

Natal and Neonatal Teeth - A Narrative Review

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Abstract

The arrival of baby teeth is a huge milestone in child’s oral development but the eruption of teeth at birth or within first month after birth is considered uncommon. These teeth are called as natal and neonatal teeth. It is common to see anxious mother worried about this rare condition in infants. Mandibular anterior region is the most common site for natal and neonatal teeth. These teeth are usually smaller in size, whitish opaque in colour. They are very mobile and loosely attached to gingiva, hence there is a risk for aspiration. Mother will be having difficulty in breast feeding. The purpose of this review article is to discuss the prevalence, aetiology,

classification, clinical features, histologic features, management and complications of natal and neonatal teeth.

Keywords: Aetiology, natal teeth, neonatal teeth, primary incisors.

Introduction

Presence of natal and neonatal teeth is considered to be a disturbance of biological chronology.¹ Dentitia praecox, dens connatalis, congenital teeth, fetal teeth, infancy teeth, PR deciduous teeth, and precocious dentition are some of the terminologies used previously. Lack of specificity and exactness in explanation of the condition leads to subsequent discontinuity of these terms.² The

analogous terms of natal and neonatal teeth described by Massler and Savara (1950) are now most accepted features. Massler and Savara defined natal teeth as teeth present at birth and neonatal teeth as teeth erupted within the first month of life.^{1,2} The purpose of this review article is to discuss the prevalence, aetiology, classification, clinical features, histologic features, management and complications of natal and neonatal teeth.

Incidence and Prevalence

Natal teeth are more common compared to neonatal teeth and both teeth seem to be observed more frequently in females. The majority studies, however give an incidence between 1 in 2000 to 1 in 3500 live births.² A prevalence rate of 1:800 has been reported by Anderson (1982). Natal teeth are said to be three times more common than neonatal teeth.² The rates of the erupted natal/neonatal teeth in descending order are as follows: Mandibular incisors (85%), maxillary incisors (11%), mandibular canines and molars (3%), and maxillary canines and molars (1%); 90% of these teeth are primary and 10% are supernumerary.^{2,3} Most of natal and neonatal teeth are considered early erupting teeth of the normal deciduous dentition and the reported incidence of supernumerary teeth ranges from 1 to 10%.⁴ Natal teeth usually occur in pairs in 61% to 76% of the cases.⁵ The eruption of more than two natal teeth is rare. Numerous times natal and neonatal tooth are seen in syndromic individuals so it is essential to rule out any such relationship. An interdisciplinary approach between the paediatrician, neonatologist and oral health professional is necessary for diagnosing syndromic association and better oral health.³

Aetiology of natal and neonatal teeth

In the past, neonatal teeth were merely considered cysts of the dental lamina of the new-born. In spite of the fact

that the precise aetiology is still not known, conceivable aetiologies proposed are as follows:¹

- The most common accepted aetiology is the superficial position of the tooth germ above the alveolar bone, possibly related to hereditary factors
- Hereditary transfer of a dominant autosomal gene- A hereditary cause has been traced in 10 out of 24 cases of natal teeth studied by Massler and Savara (1950), and in 7 out of 19 cases given by Gardiner (1961). In 1957, Halls reported a family of three brothers, one of them had 2 incisors present at birth; and in another, a tooth had erupted 9 days after birth. Similarly, in 1958 Albright described a series of 26 cases of natal or neonatal teeth in Chinese babies, out of which in only one he was able to trace any hereditary influence. Zhu king D found a hereditary transmission in 8-62% cases.⁴
- Endocrine disturbances-Excessive secretion of the pituitary, thyroid or gonads hormone can cause excessive or increased resorption of overlying bone which accelerates eruption of teeth.
- Jasmin and Clergeau-Guerithault stated that the eruption of natal and neonatal teeth could be due to increased activity of osteoblastic cells within the tooth germ.
- Infection: For example, congenital syphilis has changing effect. The tooth has erupted early in some cases whereas in others it has been retarded.
- Nutritional deficiency during pregnancy- Hypovitaminosis.
- Febrile status: Long standing fever, exanthemata in pregnancy be predisposed to increase speed of eruption of tooth.
- During initiation and proliferation stage of tooth development, excessive development leads to formation of natal teeth.

