

Case Report

Treatment of Ankyloglossia-A Two Hemostat Guided Surgery

Vinayaka A M^{1*}, Shivani Bhagat², Triveni M G³, Gayathri G V⁴

^{1,2}Post Graduate Student, Department of Periodontics, Bapuji Dental College & Hospital, Davangere, 577004, Karnataka, India

³MDS, Professor, Department of Periodontics, Bapuji Dental College & Hospital, Davangere, 577004, Karnataka, India

⁴MDS, Professor, Head of the Department, Department of Periodontics, Bapuji Dental College & Hospital, Davangere, 577004, Karnataka, India

***Corresponding Author**

Dr. Vinayaka AM

Article History

Received: 17.03.2020

Accepted: 24.03.2020

Published: 28.03.2020

Abstract: Ankyloglossia or tongue-tie is a congenital anomaly with a short, tight, lingual frenulum leading to difficulty in pronunciation due to restricted tongue movement. In this case report, we have reported a 19-years-old, 18-years-old & 17-years-old male patients with tongue-tie & both were complained of distress in their speech articulation following which they both encountered with frenectomy operation concealed by local anesthesia without any complications. Decisively, they both were habituated by Oral Physiotherapy of tongue.

Keywords: Ankyloglossia, frenectomy, speech therapy.

INTRODUCTION

In vertebrates the most essential organ in maxillofacial region is believed to be the tongue, because of its influence in the the act of swallowing, speech, position of the teeth & nutrition [1]. The tongue tie is a congenital anomaly & it is very common physiological anomaly of the tongue that limits the utilization of the tongue and it is scientifically referred as ankyloglossia[2].

In prenatal period, a powerful strings of tissue accompaniment the event of oral frenulum development that is positioned within the mouth centaly. Postnatally, this lingual frenulum continues to escort the positioning of deciduous teeth [2].

As child grows, the lingual frenulum shrinks and becomes thin and further it reaches its final position that is the base of the tongue. Nevertheless, in few children it fails to recede. Therefore it results with high attachment and immobility of tongue [3].

Several studies tested the distinct diagnostic criteria have found a prevalence of congenital abnormality between 4 and 100% [4, 5]. The incidence rate of condition in infant's ranges from 25% to 60%, with higher predilection for males compared to females with a ratio 2.5: 1. The presence of high lingual frenum attachment affects the functions of the tongue such as restricted movement, swallowing, compromised nutrition in infants, speech defects especially difficulty in articulation of words like l, t, d n, th, sh, and z. The complications of ankyloglossia such as lingual gingival recession, spacing between lower incisors, impaired oral hygiene maintenace and in severe cases can even cause distortion of the shape of the tongue [5].

Ankyloglossia in infants has an incidence rate from 25% to 60%, and its presence will cause problem in breastfeeding starting from failure to thrive to even refusing the breast [6-8]. The condition can be associated with rare syndromes like Smith-Lemli-Opitz syndrome, Orofacial digital syndrome; Beckwith Weidman syndrome, Simpson-Golabi Behmel syndrome, and X-linked congenital anomaly with chromosome dominant or recessive attribute [9-12].

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Once the diagnosis has been established further surgical intervention may be required to eliminate the associated problems. These aberrant frenae can be treated by frenectomy, a procedure where frenum is removed completely by means of scalpel, electro-surgery or lasers. The aim of this case series is to discuss the management of three such cases by conventional scalpel technique.

Case number 1

A 19-year-old male patient reported to the Department of Periodontics, Bapuji Dental College and Hospital, Davanagere, Karnataka, India, with the chief complaint of bad breath. Upon Oral examination of the patient revealed not only dental plaque and calculus accumulation along with the thick, short frenulum, restricted tongue protrusion, and lifting of the tip of the tongue latter diagnosed as an ankyloglossia (Figure 1).

Case Number 2

An 18-year-old male patient reported to the Department of Periodontics, to get his teeth cleaned. Upon clinical examination, the stains and calculus were found, with localized bleeding on probing in relation to lower anterior teeth along with reduced tongue movements, bifid or heart shape of the anterior tip of the tongue was seen upon attempted extension of the tongue hence the diagnosis ankyloglossia (Figure 2).

Case Number 3

A 17-year-old male patient reported with the chief complaint of restricted tongue movement. Clinical examination revealed ankyloglossia with attachment extending upto the tip of the tongue, giving a bifid appearance (Figure 3).

Clinical Assessment

All the cases were assessed clinically by Kotlow's criteria (Table 1) in which normal range of motion of the tongue was assessed [1], Hazelbaker's assessment tool (Table 2) to evaluate the functional movement and appearance of the tongue. [3, 13, 14] Upon diagnosis of an ankylosed tongue, each of the patients was informed about the abnormality, its functional implications, and the variety of surgical approaches. The patients were non-syndromic and the family and medical history were non-conducive. ENT and general physical examination revealed insignificant. Hematologic examination of the patients was within normal range. After obtaining the informed consent, the following procedures were carried out for the correction of high lingual frenulum.

