In the very young child the ability to tolerate a surgical procedure is of major concern. The benefit of early treatment must be weighed against the long-term effect that any unpleasant experience may have.

Second is the stage of dental development of the surrounding dentition and proximity of the mesiodens to the permanent incisors. In cases of immature root development, consideration must be given to the risk of surgical trauma to the developing roots of the permanent incisors and the potential of altering future dental development. Mesiodens that are intimately positioned with the developing permanent incisors may either alter the permanent bud positionally, impede eruption, and/or alter root development; whereas, removal of this same supernumerary tooth may cause the same sequelae through surgical trauma. In instances where the surgical approach jeopardizes the viability of sensitive developing tissue, it may be appropriate to delay treatment.

Lastly, one must evaluate the relative position of the mesiodens within the premaxilla. Assessment of access to the supernumerary must be considered in relation to the amount of bone removal and potential damage to existing incisors. In children, eruption of mesiodens is possible and, although complete eruption is infrequent, some mesiodens may erupt partially so that a more favorable surgical approach may be attained with time.

Therefore, the accurate location of supernumerary teeth is critical in determining the proper treatment approach. Clinical examination, including labial and palatal palpation, along with proper radiographs can be used with high accuracy to determine the mesiodens' location in the premaxilla. Both vertical and horizontal shift radiographic techniques, using 2 occlusal or periapical radiographs, are helpful in localizing midline mesiodens. Other useful radiographs include panoramic and lateral occlusal films.

Opposing views exist as to when supernumerary teeth should be treated, if at all (Primosch 1981). Some authors recommend early removal of most supernumerary teeth, particularly those that are inverted and/or are unlikely to erupt (Primosch 1981; Nazif et al. 1983; Rotberg and Kopel 1984). It is felt that this may prevent the need for orthodontic treatment and/or additional surgical procedures, such as surgical exposure or periodontal surgery at a later date. Advocates of early intervention feel treatment would take advantage of the spontaneous eruption of the permanent incisors and increase potential for self-correction (Tay et al. 1984).

Others feel that mesiodens that appear likely to erupt into a more favorable position can be monitored and removed more easily at a later date (Stermer Beyer-Olsen 1985; McDonald and Avery 1987). A cautious approach is advised for inverted supernumerary teeth as they present a difficult surgical problem due to proximity to developing permanent teeth (Stermer Beyer-Olsen 1985). Some recommend postponement of surgery until root development of the neighboring permanent incisors is complete (Tay et al. 1984).

This case involves an inverted conical-shaped rudimentary supernumerary tooth located in the premaxillary midline and is unusual in that a labial surgical approach was utilized. This allowed for improved access and greater visualization in removal of the tooth. The report describes the clinical and radiographic appearance, rationale for surgical intervention, and surgical approach used in treating an 8-year-old male with a mesiodens.

Case Report

An 8-year-old Caucasian male was an active patient at Children's Hospital of Wisconsin pediatric dental clinic. He was a normal healthy child with a medical and dental history which were both noncontributory. The initial examination performed 1 year previously, revealed an asymptomatic maxillary midline supernumerary. A decision was made at that time to observe the tooth and assess its potential for spontaneous eruption into a more favorable position for removal. The mother was informed of the condition and instructed to return

for re-evaluation in 6 months, or if symptoms developed. Ten months later the child returned for his routine recall appointment. His medical and dental history remained unchanged.

