

Update Of The Management And Treatment Options Of Tongue-Tie – A Case Report

Aleksandar Hadzipopovski¹, Mirjana Markovska Arsovska³, Vesna Trpevska³,
Biljana Evrosimovska⁴, Sanja Naskova², Spasovski Spiro⁵,
Ljupco Hadzipopovski¹, Cena Dimova²

¹(PHO Prodent, Bitola, North Macedonia)

²(Faculty of Medical Science, Goce Delcev University, Stip, N. Macedonia)

³(Faculty of Medical Science, Goce Delcev University, Stip, PHO Dental Clinical Centre – Skopje, N. Macedonia)

⁴(Faculty of Dentistry, Ss. Cyril and Methodius University, PHO Dental Clinical Centre - Skopje N. Macedonia)

⁵(Faculty of Dentistry, Ss. Cyril and Methodius University, Skopje, N. Macedonia)

Abstract:

Background: Ankyloglossia or tongue tie is a congenital anatomical variation characterized by a short lingual frenulum, which may result with restriction tongue's range of motion due to a short or thick lingual frenulum and as well as with the influence on oral function. There are several classifications that simplify this condition, and the most used are dr Lawrence Kotlow's classification and Coryllos' classification.

Case report and result: Treatment options for tongue tie are frenotomy (minimal invasive oral surgical procedure), frenuloplasty, (oral surgical procedure with reshapes the frenulum), myofunctional therapy (post-treatment exercises) and speech therapy.

A healthy 5-year-old girl was referred to the Department of Oral Surgery by her orthodontist to undergo a frenectomy due to the restriction of tongue movements and functions. Results of general physical examination were normal. The intraoral examination revealed that she could protrude the tongue only to the lower lip and not beyond. The ankyloglossia was classified as Class III using Kotlow's classification. According to the Coryllos' system classification (which classified tongue tie based on the tongue attachment for four different type) the ankyloglossia was classified as type 1 - attachment at the tip of the tongue.

After a general assessment, informed consent from her parents was obtained and lingual frenectomy was indicated. The frenectomy was performed with local anaesthesia infiltration. The postoperative period was uneventful with no haemorrhage complications. Sutures were removed after 1 week and the girl was sent to speech therapy sessions.

Conclusion: As a conclusion it can be emphasize that the interdisciplinary therapy is most useful treatment for this serious oral problem. Early diagnosis and surgical intervention, short lingual frenulum resection, brings complete success and tongue movements become normal, all language functions return, word articulation normalizes, and social life changes.

Keyword: tongue-tie, lingual frenectomy, ankyloglossia

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I. Introduction

Tongue tie, or ankyloglossia, is a condition that restricts the tongue's range of motion due to a short or thick lingual frenulum. Ankyloglossia is a congenital oral anomaly characterized by an abnormally short lingual frenulum. Ankyloglossia is a Greek term which means "agkilos" for curved and "glossa" for tongue and is more commonly called "tongue-tie". It is a congenital anatomical variation characterized by a short lingual frenulum, which may result in the restriction of tongue movement and can thus impact oral functions.³

Understanding tongue tie classification is essential for diagnosing and managing this condition effectively. Tongue tie occurs when the tissue connecting the tongue to the floor of the mouth, known as the lingual frenulum, is too tight or short. This can impact functions like breastfeeding, speech, and oral hygiene. Tongue-tie is often an isolated anomaly, but its association with other craniofacial abnormalities might be possible.⁵ Tongue ties are often present at birth and vary in severity, necessitating proper classification for accurate treatment.¹⁷

There is continuous controversy over the diagnostic criteria and treatment of ankyloglossia. Diagnostic criteria established by several studies are based on the length of the lingual frenulum, amplitude of tongue

movement, heart-shaped look when the tongue is protruded, and thickness of the fibrous membrane.³ In children, ankyloglossia can lead to difficulty in breastfeeding^{6,11,12,14}, pronunciation disorders, unsatisfactory oral hygiene, bullying during childhood and adolescence, sleeping disordered breathing¹⁶ as well as difficulties in sucking or ice-cream licking, kissing and playing wind musical instruments.^{1,15}

Classifying tongue tie helps healthcare providers determine its severity and the best treatment approach. The classification system evaluates the tongue's mobility and the frenulum's anatomical characteristics, which influence feeding, speech, and other functions.²

