Natal and neonatal teeth: a review and case series

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Key points

- This paper provides a succinct review of the literature around natal and neonatal teeth so that all aspects of this clinical anomaly can be well understood by general dental practitioners.
- We present three cases referred to the Paediatric Dental Department at Guy's and St Thomas' NHS Foundation Trust, demonstrating a range of presentations of natal and neonatal teeth and a variety of appropriate treatment modalities.
- We propose that reassurance and initial management can be provided by general dental practitioners, with referral to secondary care services in more complex cases or those which are likely to require extraction.

Abstract

Natal and neonatal teeth are a relatively rare but well-documented phenomenon, with the majority being prematurely erupted teeth of the normal primary dentition. Related complications include feeding issues, traumatic lingual ulceration and risk of aspiration. We present three clinical cases referred to the Paediatric Dentistry Department at Guy's and St Thomas' NHS Foundation Trust and their management. Treatment choice is based on individual assessment of each patient and options include monitoring, smoothing of the teeth or extraction. General dental practitioners should be able to diagnose natal and neonatal teeth and provide initial management in primary care, with referral to secondary care services in more complex cases or those which are likely to require extraction.

Introduction

The normal eruption of primary teeth usually begins at around six months of age.[1] Teeth present at birth or erupting shortly after are a relatively rare but well-documented dental anomaly.[2] Massler and Savara first defined 'natal' teeth as those which are present at birth and 'neonatal teeth' if they erupt within the first 30 days of life[3] and these terms are now commonly used.[4] The condition has been surrounded by many different beliefs, including being considered a bad omen in China, Poland, India and Africa and contrastingly thought to be the sign of a baby who would grow into a famous soldier in England or guarantee the conquest of the world in France and Italy.[4] Prematurely erupted teeth also come with their associated problems, such as pain on suckling or difficulty feeding; therefore, each case needs to be individually assessed and an appropriate management plan agreed.

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Prevalence

The reported prevalence of this phenomenon varies throughout the literature, depending on the population and methods used in each study.[4] A commonly quoted prevalence is between 1:2,000–1:3,500 live births, being slightly more common in women[5] and a higher prevalence has been seen in children with cleft lip and palate.[6] Natal teeth are three times more common than neonatal teeth[7] and they often occur in pairs, with the eruption of more than two natal teeth being rare.[5] Only 10% of all cases are supernumerary, with most natal and neonatal teeth representing early eruption of a deciduous tooth from the normal series.[3,8] Mandibular incisors are by far the most commonly involved teeth, which is consistent with the normal eruption of deciduous teeth.[5] Bodengoff reported that 85% of natal teeth are mandibular incisors, 11% are maxillary incisors, with canines and molars making up the remaining 4%.[9]

Aetiology

The exact aetiology for natal and neonatal teeth is unknown.[5] Suggested causative factors include infection, febrile states, malnutrition and hypovitaminosis, hormonal stimulation and maternal exposure to environmental toxins.[4,10] Some papers have found that 10% of infants born to mothers who were heavily exposed to polychlorinated biphenyls and dibenzofurans had natal teeth,[11] while other papers did not find any association between milk levels of these chemicals and the occurrence of natal teeth.[12] A positive family history has been reported in up to 62% of cases, along with hereditary transmission of an autosomal dominant gene.[4,13] Some researchers have suggested an association between natal teeth and certain

syndromes, including craniofacial dysostosis, ectodermal dysplasia and Pierre Robin.[4,10] Natal teeth are reported to occur in 2% of infants with unilateral cleft lip and palate and 10% of infants with bilateral cleft lip and palate.[14] In cleft patients, they are normally situated in the maxilla around the cleft(s), with the possible aetiology being that due to alveolar fissures, the teeth are in a superficial position in this region.[6,14] This links to the suggestion by some authors that the presence of natal and neonatal teeth is due to a superficial position of the developing tooth germ which predisposes the tooth to erupt early.[2]