Predisposing factors

- The environmental factor that may be regarded as a causative factor of natal teeth is the toxic polychlorinated aromatic hydrocarbons: Polychlorinated dibenzodioxins (PCBs), (Polychlorinated dibenzodioxins) PCDDs, and PCDFs (Polychlorinated dibenzofurans). They are capable of crossing the placenta and concentrations of PCDD/Fs in the adipose tissue of a new-born can be correlated with those in mother's milk. These children usually show other associated symptoms, such as hyperpigmentation, dystrophic finger nails etc.⁴
- A rare case, reported by Obu C Dorathy et al (2021) with findings of eight markedly enlarged anterior natal teeth in post term born male infant with a history of mother consuming herbal medication throughout pregnancy implicated aetiology of natal teeth to phytochemicals.

Classification of natal and neonatal teeth

Spouge and Feasby (1966) recognized the need to classify these teeth. On the basis of clinical characteristics, as follows:¹

- Mature: when they are fully developed in shape and comparable in morphology to the primary teeth, well-developed compared to the remainder of the primary dentition and that its prognosis is relatively good
- Immature: when their structure and development are incomplete, and implies a poorer prognosis for the tooth in question

On the basis of literature data, Hebling (1997) recently classified natal teeth into four clinical categories:¹

1. Shell-shaped crown weakly attached to the alveolus by gingival tissue and devoid of a root.
2. Solid crown that is poorly fixed to the alveolus by gingival tissue and little or no root.

3. Erupted incisal margin of the crown through gingival tissue.

4. Oedema of gingival tissue with an unerupted but palpable tooth.

Clinical presentation of natal and neonatal teeth

The natal teeth or neonatal teeth usually manifest with variable shape and size ranging from small, conical to resembling normal teeth. Normally they appear coniform, yellowish/white in colour, composed of compact keratin, and projected above the alveolar ridge. The morphology these teeth is dependent on the degree of maturity, many a times they are loose, small, discoloured and enamel hypoplasia/ hypo-mineralization and a short root formation indicative of an immature nature.²

As described by Basavanthappa *et al*, and Leung *et al*, the natal/neonatal teeth are often smaller and also more conical than normal deciduous teeth. They are fixed to the oral mucosa in many cases as the root development is deficient. The mobility also may lead to deterioration of Hertwig's sheath which is accountable for the formation of root, thus resultant in further incomplete root development.² According to Costa CAA, early eruption and expulsive folliculitis are two different entities, in expulsive folliculitis rapid tooth eruption occurs (2 to 3 mm in one day), together with extreme mobility, turgidity and inflammation of gingiva in the eruption zone. Whereas in true early eruption, no mobility and normal eruptive path of tooth was observed with integrity of alveolar gum pads.⁶

Diagnosis of natal and neonatal teeth

Teeth were deemed to be 'mobile' when the mobility >2 mm in any direction and 'normal' when the mobility <2 mm.⁷ According to Singh *et al*, if the degree of mobility is more than 2mm, the natal tooth usually has to be extracted.

Radiographic examination is an auxiliary tool to establish if these natal/neonatal teeth are components of normal dentition or are supernumerary teeth, to determine the amount of root development and to establish differential diagnosis. Dental lamina cysts, Bohn's nodules and congenital epulis might be confused with natal teeth.⁷

Natal and neonatal teeth associated with cleft palate

A high prevalence of natal/neonatal teeth has been reported among both unilateral (2.02%) and bilateral (10.06%) cleft lip and palate neonates.⁵ Natal teeth among clefts are situated in the lateral margin of the premaxillary and maxillary segment.⁵ This indicates anatomic alveolar disturbance with more superficial site of teeth in the region of the cleft. occurrence of neonatal teeth does not appear to influence primary or secondary dentition in clefts. Mainly natal teeth among clefts are located in the lateral margin of the premaxillary and maxillary segments not like in non-cleft neonates.^{5,8} A 15-days neonate reported to our department of pediatric and preventive dentistry with natal teeth associated with cleft palate (fig-1), it was managed by extraction of the natal tooth under topical anaesthesia.



Figure 1: 15-days-young infant with cleft palate and a neonatal tooth.

