

Natal and Neo natal Tooth – A Clinicohistological Study and Management Perspective - Case Series.

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ABSTRACT

Presence of teeth at birth or before its normal eruption time frame is an occurrence of rarity. Natal and neonatal teeth are observed in infants at birth or within thirty days of life. The etiology of natal and neonatal teeth is still not clearly understood. A thorough clinical knowledge and proper treatment plan is essential to manage such rare conditions which are often entangled with varied social taboos. Here we report a case series of natal and neonatal teeth in the lower anterior region with clinical, histological aspect and its management.

Keywords: Natal, Neonatal, Dentitia pracoex, taboos.

INTRODUCTION

Normal eruption follows a chronological sequence with eruption of lower anterior as the first primary tooth at around 6 months of age.^[1] Massaler and Savaral defined natal tooth/teeth as those which are present at birth and neonatal tooth/teeth are those which are seen within 30 days of life in an infant's oral cavity.^[2] Sometimes teeth may develop between the natal age of 1 to 3.5 months which are called early infancy tooth. Teeth which erupt before the normal eruption time are given various names like congenital teeth, predeciduous teeth, fetal teeth, dentitia pracoex, dens canntalis, infancy teeth, precocious dentition. Many myths and misconceptions are present with the eruption of natal and neonatal teeth which are still believed in today's modern age.^[3]

The prevalence of natal teeth was found to be between 1 in 2000 to 3500 live births. In some studies, the incidence has a female predilection. The exact cause of such tooth / teeth is still unknown but factors which are thought to play a role are infections, febrile and pyretic conditions, trauma during delivery, malnutrition, hormonal imbalance, environmental toxins, maternal exposure to chemicals and tooth germ anomalies.^[4]

The clinical characteristics of natal and neonatal teeth may resemble natural primary dentition or may be conical in shape but histologically it may show different enamel, dentin, cementum and pulp changes. Mostly they have a hypoplastic enamel, dentin and pulp.^[5]

The treatment requires an interdisciplinary approach of paediatrician and maxillofacial surgeon as it is concerned with the child's health and future dentition. Many a times natal and neonatal tooth are present in syndromic individuals so it is important to rule out any such association. If the presence of natal tooth results in any complication, then the treatment of choice is extraction along with regular follow up of the infant.^[3]

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CASE SERIES

CASE 1

A five-day old female infant was brought to the emergency department of maxillofacial surgery with a concern of mobile lower front tooth. The infant's parents gave a history of presence of the tooth in the lower anterior tooth region since birth, which was 1 mm in size and attained the size of about 7mm in a span of five days. The infant born was normal and in full term, born to Hindu parents. Prenatal, postnatal and family history was non - contributory. On extra oral examination no abnormality was detected. Intraoral findings revealed a tooth measuring 7 mm present in 81 region, with grade III mobility

according to Miller Classification, which was loosely attached to alveolar gum pads [Figure 1]. The tooth was opaque white in colour. The lips, gingivae, palate, tongue, floor of the mouth, and buccal mucosa were clinically normal in appearance and there was no ulceration on the ventral surface of the tongue. A diagnosis of Natal tooth was made on the basis of these clinical findings. The treatment plan was extraction of the natal tooth under topical anaesthesia, as aspiration of the tooth was a major complication associated with its retention. The paediatrician and neonatologist were consulted before the procedure for child's fitness, to rule out any syndromic associations and to confirm the administration of Vitamin K at the time of birth. After getting fitness from the Paediatrician and Neonatologist, as no associated syndrome was found and as Vitamin K was already administered at birth, written consent was taken from the parents for performing the procedure. The extraction of the tooth was done under topical anaesthesia. The tooth

was held with gauze and gently pulled out and any remaining tooth follicle in the extraction socket was curetted. Bleeding was arrested with pressure packs, antibiotics and analgesics were prescribed [Figure 2]. The child was kept under observation for a day and then discharged. The tooth was sent for histopathologic evaluation. The macroscopic appearance of the tooth was a shell shaped crown [Figure 3]. On ground sectioning of the tooth, it showed hypoplastic enamel with reduced thickness and loss of enamel at few places. Enamel rods showed a fish scale pattern [Figure 4]. Enamel spindles were seen focally. Predominantly tubular dentin was present. Dentinoenamel junction was flat, with no cementum formation [Figure 5], immature crystals were seen in dentin which shows incomplete mineralisation [Figure 6]. Haematoxylin and eosin sections of the pulp tissue showed pulpal connective tissue with collagen fibres interspersed with plump spindle shaped fibroblasts and mesenchyme like cells [Figure 7].

Table 1: Classification.