Table 1 Classification developed by Spouge and Feasby based on maturation

Type	Classification
Mature	Nearly or fully developed in shape and comparable in morphology to primary teeth, with a relatively good prognosis for maintenance
Immature	Structure and development are incomplete or substandard, implying a poor long-term prognosis

Table 2 Clinical classification of natal and neonatal teeth by Hebling *et al.*

Class	Classification
Class I	A shell-like crown structure, loosely attached to the alveolar by a small amount of gingival tissue, with no root
Class II	A solid crown loosely attached to the alveolus by gingival tissue, with little or no root
Class III	The incisal edge of a crown just erupting through the gingival tissue
Class IV	A mucosal swelling with an unerupted but palpable tooth

Classification

While the terms natal and neonatal teeth defined by Massler and Savara (1950) focus on the time of eruption of the teeth,[3] Spouge and Feasby (1996) recognised a need to classify these teeth based on developmental stages,[15] as seen in Table 1. Hebling *et al.* (1997) developed a more recent classification of four categories based on clinical appearance, as seen in Table 2.[16] If the tooth has mobility of more than 2 mm, the natal teeth of category I or II of Hebling's classification usually warrant extraction.[7]

Clinical characteristics

Natal or neonatal teeth can bear a resemblance to normal primary teeth in terms of size and shape; however, they are often smaller and conical with a yellowish appearance,[5,17,18] which can be clearly seen in Figure 1a. There are numerous case reports describing hypoplastic enamel and dentine with poor or absent root development, demonstrated by the radiograph in Figure 1b.[2,17] Subsequently, many natal teeth are mobile.[5,17,19] As discussed previously, these teeth are often seen in children with cleft lip and palate,[14] as shown in Figure 1c. Natal and neonatal teeth may be found incidentally alongside a presenting complaint, such as a traumatic ulcer or reported difficulty suckling, which will be discussed in more detail later in this article. Unproblematic teeth can present later, during early childhood and may be picked up during a routine clinical exam or radiographic investigation.

Radiographic characteristics

Radiographic examination allows assessment of root development and it is often noted that natal and neonatal teeth have incomplete or defective root development, suggestive of an immature nature.[5] In many cases, they are attached to the oral mucosa alone with very little surrounding bone,[7] leading to associated complications such as mobility of the tooth and risk of aspiration.[4]

Histological characteristics

The majority of these prematurely erupted teeth are found to have a thin layer of hypoplastic enamel of varying severity.[4,17] This abnormal mineralisation of enamel may be linked to premature eruption of the tooth, resulting in disturbance of the amelogenesis process.[5,20] The enamel, therefore, may appear thinner and worn.[21] The dentino-enamel junction is not scalloped, similarly seen in deciduous teeth.[7] Irregular dentinal tubules are seen through the dentine layer and atypical dentine may be seen, which could be a response to irritant stimulus from the oral cavity.[7] Normal pulp tissue is often found, though pulp chambers and canals are often wider and the presence of inflammatory infiltrate observed in some cases is suggestive of pulpitis.[7,22] Further studies into the histology of natal and neonatal teeth are required to draw more significant conclusions.