Natal and neonatal teeth associated with congenital heart disease

David J (1976) reported a series of two cases with natal teeth in the mandibular anterior region associated with patent ductus arteriosus and intestinal pseudo-obstruction.⁹ Toromonovic A. (2009) reported a case of a female child of 37 weeks gestation, delivery by caesarean section.¹⁰ The child showed positive screening for congenital hypothyroidism. 5th day of age tooth eruption was noted in the lower central incisor region.¹⁰ Echocardiography revealed coarctation of aorta, patent ductus arteriosus, patent foramen ovale with aneurysm of interatrial septum. Because of a high degree of mobility, and a danger of aspiration the tooth was extracted on the 20th day of life under antibiotic prophylaxis.¹⁰

Natal and neonatal teeth associated with syndromes

Some of the syndromes reported to be associated with natal teeth and neonatal teeth include Ellis-Van Creveld (Chondro-ectodermal Dysplasia), Hallermann-Streiff (Oculo-mandibulodyscephaly with Hypotrichosis), Pachyonychia Congenital (Jadassohn-Lewandowsky), Rubinstein-Taybi, Steatocystoma multiplex, Pierre-Robin, Cyclopia, Pallister-Hall, Wiedemann-Rautenstrauch (Neonatal Progeria), Short Rib-Polydactyly (type II), Cleft Lip and Palate, Pfeiffer, Ectodermal Dysplasia, Multiple Steatocystoma, Sotos, Adrenogenital, Epidermolysis-Bullosa Simplex including Van-der-Woude, Down's Syndrome, Craniofacial Dysostosis and Walker-Warburg Syndromes.^{2,11}

Complications of natal and neonatal teeth

- Riga-Fede Syndrome- The most common complication of natal teeth with sharp incisal edge of teeth causing the ulceration of the tongue on ventral surface, or Riga-Fede disease, which is the result of

repetitive trauma to the tongue area named after Riga and Fede who histologically described the lesion. Coldarllin first described this condition in 1857. This condition leads to difficulty in feeding /refusal to feed because of the pain.¹²

- Kiniron's described presence of sublingual ulceration seen immediately after birth, had probably been caused by suction during intrauterine life. This condition leads to difficulty in feeding or refusal to feed because of the pain.¹³ Other complications may include: potential risk of swallowing and aspiration of tooth, due to its great mobility, injuries to the mother's breast and apical abscesses.¹²

Management of Natal and Neonatal teeth

Even though some authors reported natal/neonatal tooth is supernumerary, most other studies have shown that most of such teeth are, in fact, primary teeth. Thus, it would be better to decide preservation first, rather than extraction.

- When possible, natal/neonatal teeth extraction should be delayed after the child is 10 days of age or more, in order to permit the normal flora of the intestine to generate vitamin K, an important factor for prothrombin synthesis in the liver (Cunha et al, 2001).

The American Academy of Paediatrics (1961) recommends that all new-borns immediately after birth should be given a single intramuscular dose of 0.5 to 1mg of vitamin-K for prevention of Vitamin-K Deficiency Bleeding (VKDB).¹⁴

- These teeth are merely separated from gum and not really extracted. The extraction of the natal teeth should be followed by a mild curettage of the socket to eliminate the remaining dental papilla and Hertwig's epithelial root sheath. Failure to curette the socket can lead to ongoing development of the cells of the dental papilla, which may result in eruption of tooth-like

structures some months later, referred as residual natal tooth this was reported Tsubone et al. According to King and Lee (1998), the risk of residual tooth formation is about 9.1%. In these cases, if this residual tooth formation starts, a second surgical procedure is required. In addition, lately there is a tendency for much clearer management in the cases of prematurely erupted teeth in new-borns.¹⁵ Two cases with natal and neonatal teeth reported to our department (fig-2 and fig-3) were managed by extraction under topical anaesthesia.

- There are other treatments to reduce injury to both the mother and infant. According to Padmanabhan et al, grinding of the incisal edge may be an option to prevent maternal wounding during breastfeeding.¹⁶

- Choi et al, described a technique where layering the incisal edge with composite resin is done, which can facilitate rapid healing of an ulcer on the infant's tongue.