Clinical Management

Phase I therapy was performed for all the cases 1 week prior to the surgical procedure, following that lower lingual frenectomy with was planned. Topical anesthetic spray (LOX 10% spray) was applied to the underside of the tongue following which local anesthesia was administered (2 % Lidocaine with 1: 80,000 adrenalines). A hemostat was used to clamp the frenum and incisions were placed with #15 Bard Parker (B.P) blades (Figure 1a). Two incisions were given, one above the hemostat and other beneath the hemostat(Figure 1b) so as to release the complete frenum starting from tip of the tongue till the base of frenum. After undermining the fibers (Figure 1c) and achieving hemostasis, the incisions were passively approximated with simple interrupted Trulon 4-0 suture material (Ethicon® USA) (Figure 1d). Postoperative instructions were given and analgesics were prescribed. For oral hygiene maintainance, 0.2% chlorhexidine mouthwash was given twice daily for two weeks and patients were asked to avoid vigorous tongue movements/stretching the tongue. The patients were recalled after 7 days for suture removal (Figures 4, 5 and 6) and were kept on regular follow-up for 12 months.

The following tongue exercises were advised after suture removal [15].1) Stretch the tongue up towards the nose, then down towards the chin and repeat, 2) Open the mouth widely and touch the front teeth with the tongue with mouth still open, 3) Close the mouth and poke the tongue into the left and right cheek to make a lump: for 3 to 5 minute bursts, once or twice daily for 3 weeks post-suture removal. After 12 months, there was no recurrence in any of the cases and reassessment was done for all the cases by using the same criteria.

RESULTS

Employing the Kotlow's criteria and Hazelbaker's assessment tool, preoperative and postoperative scores were recorded by using UNC periodontal probe as a measuring tool. After 12-months followup, significant improvement in prognosis of symptoms of the ankyloglossia was observed in all the three cases(Figures7, 8 and 9). Free tongue movement increased from 7, 9, and 8 mm to 13,14, and 15 mm (Table 3), respectively, and functional score of 9 and 10 and appearance score of 6 and 7 were changed to 6, 6, and 7 were changed to 14, 13, 12, and 9, 9, and 10 (Table 4), respectively.

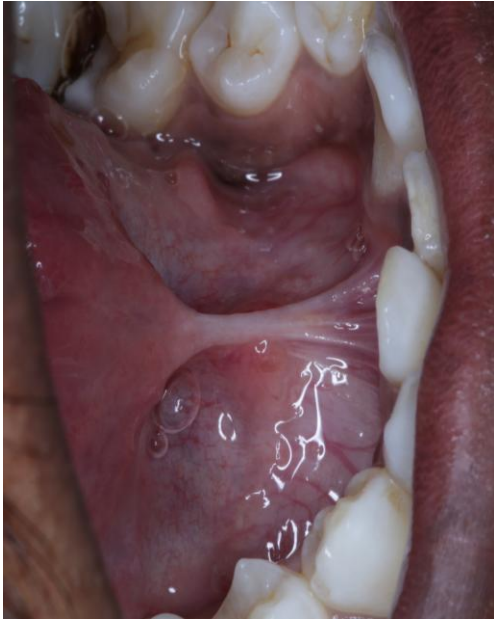


Fig-1: Preoperative photograph (Case 1)



Fig-1b: Two incisions were given, one above the hemostat and other beneath the hemostat



Fig-1a: hemostat was used to clamp the frenum and incisions were placed with #15 Bard Parker (B.P) blade



Fig-1c: Undermining the fibers



Fig-1d: Simple continuous interrupted Trulon 4-0 suture material (Ethicon® USA)



Fig-4: Postoperative photograph after 7 days (Case 1)



Fig-2: Preoperative photograph (Case 2)



Fig-5: Postoperative photograph after 7 days (Case 2)



Fig-3: Preoperative photograph (Case 3)



Fig-6: Postoperative photograph after 7 days (Case 3)



Fig-7: Postoperative photograph after 1 year (Case 1)



Fig-9: Postoperative photograph after 1 year (Case 3)



Fig-8: Postoperative photograph after 1 year (Case 2)

Table-1: Kotlow's classification

| Type | Movement of the tongue |
|---|------------------------|
| Clinically acceptable, normal range of free tongue movement | Greater than 16 mm |
| Class I: Mild ankyloglossia | 12 to 16 mm |
| Class II: Moderate ankyloglossia | 8 to 11 mm |
| Class III: Severe ankyloglossia | 3 to 7 mm |
| Class IV: Complete ankyloglossia | less than 3 mm |

