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Ankyloglossia and its management: A case series

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Abstract
Ankyloglossia or tongue-tie is the result of a short and thick lingual frenulum that causes limited tongue movement. Eventually, it may lead to a series of problems such as difficulties in breastfeeding during infancy, abnormal swallowing pattern, speech impairment, malocclusion, and gingival recession. In this case series, three adult patients with ankyloglossia were treated by performing lingual frenectomy using a scalpel under local anesthesia without any complications. This was followed by post-operative recall and speech therapy sessions. A marked improvement in tongue movement and speech was observed at follow-up visits in all the treated cases.

Keywords: Ankyloglossia, tongue-tie, Lingual frenectomy

Introduction
The term 'ankyloglossia' is defined as a partial or complete fusion of the tongue with the floor of the mouth or the lingual gingiva due to an abnormally short lingual frenum, resulting in restricted tongue movement [1]. Tongue-tie may lead to various functional complications like abnormal speech, malocclusion, midline diastema, mandibular lingual gingival recession, inability to swallow the food which could entail difficulty in the normal life activity of an individual. Signs of symptomatic tongue-tie include a notched or heart-shaped tongue tip, a flattened or square-shaped tongue tip when the tongue is extruded, inability to move the tongue sideways and to touch the roof of the mouth or extend beyond the lips or cannot be protruded beyond lower incisor teeth [2]. Various techniques like electro-surgery, laser, and scalpel have been performed in treating tongue-tie. Though each technique has got its advantages and disadvantages, all aim to relieve the high muscle attachment to improve the movement of the tongue. This case series describes the management of a case with ankyloglossia, treated through surgical excision with a scalpel.
Kotlow (1999) [3] has classified the severity of ankyloglossia based on the length of the "free tongue". The free tongue is defined as the length of the tongue from the insertion of the lingual frenum into the ventral surface (base) of the tongue to the tip of the tongue. The clinically accepted length of the free tongue is equal to or more than 16 mm. According to Kotlow, ankyloglossia can be of four types depending on the clinically available free tongue. (Table-1)

Table 1: Kotlow's classification of ankyloglossia (1999) [3]

Class I - Mild type of Ankyloglosssia - Range of free tongue is 12-16mm
Class II - Moderate type of Ankyloglosssia - Range of free tongue is 8-11mm
Class III - Severe type of Ankyloglosssia - Range of free tongue is 3-7mm
Class IV - Complete type of Ankyloglosssia - Range of free tongue is Less than 3 mm

Case Series
The three cases of ankyloglossia presented in this case series were reported to the Department of Periodontics, Nair Hospital Dental College, Mumbai. On intraoral examination, these individuals were diagnosed with Mild (class I), Moderate (class II) & Severe (class III) type of ankyloglossia by utilizing Kotlow's assessment. Lingual frenectomy was performed in all cases using scalpel. Informed consent was obtained for the same.

Case -1 report (Figure 1, 2, 3)
A 26-year-old female reported in the Department of Periodontics and Implantology, NHDC with the chief complaint of slurred speech. On intraoral examination, it was found that the individual had a mild type (Class I) of ankyloglossia by utilizing Kotlow's assessment criteria.

CASE – 1: Mild type of ankyloglossia (Class I)