- However, unfortunately, most natal/neonatal teeth exhibit immature appearances along-with enamel hypoplasia, with a limited surface area of enamel available for resin bonding which results in difficult bonding procedures in these teeth due to improper moisture control and a lack of cooperation from the infant. Clinicians should also be aware that if the restoration fails, there is a risk that the composite resin could be swallowed.^{17,18}

- If the natal or neonatal teeth is diagnosed as a normal dentition without significant mobility, then retention of these teeth is advised. Silicone breast protector can be given to the feeding mother for her protection against traumatic suckling. Fluoride tooth paste should be used by this, infants as there are high chances of getting early childhood caries and regular follow up is necessary.¹²



Figure 2: A-15-days-young infant with two natal teeth, B- Extraction of teeth under topical anaesthesia.



Figure 3: A-10-days-young infant with two natal teeth, B- extraction of teeth under topical anaesthesia.

Post extraction complications

1. According to Ooshima et al, after the exfoliation of natal teeth, the retained dental papilla separated from the natal tooth crown can continue its growth and differentiate into another tooth-like structure.¹⁹
2. Local haemorrhage- Furthermore, the risk of haemorrhage is directly proportional to the degree of mobility of the natal teeth, so the more mobile the tooth is, the lower the risk of haemorrhage. However, The American Academy of Paediatrics recommends that a single intramuscular dosage of 0.5 to 1 mg of vitamin-K should be administered to all new born babies before extraction, since it is necessary for the formation of clots at the extraction spot. Usually, this vitamin is synthesized by bacteria in the large intestine and since commensal intestinal flora will not have been formed until the infant is 10 days old.¹⁵

Histological features seen in natal and neonatal teeth

The histological examination of teeth showed hyperaemia and thick blood vessels, thus normal microscopic structure of pulp tissue in neonatal and natal teeth (Mhaske et al, 2013; Bulut et al, 2019). On the contrary, other study showed the histological results showed something new, that is the presence of a widely spread inflammatory infiltration similar to that found in pulpitis which may be agitation in infant widespread phlogistic infiltrate from pulpitis in natal or neonatal teeth.²⁰

Histologically the enamel in natal and neonatal tooth may vary according to the degree of mineralization. The enamel thickness of these teeth is usually less than primary teeth. The enamel thickness of natal teeth is 300 nm and for neonatal teeth is 135 nm, however once the teeth erupt prematurely the uncalcified enamel matrix wears off. In some studies, hypoplastic as well as total absence of enamel is also seen. Friends et al,

demonstrated that the alteration in amelogenesis was detected due to premature exposure of the tooth to the oral cavity which resulted in metaplastic changes in the epithelium of the normal columnar to a stratified squamous epithelium. Howkins (1932) examined natal and neonatal tooth section under the microscope and observed normal dentin, except for certain irregular spaces in the region close to the amelodentinal area.²⁰

In some studies, structures resembling osteo-dentin, atypical arrangement of dentinal tubules is also seen. Dentin will have irregular dentinal tubules, neonatal line and change in the direction of primary and secondary dentinal tubules and Y shaped branching of dentinal tubules towards dentino-enamel junction The pulp chamber and the pulp canal are wider, but pulp shows normal development. There was absence of zone of Weil and cell rich zone. In polarised light and micro-radiographic analysis of neonatal teeth showed enamel hypoplasia. In other studies, cartilage like tooth was also seen.²⁰

Studies have demonstrated that most of the crowns of natal and neonatal teeth are covered with hypoplastic enamel with varying degrees of severity, absence of root formation, ample and vascularized pulp, irregular dentin formation, and lack of cementum formation and dentinal disturbance. In some case reports natal and neonatal teeth have been seen in association with pulp polyp, gingival overgrowth, pyogenic granuloma.¹⁵

Conclusion

Natal and neonatal teeth are rarely seen in the infant's oral cavity. A proper clinical and radiographic assessment is important for making an accurate diagnosis and providing best treatment. Parents should be counselled as these conditions hold mystic beliefs and treatment modality may vary according to patients' risk and complication associated with it. An interdisciplinary

approach between the paediatrician, neonatologist and oral health professional is necessary for diagnosing syndromic association and better oral health.¹¹

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