



RESEARCH ARTICLE

BREAKING THE TIE: A CASE SERIES ON THE SUCCESSFUL MANAGEMENT OF ANKYLOGLOSSIA IN THREE PATIENTS

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ABSTRACT

Ankyloglossia, commonly known as tongue-tie, is a congenital condition caused by an abnormally short or restrictive lingual frenulum, which can significantly impact oral function, speech, and quality of life. This case series explores the clinical presentation, management, and outcomes of three patients with symptomatic ankyloglossia, ranging from childhood to adulthood, who presented with varied functional and social challenges. Each patient underwent a lingual frenectomy, tailored to their specific needs, followed by individualized rehabilitation strategies such as speech therapy and orthodontic care. The multidisciplinary approach in each case resulted in successful resolution of symptoms, including improved tongue mobility, speech clarity, oral function, and enhanced confidence. This series highlights the importance of early diagnosis and personalized management plans in addressing both the functional and psychosocial aspects of ankyloglossia, offering valuable insights into the effectiveness of comprehensive care for this condition.

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INTRODUCTION

Ankyloglossia, commonly referred to as tongue-tie, is a congenital condition characterized by an abnormal restriction of the lingual frenulum, a band of connective tissue located beneath the tongue. This restrictive condition limits the tongue's mobility, which can affect a wide range of functions, including breastfeeding in infancy, speech development in early childhood, and oral hygiene, mastication, and swallowing in later years. The term "ankyloglossia" originates from the Greek words "ankylo," meaning "curved" or "stiffened," and "glossa," meaning "tongue." The condition can vary in severity, ranging from minor restrictions with minimal impact on function to severe cases where the tongue's ability to move is significantly impaired.¹⁻³ The condition has a reported prevalence of 0.02% to 4.8%, and its impact is more pronounced in males, with an approximate male-to-female ratio of 3:1. Despite its relatively low prevalence, ankyloglossia is an important condition to diagnose and treat due to its potential to interfere with various aspects of oral function and development. The condition arises during fetal development, with the frenulum initially forming as a band of tissue that guides the development of oral structures. Normally, the frenulum recedes and becomes thinner as the fetus develops.

However, in cases of ankyloglossia, the frenulum remains thick, short, or abnormally attached, resulting in the characteristic functional limitations.⁴⁻⁵ In infants, the inability to latch onto the mother's breast effectively is often one of the earliest signs of ankyloglossia. If left untreated, this condition may lead to secondary complications as the child grows. These include improper tongue positioning, resulting in abnormal swallowing patterns, malocclusion, or even speech impediments due to the tongue's restricted ability to move freely within the oral cavity. Speech difficulties often manifest when the patient begins to develop more complex language skills that require precise tongue movements, such as articulation of sounds like "r," "l," "t," "d," and "s." Consequently, this can have a significant psychosocial impact, especially during the school years, when peer interactions and communication skills play a pivotal role in social development.⁶⁻⁸ In addition to functional impairments, ankyloglossia can have esthetic implications. Restricted tongue mobility may contribute to secondary dental issues, such as spacing between teeth (diastema), caused by abnormal tongue positioning during swallowing and speech. This spacing is often more pronounced in the anterior segments of the maxillary and mandibular arches, where the tongue's pressure plays a significant role in shaping the alignment of the teeth.

Over time, this can lead to malocclusion, further affecting oral function and esthetics.⁹⁻¹⁰ While many cases of ankyloglossia are diagnosed and treated in infancy or early childhood, a significant number remain undiagnosed until adolescence or adulthood, when functional or social challenges prompt evaluation. In adults and older children, the condition may present with a broader range of symptoms, including speech difficulties, poor esthetics due to malocclusion or spacing, difficulty swallowing pills or certain foods, and even challenges in activities.¹¹ The management of ankyloglossia has evolved over time, with treatment decisions based on the severity of the restriction and its functional and social impact. Mild cases may be managed with speech therapy or myofunctional exercises, while moderate to severe cases often require surgical intervention. Surgical options include frenotomy, a simpler incision of the frenulum; frenectomy, complete removal of the restrictive tissue; and more advanced techniques such as Z-plasty or laser frenectomy. The choice of procedure depends on factors such as the patient's age, the severity of restriction, and the surgeon's expertise. Laser frenectomy has gained popularity in recent years due to its precision, minimal invasiveness, reduced bleeding, and faster recovery time.¹²

