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Surgical frenectomy versus laser frenectomy in pediatric patients with ankyloglossia: Case report

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Abstract

Ankyloglossia is a congenital anomaly. It is also known as tongue-tie. A short lingual frenum is a characteristic feature of this anomaly.[1, 2] This term has been used to describe a tongue that is attached to the floor of the mouth as well as a tongue with decreased mobility due to a short and thick lingual frenum.[1, 3] Prevalence of ankyloglossia in children is approximately 3.2%.[4, 5] Ankyloglossia mainly causes speech defects in children. There will be a difficulty in pronunciation of consonents and dipthongs.[4, 6] sometimes it can also be associated with midline diastema, anterior open bite, gingival recession and oral motor dysfunction.[4, 7, 8]

The term free tongue refers to the distance between the tip of the tongue and the insertion of the frenum into the base of the tongue. Based on the length of the free tongue, ankyloglossia can be classified into 5 categories (Table 1).[4, 9]

Keywords: Surgical frenectomy, laser, frenectomy pediatric

Table 1: classification of ankyloglossia.

Type	Description
Clinically acceptable	Normal, greater than 16mm
Class I	Mild ankyloglossia: 12-16mm
Class II	Moderate ankyloglossia: 8-11mm
Class III	Severe ankyloglossia: 3-7mm
Class IV	Complete ankyloglossia: less than 3mm

Ankyloglossia can be treated by performing lingual frenectomy. Lingual frenectomy can be done either by a surgical blade[4, 10] or diathermy[4, 11] or lasers[4, 5]. Lasers help the dental professionals to provide essential treatment. They are safe and show good results when operated by a trained professional. Lasers can be used in dentistry for both hard tissue management such as caries removal, bone removal, and soft tissue management such as frenectomy, operculectomy, excision of fibroma etc. It reduces the occurrence of postoperative infections and anxiety in children. Also it decreases the use of armamentarium and sutures during the soft tissues management.[12, 13] In this article we are comparing the effect of laser to surgical blade on lingual frenectomy.

Surgical Frenectomy

5 patients, with difficulty in speech reported to the Department of Pedodontics and preventive dentistry. On clinical examination, ankyloglossia was observed. The patients could not protrude the tongue completely due to attachment of the lingual frenum to the base of the tongue varying from class I to IV (Fig 1 - class III frenum).

Informed consent was obtained from the parents for the surgery. Lignocaine with 1:80,000 adrenaline was used for lingual nerve block bilaterally and also local infiltration in the base of the tongue and floor of the mouth on either sides of the frenum. A suture was passed through the tip of the tongue for retracting the tongue (Fig 2). An artery forceps was used to hold the middle of the frenum (Fig 3) and then a horizontal slit was made above the artery forceps using a no.15 surgical blade. The fibres were cut using the blade (Fig 4). Then the suture was removed and the frenum tension was assessed by protruding the tongue. Sutures were placed in the operated site to facilitate healing (Fig 5). Then the suture passed through the tongue was removed. Analgesics and antibiotics were prescribed. Sutures were removed after a week and the healing was found uneventful (Fig 6).

Fig 1: Preoperative view.

Fig 2: Suture passed through the tip of the tongue.

Fig 3: Artery forceps to hold the frenum.

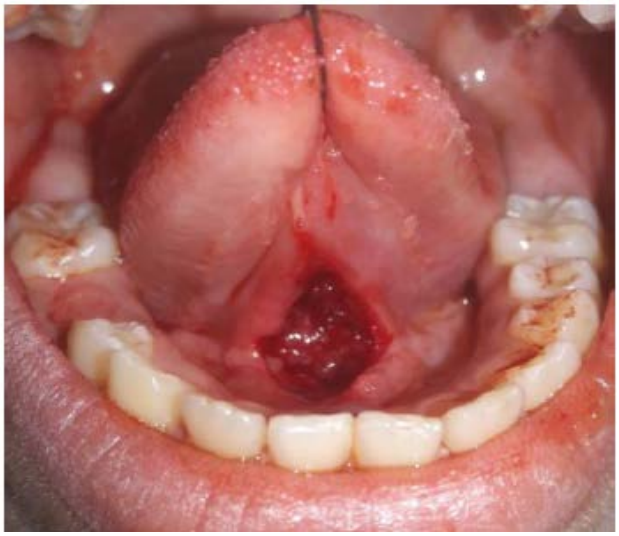

Fig 4: After excision of the fibres.

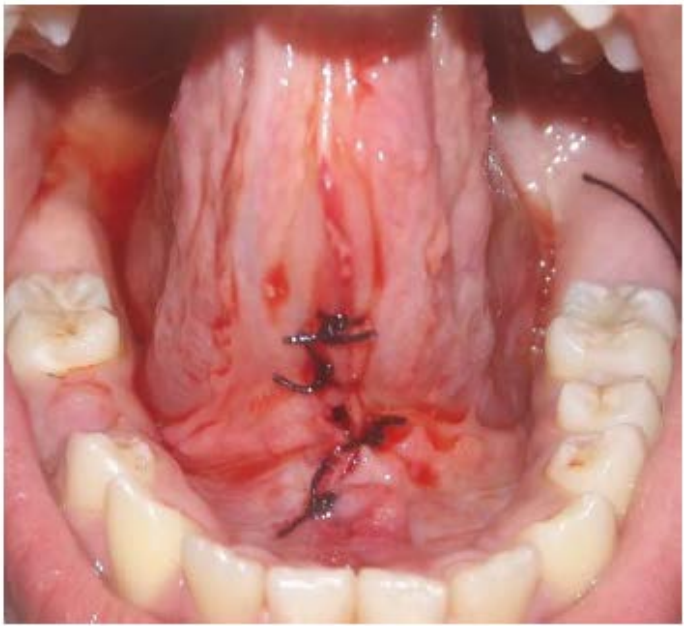

Fig 5: Sutures placed

Fig 6: Post operative view after 1 week

Laser Frenectomy

5 patients, with difficulty in speech reported to the Department of Pedodontics and preventive dentistry. On clinical examination, ankyloglossia was observed. The patients could not protrude the tongue completely due to attachment of the lingual frenum to the base of the tongue varying from class I to IV (Fig 7 - class III frenum). It was decided to use diode laser for the surgery (Picasso).