Oral Examination

The intraoral soft tissues were healthy and he practiced good oral hygiene. He presented in the middle mixed dentition stage with a 60% overbite and an end-to-end molar relationship, primary canines relating as Class I. Maxillary anterior spacing was slightly excessive with a 1-2 mm midline diastema present and lateral incisors flared and incompletely erupted (Fig 1). Previ-

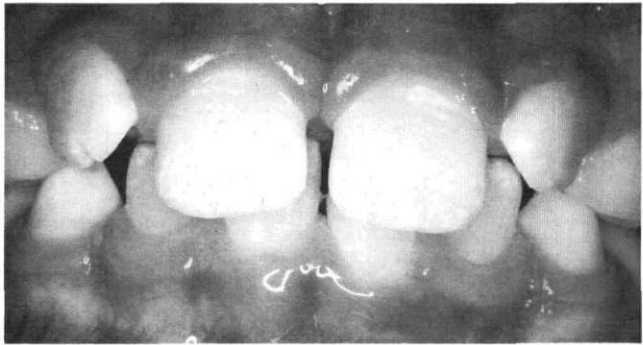


FIG 1. Preoperative condition demonstrates the diastema and the altered eruption path of the maxillary permanent incisors.

ously placed sealants and restorations presented in good repair. No carious lesions were evident and no restorations were required. The maxillary permanent incisors presented with slight fluorosis, normal mobility, and were asymptomatic to percussion. Labial and palatal palpation was not helpful in locating the mesiodens. Radiographs then were taken in order to localize the supernumerary tooth and assess the potential surgical approach.

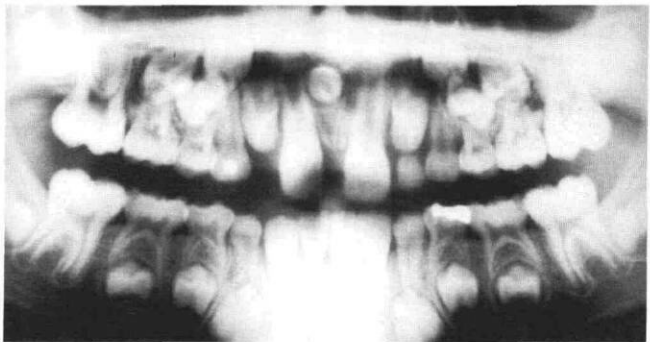


FIG 2. Panoramic radiograph taken at the initial examination, 1 year previously, depicts a horizontal orientation of the mesiodens.

Radiographic Examination

A panoramic radiograph was obtained at the initial exam 1 year previously. The following additional radiographs were obtained: maxillary anterior periapical, lateral projection of maxilla (lateral occlusal), and 2 anterior occlusal films with differing horizontal angulations. The panoramic radiograph gave the impression of a horizontal long axis of the mesiodens (Fig 2) while the periapical radiograph depicted a vertical long axis (Fig 3). The lateral occlusal film revealed a slight elevation of



FIG 3. The periapical radiograph depicts an inverted and vertical oriented maxillary midline mesiodens.

the alveolus labial to the apical one-third of the permanent central incisors (this radiograph was not reproducible with sufficient clarity for publication). The buccal object rule (Langlais et al. 1979) was utilized with 2 anterior occlusal films of differing horizontal angulations. Application of this rule indicated a mesiodens, at least partially, positioned labially to the roots of the permanent central incisors. Root development of the maxillary permanent central incisors was noted to be nearing

completion with the maxillary lateral incisor roots being moderately immature. Root development appeared normal with the mesiodens primarily affecting tooth position.

No significant change in the supernumerary tooth's position had occurred during the observation period. From the radiographic survey it was determined that the mesiodens was likely inverted with the long axis oriented vertically. The tooth was definitely not palatally positioned and at least part of the tooth was expected to be labial to the roots of the permanent incisors. With parental approval, the decision was made to remove the mesiodens surgically in the dental clinic. A labial surgical approach was planned.

