Norms And Myths of Tooth Eruption: Birth to Adolescence

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ABSTRACT

Tooth eruption is a critical, age-specific developmental milestone that occurs in a well-ordered sequence from infancy to adolescence. Human dentition transitions through three distinct phases-primary, mixed, and permanent; each influenced by a complex interplay of genetic, systemic, environmental, and local factors. This paper outlines the sequence of both primary and permanent teeth, and the significance of eruption in functional and aesthetic oral development. It also explores variations in eruption patterns, including premature eruption, delayed eruption, and tooth agenesis, along with their clinical implications. Cultural myths and misconceptions; particularly those surrounding teething and natal/neonatal teeth are examined, with emphasis on their potential to prompt harmful practices in certain regions. In many communities, especially within parts of Africa, cultural beliefs and myths continue to shape perceptions of teething and tooth eruption. Misattributions of symptoms such as fever, diarrhea, and irritability often result in traditional or harmful practices, including gum lancing, extraction of unerupted canines, and use of unsafe herbal remedies. These myths can also lead to child stigmatization, neglect, or even infanticide in extreme cases.

There is urgent need for public health education to dispel misconceptions and promote culturally sensitive health education to correct misinformation, alleviate parental anxiety, and encourage evidence-based management. Early identification of abnormal eruption and timely intervention by dental professionals are essential to ensure optimal oral health outcomes in children. Healthcare professionals, caregivers, and community leaders must be empowered with accurate knowledge to recognize normal developmental variations and seek appropriate dental care when abnormalities arise.

Keywords: Norm, myths, tooth eruption, childhood, adolescence

INTRODUCTION

The Norms of Tooth Eruption

The establishment of dentition is an orderly, sequential, and age-specific event that occurs during child development, spanning from birth to adolescence (Verma, 2017; Jain & Rathee, 2023). Human dentition progresses through three distinct phases: primary dentition, mixed dentition, and permanent dentition.

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The primary dentition phase begins when the first set of teeth erupt in the oral cavity, typically between six months and three years of age. This is followed by the mixed dentition phase, which begins with the eruption of the first permanent tooth. During this transitional phase, both primary and permanent teeth coexist, as

primary teeth exfoliate and permanent teeth continue to emerge. The final phase, permanent dentition, is established when all primary teeth have exfoliated, leaving only permanent teeth in the oral cavity.

Tooth eruption is the physiological process by which a tooth migrates from its developmental position within the alveolar bone to its functional position in the oral cavity (Choukroune, 2017; Jain & Rathee, 2023). According to Marks and Cahill (2007), eruption involves a series of metabolic events within the bone, coordinated by the dental follicle, which include bone apposition and resorption. For eruption to occur, mononuclear cells—osteoclast precursors—must be recruited to the dental follicle, where they fuse to form osteoclasts. These osteoclasts resorb alveolar bone to create an eruption pathway (Almonaitiene, Balciuniene & Tutkuviene, 2010).

Tooth eruption is a prolonged process, extending over nearly two decades, and therefore susceptible to various disturbances. Despite potential complications, it remains a key developmental milestone eagerly anticipated by parents and caregivers.

Several factors influence the timing and pattern of tooth eruption. These include genetic and hormonal factors, general health, gender, ethnicity, climate, nutrition, socioeconomic status, urbanization, craniofacial morphology, and growth indicators such as body height and weight (Aktoren et al., 2010; Almonaitiene, 2010; Verma et al., 2017; Vahdat et al., 2019; Nahajowski, 2021). Local factors also play a role, including the position of the tooth (whether within bone or soft tissue) and the number of roots. Eruption is typically slower through bone than through soft tissue, and single-rooted (anterior) teeth erupt faster than multi-rooted (posterior) teeth. As eruption approaches, the overlying bone is resorbed, accompanied by significant changes in the soft tissues (Jain & Rathee, 2023).

Teething refers specifically to the process of primary tooth eruption through the gingiva and is often associated with various signs and symptoms. Although physiological, teething may cause discomfort in infants, manifesting as irritability, restlessness, loss of appetite, increased salivation, mild temperature elevation (below 38°C or 100.4°F), gum inflammation, and circumoral rash. Infants may exhibit behaviours such as gum rubbing and chewing on objects. Symptomatic relief can be provided through the use of cold teething toys, teething rusks, and paediatric analgesics as necessary.

The primary dentition, also referred to as milk teeth, comprises 20 teeth evenly distributed across the four quadrants of the mouth. These teeth begin erupting between six months and three years of age. The mandibular central incisors typically erupt first, followed by the maxillary central incisors. The general sequence of eruption in both jaws is: central incisors, lateral incisors, first molars, canines, and second molars. Although maxillary teeth usually lead mandibular teeth in development, exceptions occur—particularly with second molars, lateral incisors, and canines.