Case Presentation

Case 1

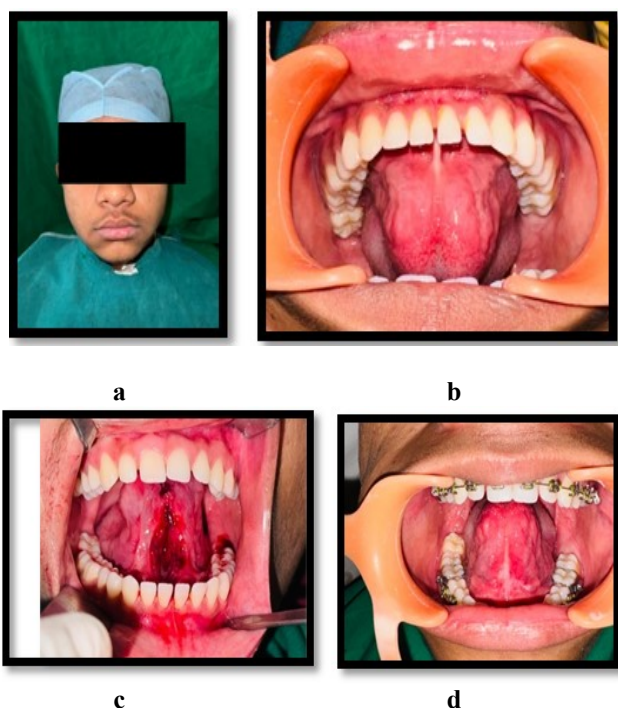


Fig. 1.a), b),c),d) represents the 19 year old patient of ankyloglossia with pre and post operative views respectively



Fig. 3 and 4 presents OPG and cephalogram for the case 1.

A 19-year-old male student presented to the clinic with concerns about poor esthetic appearance due to spacing in the upper and lower dental arches, which had been present for the past three years. In addition, he reported speech difficulties that had persisted for over six years, particularly with articulating certain sounds, which significantly affected his confidence during social interactions. The patient's medical history was unremarkable, with no familial medical conditions. His prenatal history showed no maternal complications, and he was born full-term, meeting all developmental milestones on time. He was breastfed until the age of three, though feeding sessions were notably prolonged. Clinical examination revealed symmetrical facial structures with proportional vertical facial dimensions, competent lips, and smooth, synchronous temporomandibular joint movements bilaterally. There was no palpable tenderness in the lymph nodes, and intraoral examination showed good oral hygiene, with no evidence of dental caries, restorations, or fractures. All permanent teeth were present, and molar and canine relationships were classified as Class I bilaterally. There was, however, significant spacing in the anterior regions of both the upper and lower arches, especially between the central and lateral incisors. The patient exhibited tongue thrusting, which likely contributed to the anterior spacing. Examination of the soft tissues revealed a low and restrictive lingual frenulum, limiting tongue movement. The patient was unable to protrude the tongue beyond the lower anterior dentition, and elevation was significantly restricted. The tongue appeared heart-shaped during elevation, a sign of severe ankyloglossia. Other soft tissues, including the buccal mucosa, palatal mucosa, floor of the mouth, and labial frenum, appeared normal. Based on the clinical findings, a diagnosis of symptomatic ankyloglossia (Kotlow Class III) was confirmed, along with associated dental spacing and speech difficulties. Further investigations, including a Complete Blood Count (CBC), Bleeding Time (BT), Clotting Time (CT), Blood Grouping, Orthopantomogram (OPG), and Lateral Cephalogram, were conducted to support the diagnosis and inform treatment planning. Given the severity of the condition and its impact on both function and esthetics, a multidisciplinary treatment approach was adopted. The management plan included surgical intervention, speech therapy, and orthodontic treatment. A lingual frenectomy was performed under local anesthesia, using a scalpel to carefully incise the restrictive frenulum and release the tethered tissue. The dissection was

conducted with precision to avoid damaging adjacent structures, including the submandibular ducts. Hemostasis was achieved, and the incision was closed with absorbable sutures. Post-surgical examination showed significant improvement in tongue mobility, with the patient now able to protrude and elevate the tongue without restriction. Following surgery, the patient was instructed to follow a soft diet for one week to reduce irritation at the surgical site. Detailed oral hygiene instructions were provided to prevent infection, and analgesics and anti-inflammatory medications were prescribed for pain management. Tongue-stretching exercises were introduced 48 hours post-surgery to enhance mobility and prevent recurrence of tethering. Speech therapy was initiated to address the articulation issues and retrain tongue function, specifically focusing on improving the patient's ability to articulate previously challenging sounds. Orthodontic treatment was planned to correct the anterior spacing in both the upper and lower arches and improve esthetics.

