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Research Note

Poster 2: Posterior lingual frenulum and breastfeeding

Roberta Lopes de Castro Martinelli (*Hospital Santa Therezinha, Brazil*)
Irene Queiroz Marchesan (*CEFAC, Brasil*)
Giedre Berretin-Felix

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POSTER 2: POSTERIOR LINGUAL FRENULUM AND BREASTFEEDING

ROBERTA LOPES DE CASTRO MARTINELLI, PH.D., SLP
IRENE QUEIROZ MARCHESAN, PH.D., SLP
GIÉDRE BERRETIN-FELIX, PH.D., SLP

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ABSTRACT

Introduction: The literature refers to ankyloglossia as anterior, when the lingual frenulum is visible, and posterior, when the frenulum is not visible. Posterior ankyloglossia is sometimes referred to as a submucosal tongue-tie. The anatomical variations of the posterior ankyloglossia and its interference with tongue movements are poorly described in the literature. **Aim:** The aim of this study is to verify the occurrence of posterior lingual frenulum in infants and its interference with sucking and swallowing during breastfeeding. **Methods:** This clinical study included 1084 newborns, who were assessed at 30 days of life, using the Lingual Frenulum Protocol for Infants (LFPI). This study included healthy full-term infants, who were being exclusively breastfed. Prematurity, perinatal complications, craniofacial anomalies, neurological disorders, and visible genetics syndromes were the exclusion criteria. The LFPI was administered to the infants, and the assessments were registered and videotaped. Tongue movements, sucking rhythm, sucking/swallowing/ breathing coordination, nipple chewing, and/or tongue clicking were assessed during nutritive and non-nutritive sucking evaluations. Descriptive statistics were performed. **Results:** Of the 1084 newborns, 479 (44.2%) had normal lingual frenulum; 380 (35%) had posterior lingual frenulum; and 225 (20.8%) had lingual frenulum alterations. Infants with posterior lingual frenulum did not have any restrictive tongue movement during sucking and swallowing. **Conclusion:** The occurrence of posterior frenulum in this sample was 35%. The posterior frenulum did not interfere with sucking and swallowing during breastfeeding; therefore, surgery was not recommended for any of the subjects in this sample.

KEYWORDS: lingual frenum, frenotomy, breastfeeding, Speech, Language and Hearing Sciences, clinical protocols

INTRODUCTION

The embryology, pathophysiology, histology, clinical features, and treatment of tongue-tie have been extensively studied over the past years. Knowledge on the anatomy of the tongue and the floor of the mouth will contribute to the understanding of anatomical variations of the lingual frenulum (Knox, 2010; Martinelli, Marchesan, Gusmão, Rodrigues, & Berretin-Felix, 2014).

Tongue-tie, also known as ankyloglossia, is classified as a minor congenital anomaly. It occurs when a common minor embryologic tissue remnant causes restriction of normal tongue movement. Tissue remnant refers to the persistence of midline sublingual tissue that usually undergoes apoptosis during embryonic development (Knox, 2010). Ankyloglossia may be anterior or posterior. The literature refers to ankyloglossia as anterior, when the lingual frenulum is visible and posterior, when the frenulum is not visible (Chu & Bloom, 2009; Hong, Lago, Seargeant, Pellman, Magit, & Pransky, 2010; Coryllos, Watson, & LeVan, 2013; Douglas, 2013; O'Callahan, Macary, & Clemente, 2013; Pransky, Lago, & Hong, 2015).

Posterior ankyloglossia is sometimes referred to as a submucosal frenulum. The anatomical variations of the posterior ankyloglossia and its interference with tongue movements are poorly

