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Ankyloglossia- Detailed Review with a Case Report

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Ankyloglossia is derived from Greek terms skolios (curved) and glossa (tongue). Ankyloglossia or tongue-tie is a congenital condition that results due to abnormal attachment between the tongue and floor of the mouth, leading to an abnormally short tongue. Several problems are associated with ankyloglossia. Since there is never an accepted standard criterion nor clinically practical criteria for diagnosing the condition; proper defining of the term is necessary before contemplating whether to treat or not to treat. In children, ankyloglossia is asymptomatic in many cases. As growth occurs condition resolves spontaneously, or in some mild cases children may learn compensatory mechanisms to counteract decreased lingual mobility. Frenotomy/ frenectomy are an effective treatment for ankyloglossia.

KEYWORDS: Ankyloglossia, Tongue tie, Tongue division, Frenotomy, Frenulotomy.

INTRODUCTION

Ankyloglossia is derived from greek terms skolios (curved) and glossa (tongue). Tongue tie is nonmedical term used to define the same condition that limits the use of the tongue. Ankyloglossia or tongue-tie is a congenital condition that results due to abnormal attachment between the tongue and floor of the mouth, leading to an abnormally short tongue.^{1,2} Characteristically there is short and thick lingual frenum that limits the movement of tongue.the abnormal short and thick frenulum causes the tongue to become heart-shaped upon protrusion. Ankyloglossia is sometimes self- corrective, as child age advances, the frenum recedes to a more lower position thus increasing tongue mobility.³ Prevalence of ankyloglossia is between 4.2% and 10.7% depending on the population examined. It is more common in males, with male to female ratio of 2.5: 1.0.⁴ Ankyloglossia can present as single entity or be a part of certain rare syndromes like i) smith-lemli-opitz syndrome, ii) orofacial digital syndrome,iii) beckwith weidman syndrome, iv) simpson-golabi-behmel syndrome, v) x-linked cleft palate syndrome, vi) kindler syndrome, vii) van der woude syndrome viii) opitz syndrome, ix) ehlers-danlos syndrome, x) beckwith-wiedemann syndrome, xii) simosa syndrome, and others . It is

also frequently seen in children of mother's with cocaine use.⁵

Problems associated with ankyloglossia are:

1. Infants with restrictive ankyloglossia cannot extend their tongues over the lower gum line to form a proper seal and every time they must use their jaws to keep the breast in the mouth.⁶
2. In infants, ankyloglossia can cause difficulties with breastfeeding; poor milk suckling can ultimately lead to failure of infant to flourish due to malnutrition associated with suckling. Ultrasound studies of breastfeeding in affected children demonstrated abnormal tongue mobility required for effective breastfeeding.⁷
3. For feeding mothers there shall be breast pain and engorgement, nipple damage, maternal breast pain, poor milk ejection, breast engorgement, and refusal to feed.⁸
4. Inability to raise the tongue to the roof of the mouth may prevent development of an adult swallow and encourage continuation of the infantile swallow, which may lead to open-bite.⁹
5. Absence of free upward and backward movement of the tongue causes exaggerated thrusting of tongue against anterior body of the mandible and produce a mandibular

prognathism.^{2, 10}

6. Mandibular prognathism and maxillary hypo development due to the low position and the forward and downward pressure applied by tongue.¹¹

7. Gingival recession on the lingual surfaces of lower incisors.¹²

8. Greater periodontitis with lower anterior due to improper cleansing.¹²

Diagnosis: What is Ankyloglossia?

Before one contemplates treatment, it is necessary to understand the term properly. Since there is never an accepted standard criterion nor clinically practical criteria for diagnosing the condition; proper defining of the term is necessary before contemplating whether to treat or not to treat; this lack of standardized criteria for diagnosing ankyloglossia is one of the Canadian paediatric society's main criticisms of research on this condition.¹³ Search through literature has yielded following criteria as discussed in Table 1.

CASE REPORT

A Male child aged 7 years was referred to our hospital from speech therapist regarding problem in articulation of speech. Prior history from medical reports suggested that the child was under treatment for improvement of speech past 2 years. The child had initially reported to speech therapy due to misarticulation of certain words during speech which caused social apathy and ridicule amongst siblings. Though the child showed improvements in certain syllables following speech therapy, the cause for referral was to free the tongue to improve overall mobility of tongue to improve the child's speech in entirety.

Clinical examination showed an otherwise normal child. Intraoral examination of area of interest showed the presence of thick and short lingual frenum (figure-1). Movements of tongue were restricted in all directions (figure 2). Protrusion of tongue was approximately 4 mm from vermilion border (figure 3). Heart shaped tongue on protrusion of tongue (figure 3). There were speech abnormalities for sounds like "s, z, ch, sz". Other problems like plaque and calculus was seen especially in the lower lingual aspect of anterior which can be attributed to limited tongue movement.

A diagnosis of severe ankyloglossia was given. It was decided to relieve the tongue from its lingual frenum.

Pre-treatment preparation: oral prophylaxis was performed and patient was advised antiseptic mouthwash twice a day for 1 week before the planned surgery.

