Journal of Chemical Health Risks

www.jchr.org

JCHR (2025) 15(5), 2835-2838 | ISSN:2251-6727

Ankyloglossia and its Multidisciplinary Management: A Comprehensive Review

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(Received: 30 July 2025 Revised: 12 September 2025 Accepted: 13 October 2025)

KEYWORDS

Ankyloglossia, tongue-tie, lingual frenulum, breastfeeding, speech disorders, pediatric dentistry, frenotomy, frenectomy

ABSTRACT:

Ankyloglossia, also known as Tongue-Tie, can be observed in neonates, children, or adults. Tongue-tie, is a congenital condition characterized by a short, tight, or thick lingual frenulum that restricts tongue movement. This condition can impair breastfeeding, speech articulation, oral hygiene, and craniofacial development. Although recognized since ancient times, clinical diagnosis and management of ankyloglossia remain inconsistent due to the lack of universally accepted criteria. This review provides a concise overview of the embryological basis, clinical implications, diagnostic strategies, and multidisciplinary management of ankyloglossia in children. Emphasis is placed on early diagnosis and the need for coordinated care involving pediatric dentists, lactation consultants, otolaryngologists, and speech-language pathologists to ensure functional outcomes and prevent long-term complications.

1. INTRODUCTION

Ankyloglossia, or tongue-tie, is a congenital anomaly involving a restrictive lingual frenulum that impairs normal tongue mobility. Most commonly identified in infancy due to breastfeeding issues, its effects may persist, influencing speech, mastication, dental development, and psychosocial interaction [1].

Etymologically, Ankyloglossia originated from Greek word “agkilos” (Curved) and “glossa” (tongue). The English synonym is tongue-tie [2]. The first use of the term Ankyloglossia in the medical literature dates back to the 1960s, when Wallace defined Tongue-tie as a condition in which the tip of the tongue cannot be protruded beyond the lower incisors due to short frenulum linguae. The American Academy of Pediatrics (AAP) described the term Ankyloglossia, or tongue-tie, as a short or tight lingual frenulum causing a restriction of proper tongue extension and movement past the gums. This restriction hinders effective breastfeeding abilities in an infant [3,4].

Historical texts from the Greek and Roman periods describe tongue-tie, but modern medicine continues to debate its significance and treatment. Increased awareness among caregivers and clinicians has led to more frequent diagnosis and a growing interest in intervention, although high-quality evidence supporting universal management strategies remains limited [5-8]. The prevalence of Tongue-tie ranges from 0.1% to 10.7% [2]. This wide range in prevalence may be because of the several definitions of Ankyloglossia being used by the clinicians and the differences among investigators. No definition, classification system, or diagnostic parameters has been generally accepted. Therefore, controversy exists concerning when to treat the condition, when it should be left untreated, and what intervention is best if managed [7,9,10].

ETIOLOGY AND PATHOPHYSIOLOGY

Ankyloglossia is a congenital anomaly caused due to both genetic and environmental factors. Exact etiology is unknown [11]. The tongue arises from the first, second, and third pharyngeal arches during embryogenesis and separates from the floor of the mouth through apoptosis. Incomplete apoptosis results in residual tissue, forming

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an abnormal frenulum. Ideally, the frenulum permits free tongue movement necessary for feeding, speech, and oral function [12]. In ankyloglossia, the aberrant frenulum may restrict anterior movement, particularly affecting newborns [13]. Arises, physiologically, from a thickening of the geniohyoglossus muscles meeting in the midline of the tongue and elevated into a distinct vertical fold called the frenum linguae. The latter unites the tip of the tongue to the floor of the mouth and the posterior lingual surface of the gum. Since the tongue is always short at birth, it is not always easy to determine how much the frenum interferes with its movement. In the newborn infant the tip of the tongue is as yet incompletely developed, and the frenum may normally be well forward. As the infant grows, the tongue becomes longer and thinner toward the tip [14].

EFFECTS OF ANKYLOGLOSSIA

Restricted tongue mobility can impair latch and milk transfer, leading to inadequate nutrition in infants. Mothers may experience nipple pain, mastitis, and early cessation of breastfeeding [15,16]. Articulation of lingual sounds such as /t/, /d/, /l/, /r /n may be affected. While some children compensate, others benefit from surgical correction and speech therapy [17]. Altered tongue posture due to tongue-tie may contribute to high-arched palate, maxillary constriction, mandibular prognathism, and anterior open bite. These effects are attributed to tongue dysfunction during craniofacial development. Low tongue posture may contribute to upper airway narrowing and increase the risk of sleep-disordered breathing, including obstructive sleep apnea [18,19].