In a study of Nigerian children, Folayan et al. (2007) observed that lateral incisors, canines, and molars had similar eruption timings in both jaws. Conversely, Oziegbe et al. (2008) found that the lateral incisors, first molars, and canines erupted earlier in the maxilla than in the mandible. The primary dentition is essential not only for mastication and aesthetics, but also for guiding jaw growth, maintaining arch space for the succeeding permanent teeth, and facilitating speech development. For instance, the maxillary central incisors play a critical role in the articulation of sounds such as /th/, /z/, /f/, /s/, and /v/ (Jain & Rathee, 2023). Moreover, they help maintain proper eruption timing and prevent aberrant tongue habits.

The mixed dentition phase begins with the eruption of the first permanent molars, usually around age six. At this stage, both primary and permanent teeth are present, and the total number of teeth varies by age due to the dynamic processes of exfoliation and eruption. A full permanent dentition in a young adolescent includes 28 teeth (excluding third molars), while a mature adolescent or adult typically has 32 teeth. In the mandible, the sequence of permanent tooth eruption generally follows this order: first molars, central incisors, lateral incisors, canines, first premolars, second premolars, second molars, and third molars. In the maxilla, the eruption sequence is similar, except that the first premolars often erupt before the canines.

Variations in Tooth Eruption

Tooth eruption is a significant developmental milestone in childhood. However, deviations from normative eruption patterns are frequently encountered in clinical practice and may become a source of concern for parents and caregivers. These concerns are not solely biological; they may carry psychosocial implications. Visible gaps in the dentition, for example, may contribute to social isolation and anxiety, especially in a society where aesthetics and the concept of a "perfect smile" are often overemphasized. In this context, dental professionals must use appropriate terminology such as normal or functional dentition instead of perfect. Normal eruption is essential for the development of a functional and aesthetically acceptable occlusion.

Dentists must carry out appropriate investigations when eruption abnormalities are suspected, not only to diagnose underlying causes but also to reassure parents and alleviate potential guilt. In cases with a suspected hereditary component, detailed family

history; on both the maternal and paternal sides, should be obtained.

This section addresses the variations in tooth eruption, organized by developmental stages: infancy, early childhood, and adolescence.

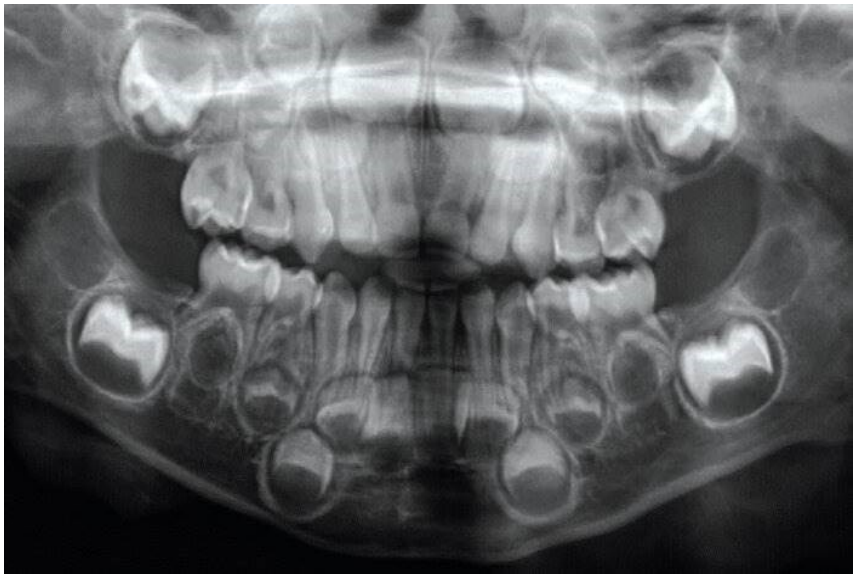

Figure 1: An orthopanthomograph showing erupted primary dentition and the permanent dentition within the jaws