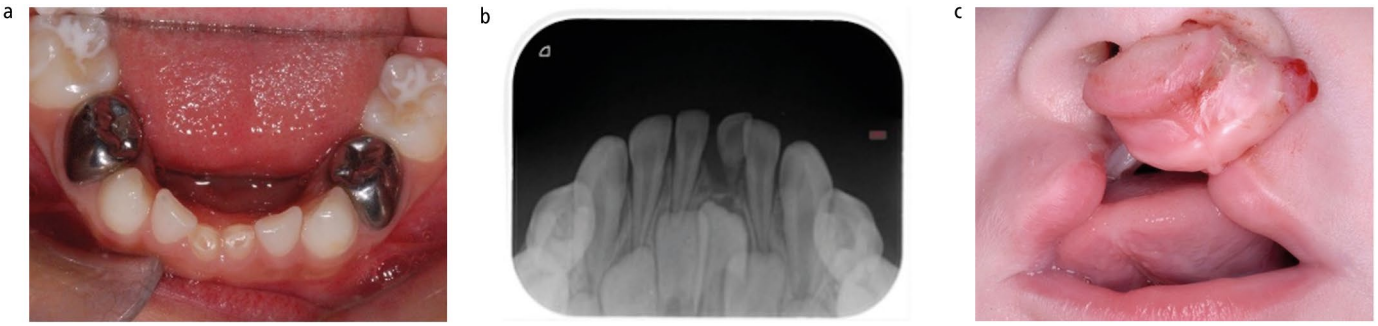


Fig. 1 a) Two neonatal teeth, the lower right primary central incisor (81) and lower left primary central incisor (71), can be seen in the anterior mandible. Note how these teeth are smaller in size and worn compared to the adjacent primary lateral incisors, as well as being slightly conical and yellowish. b) Lower standard occlusal radiograph of a three-year-old child with a natal 71, showing poor root development of this tooth and very little surrounding bone. c) Natal tooth in the right anterior maxilla seen in a neonate with cleft lip and palate

Diagnosis

Diagnosis is traditionally based on clinical presentation, due to the obvious difficulties with and little justification for taking radiographs in young infants. However, some natal or neonatal teeth may present to a clinician a few years post eruption and in these situations, along with a thorough history and good clinical examination, diagnosis may be aided by radiographic investigation. Assessing root development helps to determine tooth prognosis and suggested management, along with confirming whether the prematurely erupted tooth is a supernumerary tooth or one of the normal primary dentition.[2,4]

Differential diagnosis

Differential diagnoses for natal and neonatal teeth include Epstein pearls, Bohn's nodules and Epulis.[5,23] Epstein pearls have been observed in up to 85% of newborns and these keratin-filled cysts appear as small and opaque whitish-yellow lesions, adjacent to the mid-palatine raphe.[24] Bohn's nodules, which are mucous gland remnants, are often multiple, greyish-white and firm and are found either on the buccal or lingual aspects of the alveolar ridges.[5] Epulis may be sessile or pedunculated and are reactive tumour-like growths.[5] These self-limiting conditions are asymptomatic with no effect on suckling, so only reassurance is required.

The location of the above lesions and their spontaneously resolving nature will aid in their differentiation from natal teeth. Radiographic examination, if indicated, will also allow easy differentiation. If a natal or neonatal tooth presents later in life, the smaller and yellowish appearance may lead to a misdiagnosis of a normal primary tooth with either caries, hypomineralisation or tooth surface loss. If they are seen incidentally on radiographs, they may be incorrectly diagnosed as normal primary teeth with failed root development or premature root resorption, for reasons such as infection or trauma. The patient may also be diagnosed as having hypodontia if the natal or neonatal tooth was previously extracted and therefore a detailed history is essential to avoid misdiagnosis.

Potential complications

There are multiple complications that can arise due to the presence of natal and neonatal teeth. They may cause pain to the mother and wounding of the nipple during suckling; however, the natural position of the tongue between the teeth and the nipple during breastfeeding means this does not always occur.[4] It is more likely that the sharp edge of the tooth will cause traumatic ulceration on the ventral surface of the tongue, which can cause avoidance of feeding and be quite distressing for parents.[5] Traumatic lingual ulceration seen in newborns, characterised by Riga and Fede, has since been termed Riga-Fede.[4] A further complication of natal and neonatal teeth is the aspiration risk resulting from mobility and spontaneous exfoliation; therefore, significant mobility warrants consideration of extraction of the tooth.[25] Because the majority of these teeth are prematurely erupted rather than supernumerary, should they require removal due to associated traumatic ulceration, difficulty feeding or aspiration risk, the likelihood of the child having no replacement tooth until the permanent successor erupts must be discussed with the parents.