Although the clinical significance of ankyloglossia is controversial, many lactation consultants and some physicians believe that tongue-tie can make breastfeeding difficult, causing sore nipples, poor infant weight gain, and early weaning in some infants with this condition. According to Belmehedi et al.² There are several classifications that simplify this condition, and the most used are Dr Lawrence Kotlow's classification and Coryllos' classification:

1. Kotlow's Classification - Dr. Lawrence Kotlow's system measures the distance between the tip of the tongue and the lingual frenulum's attachment to the tongue. It categorizes tongue tie into four grades: Class I (Mild): 12-16mm; Class II (Moderate): 8-11mm; Class III (Severe): 3-7mm; Class IV (Complete): <3mm. This system focuses on functionality and is commonly used in pediatric cases.
2. Coryllos' Classification⁸: Coryllos' system classifies tongue tie based on the location of the frenulum attachment: Type 1: Attachment at the tip of the tongue, Type 2: Attachment 2-4mm behind the tip, Type 3: Attachment at the base of the tongue, Type 4: Submucosal attachment, where the frenulum is not easily visible. This system is particularly helpful in identifying hidden tongue ties.
3. Hazelbaker Assessment Tool - This tool combines anatomical and functional evaluations to grade tongue tie severity. It scores features like tongue movement, elasticity of the frenulum, and tongue lift to assess the impact on feeding and speech^{4,9,10}.

The aim of this paper is to enhance the contemporary classification of ankyloglossia as well as the Treatment options for tongue tie which are frenotomy (minimal invasive oral surgical procedure), frenuloplasty, (oral surgical procedure with reshapes the frenulum), myofunctional therapy (post-treatment exercises) and speech therapy^{9,13,17}.

II. Case Report

A healthy 5-year-old girl was referred to the Department of Oral Surgery, Dental Clinical Centre in Skopje, by her orthodontist to undergo a frenectomy due to the restriction of tongue movements and functions. Results of general physical examination were normal.

The intraoral examination revealed that she could protrude the tongue only to the lower lip and not beyond. The ankyloglossia was classified as Class III using Kotlow's classification.

According to the Coryllos' system classification (which classified tongue tie based on the tongue attachment for four different type) the ankyloglossia was classified as type 1 - attachment at the tip of the tongue (figure 1-2).

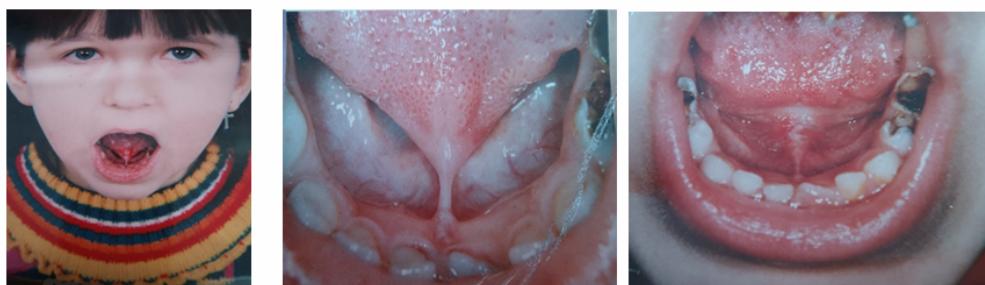


Figure 1-2. Preclinical outcome

Figure 3. Clinical outcome after frenectomy

After a general assessment, informed consent from her parents was obtained and lingual frenectomy was indicated. The frenectomy was performed with local anesthesia infiltration. The postoperative period was uneventful with no hemorrhage complications. Sutures were removed after 1 week and the girl was sent to speech therapy sessions.

Surgical procedure: After a general assessment, informed consent from their legal guardians was obtained and lingual frenectomy was indicated. The frenectomy was performed with a scalpel using blade No. 15. Local anesthesia infiltration was deposited bilaterally at the base of the tongue, floor of the mouth and toward the

genial tubercle on the lingual aspect of the mandible. The frenulum was maintained with a curved hemostat by inserting the convex curve at the depth of the vestibule, and then clamped into position, followed by 2 incisions at the superior and inferior aspect of the hemostat. The frenulum was then removed, leaving a diamond-shaped wound.