Treatment

The surgical procedure was performed in the outpatient dental clinic. Initially the patient was mildly apprehensive. He was given permission to stop treatment by raising his right hand if any discomfort was experienced. Local anesthetic, 3.6 cc 2% lidocaine with 1/100,000 epinephrine, was administered slowly via labial

and palatal infiltration with a 30-gauge needle. After anesthesia was accomplished the patient seemed much more relaxed. Using a #15 blade (Bard Parker; Rutherford, NJ) an elliptical incision was made from the distal aspect of the maxillary right lateral incisor to the distal aspect of the maxillary left lateral incisor. A full thickness flap then was reflected with a periosteal elevator. A slight elevation in the alveolus was evident midway between the root apices of the permanent central incisors. With palpation it was determined that this was the anterior limit of the mesiodens. A sterile #8 round bur was used with slow speed to remove the buccal plate of bone which allowed the tooth to be seen. With liberal saline irrigation a circular window was made surrounding the tooth. Care was taken to avoid excessive bone removal or damage to roots of the adjacent permanent teeth. At this point it was determined that the mesiodens was in a more horizontal position with the root apex labially positioned and the crown positioned palatally. The tooth was then luxated with an elevator (Fig 4). Although mobile, the larger contour of the crown impeded final removal. Following additional circumferential expansion of the bony window, delivery of the supernumerary was accomplished. The mesiodens measured 12 mm in length.

The extraction site was gently curetted, irrigated with saline (Fig 5, page 62), and the wound closed with 11 interrupted 4-0 silk sutures (Fig 6, page 62). The patient tolerated the procedure comfortably. Postoperative pain was controlled with acetaminophen with codeine (Tylenol No. 2 — McNeil Pharmaceutical; Spring House, PA). Swelling was prevented via use of immediate ice pack application. The patient's recovery

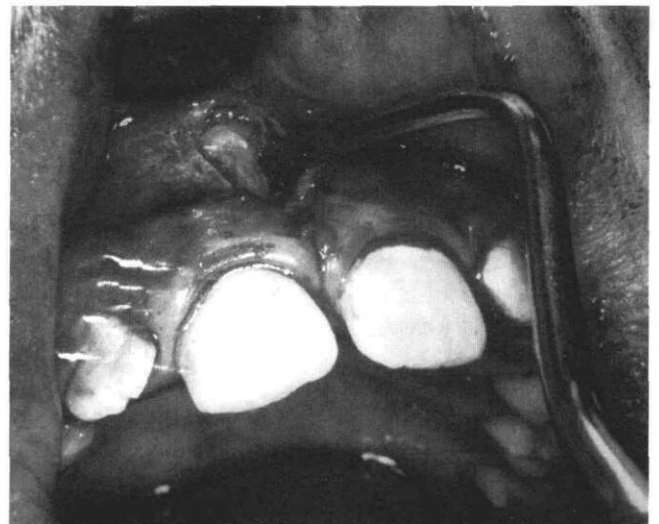


FIG 4. A labial access was used with an elliptical incision being made near the mucogingival junction. A full-thickness mucoperiosteal flap was reflected, a bony window made, and the mesiodens elevated prior to removal.

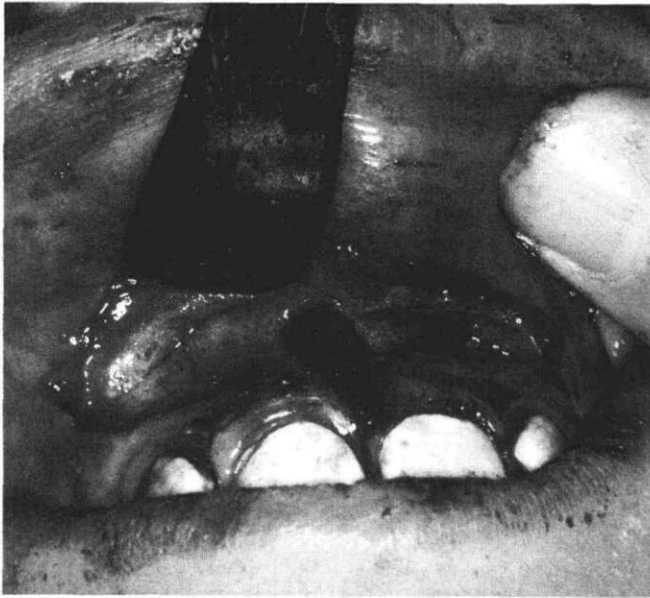


FIG 5. The supernumerary tooth was removed, the follicle gently curetted, and the area irrigated with saline prior to closure.