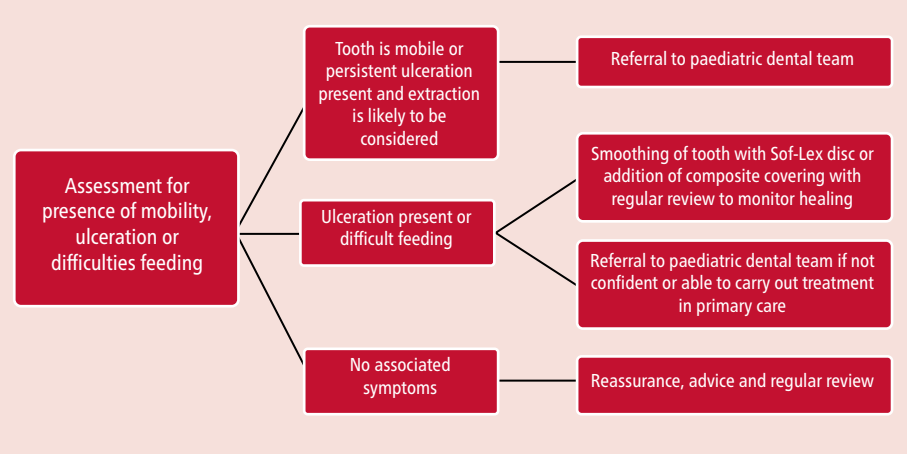
Treatment options

If the tooth does not interfere with breastfeeding, is not excessively mobile and is otherwise asymptomatic, no active intervention may be required.[5] Regular monitoring with appropriate preventative advice and interventions is appropriate and this can be done by the general dental practitioner (GDP). Natal or neonatal teeth causing traumatic lingual ulceration do not necessarily require extraction. The preferred treatment includes smoothing of the incisal edge which can be done with a handheld Sof-Lex disc, or placement of an appropriate dental material, such as composite resin, over any sharp areas and reviewing the patient to assess for healing.[26] If confident carrying out this treatment, this can be performed by the GDP in primary care.

In cases of persistent traumatic ulceration, significant mobility, ongoing issues with feeding or when the tooth is supernumerary, extraction is the preferred treatment.[17] Extraction of these teeth comes with some complicating factors, such as aspiration concerns during the procedure and a risk of haemorrhage; therefore, referral to a paediatric specialist is recommended if extraction is to be considered.[5,21] All babies are required to have a vitamin K administration shortly after birth since coagulation may not be achieved properly until the child is ten days old.[27] After the tenth day of life, the intestinal flora becomes established and starts to produce vitamin K, which consequently reduces the risk of haemorrhage.[21] Therefore, extraction should be delayed until after ten days of age, or it must be ensured that vitamin K is administered before the procedure. Extraction is usually performed using gauze and finger pressure, with the child held by the parent or secured in their baby carrier and then immediately comforted with a bottle or breast.

Early extraction of a primary natal tooth may result in space loss and overcrowding of the permanent teeth and this should be discussed with the parents. However, many papers have found that this is not inevitable, with no appreciable space loss seen in a significant number of cases.[20] As previously discussed, parents must also be made aware of the risk that the natal or neonatal tooth may not be replaced until the permanent dentition. Unproblematic natal teeth presenting later in life, such as during preschool age, are often left to exfoliate naturally. In some situations, however, these teeth may require extraction, for example as part of a comprehensive treatment plan under general anaesthetic due to severe tooth surface loss or caries. The management options discussed above which can be provided by the GDP following a thorough history, clinical examination and subsequent diagnosis of natal or neonatal tooth can be seen clearly in Figure 2.

Fig. 2 Management options by the GDP for natal and neonatal teeth



Case examples

Written consent was obtained from parents for each of the case examples included here.

Case 1

A three-year-old, male, fit and well child was referred to the paediatric dental department by the GDP for management of primary tooth caries. Incidentally, the parent reported a history of a tooth that had been present since birth and showed us a photograph of this from when the child was just a few days old. Clinical examination revealed the mandibular right primary central incisor (81), which was diagnosed as a natal tooth, to be smaller than the adjacent incisor teeth and hypomineralised with severe tooth surface loss (TSL). Radiographic examination (Fig. 3a) showed the developing permanent central incisor teeth only, which suggested that the natal 81 had erupted prematurely rather than being supernumerary. Due to the severity of the TSL, the natal 81 was extracted as part of the general anaesthetic treatment plan for management of caries and this tooth can be seen just before the extraction in Figure 3b.