Table-2: Hazel baker’s Assessment tool for appearance and function of the tongue

| Appearance | Function |
|---|--|
| Appearance of tongue when lifted | Lateralization |
| 2: Round or square | 2: Complete |
| 1: Slight cleft in tip apparent | 1: Body or tongue but no tongue tip |
| 0: Heart or V-shaped | 0: None |
| Elasticity of frenulum | Lift of tongue |
| 2: Very elastic | 2: Tip to mid-mouth |
| 1: Moderately elastic | 1: Only edges to mid-mouth |
| 0: Little or no elasticity | 0: Tip stays at lower alveolar ridge or rises to mid-mouth only with jaw closure |
| Length of lingual frenulum when tongue lifted | Extension of tongue |
| 2: >1 cm | 2: Tip over lower lip |
| 1: 1 cm | 1: Tip over lower gum only |
| 0: <1 cm | 0: Neither of the above, or anterior or mid-tongue humps |
| Attachment of lingual frenulum to tongue | Spread of anterior tongue |
| 2: Posterior to tip | 2: Complete |
| 1: At tip | 1: Moderate of partial |
| 0: Notched tip | 0: Little or none |
| Attachment of lingual frenulum to inferior alveolar ridge | Cupping |
| 2: Attached to floor of mouth or well below ridge | 2: Entire edge, firm cup |
| 1: Attached just below ridge | 1: Side edges only, moderate cup |
| 0: Attached at ridge | 0: Poor or no cup |
| | Peristalsis |
| | 2: Complete, anterior or posterior |
| | 1: Partial, originating posterior to tip |
| | 0: None or reverse |

14 = Perfect score, 11 = Acceptable if appearance item score is 10. Frenectomy is necessary if function score is <11 and appearance score is <8.

Table-3: Pre-operative and post-operative assessment of free tongue movement in all the 3 cases by using Kotlow’s criterias

| Case number | Pre-operative free tongue movement | Diagnosis | Post-operative, free tongue movement | Diagnosis |
|-------------|------------------------------------|-----------|--------------------------------------|-----------|
| 1 | 7 mm | Class III | 13 mm | Class I |
| 2 | 9 mm | Class II | 14 mm | Class I |
| 3 | 8 mm | Class II | 15 mm | Class I |

Table-4: Pre-operative and post-operative assessment of functional and appearance score of all the 3 cases by using Hazel-Baker’s assessment tool

| Case number | Pre-operative function score | Pre-operative appearance score | Post-operative function score | Post-operative appearance score |
|-------------|------------------------------|--------------------------------|-------------------------------|---------------------------------|
| 1 | 9 | 6 | 14 | 9 |
| 2 | 10 | 6 | 13 | 9 |
| 3 | 10 | 7 | 12 | 10 |

DISCUSSION

In the existing line of work, a case series of people who were diagnosed with ankyloglossia and approached with different surgical techniques were presented. The selection of the technique was supported on appropriate circumstances carefully evaluated preoperatively.

After the institution of diagnosis of ankyloglossia, the clinicians may conflict in the management of those patients, since there is no literature or consensus on the data point, timing and variety of surgical intervention. The introspection of lingual frenulum should conceive the structural and functional prospect of the tongue. The

indicant of surgical treatment for purposeful limitations because of congenital disorder ought to think about forefront, if appraisal shows that perform could also be bolstered by surgical intervention [16].

Meticulous diagnosis of ankyloglossia and primordial intercession are adjutory, since several consequences ranging from restriction of tongue movement to alteration of mandibular growth may happen. Speech problems are the most communal indications for lingual frenulum surgery [17, 18].

Frenectomy involves the complete surgical excision of the frenulum. This procedure is more invasive and difficult to be performed in young children, although the results are more predictable, decreasing the recurrence rate [19, 20]. Till now there are no absolute parameters regarding the timing of frenectomy in the available literature [20, 21]. Withal, the surgery should be performed before the child develops abnormal swallowing and speech patterns. When the operation is performed in older children, they should be intending to a speech therapist in ordination to reestablish the normal functions of the tongue [20].

In the cases presented here, frenectomy were performed with the aid of different instruments, such as hemostats and scalpel. The hemostats are used to delimit the area to be excised as well as to guide the incisions. When two hemostats are used, the risk of inadvertent soft tissue laceration is decreased, since the operator should only follow the hemostats with a blade to completely remove the tissue. After the release of the tongue, care must be taken not to injury the submandibular ducts when making the second incision at the lower aspect of the frenulum [22].

It is important to agree upon one examination criteria, about the rationale and it's gradation of tongue ties to implement comparisons between future observational and interventional data points, Likewise the criteria used in the present case series from the the kotlow's diagnostic and Hazelbaker's assessment tool gave us an complete insight of the staging and morphological features of the diagnosed ankyloglossia. Both criterias also aids us to compare and evaluate the preoperative and postoperative status of the anamoly, which has helped us to do the treatment planning in a more scientific manner. Henceforth the significant results obtained from the present cases depicted here helped us to inculcate and learn not only the morphotype of the ankyloglossia but also the functional aspects were observed tends to be true from the present case series [13].

CONCLUSION

Optimal management of ankyloglossia including well timed and properly managed surgical intervention followed by the proper tongue exercises and speech therapy as and when indicated holds the potential to deliver pleasing results in the diagnosed ankyloglossia cases.

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