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Research Article

A Comprehensive Approach to the Treatment of Ankyloglossia in Newborns

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Abstract

Introduction: In recent years, ankyloglossia has been reported to be high among newborns in Ukraine. A short hyoid frenulum in breastfed infants can cause discomfort and damage to the mother's nipples. In addition, it complicates the sucking process for the baby, which increases the likelihood of early cessation of breastfeeding.

Purpose of the Study: The purpose of the study is to establish the structure of ankyloglossia in newborns of the Mykolaiv region, to analyze methods for correcting a short frenulum of the tongue.

Materials and Methods: We examined 265 newborns at the Perinatal Center of the Mykolaiv Regional Clinical Hospital in 2024. The children were examined by the following specialists: a neonatologist, a dental surgeon, and a breastfeeding expert.

Results and Discussion of the Study: Of the 265 newborns examined, 38 (14.34%) were diagnosed with a short frenulum of the tongue. The most common pathology was ankyloglossia type II. A thin, translucent frenulum, which was closely attached to the tip of the tongue and had a small length, was found in 16 children (42.10%). Type III frenulum, a solid short cord, closely attached to the tip of the tongue, was observed in 12 newborns (31.58%). Thin, transparent frenulum with a small length (type I) was found in 10 examined and amounted to 26.32%. Newborns with a short and thin frenulum of the tongue, which causes difficulty sucking and insufficient weight gain, usually undergo surgical transection of the frenulum, if it is represented by a fold of the mucous membrane - frenulotomy, in the first days or weeks of life. Frenulotomy, which is usually a very gentle procedure, is performed in the first months of a child's life, or better in the first days of life, when there is a thin frenulum, and has almost no complications. Immediately after the frenulum is cut, the child is placed on the mother's breast to calm her down and practice the skill of proper attachment. Intervention in such cases is carried out in the maternity hospital, or in the conditions of the polyclinic, the wound is not sutured. It is believed that the sooner this procedure is carried out in the child, before the wrong stereotype of breast sucking has been formed, the smaller the expected consequences will be.

Conclusion: A high percentage of newborns with a malformation of the lingual frenulum was found, which was accompanied by difficulties in establishing breastfeeding. A comprehensive interdisciplinary approach to the diagnosis and treatment of ankyloglossia is the key to the most complete and rapid medical and social rehabilitation of children. The need for timely diagnostics, interdisciplinary consultation, and establishing the correct diagnosis makes it possible to provide timely assistance to children, establish breastfeeding accordingly, and restore the necessary weight gain, which will contribute to the normal development of the child and preserve the quality of life. Educational work for mothers, especially those giving birth for the first time, is important.

Keywords: *Ankyloglossia; Short Lingual Frenulum; Frenulotomy; Breastfeeding*

Introduction

Ankyloglossia (congenital shortening of the sublingual frenulum) is a type of oral cavity anomaly that limits tongue mobility. This pathology can make breastfeeding difficult in infancy and later cause problems with articulation and pronunciation of sounds [1]. Among newborns, lingual frenulum malformation occurs with a frequency of about 4.5 - 4.8%, the ratio of boys to girls is 3:1 [2,3]. In most cases, the presence of ankyloglossia is noticed when problems with articulation occur during the stage of speech development in a child. However, it is important to detect a short lingual frenulum much earlier, namely immediately after the birth of the child, as ankyloglossia can become a problem during the breastfeeding stage. During breastfeeding, the movement of the baby's tongue largely depends on its free mobility. A shortened frenulum makes it difficult to make wave-like movements of the tongue during sucking and prevents proper attachment to the mother's breast and effective sucking.

There are the following types of neonatal screening: genetic, audiological, ophthalmological and dental. Dental screening is aimed at the early detection of maxillofacial anomalies, the most common of which are shortened frenulum of the tongue/lips, congenital cleft lip/palate, shallow vestibule of the mouth, orofacial dysplasias of the soft tissues and bones of the face, changes in the oral cavity caused by genetic defects in the development of the maxillofacial region.

The problem of ankyloglossia is detected directly upon palpation of the floor of the oral cavity [4].

The frenulum of the tongue is a thin fold of mucous membrane that is attached 1 - 1.5 cm below the tip of the tongue. Its lower edge is attached to the floor of the oral cavity along the central line between the sublingual papillae. Pathological variants of the frenulum are usually characterized by an atypical attachment site, excessive cord expression, and shortening, sometimes to the point of fusion with the floor of the mouth. Such changes limit the mobility of the tongue, can cause its contracture and incorrect position. The frenulum differs in a variety of forms, degree of density and relationship with the muscles of the tongue [5].