Case 2

A six-week-old, male, fit and well child was referred to the paediatric dental department due to a large ulcer on the tongue, which was affecting feeding and causing distress for the child (Fig. 4a). Clinical exam revealed a partially erupted lower left primary central incisor (71) which the parents said presented shortly after birth and therefore was a neonatal tooth. Associated with this tooth was a large traumatic ulcer on the ventral surface of the tongue to the left of the midline. Treatment options were discussed with the parents, including monitoring, smoothing of the neonatal 71, or extraction. Risks for all options were explained, including the possibility of the tooth not being replaced until the permanent dentition has erupted. The parents preferred for the tooth to be smoothed and this was done with a handheld Sof-Lex disc. The two-week review showed good healing of the ulcer (Fig. 4b) and the parents reported that the child was now feeding well and seemed much happier in himself. The ulcer had almost totally resolved by the four-week review, with just a small area of scarring remaining. A review at one year showed the neonatal 71 to still be present (Fig. 4c), with a notably hypomineralised appearance and it was confirmed to be a prematurely erupted tooth of the normal series.

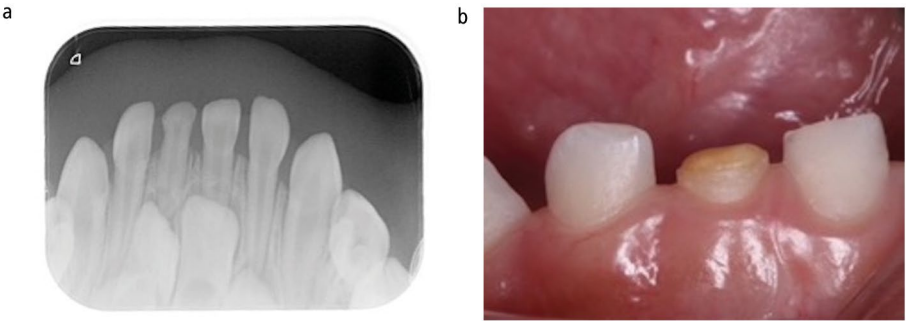


Fig. 3 Case 1. a) Lower standard occlusal radiograph showing natal 81 with severe TSL and developing permanent central incisors. b) Patient at age three with natal 81 prior to extraction. Note the severity of the tooth surface loss of the hypomineralised 81 compared to the adjacent primary incisor teeth

Case 3

A five-day-old, female, fit and well child was referred from the postnatal ward regarding a possible tooth in the lower arch that felt mobile and was causing the parents some concern. The child's mother reported it has been hardly noticeable at the beginning but was becoming more obvious every day and was now affecting feeding. Examination showed a lower right primary central incisor (81) which was partially erupted at an angle (Fig. 5) and the tooth was grade I+ mobile. Management options were discussed with the parents and due to the risks associated with mobility of the tooth, they requested extraction of the neonatal 81. They accepted that it was likely that the tooth had erupted early rather than being supernumerary and therefore it would not be replaced until the permanent incisor tooth erupted. The neonatal 81 was extracted using gauze and finger pressure without any problems. The patient was later reviewed at age seven months and it was noted that the 71 had erupted but the neonatal 81 had not been replaced, confirming that it had been a prematurely erupted primary incisor of the normal series.

