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Current concepts in the management of ankyloglossia: An overview

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Abstract

Ankyloglossia is a clinical challenge characterized by restricted tongue mobility due to abnormal lingual frenulum attachment. Despite increasing diagnosis rates and surgical interventions globally, considerable controversy persists regarding the diagnostic criteria, indications for treatment, and optimal management. Current evidence demonstrates that frenotomy improves breastfeeding outcomes and maternal comfort in symptomatic dyads, but its effects on speech remain inconclusive. Modern laser techniques offer advantages over conventional methods, including reduced bleeding, faster healing, and improved patient acceptance. Comprehensive assessment protocols and individualized treatment decisions are essential for optimal clinical outcomes.

Keywords: Ankyloglossia, lingual frenulum, tongue tie, frenectomy

Introduction

Ankyloglossia affects approximately seven to ten percent of infants and involves congenital restriction of tongue mobility because of a shortened or tight lingual frenulum [1]. This condition affects multiple oral functions, including sucking, swallowing, speech articulation, and dental health [2]. Management remains controversial due to the absence of universally accepted diagnostic criteria, variable classification systems, and inconsistent evidence regarding treatment indications [3]. This review synthesizes the current evidence on diagnostic approaches, treatment indications, surgical techniques, and clinical outcomes of ankyloglossia management.

Diagnostic Assessment and Classification

A comprehensive systematic review examining tongue structure and function assessment identified nine distinct evaluation tools with varying appearance and function parameters [4]. Multiple assessment tools exist for evaluating ankyloglossia; however, no single instrument has achieved universal acceptance [5]. The Lingual Frenulum Protocol for Infants demonstrated the most reported reliability and validity for the comprehensive assessment of both tongue structure and function. The Tongue-tie and Breastfed Babies assessment tool provides a simple picture-based version scored from zero to eight, with scores of four or less indicating significant impairment [4]. Functional definitions have been proposed using the tongue range of motion ratio as a screening tool, with grades ranging from normal function above 80 percent to severe restriction below 25 percent [6]. Assessment should incorporate both structural characteristics and functional impact, particularly feeding performance, in infants [4].

Indications for Surgical Intervention

For breastfeeding dyads, surgical intervention is indicated when tongue restriction coexists with persistent nipple pain, inadequate latch, or poor weight gain despite professional lactation support [7]. Frenotomy should be performed selectively in symptomatic cases where ankyloglossia demonstrably impairs function [8]. A systematic review and meta-analysis demonstrated that breastfeeding self-efficacy improved significantly post-frenotomy, with a medium effect after five to ten days and a large effect after one month. Maternal nipple pain decreased significantly with large effect sizes at both short-term and one-month follow-up [7]. However, prospective studies have revealed that only thirty-five percent of patients experience mild improvement, emphasizing the multifactorial nature of breastfeeding difficulties [9]. Regarding speech concerns, evidence remains inconclusive regarding the causative association between ankyloglossia and articulation problems [10]. Most children with ankyloglossia develop normal language skills through compensatory mechanisms [2]. Surgical intervention for speech should be considered only after a comprehensive speech pathology evaluation in children with demonstrated articulation difficulties unresponsive to therapy [11].

Surgical Techniques and Approaches

Multiple surgical techniques exist for ankyloglossia correction, with no clear superiority demonstrated among the approaches [3]. Frenotomy involves a simple incision of the frenulum and represents the most common procedure for infants, performed with scissors under minimal anesthesia [12]. The limited innervation and vascularization of the lingual frenulum allow the procedure to be performed without local anesthesia, although topical anesthetics may be applied [8]. Diode laser frenotomy offers significant

advantages, including reduced postoperative pain by 80 percent, improved healing quality by 45 percent, absence of bleeding, no suture requirement, and faster recovery compared to conventional techniques [13]. A prospective cohort study of laser frenotomy reported a mean intraoperative pain intensity of 5.7 points, which resolved within 30 minutes [14]. Laser techniques provide excellent hemostasis, reduced operating time, precise incision, minimal tissue damage, and greater patient acceptance, particularly in the pediatric population [15]. For complex cases, frenuloplasty techniques, including four-flap Z-plasty, demonstrate superiority in achieving tongue lengthening and improving speech articulation [2]. Functional frenuloplasty incorporating pre-and postoperative myofunctional therapy represents an emerging approach for comprehensive rehabilitation [15].

Treatment Outcomes and Postoperative Management

Frenotomy demonstrates significant improvements in multiple functional outcomes when performed for appropriate indications [7]. Ultrasound studies have documented that infants show reduced nipple compression post-frenotomy, which is associated with improved attachment, increased milk transfer, and decreased maternal pain [16]. Complications following frenotomy remain minimal, with low recurrence rates and minor issues such as transient infection [1]. Systematic reviews examining major complications have reported rare adverse events when procedures are performed by experienced practitioners [17]. Regarding postoperative care, substantial controversy exists regarding stretching exercises, with recent evidence suggesting that they lack evidence-based support and may cause oral aversion in neonates [1]. Myofunctional therapy shows promise when combined with surgical intervention, particularly in older children with speech or swallowing concerns [15]. Setting realistic expectations for families regarding multifactorial breastfeeding challenges remains essential for patient satisfaction [9].

Table 1: Comparison of Frenotomy Techniques

Technique	Advantages	Disadvantages
Conventional scissors	Simple, rapid, minimal equipment	Bleeding, sutures often needed, longer healing
Diode laser	Excellent hemostasis, no sutures, reduced pain (80% reduction), faster healing	Equipment cost, technical training required
Z-plasty	Superior tongue lengthening, improved articulation outcomes	Complex procedure, general anesthesia, longer operative time

Conclusion

Contemporary ankyloglossia management requires comprehensive functional assessment using validated tools, selective intervention in symptomatic cases, and individualized surgical approach. Frenotomy has significant benefits for breastfeeding outcomes, but its benefits for speech remain uncertain. Modern laser techniques provide clinical advantages, justifying their consideration as a primary treatment modality. Evidence-based postoperative protocols that minimize unnecessary interventions can optimize outcomes and patient satisfaction.

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