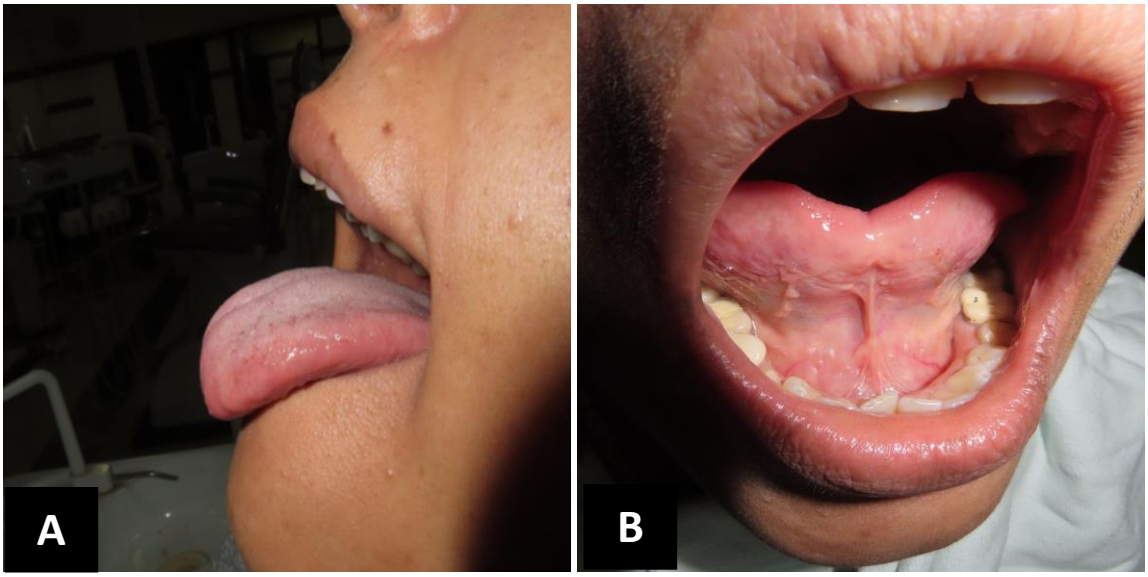


Fig 1: Pre-operative view

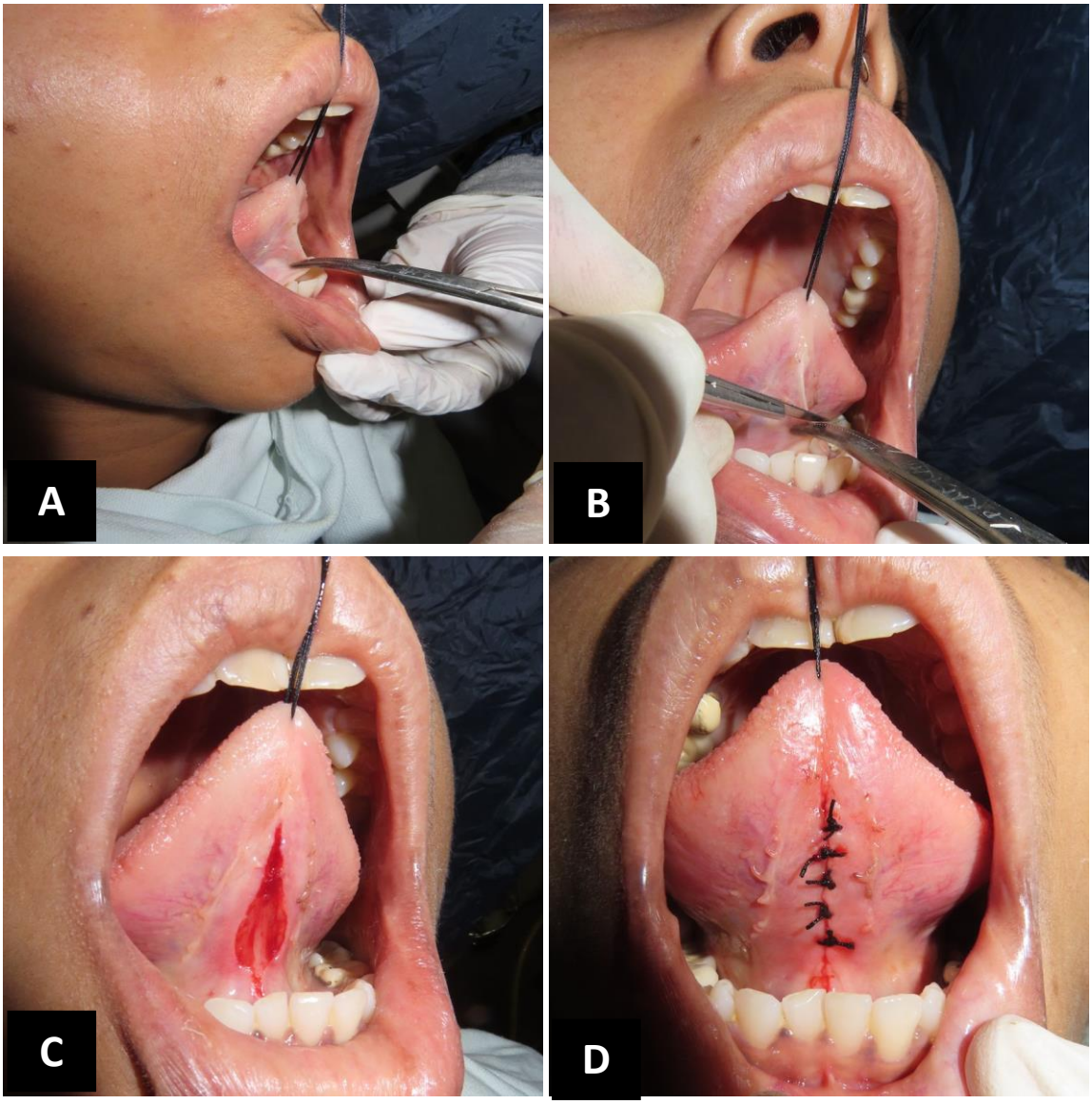


Fig 2: Surgical procedure

Fig 3: Post-operative follow up

Case -2 report (Figure 4, 5, 6)
A 20-year-old male reported in the Department of Periodontics and Implantology, NHDC with the chief complaint of difficulty in speaking. On intraoral examination, the tongue exhibited limited movements leading to inability in movements like protrusion and lateral movements. It was diagnosed as a moderate type (Class II) type of ankyloglossia so frenectomy was planned using the scalpel.