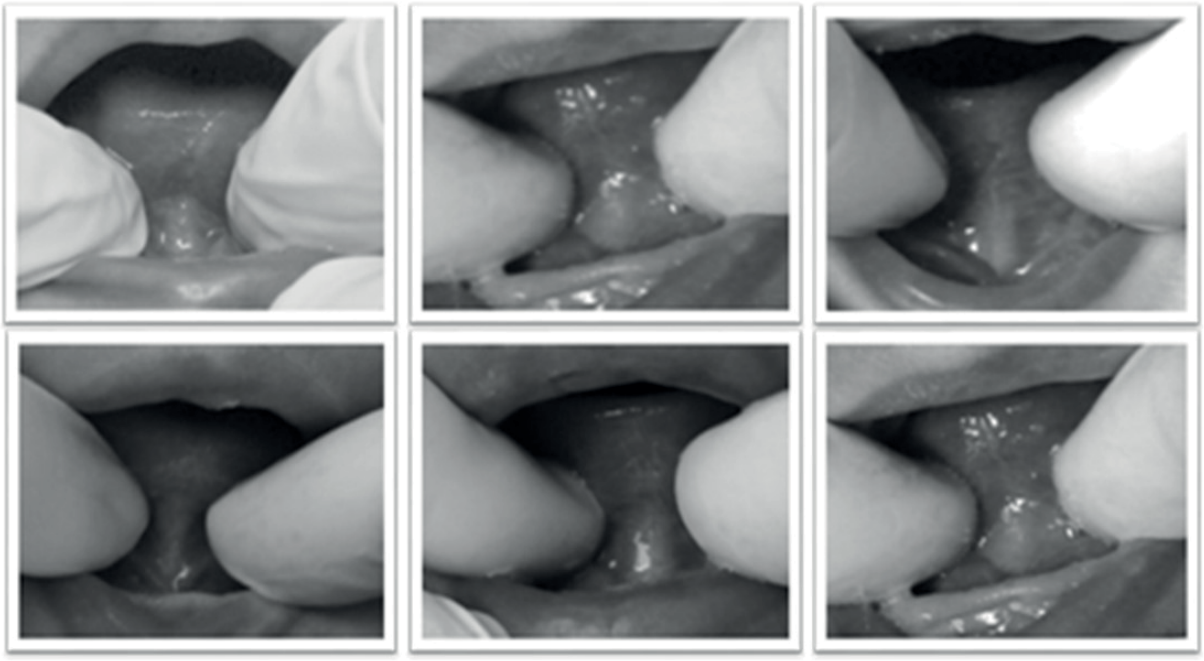

Figure 1 – Lingual frenulum with mucosal hooding classified as posterior

described in the literature. Published studies concerning ‘‘posterior’’ tongue-tie do not provide evidence that the diagnosis of ‘‘posterior’’ tongue-tie has validity, or that a frenotomy could serve as an effective treatment for this condition (Douglas, 2013).

In the literature, photographs of the frenula were purported to show that ‘‘posterior’’ tongue-ties are indistinguishable from normal frenulum variants. The data in those studies were either deemed to be unreliable or were seemingly interpreted through the lens of ‘‘posterior’’ tongue-tie when there were clearly multiple other potential factors could explain the results (Hong, Lago, Seargeant, Pellman, Magit, & Pransky, 2010; Douglas, 2013; Pransky, Lago, & Hong, 2015). The present study aims to verify the occurrence of posterior lingual frenulum in infants and its interference with sucking and swallowing during breastfeeding.

METHODS

A clinical experimental study was conducted that consisted of 1084 newborn subjects, 531 females and 553 males, who were assessed at 30 days of life, using the Lingual Frenulum Protocol for Infants (LFPI) (Martinelli, 2015). The LFPI consists of a clinical medical history, anatomical-functional evaluation, nutritive and non-nutritive evaluations.

The LFPI was administered to the infants and all assessments were registered in the patients' records and were videotaped. Tongue movements, sucking rhythm, sucking/swallowing/ breathing coordination, nipple chewing, and/or tongue clicking were assessed during nutritive and non-nutritive sucking evaluations (Martinelli, Marchesan, & Berretin-Felix, 2013). The study included healthy full-term infants of both genders, who were being breastfed exclusively. Prematurity, perinatal complications, craniofacial anomalies, neurological disorders, and visible genetic syndromes were the exclusion criteria.

For the anatomical-functional evaluation, the Speech Language Pathologist opened the infant's mouth by pushing down the infant's chin with the thumbs, and at the same time, elevated the tongue using the index fingers. The maneuver enabled the clinician to have complete visualization of the infant´s lingual frenulum. Lingual frenulum with mucosal

hooding was classified as posterior (Fig 1). For the evaluation of the nutritive and non-nutritive sucking, tongue movements, sucking rhythm, coordination among sucking/swallowing/ breathing, nipple chewing, and clicking during sucking were assessed.

The sum of the scores proposed by the items of the LFPI indicated whether the lingual frenulum was altered or not (Fig 2 and 3). Descriptive statistics were performed. The study was approved by the ethics committee of CEFAC – Saúde e Educação under the number CAAE 47613115.9.0000.5538.

