

# CASE REPORT

## Olgu Sunumu

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# Treatment of Severe Ankyloglossia in an Adult Patient Using the Myofrenuloplasty Technique: A Case Report

## Yetişkin Hastada Şiddetli Ankiloglossinin Miyofrenuloplasti Tekniği ile Tedavisi: Bir Olgu Sunumu

### ABSTRACT

Ankyloglossia, characterized by an abnormal lingual frenulum, is a condition that restricts tongue mobility and impacts oral functions such as speech, swallowing, and chewing. This congenital anomaly, occasionally acquired, may present as an isolated finding or in association with syndromes like Ehlers-Danlos or Beckwith-Wiedemann. Proper diagnosis requires clinical examination and functional assessment of the tongue. Various surgical techniques, including frenotomy, frenectomy, Z-plasty, and myofrenuloplasty, are utilized depending on the severity and age of the patient. This study presents the case of a 25-year-old woman with severe ankyloglossia, as defined by Kotlow's classification system, a condition known to cause difficulties in speech. A detailed surgical intervention using the myofrenuloplasty technique was performed, targeting the restrictive anterior genioglossus fibers while preserving sublingual structures. Postoperative recovery was uneventful, with significant improvement in tongue mobility, and the patient was subsequently referred for speech therapy to enhance functional outcomes and prevent postoperative scarring complications. This case underscores the importance of selecting appropriate surgical techniques based on anatomical and functional assessments, while integrating postoperative rehabilitation with speech therapy is essential for optimizing outcomes and ensuring long-term success in ankyloglossia management.

### Key Words

Ankyloglossia, Lingual Frenectomy, Myofrenuloplasty

## ÖZ

Ankiloglossi, anormal bir lingual frenulum ile karakterize olup, dil hareketlerini kısıtlayan ve konuşma, yutma ve çiğneme gibi oral fonksiyonları etkileyen bir durumdur. Genellikle doğuştan gelen bu anomali, bazen edinsel olarak da görülebilir ve Ehlers-Danlos veya Beckwith-Wiedemann gibi sendromlarla ilişkili olabileceği gibi izole bir bulgu olarak da ortaya çıkabilir. Doğru tanı, dilin klinik muayenesi ve fonksiyonel değerlendirilmesi ile konulmaktadır. Tedavi seçenekleri, hastanın yaşı ve durumun ciddiyetine bağlı olarak frenotomi, frenektomi, Z-plasti ve miyofrenuloplasti gibi çeşitli cerrahi teknikleri içermektedir. Bu çalışmada, Kotlow sınıflandırma sistemine göre şiddetli ankyloglossi tanısı konulan 25 yaşındaki bir kadın hasta sunulmaktadır. Bu durumun konuşma güçlüğüne neden olduğu bilinmektedir. Miyofrenuloplasti tekniği kullanılarak, anterior genioglossus kas liflerinin kısıtlayıcı etkisi hedef alınmış ve sublingual yapılar korunarak başarılı bir cerrahi müdahale gerçekleştirilmiştir. Ameliyat sonrası iyileşme sorunsuz ilerlemiş ve dil hareketliliğinde belirgin iyileşme sağlanmıştır. Hasta, fonksiyonel sonuçları artırmak ve postoperatif skar komplikasyonlarını önlemek amacıyla konuşma terapisine yönlendirilmiştir. Bu vaka, anatomik ve fonksiyonel değerlendirmelere dayalı uygun cerrahi teknik seçiminin önemini vurgulamaktadır. Ayrıca, postoperatif rehabilitasyonun konuşma terapisi ile entegre edilmesi, sonuçların optimize edilmesi ve uzun vadeli başarının sağlanması açısından kritik öneme sahiptir.

## Anahtar Sözcükler

Ankiloglossi, Lingual Frenektomi, Miyofrenuloplasti

## INTRODUCTION

The lingual frenulum is a small structure located beneath the tongue and is responsible for maintaining stability between the intrinsic and extrinsic muscles of the tongue. However, anomalies in this structure can have a restrictive effect on tongue movements. Historically, the lingual frenulum was merely described as a prominent fold of the mucous membrane. Recent studies, however, have demonstrated that the lingual frenulum exhibits a more complex anatomy that varies between individuals (1,2).

Ankyloglossia is a condition characterized by impaired motor functions of the tongue due to the embryological malformation of the lingual frenulum or scarring resulting from surgical interventions or trauma. The most common cause of ankyloglossia is tongue-tie syndrome (3), and its prevalence in neonates ranges from 0.02% to 10.7%. Studies indicate that it is more commonly observed in males than females, with reported ratios ranging between 4:1 and 1.7:1 (4). In some cases, restricted tongue movements may result from a short mucosal fold, submucosal fascial fibers, or the combined influence of mucosa, fascia, and anterior genioglossus muscle fibers. Uninterrupted tongue motor functions are essential for proper swallowing, chewing, breathing, and speech development. These

functions are fundamental to the development of the maxillofacial complex and directly influence the quality of life.