Case – 2: Moderate type of ankyloglossia (Class II)

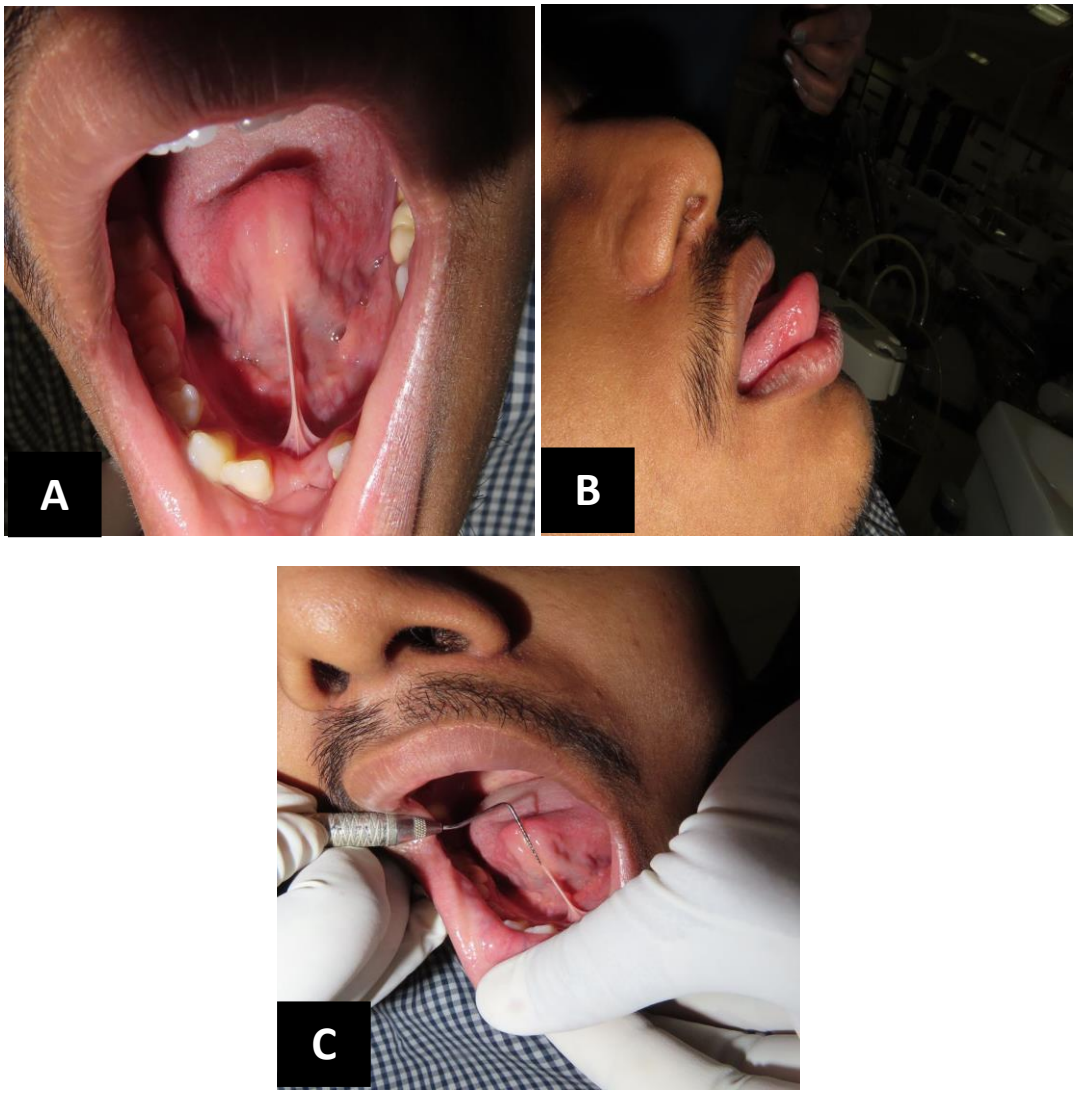