Informed consent was obtained from the parents for the surgery. Lignocaine with 1:80,000 adrenaline was used for lingual nerve block bilaterally and also local infiltration in the base of the tongue and floor of the mouth on either sides of the frenum. A suture was passed through the tip of the tongue for retracting the tongue (Fig 8). An initiated tip of core diameter 400µm and length of 5mm was used at 2.70 W, pulse interval of 20ms and duration of 20ms in a pulsed mode (Fig 9). The tip was initiated by firing it at 1.4W in continuous mode and allowing it to dip into the initiator device which is a piece of cork. After initiation the tip was carbonized. An artery forceps was used to hold the middle of the frenum and the tip was moved horizontally above the artery forceps in a brushing stroke thereby cutting the frenum. Drops of Saline were used simultaneously while cutting the frenum with the diode laser (Fig 10). The frenum tension was assessed by protruding the tongue. The area was cleaned and suturing was not required (Fig 11). Then the suture passed through the tongue was removed. Analgesics were prescribed. The operated site was examined after a week and the healing was found uneventful (Fig 12).

Fig 7: Preoperative view.

Fig 8: Suture passed through the tip of the tongue

Fig 9: Laser unit

Fig 10: Artery forceps to hold the frenum

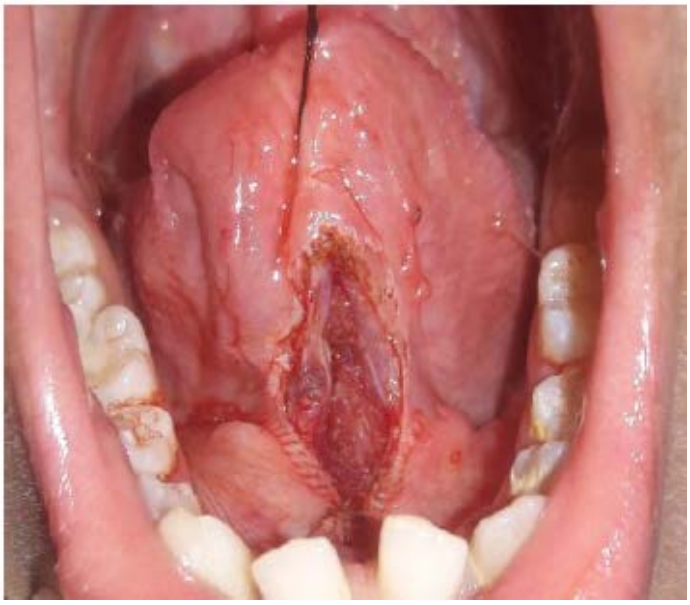

Fig 11: After excision of the fibres

Fig 12: Post operative view after 1 week

Table 2: Post operative findings

PROCEDURE	SURGICAL		LASER	
FOLLOW UP	1 WEEK	4 WEEKS	1 WEEK	4 WEEKS
PAIN	-	-	-	-
SWELLING/INFLAMMATION	MILD INFLAMMATION - 1 PATIENT	-	-	-
WOUND HEALING	NORMAL	NORMAL	DELAYED – 2 PATIENTS	NORMAL
SPEECH	IMPROVED	IMPROVED	IMPROVED	IMPROVED

Both surgical as well as laser techniques have given good postoperative results. The frenal attachment was relieved and speech of the patient was improved in both the procedures.

In both the procedures, the slit was given above the artery forceps in order to prevent any damage to the submandibular and sublingual ducts. Diode laser was used in a pulse mode with drops of saline to prevent tissue necrosis.

However, both the procedures had their own advantages and disadvantages.

The advantage of surgical blade over laser was that there was no fibre reattachment found postoperatively which was otherwise noticed in the laser procedure. However as Hall10 has stated, surgical technique though gives good results, it has certain disadvantages when compared to laser procedure i.e.

Table 2: Post operative findings

1) Suturing on the ventral surface of the tongue can sometimes lead to the blockage of the submandibular and sublingual ducts leading to the swelling of the glands.

2) Any manipulation on the ventral surface of the tongue surgically can at times cause damage to the lingual nerve resulting in numbness.4, 14

3) Suturing can also cause contamination thereby resulting in postoperative infections. [4, 15]

The risk of occurrence of these problems is less with lasers as they are minimally invasive. Apart from these, the fundamental advantages of lasers over surgical blade are that[13]

1) They provide a clean, bloodless operative field

2) High patient cooperation

3) Minimal postoperative pain

4) No need for Suturing

5) No need for antibiotics as they do not cause postoperative infections

Conclusion

Laser is one of the best options for treatment in children as it is minimally invasive, bloodless and painless procedure. Hence it increases the cooperation of the child towards the dental procedure. However, though laser is advantageous over surgical procedure in many ways, it performs more of frenotomy rather than frenectomy as it is less efficient than surgical blade in excision of fibres thereby causing some amount of fibre reattachment postoperatively.

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