TREATMENT DONE

After performing proper antisepsis of site, local anaesthesia was given to provide good pain control during procedure. Later tongue was stabilized while performing procedure. Incisions were marked with indelible pencil outlining the future areas of cuts. Important anatomical landmarks like submandibular & sublingual duct and lingual vessels were protected to prevent undue damage and postoperative complications. Dissection was carried out through submucosa and the muscle layer; later movement of the tongue is assessed for amount of freeing of the tongue (figure 4). Diode laser was used at a wavelength of 750 nm and power of 2 W in non-contact mode. Multilayer suturing of muscles and submucosa was contemplated. Achievement of haemostasis was checked before relieving the patient. Antibiotics and analgesics with information regarding oral hygiene were mentioned.

Post operatively the patient was followed 1 day, 1 week, and 3 month after surgery. Post operatively there was improvement in movement of tongue (figure 5). Report from speech therapy indicated a betterment of syllables too.

DISCUSSION

There are wide and different views regarding its clinical significance and optimal management of ankyloglossia. In children, ankyloglossia is asymptomatic in many cases. As growth occurs condition resolves spontaneously, or in some mild cases children may learn compensatory mechanisms to counteract decreased lingual mobility.^{3,15}

Some children, however, benefit from surgical intervention of their tongue tie. Frenotomy/frenectomy are an effective treatment for ankyloglossia.^{12,16} Several classifications are available to distinguish severity of ankyloglossia-

all of which aid in deciding the need for treatment-
i) Kotlow's classification (table 2)¹⁷ ii) Hazel baker's classification the assessment tool for lingual frenulum function (ATLFF) (figure 8)¹⁸

Several complications can occur during frenotomy like haemorrhage (damage to vessels in the floor of the mouth-e.g. lingual artery), secondary infection during healing stages, and in rare cases hyperopia due to falling back of tongue.¹⁹ Frenectomy is not done in all cases, but performed only when its benefits outweigh risk with the procedure. Indications include- children with abnormal swallowing pattern, defect in speech, malocclusions. Speech problems especially in children can cause social problems, licking ice cream, kissing with tongue, playing wind instruments, whistling and ridicule amongst siblings. In case of speech disorders associated with tongue tie, it is important to consult speech therapy before and after contemplating treatment to re-establish proper speech. With tongue tie the speech deformity is especially seen for "r" and other consonants like "s, z, t, d, l, j, zh, ch, th, dg."²⁰

PROGNOSIS

Several criteria can be used to check for successful treatment of ankyloglossia like- i) absence of Complications, ii) improvement of breastfeeding (characterised by weight gain), iii) presence of good Latch iv) amount of tongue protrusion (Kotlow's criteria).^{6,21,22}

In present case the child showed improvement in tongue protrusion, speech improvements. Advantages of using laser in present case included haemostasis, little/ no local anaesthesia requirement, less post-operative complications like pain, swelling, good antisepsis, no need for suture, better accessibility of working area.²³

LEARNING POINTS

- Not all cases of ankyloglossia require treatment. Selection of cases should be against strict criteria.
- Consultation with speech therapist before and after contemplating treatment to re-establish proper speech is required. Hence a multi-disciplinary approach is very important.
- Treatment with soft tissue have several benefits.

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LEGENDS

AUTHOR	YEAR	CRITERIA
Fleiss et al.	1990	Tongue tip cannot reach top of gums; tongue tip cannot swing from one corner of mouth to the other; tongue displays notching when protruded; tongue cannot be protruded beyond
Masaitis and Kaempf	1992	Frenulum short, thick, and fibrous; frenulum extends to the papillated surface of tongue.
Messner and Lalakea	1996	Tongue heart-shaped when protruded; inability to bring tongue over lower gum ridge.
Messner et al.	2000	Frenulum abnormally short.
Harris et al.	2000	Frenulum abnormally short and thick.
Griffiths	2004	Frenulum thick; tongue heart-shaped when protruded.
Hogan et al.	2005	Frenulum extending along 25%-100% of tongues' total length.
Wallace	2005	condition in which the tip of the tongue cannot be protruded beyond the lower incisor teeth because of a short frenulum. Patients should be asked to pronounce certain words which start from "l," "th," "s," "d," and "t" to check the accuracy of the word pronunciations.

Table 1. Criteria for diagnosing ankyloglossia

KOTLOW'S CLASSIFICATION		
Clinically acceptable	NORMAL RANGE OF FREE TONGUE MOVEMENT	> than 16 mm
Class I:	MILD ANKYLOGLOSSIA	12-16 mm
Class II:	MODERATE ANKYLOGLOSSIA	8-11 mm
Class III:	SEVERE ANKYLOGLOSSIA	3-7 mm
Class IV:	COMPLETE ANKYLOGLOSSIA	< than 3mm

Table 2. Kotlow's classification to distinguish severity of ankyloglossia



Figure 1. Presence of thick and short lingual frenum pre-operatively



Figure 2. Restricted movements of tongue in all directions



Figure 3. Protrusion of tongue was approximately 4 mm from vermilion border also heart shaped tongue on protrusion of tongue



Figure 4. Presence of thick and short lingual frenum pre-operatively



Figure 5. Post operative view of patient at 3 months after surgery