Discussion

The cases discussed in this report have demonstrated a range of presentations of natal and neonatal teeth and a variety of suitable management options depending on each individual case. Treatment choice is governed by multiple factors, including tooth

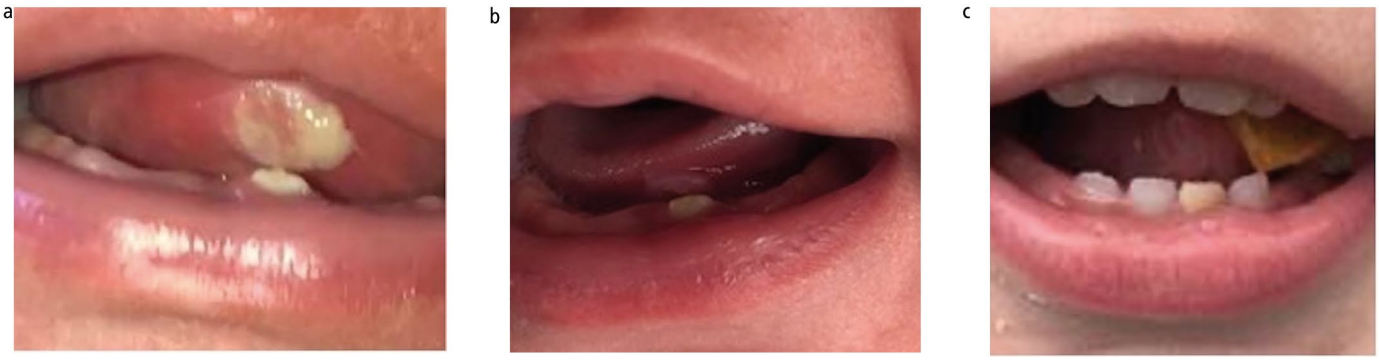


Fig. 4 Case 2. a) On initial presentation with neonatal 71 and Riga-Fede. b) At two-week review following smoothing of neonatal 71. Lingual traumatic ulcer healing and much reduced in size. c) At one-year review showing neonatal 71 still present with a hypomineralised appearance to the enamel

Fig. 5 Case 3. On presentation with neonatal 81 seen in patient aged five days old

prognosis, aspiration risk, issues with feeding and beliefs or misconceptions associated. In scenarios with an unproblematic tooth of the normal series, leaving the tooth *in situ* and monitoring with regular review is our recommended management and this is agreed by other authors.[4,5,28] As seen in case 1 of this series, unproblematic natal teeth presenting in older children may warrant radiographic examination to aid diagnosis or in order to formulate an appropriate management plan.

Smoothing of the problem tooth in cases of traumatic ulceration is a quick and simple solution, as demonstrated in case 2 and the patient can be followed up to review healing. This option has been discussed in multiple papers on natal teeth[4,19,26] and may be carried out in primary care or referred into a secondary care setting. In cases of non-resolving ulceration or ongoing issues with feeding, the associated tooth will require referral for extraction and this is also the case for teeth which are supernumerary or an aspiration risk.

Extraction of a problematic tooth, as chosen by the parents of case 3 in this report, was the most commonly performed treatment for natal teeth in the literature, due to the multiple complications associated with these teeth.[7,17,19,20] When consenting parents for an extraction, these associated complications should be weighted against the potential loss of space and the likelihood of the child remaining without a tooth until the corresponding permanent tooth erupts.[19] As discussed, before the extraction, it is essential to ensure that neonates have received their vitamin K administration and it is appropriate for the child to be referred to secondary care services for the extraction to be carried out.

Conclusion

Natal and neonatal teeth are relatively rare, but it is important that GDPs are able to confidently diagnose and provide appropriate initial management in primary care. It is reasonable to refer to secondary care in more complex cases or when extraction is likely to be needed. It is essential to obtain a thorough history alongside clinical examination, so that management can be based on a correct diagnosis and understanding of all complicating factors. Parental opinion and concerns will also need to be taken into consideration and reassurance is essential, along with good communication of all aspects involved.

Ethics declaration

The authors declare no conflicts of interest.

Author contributions

The study was conceived and designed by Nabina Bhujel. Michaela DeSeta, Ella Holden, Dania Siddik and Nabina Bhujel were involved in the literature search, analysis, drafting and final approval of the manuscript.

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