Multiple methods are available for treating ankyloglossia, including frenotomy, frenectomy, frenuloplasty, Z-plasty, and V-Y plasty (5). Typically, frenotomy with simple scissors or frenectomy using lasers are employed, though outcomes may vary. Sometimes, the surgeon may need to repeat the procedure on the same patient multiple times. This is often due to fibrosis and uncontrolled scarring caused by misdiagnosis or the selection of an inadequate surgical technique. This study discusses the successful surgical treatment of a severe case of ankyloglossia in an adult patient using the myofrenuloplasty technique. Additionally, a brief review of the literature on the subject is presented.

## CASE REPORT

A 25-year-old female patient without any systemic diseases presented to the Oral and Maxillofacial Surgery Clinic at Recep Tayyip Erdoğan University Faculty of Dentistry with complaints of articulation difficulties and impaired speech. An intraoral examination revealed restricted tongue movements. The lingual frenulum was observed to be located approximately 5 mm from the tongue apex and extended between the lingual papillae of the mandibular central teeth (Fig. 1).



Figure 1. Lingual frenulum intraoral examination

Severe limitations in superior-inferior, lateral, and anterior-posterior tongue movements were noted. Additionally, during the preoperative period, the patient was asked to pronounce specific words in the local language (ruj, arı, biber), and both their pronunciation patterns and any speech difficulties were recorded. The patient was orally informed about the surgical procedure, and written informed consent was obtained. Surgery was planned under local anaesthesia.

Local anaesthesia was administered bilaterally via infiltrative techniques targeting the tongue tip, tongue base, floor of the mouth, and the genial tubercle on the lingual surface of the mandible. The tongue was secured in the most superior position by passing a 3/0 silk suture through its apex and suspending it between the 2 maxillary central teeth (Fig. 2).



**Figure 2.** Suspension of the tongue between the 2 maxillary central incisors

The frenulum was stabilized with a curved haemostat placed following the convexity of the tongue (Fig. 3).



**Figure 3.** Fixation of the frenulum with a hemostat following its convexity

A superficial horizontal incision was made using a 15C scalpel below the inferior edge of the haemostat, involving the elastic mucosal membrane encasing the frenulum and the underlying superficial fascia (Fig. 4). It is critical to avoid damage to the superficial venous branches and the lingual nerve located near the midline during this stage.

Subsequently, a horizontal incision was made into the deeper fascial layer. This incision was made after frenotomy and was used for dissection in the area marked with a white line (Fig. 4).



**Figure 4.** Horizontal incision made with a No. 15C scalpel

Blunt dissection along the epimysium surrounding the genioglossus muscle was performed to release its anterior fibers (Fig. 5).



**Figure 5.** Post-view after blunt dissection along the epimysium surrounding the genioglossus muscle

Tongue mobility was then assessed. After achieving haemostasis, the wound was closed primarily with absorbable polyfilament sutures starting from the apex. Postoperatively, there was a substantial increase in the free tongue length.

Given the possibility of scar tissue formation, this value exceeded 20 mm as a result of overcorrection (Fig. 6).



**Figure 6.** Ensuring mobility and primary closure of the wound sites

This finding indicated a substantial increase in tongue mobility. To prevent tissue rupture, the wound edges were approximated with a minimum margin of 2 mm. The inferior part of the wound near the sublingual caruncle was left for secondary healing to avoid unintended closure of the sublingual ducts. This area healed with non-tension scar tissue during the postoperative period. The patient was prescribed antibiotics, analgesics, and a mouthwash postoperatively and was referred to a speech and language therapist following wound healing.

In this case, the choice of myofrenuloplasty over other techniques such as frenotomy, frenectomy, or laser-based approaches was based on a combination of factors. The patient was an adult (25-year old) with a severe degree of ankyloglossia according to Kotlow's classification, which significantly impaired articulation. In such cases, simple frenotomy or frenectomy is often insufficient due to the involvement of the anterior fibers of the genioglossus muscle. Therefore, myofrenuloplasty was selected as the most appropriate technique to ensure adequate release of the restrictive fibers, preservation of vital sublingual structures, and long-term improvement of tongue mobility.

## DISCUSSION

Ankyloglossia is a common anomaly, generally congenital but occasionally acquired, characterized by the lingual frenulum and its restrictive impact on tongue movements, thereby affecting oral functions (4,6). The tongue develops during the fourth week of gestation from the first, second, and third pharyngeal arches. Initially, frenulum cells are located at the tip of the tongue; however, they undergo apoptosis and migrate toward the middle region of the lingual dorsum during development. Disruptions in cellular control, incomplete migration, or failure to migrate can result in ankyloglossia (7). Although it is often observed as an isolated finding, as in our case, it can also be associated with various syndromes such as Ehlers-Danlos syndrome, Beckwith-Wiedemann syndrome, Simosa syndrome, X-linked cleft palate, and orofaciogigital syndrome (4,8,9).