Fig 4: Pre-operative view

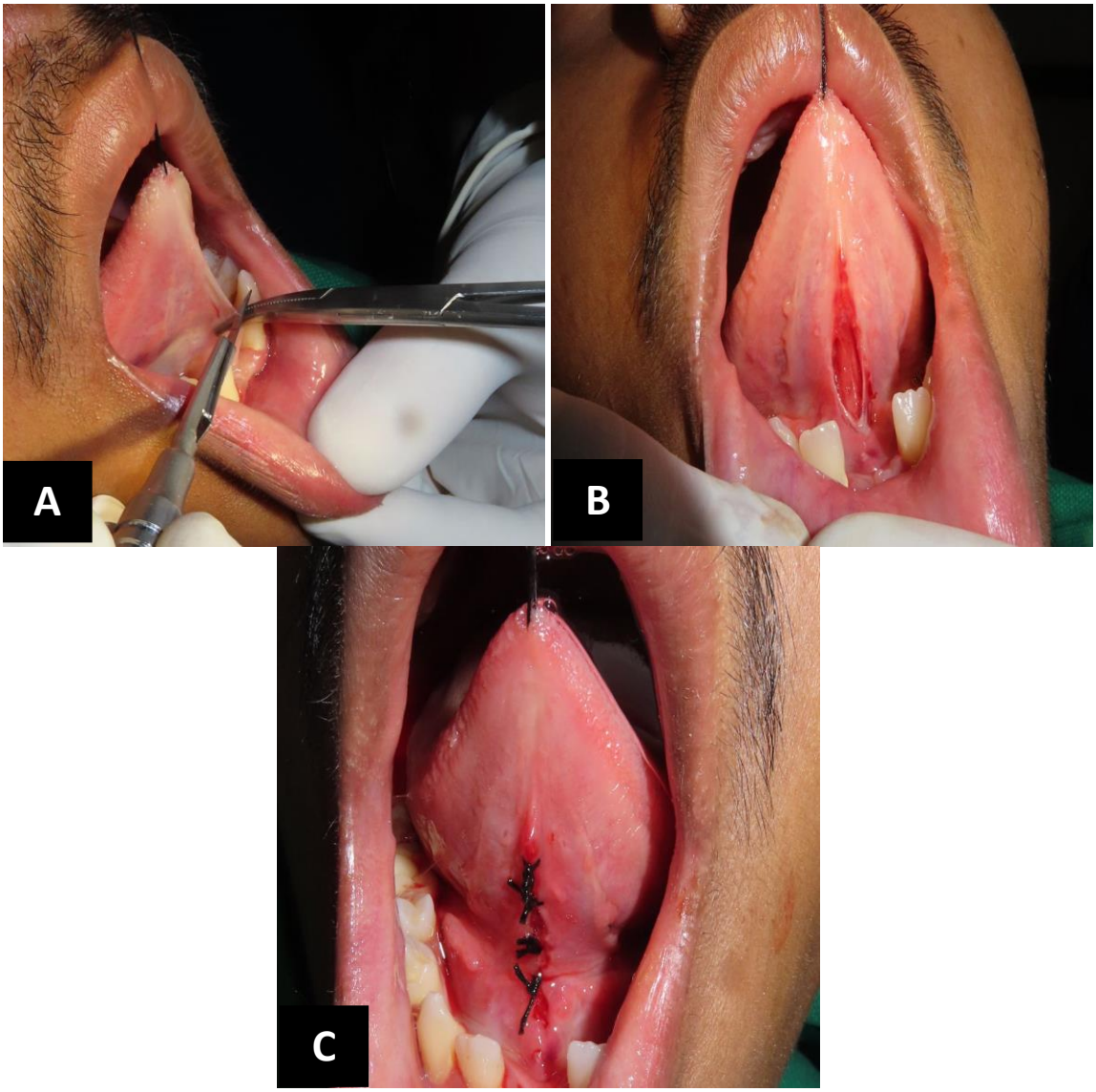
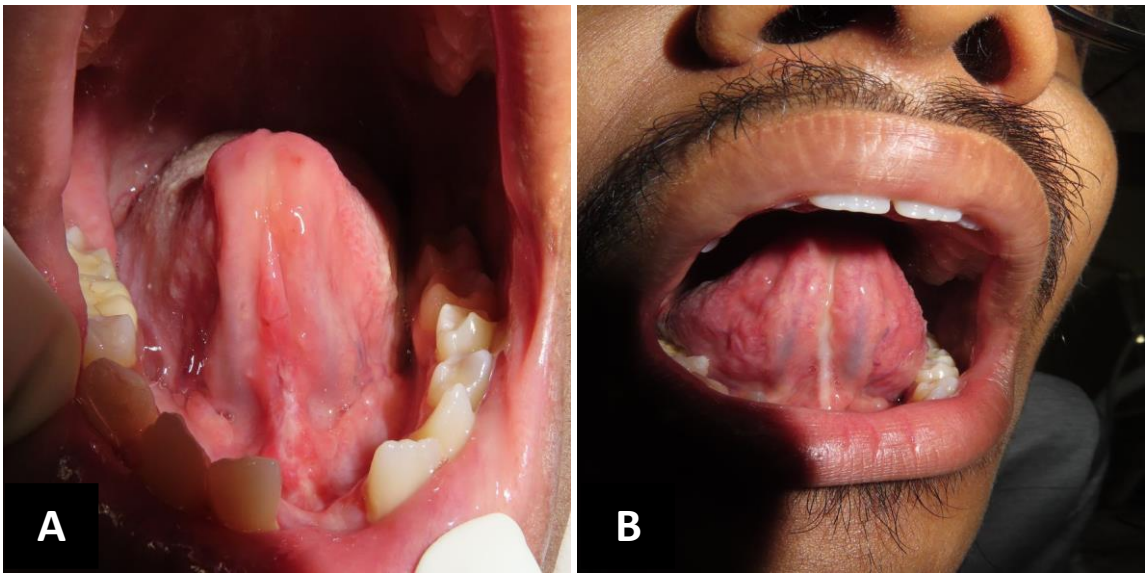