Sponge and Feasby (1966) ^[5]	Type 1	A mature natal and neonatal teeth are those which are nearly or fully developed and has relatively good maintainable prognosis.
	Type 2	An immature natal or neonatal teeth are those which are having an incomplete or a substandard structure with a poor prognosis.
Hebling ^[2]	Type 1	Shell shaped crown poorly fixed to the alveolus by gingival tissue and absence of root.
	Type 2	Solid crown poorly fixed to the alveolus by gingival tissue and little or no root.
	Type 3	Eruption of the incisal margin of the crown through the gingival tissue
	Type 4	Oedema of the gingival tissue with unerupted but palpable tooth.



Figure 1: Natal tooth present in the 81 region.



Figure 2: After extraction of the natal tooth.

CASE 2

A twenty-nine-day old female infant was brought to the emergency department of maxillofacial surgery with a concern of difficulty in breast-feeding. The infant's parents gave a history of appearance of the tooth 4 days back in the lower jaw. The infant was also febrile and irritable since few days. Initially of 1mm in size, it gradually attained the present size of 8mm. Prenatal birth, post-natal, medical and family history was non-contributory. She was born to Muslim parents and was a full term baby. On examination extra orally no abnormality was detected. Intraorally a horn-like yellowish white tooth attached to hyperplastic gingiva was present in 3rd quadrant in the region of 71 [Figure 8], with grade III mobility. Radiological evaluation revealed it to be a supernumerary tooth [Figure 9]. A diagnosis of neonatal tooth was made after clinical and radiological examination. A treatment plan of extraction of the tooth was reached as there was a possibility of aspiration of tooth and also because the tooth was a supernumerary one. The infants parents were informed about the procedure and a informed consent was signed by them. After getting fitness from the paediatrician and neonatologist, ruling out any syndromic association and confirmation of Vitamin K administration, and extraction of the natal

tooth was done under topical anaesthesia, with thumb and fore finger by gently holding the tooth with gauze, bleeding was stopped with pressure packs [Figure 10]. Extracted tooth had a shell shaped crown [Figure 11]. Post-operative events were uneventful.



Figure 3 (A): extracted natal tooth, 3 (B): shell shaped crown

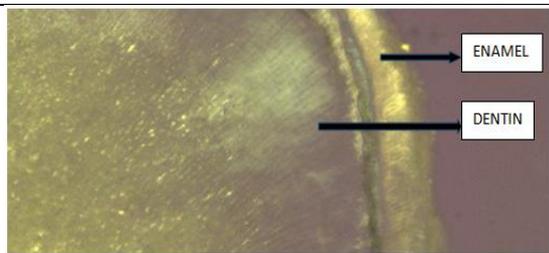


Figure 4: polarized microscopy of enamel and dentins shows fish scale pattern of enamel.

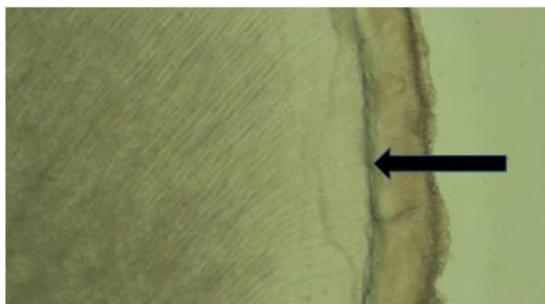


Figure 5: Ground section shows flat dentino enamel junction.

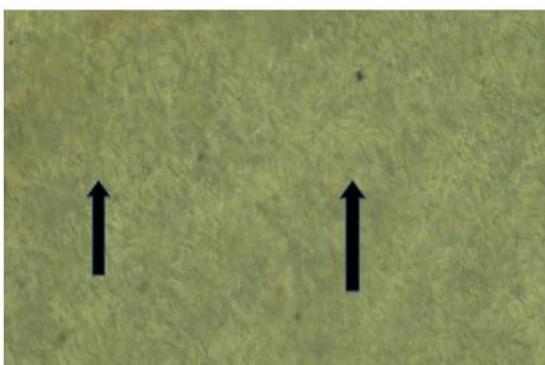


Figure 6: Polarised microscopy of dentin – Arrows showing crystal patten of dentin, which a mineralized.

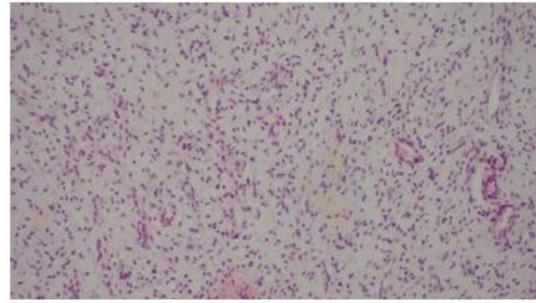


Figure 7: H and E section of pulp tissue shows mesenchyme like cells.