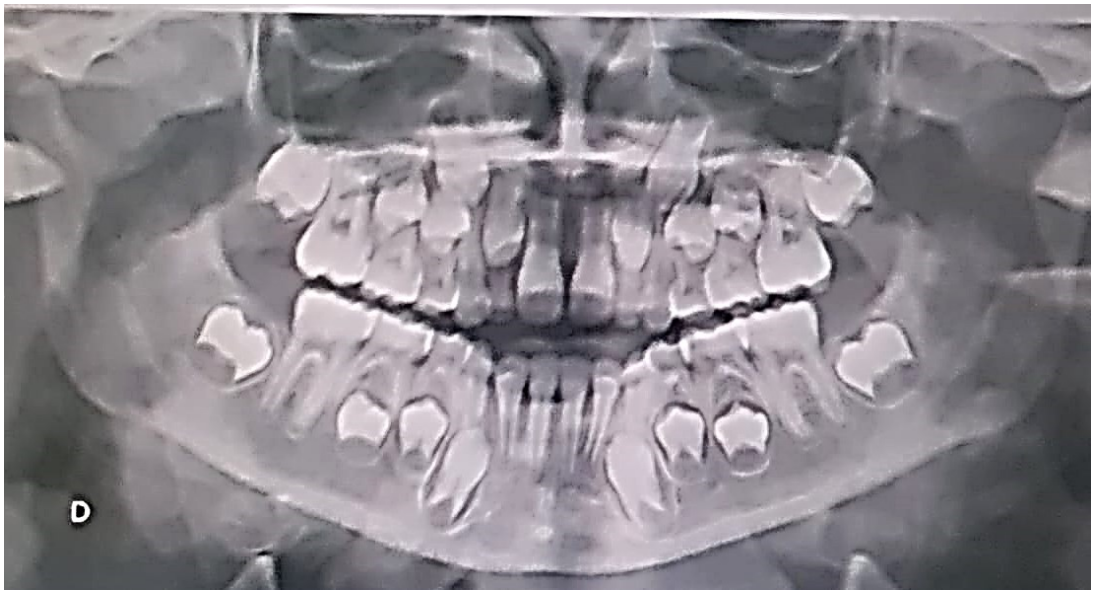

Figure 2: Panoramic view of a 9-year-old child showing bone resorption that occurs over 37/47 germs and the formation of an "eruption path" across the bone (ODF service, Pitié-Salpêtrière Hospital). Choukroune, 2017

Variations in primary dentition

Premature Tooth eruption (Natal and Neonatal teeth)

Premature eruption at or shortly after birth is classified as natal teeth (present at birth) or neonatal teeth (eruption within the first 30 days of life) (Holden et al., 2022). Natal teeth are more frequently observed than neonatal teeth (Olatosi et al., 2012; Mhaske et al., 2013). Incidence ranges from 1 in 800 to 1 in 6,000 births. In a large study of 17,829 newborns in Turkish hospitals, the incidence was 1:1,048 for natal teeth and 1:1,782 for neonatal teeth (Bulut, Bulut & Ortac, 2019).

Although no population-based data exist for Nigeria, numerous case reports have documented natal and neonatal teeth (Olatosi et al., 2012; Chukwuma et al., 2014).

The aetiology remains uncertain, though hypothesized contributing factors include infections, febrile states, nutritional deficiencies, maternal exposure to environmental toxins, and associations with genetic syndromes (e.g., ectodermal dysplasia, cleft lip/palate, Pierre Robin sequence, Soto syndrome) (Mhaske et al., 2013). Some studies report a female predilection

(Anegundi, 2002), while others do not (Mhaske et al., 2013).
These teeth often appear in the mandibular anterior region and may be conical, small, and discolored. Over 90% are part of the normal dentition (Adekoya-Sofowora, 2008; Mhaske et al., 2013). Management includes monitoring, smoothing sharp edges (to prevent Riga-Fede syndrome or nipple trauma), or extraction in cases of feeding difficulties, excessive mobility, aspiration risk, or parental concern over stigma (Olatosi et al., 2012; Chukwuma et al., 2014).

Early and Delayed Eruption
Early eruption of primary teeth may occur in endocrine disorders such as hyperthyroidism and Turner syndrome. Conversely, delayed eruption may be attributed to systemic conditions including Down syndrome, Gardner's syndrome, infantile rickets, hypopituitarism, hypothyroidism, achondroplasia, cleidocranial dysplasia, osteopetrosis, developmental disabilities, and preterm birth (Aktoren et al., 2010; Vahdat et al., 2019).
Localized eruption delays may result from obstructions such as eruption cysts, odontomas, or scar tissue from trauma (Nahajowski, 2021). In rare cases, anodontia; the complete absence of teeth occurs, often associated with ectodermal dysplasia. Diagnosis is typically confirmed radiographically around 13 months of age.

Variations in Permanent Dentition
Early Eruption
Premature eruption of permanent teeth may follow early exfoliation of primary teeth, often due to trauma or pulpal/periapical infections (Singh & Jha, 2020). Bone loss and inflammation may expedite the eruption pathway. Ectopic eruption and idiopathic causes are also documented (Yamaguchi et al., 2022).
Systemically, generalized premature eruption may occur in conditions such as hyperthyroidism, hypophosphatasia, juvenile diabetes, cyclic neutropenia, leukemia, and oral clefts. Treatments such as radiation therapy and chemotherapy may disrupt dental development and eruption sequence.