Fig 5: Surgical procedure



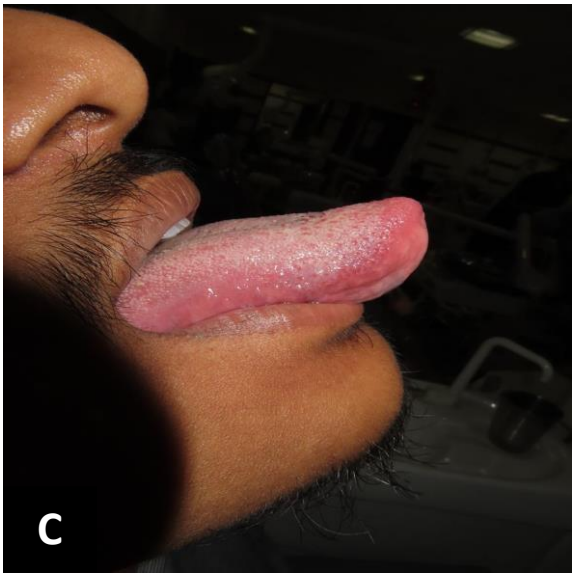


Fig 6: Post-operative follow up

Case -3 report (Figure 7, 8, 9)
An 18-year-old male reported in the Department of Periodontics and Implantology, NHDC with the chief complaint of difficulty in movement of tongue freely, which often causes speech difficulty in pronouncing certain words freely. On intraoral examination, it was found that the individual had a severe (class III) type of ankyloglossia. He was not able to protrude the tongue beyond the lower lip. There were no malocclusion or any dentofacial deformities found.

Case – 3: Severe type of ankyloglossia (Class III)