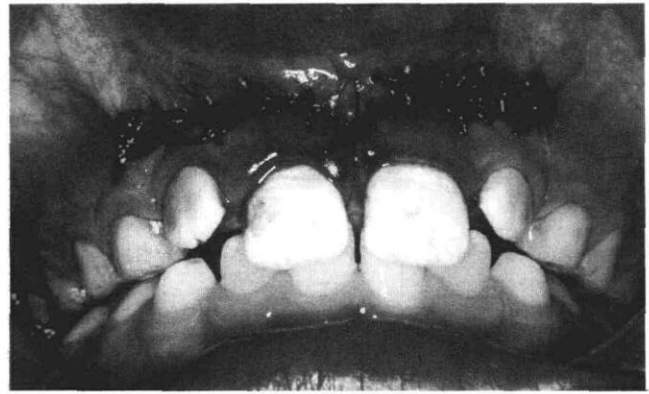


FIG 6. Wound closure with 4-0 silk sutures.

was uneventful with no unusual signs or symptoms reported. The sutures were removed 1 week postoperatively with normal healing at the surgical site. Six-month follow-up found continued eruption of the maxillary permanent lateral incisors with minimal scar formation in the area. Initiation of comprehensive orthodontic treatment, previously discussed with the parent and largely unrelated to the mesiodens, was planned in approximately 12-18 months.

Discussion

Supernumerary teeth, which occur predominantly in the maxillary midline, are termed mesiodens. It has been stated that only 25% of maxillary anterior supernumeraries erupt (Tay et al. 1984). Nazif et al. (1983) reported that only 6% of the impacted mesiodens are found to be in a labial position. The vast majority (80%) are reported to be positioned palatally with the remaining 14% located between the roots of the permanent central incisors (Nazif et al. 1983). The small percentage that are labially positioned are due, in large part, to growth changes of the premaxilla that influence the position of the mesiodens. Enlow (1982) described apposition-resorption patterns of the nasal floor, palate, premaxilla, and alveolus which help explain the mesiodens relative labiolingual positional change over time. His growth theories are confirmed by a study that found that mesiodens become more labial and nearer the nasal floor with time (Stermer Beyer-Olsen et al. 1985). This is particularly true for inverted supernumerary teeth. From this, a labial surgical approach would

seem to have practical applications and should be considered when removing midline supernumeraries in 8 to 10-year old children.

The radiographic series described located the mesiodens in a labial position. Accurate localization is important in order to reduce the risk of damage to the permanent teeth and blood supply during surgery. Clark's rule refers to the use of multiple radiographs with differing horizontal angulations to determine the buccolingual position of a tooth on a 2-dimensional radiograph (Langlais et al. 1979). Application of this rule found that the mesiodens moved in the same direction as the x-ray head, suggesting its buccal position in the maxilla. This was confirmed with the lateral occlusal film by observing a small elevation labial to the apical one-third of the permanent central incisors roots. Interestingly, the panoramic radiograph implied a horizontally positioned supernumerary while the occlusal and periapical films indicated a vertical orientation of the long axis of the mesiodens. The intraoral films were thought to be more indicative of the actual position of the mesiodens than the extraoral, panoramic film. Differences in film packet position and angulation of the central beam, relative to the mesiodens and the permanent incisors, make radiographic interpretation of axial orientation difficult. Thus, it was felt that surgical exposure and clinical observation was the only way to resolve this pre-operative diagnostic discrepancy. Surgical exposure did confirm the horizontal orientation of the mesiodens and suggest that a preoperative panoramic film may give a more accurate representation of the mesiodens axial position.