Delayed Eruption
Delayed eruption beyond 6–12 months may occur in otherwise healthy children. Local causes include insufficient arch space, retained primary teeth, ectopic positioning, odontomas, cysts, or ankylosed teeth (Boka et al., 2009; Nahajowski et al., 2021). Gingival hyperplasia, fibromatosis, or enamel pearls may also interfere with eruption. Endocrine disorders such as hypothyroidism and hypopituitarism, chronic medication use (e.g., NSAIDs), and exposure to radiation may lead to systemic eruption delays.
Syndromes associated with delayed eruption include Down syndrome, Turner syndrome, Gardner syndrome, cleidocranial dysostosis, and ectodermal dysplasia. In primary failure of eruption (PFE), posterior teeth fail to erupt despite no physical obstruction, often due to mutations in PTH1R. These teeth are non-responsive to orthodontic intervention and may require prosthetic rehabilitation.
Tooth agenesis, either syndromic (e.g., in cleft lip/palate, ectodermal dysplasia) or non-syndromic, may involve one or more missing teeth. Third molars, mandibular second premolars, and maxillary lateral incisors are most commonly absent (Fauzi et al., 2018; Ritwik & Patterson, 2018). Environmental factors during odontogenesis such as maternal infections, trauma, and chemotherapy, may also result in agenesis.

Influence of oral habits
Prolonged non-nutritive sucking (e.g., pacifier use) may indirectly affect eruption by altering jaw and dental development. It may result in malocclusion, open bite, or class II molar relationships. National campaigns such as those in Italy promote breastfeeding to encourage normal jaw development (Majorana et al., 2015).

Myths and misconceptions surrounding Tooth eruption
Global and Local Beliefs
Teething, although physiological, is surrounded by myths; particularly in Africa and parts of Asia. A systematic review by Pereira et al. (2023) involving 10,524 respondents across 16 countries reported common symptoms attributed to teething: drooling, fever, diarrhea, appetite loss, irritability, and sleep disturbances. Remedies ranged from harmless (teething toys, analgesics) to harmful (gum incisions, extractions, herbal concoctions).
In Uganda, primary canines are extracted due to beliefs associating them with illness (Getaneh et al., 2018). Similar practices are observed in Ethiopia, Tanzania (e.g., nylon teeth), and Sudan. These traditional practices may involve unsterile instruments, risking infections and long-term oral damage (Mungozibwa et al., 2018; Abdul Salam et al., 2023).

Nigerian perspectives
Studies in Nigeria (Uti et al 2005; Bankole, Taiwo & Adesakin, 2013; Ige and Olubukola 2013; Paul and Fatoki, 2014; Bankole and Lawal, 2017; Olatunya, et al 2020) confirm widespread belief in teething-related illnesses such as fever and diarrhea, other conditions were boils, weight loss, vomiting, reduced food intake/reduced appetite, pain, irritability, sleep problems, mouthing/ biting on objects, drooling, red cheeks, gum inflammation, runny nose and ear infection.
Remedies include OTC medications, herbal remedies, teething mixtures, gum incision, and even fetish

practices. Poor hygiene, exposure to pathogens during crawling, and weaning practices contribute to symptoms attributed to teething, particularly around 6–12 months when maternal antibodies decline.

Harmful beliefs and interventions

Myths surrounding natal/neonatal teeth and eruption sequence reversal are particularly dangerous. In some cultures, children with such conditions are believed to have supernatural or evil powers, resulting in stigmatization or infanticide (Ogbeide, 2021). These misconceptions often arise from a lack of awareness and are perpetuated across generations.

Educational campaigns and culturally appropriate health communication tools are essential to debunk myths and promote evidence-based care. Such efforts have been initiated in southwestern Nigeria (Bankole, Lawal & Ibiyemi, 2017; Bankole, Lawal & Ibiyemi 2018; Bankole, Ibiyemi and Lawal, 2019)

CONCLUSION

Tooth eruption is a vital milestone in a child's developmental trajectory, typically following a well-defined and sequential pattern from infancy through adolescence. However, variations in the timing, sequence, and pattern of eruption are not uncommon and may cause concern among parents and caregivers. While many of these deviations fall within the range of normal development, a lack of awareness can lead to unnecessary anxiety, misconceptions, and in some cases, harmful practices.

It is therefore essential to provide accurate education to parents, caregivers, and healthcare professionals to promote understanding and appropriate responses to these variations. Early recognition of true abnormalities and timely referral to a paediatric dentist can ensure proper diagnosis, intervention, and prevention of potential complications. Empowering communities with correct information will also help dispel myths and improve the overall quality of oral health care for children.

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