RESULTS

Of the 1084 newborns at 30 days of life, 479 (44.2%) had normal lingual frenulum; 380

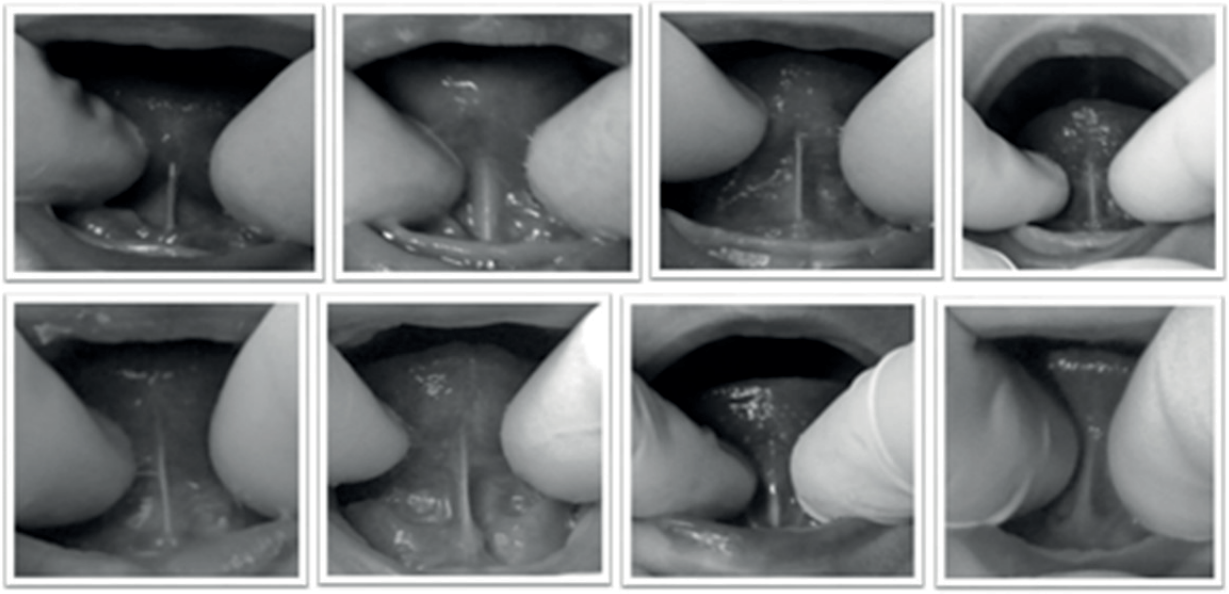

Figure 2 – Altered frenulum

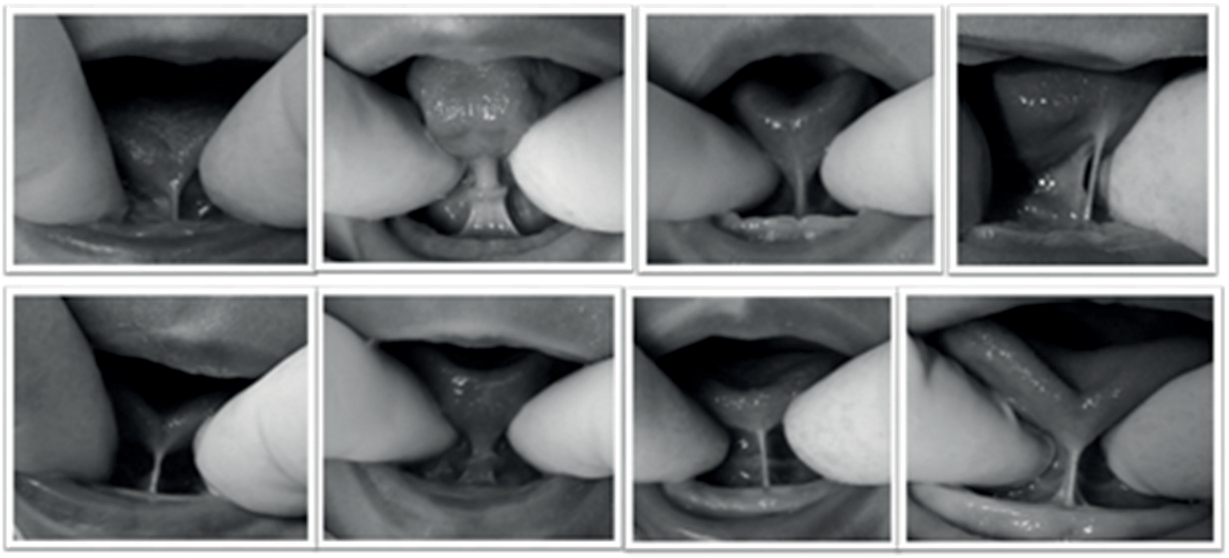

Figure 3 – Unaltered frenulum

(35%) had posterior lingual frenulum; and 225 (20.8%) had lingual frenulum alterations. Of the 531 females, 241 had normal frenulum, 201 had posterior frenulum, and 89 had lingual frenulum alterations. Of the 553 males, 238 had normal frenulum, 179 had posterior frenulum, and 136 had altered frenulum. Infants with posterior lingual frenulum did not present with any restriction of their tongue movement when sucking and swallowing. Table 1 shows the types of frenulum, the interference with sucking

DISCUSSION

Recent studies have demonstrated the importance of tongue movements for breastfeeding; therefore, the effective lingual frenulum assessment is required for clinical practice and treatment planning (Geddes, Langton, Gollow, Jacobs, Hartmann, & Simmer, 2008; Geddes, Kent, Mitoulas, & Hartmann, 2008; Elad, Kozlovsky, Blum, Laine, Po, Botzer, Dollberg, Zelicovich, & Ben Sira, 2014; McClellan, Kent, Hepworth, Hartmann, & Geddes, 2015). Moreover, several studies have reported the importance of frenotomy for normal mobility of the tongue (Cho, Kelsberg, & Safranek, 2010; Buryk, Bloom, & Shope, 2011; Constantine, Williams, & Sutcliffe, 2011; Edmunds, Miles, & Fulbrook, 2011; Berry, Griffiths, & Westcott, 2012; Martinelli, Marchesan, Gusmão, Honório, & Berretin-Felix, 2015).

Posterior ankyloglossia is poorly described in the literature. The studies on posterior ankyloglossia do not provide sharp images of the posterior lingual frenulum; therefore, its diagnosis and treatment may be compromised (Chu & Bloom, 2009; Hong, Lago, Seargeant, Pellman, Magit & Pransky, 2010; O'Callahan, Macary, & Clemente, 2013; Pransky, Lago, & Hong, 2015).

