THE UNIVERSITY of NORTH CAROLINA at CHAPEL HILL

Frenotomy and breastfeeding outcomes in infants with ankyloglossia

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Introduction

This systematic review explores whether frenotomy (lingual frenulum division) improves breastfeeding outcomes for newborn infants with ankyloglossia. Ankyloglossia, also called tongue-tie, is a congenital anomaly whereby the baby has an unusually short or thick lingual frenulum. This condition can restrict breastfeeding by limiting tongue movement (NICE, 2005).

Perceived feeding problems associated with ankyloglossia include:
- difficulties with latch and suck
- maternal nipple pain

Reported benefits following frenotomy include:
- improved latch
- increased milk intake
- decreased maternal pain and discomfort

Debate exists surrounding the efficacy of frenotomy, and whether positive breastfeeding outcomes are genuine and long-term or merely a placebo.

Methods

Search Strategy and Reliability
- Search query developed in consultation with a clinical partner
- 7 databases searched for relevant literature
- Articles screened for inclusion or exclusion by 3 reviewers with 91% reliability

PICO
Population: infants with ankyloglossia
Intervention: frenotomy
Comparison: no intervention
Outcome: improvements in breastfeeding

Inclusion Criteria
- Breastfed, full-term infants with ankyloglossia

Exclusion Criteria
- Infants who were bottle-fed, premature, or had craniofacial, neuromuscular, or other syndromic anomalies

Final Selection
Title and abstract review resulted in 65 relevant articles, including several recent systematic reviews. We opted to focus on articles published after August 2014 with an evidence level of 3 or higher, as based on Cincinnati Children's Hospital's evidence level appraisal system (including systematic reviews, RCTs, CCTs, and prospective cohort studies).

Summary of Research

Quality of Research
Following appraisal of the research, our team found 1 good quality systematic review, 2 lesser quality systematic reviews, and 1 lesser quality controlled clinical trial (CCT). After consideration, the CCT was excluded from the review due to poor research design and a lower evidence rating.

Outcomes of Interest
Studies in the systematic reviews we analyzed used a variety of subjective and objective tools to measure breastfeeding efficacy. Using either the mother's responses or a third-party observer, objective measures like the IBFAT, LATCH, and SF-MPQ gauged:
- the infant's latch
- audible swallowing
- nipple type
- hold

All studies also used subjective measures of the mother's experience to rate her perception of breastfeeding and pain. Studies used the BSES or unique questionnaires to solicit subjective information. No two studies used the exact same outcomes of interest nor manner of collecting breastfeeding efficacy information.

Tools and Assessments Used

Measure	Description
Breastfeeding Self-Efficacy Scale (BSES)	33 item self-report instrument that utilizes a 5 point scale for each item to measure maternal breastfeeding confidence. Higher overall scores indicate higher levels of breastfeeding self-efficacy.
Infant Breastfeeding Assessment Tool (IBFAT)	Consists of 4 items that represent the major components of infant breastfeeding behavior. Components are readiness to feed, rooting, latching on, and sucking. Higher scores indicate greater perceived effectiveness.
Latch, Audible Swallowing, Type of nipple, Comfort, Hold (LATCH)	Measures effectiveness of breast latch, maternal comfort, and maternal positioning. Higher scores indicate a higher degree of effectiveness.
Hazelbaker Assessment Tool for Lingual Frenulum Function (HATLFF)	A screening tool that measures 5 appearance criteria and seven function criteria. An appearance score of ≤8 or a function score of ≤11 indicated tongue-tie.
Short-form McGill Pain Questionnaire (SF-MPQ)	Used to rate maternal nipple pain. It is a shorter version of the more globally used tests, taking 2-5 minutes to administer, and it has 3 sections. A higher score indicates greater pain.

Summary of various tools used to assess breastfeeding outcomes.

Summary of Systematic Reviews

Author, Title	Journal, Year	Appraisal Rating	Included Designs	Key Findings
Francis et al. Treatment of ankyloglossia and breastfeeding outcomes: A systematic review	*Pediatrics*, 2015	Good quality	5 randomized control trials, 1 retrospective cohort study, 23 case series	• The strength of evidence on this topic is low • No study effectively assessed mid- and long-term outcomes of frenotomy • No comparative literature that addresses that assesses nonsurgical and conservative treatment of tongue-tie • A small body of evidence may be suggestive of frenotomy being associated with improvements in breastfeeding
Power & Murphy Tongue-tie and frenotomy in infants with breastfeeding difficulties: Achieving a balance	*Archives of Disease in Childhood*, 2015	Lesser Quality	Randomized control trials, case-control studies, case series, cross-sectional studies, opinion pieces, and article reviews	• Prevalence rates of ankyloglossia range from .02 to 10.7% • There are a limited number of studies with quality evidence for this topic • Frenotomy appears to improve breastfeeding in infants with tongue-tie, but the placebo effect is hard to quantify • Complications from this intervention are rare
Burrows & Lanlehein Is frenotomy effective in improving breastfeeding in newborn babies with tongue-tie? A literature review	*British Journal of Midwifery*, 2015	Lesser Quality	3 randomized control trials, 6 questionnaire studies	• There is currently no uniform guidance regarding diagnosis and treatment of ankyloglossia • Frenotomy can improve latch and alleviate maternal nipple pain • There is little information about infants with ankyloglossia who do not receive frenotomy • Cultural and social background is not addressed in the current research to a sufficient extent • Risk to the infant is not adequately assessed

Summary of primary literature.

Results
Diverse outcome measures made study comparison challenging. A few notable findings emerged from the systematic reviews we evaluated. The good quality RCTs analyzed by Francis et al. (2015) consistently demonstrated improvement in breastfeeding effectiveness when compared with sham surgery or no intervention. However, the same studies were not in agreement over whether frenotomy decreased maternal nipple pain. Age of lingual frenulum division appeared to affect nipple pain outcomes.

While there is no scarcity of research in this area, the general strength of evidence is low. Over the past decade, there has been an ample *quantity* of research of varying designs conducted all over the world, but the *quality* of many of these studies fails to connect breastfeeding outcome measures with frenotomy in any meaningful way.

Ankyloglossia can have a negative effect on breastfeeding, including complications with latch, milk intake, and maternal nipple pain.

Discussion

Study design weaknesses
- Lack of blinding and control
- If feeding difficulties persist, controls typically proceed with frenotomy
- Mid- to long-term follow-up is limited
- Blinding is difficult to achieve and maintain
- Small number of participants

Standardization weaknesses
- Heterogeneous methodologies
- Lack of uniformity in outcome measures
- Subjective nature of available measures, frequent reference to placebo effect
- Differences in descriptions and management of ankyloglossia

Future Research Directions

More research with better study designs and more homogenous methodology would better reveal the impact of frenotomy on breastfeeding outcomes. Objective measures of breastfeeding could improve the ability to compare research, conduct meta-analyses, and determine whether true differences in outcomes exist. Other areas of future research could include nonsurgical interventions to frenotomy and a true control group that would allow for long-term follow-up of frenotomy impact. Additionally, future research could incorporate the impact that a woman's culture and background might have on breastfeeding after frenotomy. The link between frenotomy and successful breastfeeding can't be viewed in isolation.

References

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