Consensus among various authors remains divided as to the optimal timing for the surgical removal of an unerupted mesiodens (Tay et al. 1984; Kaler 1988). Several advocate early, preschool-age removal of a mesiodens in order to prevent future orthodontic problems and the need for more difficult surgical procedures (Primosch 1981; Nazif et al. 1983; Rotberg and Kopel 1984). It is reported that early surgical removal of me-

mesiodens can be performed without the loss of vitality of the permanent incisors and without causing an undue negative psychological experience for the child (Rotberg and Kopel 1984; Hogstrom and Andersson 1987). However, others feel it is best to observe badly impacted and inverted supernumeraries until 8-10 years of age (Stermer Beyer-Olsen et al. 1985; McDonald and Avery 1987). The rationale for observation is to allow for complete root development of the permanent incisors in order to decrease the chance of root damage, disruption of the blood supply, as well as to reduce the chance of devitalization.

Clearly, there are indications both for the early surgical removal of supernumeraries as well as for their supervised observation. The case presented depicts a mesiodens that did not change position in a reasonable period of time. It was positioned such that a diastema was created between the central incisors. Its effect also altered the eruption path of the permanent lateral incisors. In the present case one would not expect significant improvement in the mesiodens position and its surgical removal was indicated.

Conclusion

Surgery involving a palatal flap is most typical for impacted maxillary midline supernumerary teeth. In this case, a labial surgical approach was utilized which allowed increased visualization of the mesiodens and greater ease of removal. The background and rationale for this approach is presented and should be considered in selected cases, particularly for older children with inverted mesiodens.

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Brunning LJ, Dunlap L, Mergele ME: Report of supernumerary teeth in Huston, Texas, school children. *ASDC J Dent Child* 24:98-105, 1957.

Enlow DH: The facial growth process, in *Handbook of Facial Growth*, 2nd ed. Philadelphia; WB Saunders Co, 1982 pp 62-74.

Hogstrom A, Andersson L: Complication related to surgical removal of anterior supernumerary teeth in children. *ASDC J Dent Child* 54:341-43, 1987.

Hurlen B, Humerfelt D: Prevalence of premaxillary supernumerary teeth in Norwegian children: a radiographic study. *Dentomaxillofac Radiol* 13:109-15, 1984.

Kaler LC: Prevalence of mesiodens in a pediatric Hispanic population. *ASDC J Dent Child* 55:137-38, 1988.

Langlais RP, Langland OE, Morris CR: Radiographic localization techniques. *Dent Radiog Photog* 52:69-77, 1979.

Luten JR: The prevalence of supernumerary teeth in primary and mixed dentitions. *ASDC J Dent Child* 34:346-53, 1967.

McDonald RE, Avery DR: *Dentistry for the Child and Adolescent*, 5th ed. St Louis; CV Mosby Co, 1987 p 786.

McKibben DR, Brearley LJ: Radiographic determination of the prevalence of selected dental anomalies in children. *ASDC J Dent Child* 38:390-98, 1971.

Nazif MM, Ruffalo RC, Zullo T: Impacted supernumerary teeth: a survey of 50 cases. *J Am Dent Assoc* 106:201-4, 1983.

Pinkham JR: *Pediatric Dentistry — Infancy Through Adolescence*. Philadelphia; WB Saunders Co, 1988 pp 48, 354.

Primosch RE: Anterior supernumerary teeth — assessment and surgical intervention in children. *Pediatr Dent* 3:204-15, 1981.

Rotberg SJ, Kopel HM: Early versus late removal of mesiodens: a clinical study of 375 children. *Compend Contin Educ Dent* 2:115-20, 1984.

Sedano HO, Gorlin RJ: Familial occurrence of mesiodens. *Oral Surg* 27:360-62, 1969.

Smith RA, Newton CC, DeLuchi SF: Intra-nasal teeth. *Oral Med* 47:120-22, 1979.

Stermer Beyer-Olsen EM, Hurlen B, Humerfelt D: Changing positions of supernumerary teeth in the premaxilla: a radiographic study. *ASDC J Dent Child* 52:428-30, 1985.

Tay F, Pang A, Yuen S: Unerupted maxillary anterior supernumerary teeth: report of 204 cases. *ASDC J Dent Child* 51:289-94, 1984.