DISCUSSION

Eruption of first teeth in child at around six months of age is considered as a milestone in its life.^[2] Development of child is attributed to series of changes starting from intrauterine life till birth. Early or delayed eruption of teeth is of great concern for the child as well as the parents ^[4]. Titus and Livus in 59 B.C. were the first to document natal and neonatal teeth. In countries like Poland, India, Africa and China, infants with natal and neonatal teeth were believed to be a sign of bad omen ^[2,3]. In many African tribes, children born with teeth were murdered soon after birth because it was believed to bring misfortune to all they would contact. In England these infants were thought to be future warriors. In Malaysian culture these were signs of good fortune ^[5] In some cultures, it was thought to be a boon for boys but misfortune for girls ^[4].



Figure 8: Neonatal present in the 71 region.



Figure 9: IOPAR reveals it to be a supernumerary neonatal tooth, as permanent tooth buds are below the neonatal tooth.



Figure 10: After extraction of the neonatal tooth.

The prevalence and incidence of natal and neonatal teeth has been investigated by several authors. The prevalence rate of 1:716 has been the highest rate reported by Kates et al.^[7] The incidence rate of natal and neonatal tooth has been estimated to be 1:1000 and 1: 30,000 respectively in his study and also showed a female preponderance for natal and neonatal tooth.^[5]

Most natal and neonatal teeth are considered as early erupting teeth of normal primary dentition. The incidence of them being supernumerary teeth ranges up to 10 %. Neonatal teeth are three times more common to natal teeth.^[8] Fauconnier and Gerardy in 1953 presented an excellent discussion on the possible etiology of natal and neonatal teeth. According to them, natal and neonatal teeth occur either due to early eruption or premature eruption. They considered early eruption to be that occurring because of the changes in the endocrine system whereas premature eruption could be a pathological phenomenon where a completely rootless tooth is formed that would exfoliate within a short period of time, they called this structures as expulsive capedont follicle. These may result from trauma to the alveolar margin during delivery, which cause a traumatic ulcer making a route for infection up to dental follicle through the gubernacular canal, causing premature loss of tooth.^[2]

According to Cortez 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.^[9]

Etiology of natal and neonatal teeth is not well understood. Several authors have suggested a possible heredity component, an autosomal dominant gene responsible for inheritance of this trait.^[3] Kates et al., in his studies found a positive family history. An unusual case report documented by Prabhakar AR et al., where natal tooth was seen in fraternal twins.^[6] Studies also suggest that Muslim children exhibited more natal and neonatal teeth as compared to Hindu children.^[8] Environmental factors such as maternal exposure to toxins which

can get transmitted to the child through placenta has also been linked to be a cause for natal and neonatal tooth. Toxins like polychlorinatedbiphenyl, polychlorinated dibenzofuran, Polychlorinated dibenzodioxins.^[3] Endocrine disturbances like increase in pituitary, gonadal and thyroid hormones. Nutritional deficiency like hypovitaminosis, febrile conditions, poor maternal health, congenital syphilis, pyelitis during infancy, osteoblastic activation within the germ zone related to remodelling phenomenon.^[2,5,8] But the most accepted theory is the superior positioning or localisation of dental follicle.^[4] Various developmental abnormalities and syndromes are associated with natal and neonatal teeth. Adrenogenital syndrome with 18 hydroxylate deficiency, Cleft lip and palate, Cranio Facial Dysostosis, Epidermolysis bullosa simplex, Ellis van crevald syndrome (Chondro Ectodermal dysplasia), Craniosynostosis syndrome, Hallerman Sheriff syndrome (mandibulo-oculo facial dyscephaly with hypotrichosis), Vanderwoude syndrome, Jadassohn-Lewandowsky syndrome (Pachonychia congenital), Multiple steacystoma, WiedemanRauntestrauch syndrome (neonatal progeria) , Pfeiffer syndrome, Rubinstein Taybi syndrome , Sotos syndrome, Pierre Robin syndrome, Polydactyl type ii (Short rib polydactyli), Walker-Warburg syndrome, Pallister Hall syndrome, Hypocalcemia with fracture of the rib,Cyclopia. Few authors have also reported natal teeth in association with bifid tongue and deaf mutism. Differential diagnosis for natal and neonatal tooth could be Bohn's nodules, dental lamina cyst, epulis, lymphangioma and hamartoma of alveolar ridge, alveolar fissures, alveolar abscess.^[1-6]