The LFPI was found to be a reliable assessment tool, that ensured accuracy when diagnosing lingual frenulum alteration and its respective interference with sucking and swallowing during breastfeeding. A correct diagnosis may provide a better treatment plan (Martinelli, 2015). Although 35% of the 1084 had posterior lingual frenulum, interference with sucking and swallowing during breastfeeding was not observed; therefore, surgery was not indicated. Previous studies reported that when the posterior lingual frenulum is diagnosed,

Table 1. Types of frenulum, interference with sucking and swallowing, and surgery indication

TYPE	SUBJECTS	INTERFERENCE WITH SUCKING AND SWALLOWING	SURGERY INDICATION
NORMAL	479 (44.2%)	NO	NO
POSTERIOR	380 (35%)	NO	NO
ALTERED	225 (20.8%)	YES	YES

frenotomy is recommended (Chu & Bloom, 2009; Hong, Lago, Seargeant, Pellman, Magit, & Pransky, 2010; O'Callahan, Macary, & Clemente, 2013; Pransky, Lago, & Hong, 2015).

CONCLUSION

The occurrence of posterior frenulum in this sample was 35%. The posterior frenulum did not interfere with sucking and swallowing during breastfeeding; therefore, surgery was not recommended for this sample. Further longitudinal studies following the development of infants with posterior ankyloglossia, may contribute to future studies on the interference of posterior frenulum with chewing and speech.

CONTACT AUTHOR:

Roberta Martinelli, SLP, Ph.D.
Hospital Santa Therezinha,
Avenida Rui Barbosa, 703, Centro, Brotas,
SP, Brazil CEP17380-000.
Faculdade de Odontologia de Bauru da
Universidade de São Paulo,
Bauru, SP, Brasil.
Business telephone number: +551138715745
Fax number: +551138680818
e-mail - robertalcm@gmail.com

Irene Queiroz Marchesan, SLP, Ph.D.
CEFAC, São Paulo, SP, Brasil.

Giédre Berretin-Felix, SLP, Ph.D.
Faculdade de Odontologia de Bauru da
Universidade de São Paulo,
Bauru, SP, Brasil.

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