There are 5 types of tongue ties that can limit its mobility [6,7]:

- The first type is characterized by extremely thin, transparent frenulum that is attached to the tongue in a normal position, but restrict tongue movement due to insufficient stretching;
- The second type is represented by translucent thin frenulums, which are located close to the tip of the tongue and their limited stretching leads to the fact that when the tongue is raised, it takes on a trough-like shape;
- The third type is short, dense and thickened strands attached close to the tip of the tongue (when the tongue is protruded, the strands are strongly stretched, causing the back of the tongue to bend);
- The fourth type is distinguished by the fact that the frenulum has pronounced strands that are fused with the muscles of the tongue (this form is often found in children with congenital defects of the palate and lip);
- In type 5 frenulums, the cord appears barely noticeable, however, its fibers are closely intertwined with the muscular structures of the tongue, significantly limiting its movements.

If a child has ankyloglossia during breastfeeding, the mother experiences nipple pain when the child is placed on the breast, cracked nipples and changes their shape after sucking, congestion in the breast as a result of incorrect attachment and violation of the act sucking, prolonged feeding duration and accordingly persistent malnutrition and insufficient weight gain in the newborn. Objective signs include damage to the mother's nipples, their compression, and milk stasis, indicating ineffective sucking by the baby [8-10].

Ultrasound results have confirmed that certain tongue movements and the positional proximity of the mother's nipple relative to the junction of the hard and soft palate directly affect the effectiveness and comfort of breastfeeding.

When the tongue moves up and down in the oral cavity, the excursion of the lower jaw is slowed down, the magnitude of the negative pressure changes which facilitates the movement of milk during feeding. When the tongue is lowered, an increase in vacuum or negative pressure occurs, and conversely, a decrease in negative pressure is observed when the tongue is raised. It is important to consider that the presence and tactile sensation of breast tissue in the oral cavity causes a reflex deviation of the lower jaw, followed by the tongue, which creates a vacuum while simultaneously making close contact [2].

Purpose of the Study

The purpose of the study to establish the structure of ankyloglossia in newborns of the Mykolaiv region, to analyze methods for correcting a short frenulum of the tongue.

Materials and Methods of the Study

We examined 265 newborns at the Perinatal Center of the Mykolaiv Regional Clinical Hospital during 2024.

Examination of the oral cavity of children was carried out manually by a neonatologist and a dental surgeon. Functional disorders were diagnosed during feeding of the child by a breastfeeding expert. The diagnosis was made using the classification of F. Ya. Khoroshilkina.

The basic principles of bioethics were taken into account when conducting the research. Before the start of the research, after explaining the purpose and objectives, informed written consent was obtained from the parents for the child's participation in the research.

Statistical processing of the results was carried out using the software "STATISTICA" (StatSoft Inc., USA, Version 10). Comparison of quantitative indicators with normal distribution was carried out using the Student t-test, the probability of differences was considered statistically significant at $p<0.05$.

Results and their Discussion

As a result of the study, a short frenulum of the tongue was diagnosed in 38 newborns (14.34%).

The most common pathology was ankylosiia type 2.

A thin, translucent frenulum, closely attached to the tip of the tongue and having a small length, was found in 16 children (42.10%).

A type III frenulum, a solid, short cord, closely attached to the tip of the tongue, was observed in 12 newborns (31.58%). A thin, transparent frenulum with a small length (type I) was found in 10 examined, which was 26.32%. The structure of ankyloglossia is shown in figure 1.

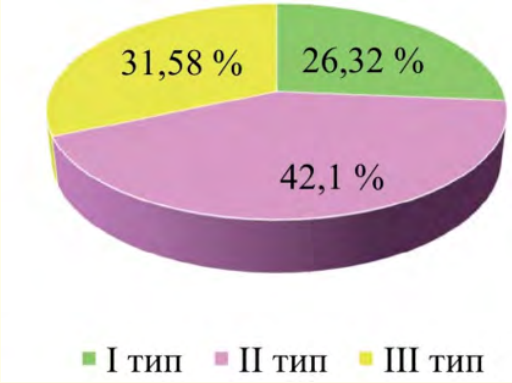

Figure 1

Ankyloglossia is primarily a diagnosis associated with a functional disorder, which, due to the presence of an anatomical defect alone, is not an indication for surgical correction. The determination of the need for surgical intervention is made only in the presence of complaints from the mother and the lack of results from conservative methods included in the breastfeeding program, including mother education, attachment adjustment, lactation assessment, etc.