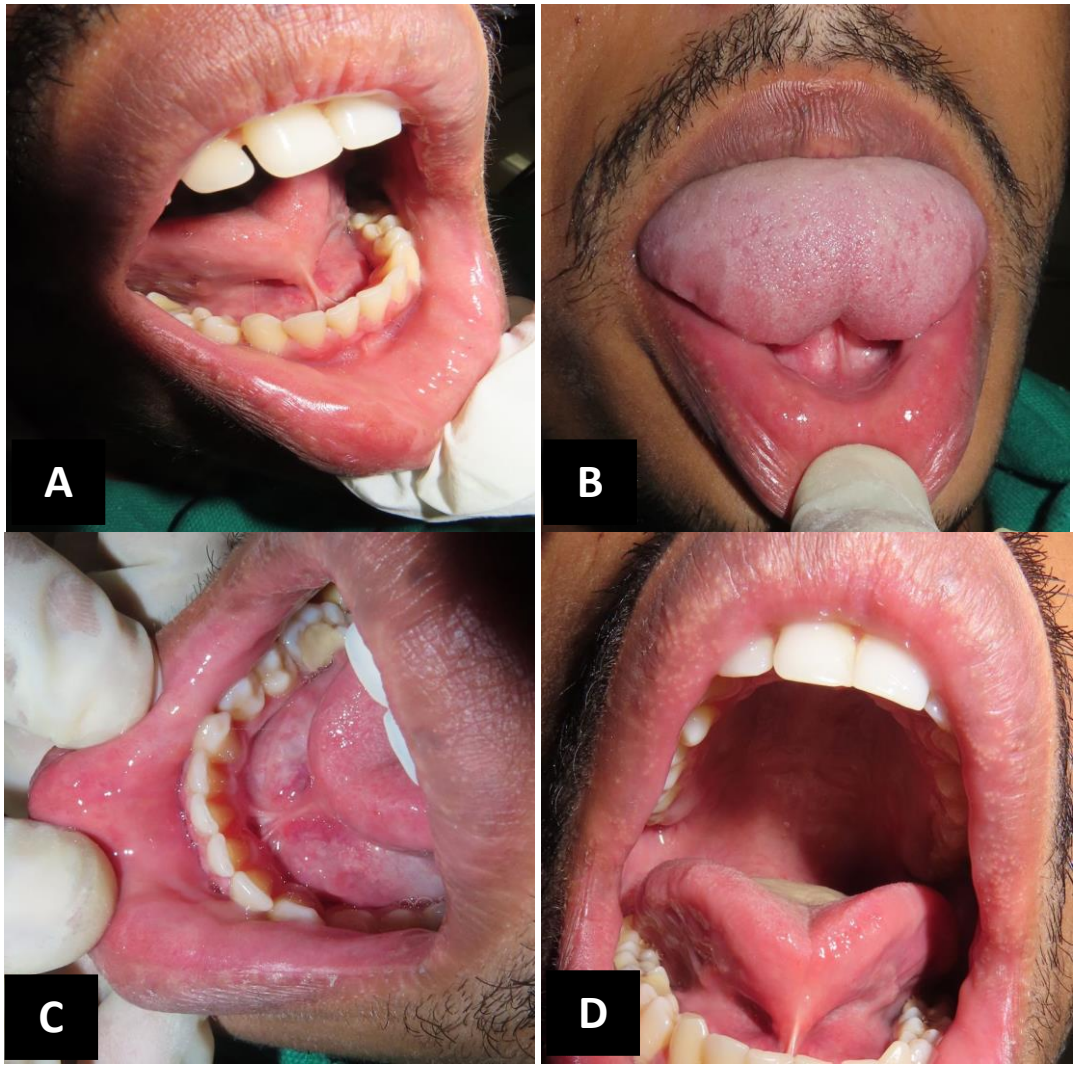


Fig 7: Pre-operative view

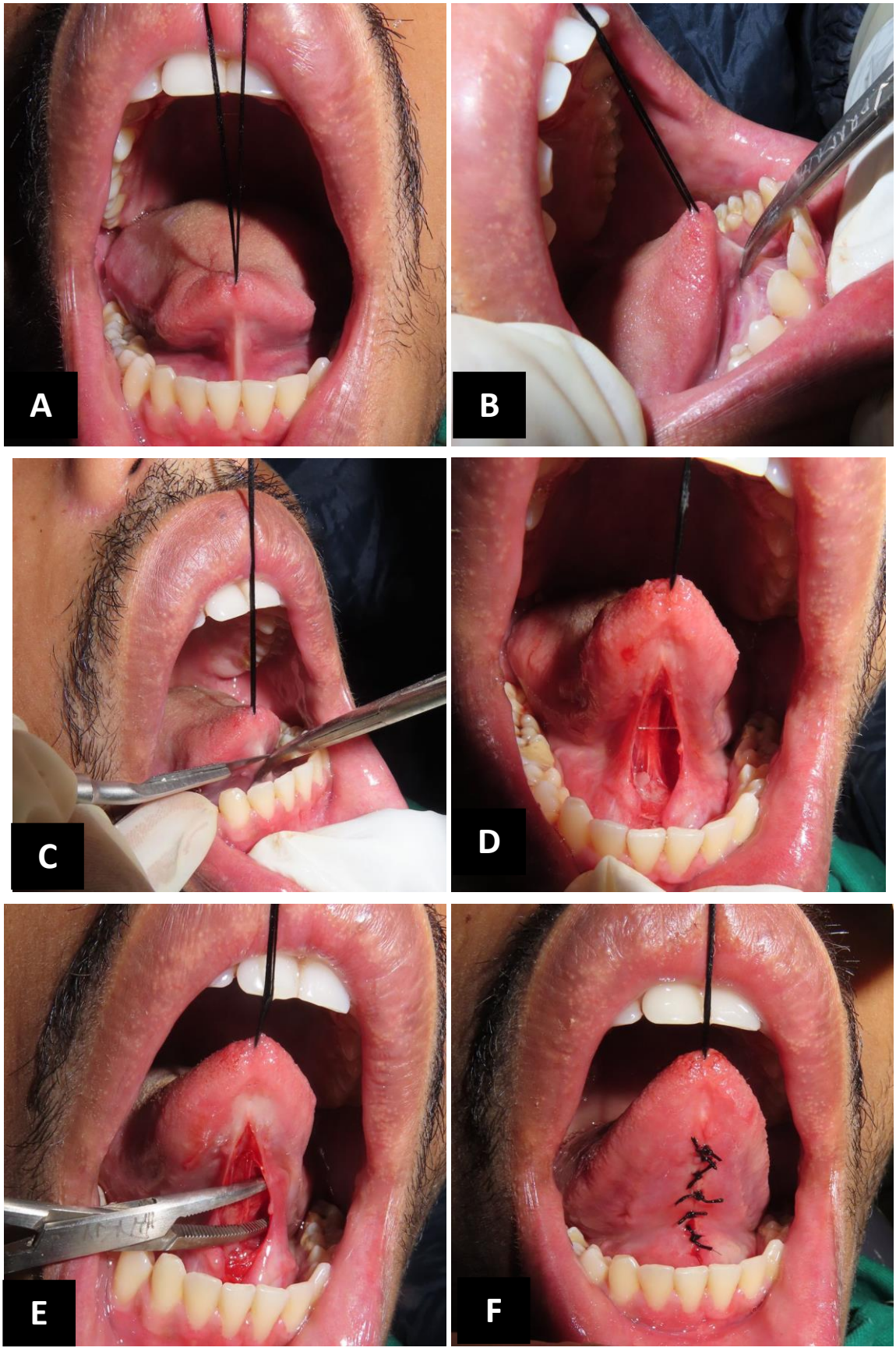


Fig 8: Surgical procedure

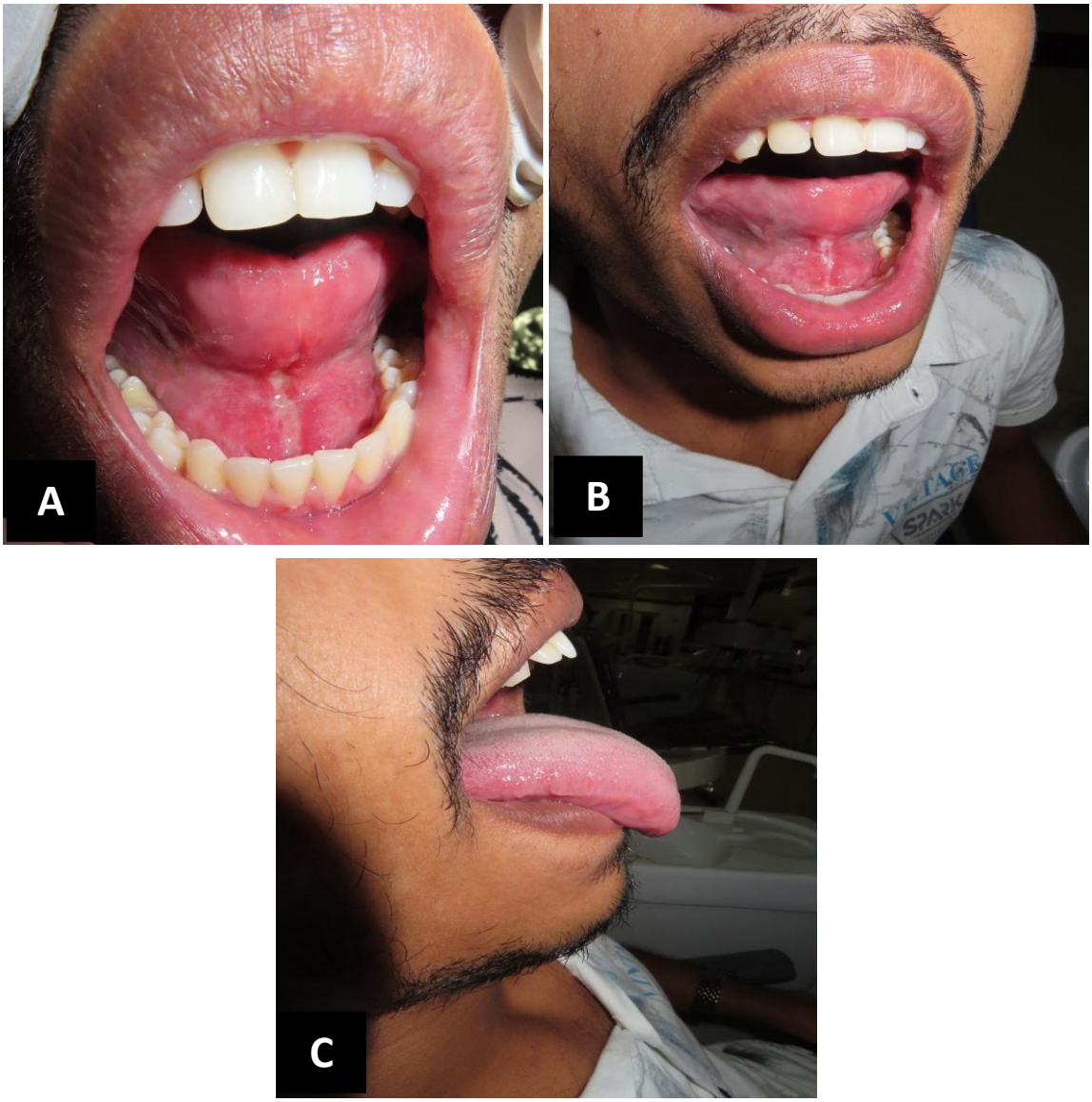


Fig 9: Post-operative follow up

Surgical procedure

After informed consent was obtained from the patient, the patient was advised to rinse the mouth with 0.2% chlorhexidine mouthwash before the commencement of the surgical procedure. 2% lignocaine HCL with 1:80,000 adrenaline (0.5–1 ml) was deposited bilaterally at the base of the tongue, the floor of the mouth for local infiltration anesthesia.