The diagnosis of ankyloglossia is made through clinical examination. Evaluation should include tongue mobility and appearance, the location of the frenulum, its point of attachment, and its length. Additionally, speech difficulties caused by restricted tongue movements can be assessed by evaluating the pronunciation of certain letters (e.g., "t," "d," "r," "n," "l") and words containing these letters (e.g., "tree," "ladder," "mirror," "balloon"). Several classification systems are discussed in the literature for evaluating ankyloglossia, including Kotlow's classification, the Hazelbaker Assessment Tool for Lingual Frenulum Function (HATLFF), and Coryllos classification (10,11). In our study, we used Kotlow's classification (Tab. 1).

**Table 1.** Kotlow's classification based on free tongue.

Classification of ankyloglossia	Range of free tongue*
Normal	>16 mm
Class I: Mild ankyloglossia	12-16 mm
Class II: Moderate	8-11 mm
Class III: Severe	3-7 mm

\*Free-tongue is measured from the insertion of the lingual frenum into the base of the tongue to the tip of the tongue

The lingual frenulum should not be defined merely as a midline mucosal fold or a submucosal band but rather as a 3D structure. *In vivo*, observations during tongue-tie surgeries reveal that the lingual frenulum has a multilayered structure. The superficial layers, consisting of mucous membranes and fascial fibers, are not typically the sole contributors to restricted tongue mobility. The choice of surgical technique depends on which layer is causing the restriction, determined through clinical evaluation and a detailed analysis of the frenulum's structure. Several studies (12-14) have highlighted the superiority of myofrenuloplasty in adult patients, particularly in cases where the anterior fibers of the genioglossus muscle restrict tongue mobility.

Compared with frenotomy or frenectomy, myofrenuloplasty provides a more definitive release and reduces the likelihood of recurrence. Laser-based techniques are associated with reduced intraoperative bleeding and faster healing, but they may not adequately address deep muscular restrictions (15). Therefore, for adult patients with severe functional impairment, myofrenuloplasty remains a highly effective option.

The choice of surgical technique depends on the structure of the frenulum, symptoms, compensatory mechanisms, and most importantly, motor dysfunction and the patient's age. For infants under six months of age, where the lingual frenulum is still thin, frenotomy of the cellular membrane is recommended (16,17). In older patients, achieving primary tension-free wound closure with soft, polyfilament, absorbable sutures are essential for optimal postoperative wound healing and scar formation. Given the strength of the lingual frenulum and the natural consequences of long-standing restricted tongue movements in adults, more radical techniques such as frenectomy, frenoplasty, or myofrenuloplasty may be applied. Myofrenuloplasty is specifically used when structural restriction of anterior genioglossus muscle fibers limits tongue mobility (12). It should be noted that surgical technique alone may not suffice, and postoperative tongue training and speech therapy are crucial for satisfactory outcomes. Postoperative speech and tongue therapy aim to minimize movement restrictions caused by scar formation and improve pronunciation.

Various intraoperative and postoperative complications may arise during the surgical treatment of ankyloglossia. Common complications include excessive bleeding or haemorrhage, retention cyst or ranula formation, sublingual hematoma, infections in the sublingual and submandibular spaces, reformation of the frenulum attachment, development of a new speech disorder or worsening of an existing one, numbness or paraesthesia in the tongue and surrounding soft tissues (18). No complications were observed in the case reported here.

The primary limitation of this report is its single-case nature, which precludes generalization of the findings. A further limitation of the study is that photographic documentation from the follow-up period could not be obtained. The patient's failure to attend follow-up examinations precluded the capture of postoperative photographs. However, subjective findings obtained from clinical follow-up were recorded and presented in the study. It is widely accepted that these data provide sufficient information for the evaluation of treatment outcomes.

The strength of this case lies in its detailed surgical description and its emphasis on integrating postoperative speech therapy with surgical intervention. This highlights the importance of a multidisciplinary approach, which is often underreported in the literature. Clinicians may consider this combined strategy when treating adult patients with severe ankyloglossia, as it may enhance both short-term recovery and long-term functional outcomes. Future studies with larger cohorts and long-term follow-up are needed to further evaluate the functional benefits of myofrenuloplasty and compare it with less invasive alternatives in adult patients.

## CONCLUSION

In conclusion, ankyloglossia is an anatomical malformation that impairs motor functions of the tongue, affecting various aspects such as speech, feeding, and breathing. Treatment strategies range from simple frenotomy to myofrenuloplasty, depending on the severity of the malformation and the patient's age. Our case highlights the importance of tailoring the surgical approach to the severity and anatomical characteristics of ankyloglossia. In adult patients with severe functional impairment, myofrenuloplasty may offer advantages over simpler techniques. Furthermore, the integration of speech therapy into the postoperative protocol is critical for achieving optimal outcomes. This case may serve as a reference point for clinicians when considering surgical and rehabilitative strategies for adult ankyloglossia.

### Ethics Committee Approval

Consent was obtained from the patient. Ethics Committee Approval Certificate was not required.

### Author Contribution Statement

Case preliminary diagnosis and follow-up, article writing: I.B.H., E.B., M.D., B.P.

### Conflicts of Interest

None of the authors mentioned in this case report are or there is no conflict of interest with the organization.

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