A shortened lingual frenulum in breastfed infants can cause pain and nipple trauma in the mother, as well as make it difficult for the infant to obtain breast milk, which increases the risk of premature cessation of breastfeeding [2,11]. According to Frezza A., *et al*. [1,12], there is currently no unified treatment protocol for ankyloglossia and specialists are in the process of finding the most effective treatment methods.

There are clear indications for surgical intervention in various anomalies of the frenulum of the tongue. Newborns with a short, thin frenulum of the tongue, which causes impaired sucking function and insufficient weight gain in the child, in the first days (weeks, less often months) of life, perform a transverse section of the frenulum, if it is represented by a fold of the mucous membrane - frenulotomy. Intervention in such cases is performed in a maternity hospital or in a polyclinic, the wound is not sutured. In cases of diagnosing a wide frenulum in young children who are breastfed, surgical correction is indicated - frenuloplasty [5].

Depending on the professional qualifications of the doctor, different methods of frenulotomy can be used. The main task of the procedure is to gently dissect the sublingual frenulum in order to eliminate restrictions on the tongue and restore its mobility, which ensures full breastfeeding. The doctor performing such an intervention must have knowledge of possible complications, inform the parents about them and obtain their informed consent in writing, and also be able to carry out postoperative supervision and provide the necessary assistance [8,13-15].

The traditional use of surgical scissors for the correction of "classical ankyloglossia" in newborns continues to occupy a leading place in the clinical practice of the dental surgeon, which is justified by many years of experience in their use. In parallel, modern medicine offers alternative methods for performing frenulotomy, in particular, scalpels, electrocautery and lasers are used. Currently, there are no studies comparing the effectiveness of these instruments when performing frenulotomy. However, experimental studies related to surgical interventions in the oral cavity show that incisions made with cold steel (scissors or scalpel) heal faster than those made with a laser. This is probably due to thermal damage to the tissues during the laser procedure [8,16].

Deep surgical incisions in the oral cavity, with the exception of standard hyoid frenulum cutting in breastfed infants, pose a certain risk and require high professional training and concentration from the doctor.

Complete visualization of all branches of the glossopharyngeal nerve is not possible, and the infant is unable to report loss of tongue sensation. In addition, pain after deep mucosal incisions may cause the infant to refuse breastfeeding [18,19].

Other methods of surgical treatment of ankylosing spondylitis are frenulectomy and frenuloplasty. Frenulectomy is indicated in the presence of a thin and wide frenulum of the tongue. The procedure consists of excision of a part of this frenulum with subsequent suturing of the wound. Frenuloplasty is a more complex procedure, which consists of dissection of the frenulum of the tongue with transfer of the place of its fixation and suturing. This procedure is usually used in older children and requires anesthesia. The decision on surgical intervention should be made together with the parents, taking into account all the disadvantages and advantages [20-22].

After performing frenulotomy, a mandatory stage is clinical observation of the child, during which the doctor must assess the result of the intervention and document the appearance of possible side effects, complications that may occur in the infant. These include prolonged bleeding, postoperative pain, infectious lesions in the incision area, refusal of the newborn to feed, as well as deterioration or

complete cessation of breastfeeding that occurred after surgery. If necessary, the mother and child should be provided with additional assistance in matters of breastfeeding [8,16].

The results of our studies showed that 26 examined children (68.42%) underwent frenulotomy and 12 (31.58%) - frenuloplasty.

Conclusion

A high percentage of newborns with a tongue frenulum malformation was found, which was accompanied by difficulties in establishing breastfeeding.

A comprehensive interdisciplinary approach to the diagnosis and treatment of ankyloglossia is the key to the most complete and rapid medical and social rehabilitation of children.

The need for timely diagnosis, interdisciplinary consultation and correct diagnosis makes it possible to provide timely assistance to children, which in turn will establish breastfeeding, restore the necessary weight gain and promote the normal development of the child, which will further improve the quality of her life. It is important to conduct timely educational work among pregnant women and mothers, especially those who are giving birth for the first time.

Conflict of Interest

The authors declare that there are no conflicts of interest.

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