Fiber remnants were excised and a blunt dissection was performed to achieve a good tension-free closure of the wound edges, and 4-0 non-absorbable silk sutures were placed over the wound. The postoperative period was uneventful with no hemorrhage complications. Sutures were removed after 1 week with no scar tissue formation and the patients were sent to speech therapy sessions. The patient had a 3-month postoperative follow-up in which no recurrence nor difficulties in lingual functions were reported, which suggests an excellent prognosis.

III. Discussion

The exact causes of ankyloglossia are unknown, but it is most likely due to abnormal development of the mucous membrane of the tongue. In many cases, it is observed as an isolated finding in children. However, many syndromes are associated with this anomaly, including Ehler-Danlos syndrome, Beckwith-Wiedemann syndrome, Simosa syndrome, cleft palate X, and Orofaciodigital syndrome.⁶

Hereditary factors are thought to be the main cause of ankyloglossia, with some family members having this anomaly. Viral diseases can affect a pregnant woman, and these diseases can cause ankylosing spondylitis in the fetus. Hormonal and antibiotic treatment of a woman, in the first three months of pregnancy, can also affect the development of ankyloglossia in the fetus, as well as late pregnancy, exposure of the woman to chemicals during pregnancy, emotional state, female stress during pregnancy, and cocaine use during pregnancy.⁸

This pathology can cause difficulty breastfeeding in infants^{6,11,12,14}, difficulty feeding and swallowing, increased salivation, dyslalia (difficulty articulating words), difficulty maintaining oral hygiene^{2,14}, difficulty placing retainers in the lower jaw, mechanical problems with licking, difficulty with French kissing and other tongue movements, difficulty breathing, and people with ankyloglossia have problems playing wind instruments.

According to the Khairnar and Chaubal^{9,10}, surgical management of tongue-tie can be classified into 3 techniques (treatment options for tongue tie):

- frenotomy defined as simple cutting of the frenulum, this quick, minimally invasive procedure involves snipping the frenulum to release tongue restriction. It's suitable for mild to moderate cases and has minimal recovery time;
- frenectomy defined as complete excision, i.e., removal of the whole frenulum;
- frenuloplasty - a more complex surgical procedure that includes various methods to release the tongue-tie and correct the anatomic situation and this is often recommended for severe tongue ties or cases requiring more precision;
- myofunctional therapy- post-treatment exercises are essential to restore normal tongue function. myofunctional therapy helps improve tongue strength, mobility, and coordination;
- speech therapy - for children and adults with speech-related issues, therapy can correct articulation problems and optimize tongue use after surgical intervention^{9,10}.

There is no sufficient evidence in the literature concerning surgical treatment options for ankyloglossia to favor any of the 3 main techniques. In this clinical case, tongue-tie was subjected to surgical correction by frenectomy procedure, which is more invasive and difficult to perform in young children, although the results are more predictable, decreasing the recurrence rate.^{9,10,15}

A tongue tie can cause complications in various areas: Feeding: Infants with tongue ties may struggle to latch, causing maternal pain and feeding difficulties. Speech: Limited tongue mobility can affect articulation, particularly for sounds requiring precise tongue movement. Poor tongue mobility can lead to plaque buildup, increasing the risk of cavities and gum disease. An abnormally short lingual frenulum can cause impaired orofacial development in early childhood. The width of the upper airway can be reduced, increasing the risk of collapse, especially during sleep. Children with an untreated short frenulum develop abnormal tongue function, with secondary effects on orofacial growth and sleep-disordered breathing.¹⁵

Ankyloglossia does not affect children's ability to learn and does not cause speech delays, but it can cause problems with word articulation. Some children exhibit social problems because of the difficulties this pathology brings. This pathology arises from an unusual short membrane that serves to connect the tongue to the floor of the mouth. It is noticeable when the tongue is protruded, and the tip of the tongue in these cases takes on a heart or V-shape.

Ankyloglossia in infants is treated with frenectomy. In older children, frenectomy is a minor procedure, but in adults and children who are uncooperative and fearful of surgery, general anesthesia should be used. Surgical correction is a simple surgical procedure that can be done at any age.

IV. Conclusion

As a conclusion it can be emphasize that the interdisciplinary therapy is most useful treatment for this serious oral problem. Early diagnosis and surgical intervention, short lingual frenulum resection, brings complete success and tongue movements become normal, all language functions return, word articulation normalizes, and social life changes.

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