Most common location of natal and neonatal tooth are present in the mandibular region of central incisors (85%), followed by maxillary incisors (11%), mandibular cuspids or molars (3%), and then maxillary cuspids or molars (1%). Natal or neonatal cuspids are extremely rare.^[8] Some case reports gives evidence of natal molars and canine.^[3] Sogis et al reported a case of 21 days old female infant with multiple natal teeth in the alveolar maxilla and multiple elevations in the posterior part of maxillary and mandibular arch.^[10] A case report presented by Yoko Masatomi presented a rare case of 18 months old Japanese boy with multiple teeth 14 in number present at birth, in the region of anterior teeth and first primary molar.^[11] The appearance of the teeth depends on the degree of maturity, but in most instances they are small, hypoplastic and discoloured. Natal and neonatal teeth may exhibit a brown-yellowish/whitish opaque colour.^[3] Histologically the enamel in natal and neonatal tooth may vary according to the degree of mineralization.^[8] The enamel thickness 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.^[1] 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 normally columnar to a stratified squamous epithelium.^[8] 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.^[2] Increased mobility leads to changes in the cervical region of dentin and cementum, it also causes degeneration of Hertwig epithelial root sheath which prevents root formation.^[8] In some studies, structures resembling osteodentin, atypical arrangement of dentinal tubules is also seen.^[2] 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 microradiographic studies these teeth showed enamel hypoplasia and dentinal disturbance.^[8] In some case reports natal and neonatal teeth have been seen in association with pulp polyp, gingival overgrowth, pyogenic granuloma.^[6] In other studies, cartilage like tooth was also seen.^[11]



Figure 11: Shell shaped crown.

It is important to determine if a natal or a neonatal tooth is a supernumerary or a tooth of normal dentition, so a radiographic examination prior to treatment planning can be of great help. If the natal or neonatal teeth is diagnosed as a normal dentition without significant mobility, then retention of these teeth is advised.^[3,8] Silicone breast protector can be given to the feeding mother for her protection against traumatic suckling.^[1] 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.^[3] But if the tooth shows severe mobility then extraction is a logical treatment as risk of aspiration can lead to major complication, after which a proper space maintainer for future

primary and permanent tooth should be given.^[8] If the tooth is a supernumerary tooth, extensively mobile, then the treatment of choice is definitely extraction owing to the risk of exfoliation and subsequent swallowing or aspiration, traumatic injury to mothers breast or infants tongue and other feeding difficulties.^[5] Ulceration of the ventral surface of the tongue has been seen in infants with natal and neonatal teeth. Coldarllin first described this condition in 1857. Riga and Fede histologically described this lesion, after which this lesion was called as Riga-Fede disease.^[8] Kissui described a unusual situation in which the birth of a baby with a natal tooth and presence of sublingual ulceration was seen immediately after birth, which according to the author had probably been caused by suction during intrauterine life.^[2] But some authors believes that lingual ulceration is unlikely as the tongue is not placed over the teeth during suckling.^[8] Lingual ulceration can be prevented by rounding the sharp edges of the tooth, application of composite resin over the sharp edges, application of photo polymerised resin but application of resin is difficult due to hypomineralised enamel, decrease resin bonding ability, less surface area, difficulty in isolation, technique sensitive, applied resin could be swallowed. All these hindrances defers the use of photopolymerised resin.^[1] Feeding splint, breast pumps and storage device alternatives can also be given.^[1,5] Other complication like prolonged gingival irritation, gingival fibrous dysplasia, growth and development of child is also affected, teething symptoms such as those with the eruption of other primary teeth are also seen.^[4,8]

If extraction is the treatment of choice then a waiting period of 10 days is recommended. As after 10 days the flora of the intestine normally produces Vitamin K which is essential for the production of prothrombin in liver, which is essential for blood coagulation, as some times these extractions can lead to life threatening haemorrhagic disease of new born.^[1,3] If extraction is an emergency treatment and waiting could increase the complications like aspiration of tooth, then Vitamin K 0.5- 1.0 mg should be administered via intramuscular route before the procedure.^[4] Extraction can be done under topical anaesthesia, with a gauze or a cotton piece, and gentle pressure pack should be applied to arrest bleeding after extraction.^[3,6] It is essential to curette the socket so that there is no remnant of dental papilla and Hertwig epithelial root sheath, which can further lead to residual natal teeth, development of root and infection in the gum pads.^[8] Oshua et al (1986) reported a case of formation of dentin and root after exfoliation of natal tooth.^[2] Residual natal teeth in a female infant is also reported.^[7] Periodic follow up is necessary for maintaining preventive oral health care in this cases.^[3]

CONCLUSION

Natal and neonatal teeth are rare occurrence 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 condition 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 ruling out syndromic association and better oral health.

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