

DENTAL HEALTH AND DIET IN PREHISTORIC CHILE

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A UNILATERAL CONNATE INCISOR IN A CA. 2,000 YEAR OLD MANDIBLE FROM THE MIDDLE COLUMBIA RIVER PLATEAU

GUY L. TASA

State Museum of Anthropology, Museum of Natural History, 1224 University of Oregon, Eugene, Oregon 97403, U.S.A.

INTRODUCTION

Examination of skeletal material from a Late Archaic cemetery site, Wildcat Canyon (35GM9), in the Middle Columbia River Plateau, Oregon, revealed the presence of a unilateral connate incisor in an Amerindian child's mandible (Fig. 1). This was the only case of connate teeth in this collection which represents at least 75 individuals. The individual derives from the main cemetery at the site dating between 100 BC and 1 AD (Dumond and Minor, 1983).

TRAIT DISCUSSION

Connate teeth, or more commonly referred to in the clinical literature as double teeth (Miles, 1954; Brook and Winter, 1970; Yenn *et al.*, 1987), include both dental fusion and gemination. Dental fusion is defined as the partial (at the root or crown) or complete union, during development, of two or more adjacent teeth (Pindborg, 1970; Duncan and Crawford, 1996). Gemination is the complete or partial division, during development, of a single tooth crown (Pindborg, 1970; Duncan and Crawford, 1996). Dental fusion can occur between two normal teeth and between a normal tooth and a supernumerary tooth, although the latter is difficult to distinguish from gemination (Nik-Hussein, 1992).

An attempt at distinguishing between dental fusion and gemination can be made in a number of ways, although none of the methods are foolproof. Fused teeth result in a diminished number of total teeth in the dentition, when fusion is between two normal teeth and the fused tooth pair is counted as one tooth. Gemination results in the normal

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Fig. 1. Dental fusion of the deciduous mandibular right central and lateral incisors on a five-year old child from the Columbia River Plateau. The dentition of the individual is complete, but the maxillary deciduous left central incisor and the mandibular deciduous left canine could not be placed in the dental arcade because of faulty reconstruction.

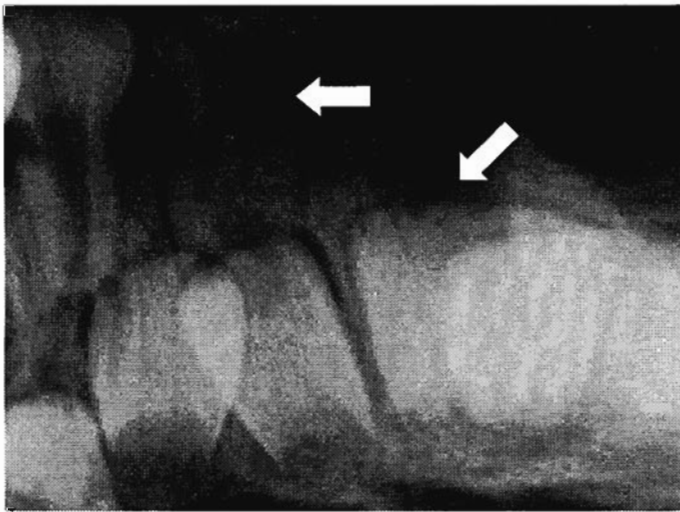


Fig. 2. X-ray of the anterior mandible of a five-year old child from the Columbia River Plateau. The arrow on the left indicates the complete fusion of the deciduous right central and lateral incisors. The arrow on the right points to the possible presence of a geminated permanent left central incisor.

complement of teeth when the geminated tooth is counted as one tooth. However, this result is also achieved when fusion occurs between a normal tooth and a supernumerary. In addition, the presence of hypodontia with connate incisors can also confuse the distinction between gemination and fusion (Brook and Winter, 1970). Geminated teeth can also be distinguished from fused teeth on the basis that geminated teeth are often mirror images of one another (Kelly, 1978).

Connate teeth occur most often in the anterior mandibular deciduous dentition (Brook and Winter, 1970; Kelly, 1978), but are also common in the permanent teeth, particularly between third molars and supernumerary teeth. Incidences for their occurrence in deciduous teeth range from 0.14 to 5.00% with no sex predilection, and unilateral expression is more common than bilateral expression (Brook and Winter, 1970). Connate teeth are also common in non-human mammals (Miles and Grigson, 1990), including many primate species (Miles and Grigson, 1990; Winkler and Swindler, 1993; Lukacs, 1998 pers. comm.).

Little is known about the worldwide distribution of this anomaly, but a strong racial component is suspected (O'Reilly, 1990). Duncan and Helpin (1987) report that Amerindians, Asians, and Mexicans exhibit the highest frequency of the trait. This is supported by various researchers including Brown (1968), who found a high incidence in Crow Indian school children (1.20%), by Saito (1959) and Niswander and Sujaku (1963), who report a 5.00% and 2.50% incidence, respectively, in living Japanese, and by Yamamoto (1989), who reports an incidence of 4.80% in Edo period Japanese. Bazan (1983), Brook and Winter (1970), Buenviaje and Rapp (1984), Järvinen *et al.* (1980), and Magnússon (1984) indicate an incidence in Caucasian populations at less than 1.00%. Ruprecht *et al.* (1985) found similar results in Saudi dental patients with an incidence at 0.40%.