At the one-month follow-up, the patient reported significant improvements in tongue mobility, speech articulation, and overall confidence during social interactions. Clinical examination confirmed no recurrence of tethering, and the patient exhibited excellent compliance with postoperative exercises and speech therapy. Orthodontic treatment was initiated to address the dental spacing and further enhance esthetic outcomes. This case highlights the importance of a comprehensive, multidisciplinary approach in managing symptomatic ankyloglossia with associated dental and speech concerns. Proper treatment planning, patient compliance, and ongoing monitoring were key to achieving a successful outcome, and future follow-ups will continue to track the patient's progress to ensure lasting improvements.

Case 2

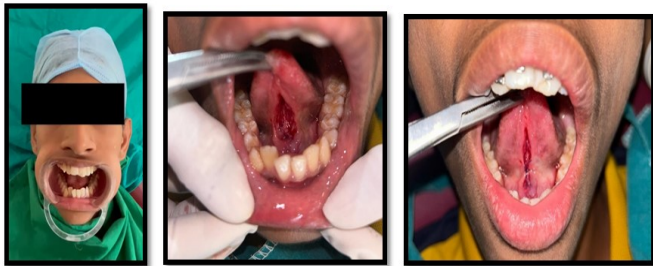


Fig.5 a) b) and c) represents case 2 for ankyloglossia with pre and post operative views respectively

A 16-year-old male presented to the outpatient department of a tertiary care hospital in Akola with complaints of difficulty in speech due to restricted tongue movement for the past 3–4 months. The patient was reportedly asymptomatic prior to this period, but gradually began noticing increasing difficulty in pronouncing certain words, which was attributed to limited tongue mobility. There was no history of trauma or significant prenatal or perinatal events. On clinical examination, the patient exhibited incompetent lips due to proclination of the upper anterior teeth. The lingual frenum was short and thin, measuring approximately 5–6 mm. Dental findings included proclination of teeth 12, 11, 21, and 22, lingually placed tooth 42, and crowding in the upper and lower anterior regions. An Ellis Class I fracture was observed in tooth 21, which also showed slight discoloration. The tongue displayed a heart shape when elevated, with a V-shaped notch at the tip. The

patient demonstrated an inability to fully protrude or elevate the tongue, and the tongue curved downward when extended. Speech difficulties were evident and attributed to these restrictions in tongue movement. The case was classified as Class III Ankyloglossia according to Kotlow's classification. Routine investigations, including CBC, bleeding time, clotting time, HIV testing, and HBsAg testing, were performed to rule out systemic concerns. The anatomical and functional restrictions of the tongue, along with the associated speech difficulties and dental malocclusions, underscore the need for early diagnosis and intervention. Treatment considerations may include a frenotomy or frenuloplasty to release the restricted lingual frenum, followed by orthodontic correction to address dental issues.

The treatment plan aimed to address the restricted tongue movement, speech difficulties, and associated dental malocclusions. Surgical intervention in the form of a frenuloplasty was chosen to release the short and thin lingual frenum. Frenuloplasty, which involves excising and reconstructing the frenum to allow for greater tongue mobility, was preferred over a simple frenotomy due to the severity of the restriction. The procedure was planned under local anesthesia, ensuring minimal discomfort to the patient. Post-operative care and regular follow-ups were emphasized to monitor healing and ensure improved tongue function. Following surgery, post-surgical rehabilitation was planned, including tongue exercises and speech therapy. These exercises focused on stretching, elevating, and improving lateral movements of the tongue to enhance its strength and mobility. Speech therapy was introduced to address residual articulation difficulties and improve the patient's pronunciation of previously challenging words.

Orthodontic treatment was proposed to manage dental malocclusions, including proclination of teeth 12, 11, 21, and 22, as well as lingual placement of tooth 42 and crowding in the anterior regions. Fixed orthodontic appliances were recommended to realign the teeth and correct the proclination. The treatment duration was estimated at 12 to 18 months, depending on the patient's compliance and the complexity of the dental misalignments. The Ellis Class I fracture in tooth 21, accompanied by slight discoloration, was planned to be managed using composite restoration to restore the tooth's esthetics. If discoloration persisted or worsened, further procedures such as veneering or internal bleaching would be considered. Regular follow-up visits were scheduled to track post-surgical improvements in tongue mobility, assess speech outcomes, and monitor orthodontic progress. This multidisciplinary approach was designed to ensure optimal functional and esthetic results, ultimately improving the patient's quality of life.