Older children and adults with tongue-tie may undergo mechanical limitations, like difficulty eating ice cream, licking their lips, several clinicians have recently reported patients with ulcerations of the lingual frenum resulting from French kiss, oral sex and doing tongue "tricks." Tongue-tie makes it difficult for a child to play a wind instrument. Restricted tongue mobility may complicate the pronunciation of certain letters; however, the link between AG and speech disorders remains controversial. The role of tongue-tie in mandibular development, malocclusion, and gingival recession may also occur [20,21].

DIAGNOSIS AND ASSESSMENT TOOLS

There is no global consensus on diagnostic criteria. Commonly used tools include: Hazelbaker Assessment Tool (HATLFF): Evaluates both structure and function. Coryllos Classification: Categorizes tongue-tie by anatomical attachment. Kotlow's Free Tongue Measurement: Measures the functional tongue length. Tongue Range of Motion Ratio (TRMR): Compares tongue elevation with interincisal distance. Supplemental tools such as the LATCH score help assess breastfeeding efficacy in infants [22,23].

MANAGEMENT APPROACHES

Initial treatment includes lactation counselling, feeding posture guidance, and myofunctional therapy. If the tongue-tie doesn't cause noticeable problems with feeding, speech, or oral hygiene, monitoring its progression as the child grows is a reasonable approach. Mild cases often improve without surgery [24].

Treatment for tongue-tie is controversial. Some doctors and lactation consultants recommend correcting it right away — even before a newborn is discharged from the hospital. Others prefer to take a wait and watch approach. The lingual frenulum may loosen over time, resolving tongue-tie. In other cases, tongue-tie persists without causing problems. In some cases, consultation with a lactation consultant can assist with breastfeeding, and speech therapy with a speech-language pathologist may help improve speech sounds [25].

Surgical treatment of tongue-tie may be needed for infants, children or adults if tongue-tie causes problems. Surgical procedures include frenotomy and frenuloplasty [26].

Frenectomy is a surgical excision of the frenulum, indicated in older children. Frenuloplasty is an advanced surgical release involving suturing, suitable for complex cases. Surgical decisions should be guided by functional impairment rather than anatomical appearance alone. Postoperative exercises and therapy support optimal healing and adaptation. Parents and clinicians should be aware of the deleterious effects of tongue-tie and the importance of its early management. Along with the surgical approach, orofacial myofunctional therapy also plays a crucial role. It helps in avoiding such effects and helps in increasing muscle activity but cannot help completely in avoidance of reattachment. It can be

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JCHR (2025) 15(5), 2835-2838 | ISSN:2251-6727

considered as a comprehensive treatment plan for the patient [25-28].

MULTIDISCIPLINARY APPROACH

Effective management requires collaboration among pediatric dentists, lactation experts, otolaryngologists, and speech-language pathologists. A coordinated approach ensures accurate assessment, appropriate intervention, and continuity of care. Education and training for healthcare providers are essential to standardize diagnosis, prevent overdiagnosis, and avoid unnecessary procedures.

2. CONCLUSION

Ankyloglossia presents with varied clinical manifestations that can impact feeding, speech, and orofacial growth. Early, functional assessment-driven intervention and interdisciplinary care improve long-term outcomes. Further research is needed to develop standardized guidelines and evaluate long-term benefits of various treatment modalities. Standards of management in AG should be developed independently for 3 groups of patients: A newborns and infants, B older children, C adults. Not all tongue-ties require surgical management. When a newborn presents with breastfeeding difficulties, other causes must be ruled out.

RECOMMENDATIONS

To develop reliable, evidence-based guidelines for managing ankyloglossia, additional randomized controlled trials involving larger sample sizes are essential. There is also a need for research focused on the creation of standardized and universally accepted tools for the assessment, classification, and diagnosis of ankyloglossia.

FUNDING: No funding sources

CONFLICT OF INTEREST: None declared

ETHICAL APPROVAL: Not required

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