Although cases of dental fusion and gemination are asymptomatic (Lamego Velasco *et al.*, 1997), dental fusion can result in a number of dental difficulties including tooth number reduction in the permanent successors (Ravn, 1971; Gellin, 1984), increased susceptibility to subgingival bacterial plaque (Brook and Winter, 1970; Mader, 1979; Lamego Velasco *et al.*, 1997), delayed eruption of the permanent teeth (Brook and Winter, 1970; Peretz and Brezniak, 1992), aplasia or malformation of the permanent successors (Peretz and Brezniak, 1992), and dental impaction.

SPECIMEN DESCRIPTION

Only a handful of archaeological examples of dental fusion or connate teeth have been reported (Sciulli, 1977, 1998; Ortnier and Putschar, 1981; Stevenson, 1985; Yamamoto, 1989; Drusini and Swindler, 1994). In the case reported here, connation occurs between the lower deciduous right central and lateral incisors of a child of approximately five years of age at death (Fig. 1). Fusion is indicated by the lower than normal complement of teeth and the retention of morphological similarity of the lower right central deciduous incisor with its antimere. Inspection of the crown and the radiograph of the fused tooth (Fig. 2) reveals that the fusion is complete and the two teeth share a common pulp chamber. The lower right central incisor is rotated approximately forty-five degrees with the mesial end of the tooth rotated lingually. No rotation of the lower left central incisor was observed. Figure 2 also reveals

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what appears to be a geminated unerupted central left permanent incisor, roughly twice the size of its antimere, and otherwise normal permanent successors.

The dentition exhibits a stepped appearance of the occlusal plane due to relatively heavier wear in the incisor region over the canine-molar region. Both the upper and lower anterior dentition also exhibits a significant degree of alveolar resorption due to periodontal disease. Calculus deposits are also noted in the groove between the two fused teeth. Other pathologies noted in the dentition include localized enamel hypoplasia of both deciduous lower canines, which is also known as localized hypoplasia of primary canines or LHPC (Skinner, 1986), and of the deciduous upper right canine.

CONCLUSION

A unilateral connate deciduous incisor in a ca. 2,000 year old Amerindian child's mandible is presented. This case conforms to generalizations about the trait, including a relatively higher incidence in Amerindians, a comparatively more frequent occurrence in anterior mandibular deciduous teeth, and an increased susceptibility to subgingival plaque. The reduced number of teeth indicates dental fusion between the right central and lateral deciduous mandibular incisors.

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PREMOLAR DOUBLE TEETH IN A GROUP OF IRISH ORTHODONTIC REFERRALS

C.M. MCNAMARA,¹ O. COONEY,² M. O'SULLIVAN,³ AND T.G. MCNAMARA⁴

^{1,2}Eastern Health Board, Regional Orthodontic Department, St. James's Hospital, Dublin 8, Ireland;

³ Department of Restorative Dentistry and Periodontology, Dublin Dental School and Hospital, Lincoln Place, Dublin 2, Ireland;

⁴ Mid-Western Health Board, Regional Orthodontic Department, St. Camillus Hospital, Limerick, Ireland.

ABSTRACT This is a report of gemination type premolar double teeth in patients who were referred for orthodontic consultation in the Eastern Health Board, Ireland. Prevalence was low (0.06%) with just three patients presenting with this dental anomaly. The premolar double teeth involving two maxillary and one mandibular premolar are illustrated.

INTRODUCTION

Dental fusion is defined as a condition where two separate tooth buds join together during development and present with the appearance of a bifid crown. Confluence of dentine and/or enamel occurs. Frequently, one root and two root canals occur. Clinically a tooth is missing in the affected quadrant (Levitas, 1965; Hagman, 1988; Morris, 1992). Connation, dichotomy, twinning, and schizodontia are terms that have been used to describe this type of dental anomaly (Smith, 1980). Gemination, another term, is defined as an attempt by a single tooth bud to divide. Partial division is halted before dental development is complete. The result is a single tooth with a bifid crown (Niswander and Sujaku, 1963; Morris, 1992). Generally the tooth has a single root canal and clinically, unlike fusion, no disruption in the normal number of teeth occurs (Levitas, 1965). The presence of a supernumerary bud complicates these definitions. In clinical practice distinguishing between dental fusion and gemination is frequently difficult. (Brook and Winter, 1970; Morris, 1992). Thus, the term "double teeth" has been suggested (Brook and Winter, 1970: 123).

The etiology of double teeth is not known. Racial variation together with familial associations indicate a genetic component (Brook and Winter, 1970), but local factors such as trauma and abnormal eruption of adjacent teeth have been suggested (Morris, 1992). The frequency of double teeth is greater in the primary dentition than in the secondary dentition. Prevalence ranges from 0.1% to 0.9% in the primary dentition and 0.1% to 0.2% in the secondary dentition (Levitas, 1965; Brook and Winter, 1970; Gellin, 1984). No significant gender bias has been reported (Gellin, 1984). Double teeth occur most commonly in the incisor and canine regions (Brook and Winter, 1970; Duncan and Helpin, 1987). Reports of double teeth in the premolar region are few (Brook and Winter, 1970). Prevalence of double teeth is also rare in the molar region, but pathological union of cementum in adults may occur giving rise to late onset dental concrescence (Levitas, 1965; Brook and Winter, 1970).

Racial variation exists with increased prevalence reported in Japanese (Smith, 1980; Hagman, 1988) and North American Indian populations (Duncan and Helpin, 1987). In cases where double teeth present in the primary dentition the probability of anomalies in the secondary dentition is increased (Gellin, 1984). Aplasia of the permanent incisor has been reported in up to 18.0% of cases, where fusion of a corresponding primary incisor was found. (Hagman, 1988). Should fusion occur in the primary lateral incisor-canine area, the incidence of a missing permanent incisor is even greater than 18.0%, with up to 50.0% of cases affected (Hagman, 1988).