Case 3



Fig. 6. Represents the 53 year old male representing pre and post-operative view

A 53-year-old male presented with ongoing difficulty swallowing and occasional discomfort in the mouth for the past several years. He also reported progressive speech changes, including unclear articulation over the last five years, which had negatively impacted his confidence and social interactions. The patient's medical history included well-controlled hypertension and mild obesity. He had no known allergies, and his family history was notable for cardiovascular disease. His prenatal, birth, and developmental histories were unremarkable. A smoker for 30 years, the patient quit 10 years ago and consumes alcohol in moderation. Upon clinical examination, the patient's facial features were symmetrical, and the lips were competent. There were no signs of temporomandibular joint dysfunction, though mild tenderness was noted in the masseter muscles, suggesting possible bruxism. The intraoral exam showed good oral hygiene, with no caries, restorations, or fractures. All permanent teeth were intact, and the molar relationships were Class I. There was mild gingival recession and slight wear on the occlusal surfaces, likely due to long-term teeth grinding. A closer examination revealed restricted tongue mobility, with the patient struggling to elevate the tongue fully. The lingual frenulum appeared mildly restrictive, and the tongue exhibited a heart-shaped appearance during attempted elevation. No other abnormalities were noted in the soft tissues of the oral cavity, including the buccal and palatal mucosa. The diagnosis of mild symptomatic ankyloglossia, with associated speech and swallowing difficulties, was made based on clinical findings. Further diagnostic evaluations, including a lateral cephalogram and panoramic radiograph (OPG), were performed to rule out other anatomical causes. Laboratory tests, including a Complete Blood Count (CBC), Bleeding Time (BT), Clotting Time (CT), and Blood Grouping, were ordered to assess the patient's overall health. Given the patient's symptoms, a multidisciplinary treatment approach was recommended. This involved a surgical procedure, speech therapy, and dental management. The patient underwent a lingual frenectomy under local anesthesia, which successfully released the restrictive frenulum, improving tongue mobility. Post-surgery, he was instructed on proper oral hygiene and prescribed analgesics and anti-inflammatory medications for pain relief. Speech therapy was initiated to address the articulation difficulties and to help improve tongue function. Additionally, the patient was referred for dental management to address mild bruxism and prevent further tooth wear.

At the one-month follow-up, the patient reported significant improvements in speech clarity and tongue mobility. He also noted less discomfort during meals, especially with foods that had been difficult to eat due to his limited tongue movement. Clinical examination revealed no recurrence of frenulum restriction, and the patient was compliant with the prescribed therapy. Further follow-up was scheduled to monitor the patient's progress and ensure the continued success of the treatment. This case illustrates the importance of treating symptomatic ankyloglossia, even in middle-aged individuals, to improve quality of life. A multidisciplinary approach combining surgical intervention, speech therapy, and dental management led to substantial improvements in the patient's function and confidence. The immediate postoperative results were promising. The patient reported significant improvement in tongue mobility and an ability to articulate previously challenging sounds. At the one-month follow-up, the patient exhibited further progress, with improved speech clarity and cessation of tongue thrusting. This improvement had a positive

impact on his confidence in social interactions. At the three-month follow-up, the patient had completed initial phases of orthodontic treatment, which successfully reduced the spacing in his dental arches. The combined surgical, therapeutic, and orthodontic interventions not only resolved the patient's functional limitations but also enhanced his overall appearance and self-esteem.

DISCUSSION

Ankyloglossia, or tongue-tie, is a condition where a restrictive lingual frenulum limits tongue movement, potentially causing speech issues, swallowing difficulties, and dental problems. While surgical intervention with scalpel frenectomy remains the gold standard, alternative management options like laser frenectomy, frenuloplasty, Botox injections, tongue-stretching exercises, and speech therapy offer tailored solutions for different patient needs.¹³⁻¹⁵ Laser frenectomy uses precise lasers to release the frenulum, minimizing bleeding and speeding up recovery. It's less invasive than traditional scalpel frenectomy and is increasingly used for adults due to its quick healing and reduced pain. Frenuloplasty is an option for patients with more fibrous or extensive frenula, offering a controlled release and longer-term solution, though recovery times are longer.¹⁶⁻²⁰ For those seeking non-surgical options, Botox injections relax the frenulum and provide temporary relief, ideal for patients unwilling to undergo surgery. Tongue-stretching exercises are another non-invasive option for mild cases of ankyloglossia, though their effectiveness is limited in severe cases. When combined with speech therapy, these exercises can help improve tongue mobility and speech articulation.²¹⁻²³ A multidisciplinary approach is essential for managing ankyloglossia, combining surgical or non-surgical treatment with orthodontics and speech therapy. For example, orthodontic care may be necessary for addressing dental issues related to tongue thrusting, while speech therapy is key to improving articulation in both mild and severe cases.²⁴⁻²⁶

CONCLUSION

In conclusion, while scalpel frenectomy remains the standard treatment for severe ankyloglossia, alternatives like laser frenectomy, frenuloplasty, Botox injections, and non-surgical therapies provide valuable options based on the severity of the condition. A comprehensive, individualized treatment plan involving surgery, speech therapy, and orthodontics ensures optimal functional and esthetic outcomes for patients with symptomatic ankyloglossia.

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