A retraction suture (3-0 silk) was placed at the tip of the tongue to facilitate retraction and visibility in the area of the operating field and to control its movement (Fig.8A). A hemostat was engaged to the bottom of the frenum and clamped at the depth of the vestibule (Fig. 8B). Using a #15 scalpel blade, incisions at the superior and inferior aspects of the hemostat were made and joined at the tip of the hemostat (Fig.8C). Then the intervening frenum was removed and a diamond-shaped wound was obtained (Fig.8D).

Care should be taken to avoid injury to the sublingual glands and submandibular ducts while making the second incision at the inferior aspect of the tongue. The persisting muscle fibers were removed with the help of a hemostat to achieve a good tension-free primary closure of the wound and minimize scar tissue formation (Fig.8E). The hemostasis was achieved and wound edges were approximated with 3-0 silk sutures (Fig.8F). The post-operative and oral hygiene instructions were given to the patient.

Postoperative care

To prevent postoperative infection and pain, amoxicillin (500 mg) thrice daily for 5 days and Ketorolac DT (10 mg) thrice a day for 5 days was prescribed. The pain was present for the first postoperative day but eventually subsided thereafter with the continuation of medications. Tongue exercises were begun after one week, without which no significant improvement of speech can be achieved. Myofunctional exercise for Post-Frenectomy (1st week after surgery) will help tongue-tie recovery and establish proper posture and function. Exercises to be done were as follows:

1. Open the mouth widely, and try to touch the upper front teeth with the mouth still wide open.
2. Stretching of the tongue toward the nose and then downward.
3. Licking of the upper lip and lower lip from one side to the other.
4. Close the mouth and poke both cheeks as far as you can.

Outcome

Sutures were removed after 1 week. A normal slough over the surgical site was present one week post-operatively (Fig.9A). The tongue showed progressive healing and it protrudes

several millimeters beyond the lower lip than before [Fig.9C]. There was no postoperative complication associated with the procedure during the next week of the surgery. After one month of surgery, the patient was re-evaluated, Changes were observed in the frenulum and tongue mobility. Improvement in the speech was observed due to an increase in tongue mobility. The patient reported improvement in oral communication.

Discussion

Ankyloglossia can also be a part of a few rare syndromes like Van der Woude syndrome [4], X-linked cleft palate syndrome [5], Opitz syndrome [6], and Kindler syndrome [7]. However, the majority of the affected individuals do not suffer from any of these congenital anomalies. Speech problems are evident in the articulation of consonants like t, z, s, d, l, ch, j, sh, th, d [8]. Ideally, frenectomy should be performed before the development of abnormal swallowing patterns and speech. The appropriate management and surgical intervention of ankyloglossia, followed by speech therapy delivers good results at an early age and reduces the risk of long-term complications. Thus, early intervention is the optimal management instead of 'wait and watch policy. However, in older individuals operated with a frenectomy, a consult with a speech therapist is necessary to set up normal tongue functions.

The incapacity to lift the tongue to the roof of the palate results in the development of an immature swallow pattern and leads to an open bite deformity. The lack of a free backward and upward movement of the tongue may result in anterior thrusting of the tongue in opposition to the anterior body of the mandible produces mandibular prognathism.

A normal range of motion of the tongue is indicated by the following criteria:

1. The tip of the tongue should be able to protrude outside the mouth without clefting.
2. The tip of the tongue should be able to sweep the upper and lower lips easily without straining.
3. When the tongue is retruded, it should not blanch the tissues lingual to the anterior teeth.
4. The lingual frenum should not create a diastema between the mandibular central incisors.

Though, Local anesthesia is often used when a patient is cooperative (as in this case report). However, sedation or general anesthesia may be necessary when treating an infant or young child.

Conclusion

Ankyloglossia in adults leads to limitation of the tongue protrusion, elevation, and especially speech problems could be improved by surgical intervention. The clinical outcome following the surgical frenectomy for the cases presented here showed better healing with improvement in tongue movements. Although various classes of tongue-ties may be diagnosed, one should intervene at an early stage to prevent the development of abnormal speech and swallowing patterns. Thus, to prevent the long-term abnormal effects of tongue-tie, early diagnosis and prompt surgical intervention are necessary.

Conflicts of interest

There are no conflicts of interest

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