Modified Mandibular Lingual Arch

Nikhil Vashi*
Bombay, Maharashtra.

A modified mandibular lingual arch is presented which would be easy to fabricate, easy to use and economical. It can be used during mixed dentition treatment and with fixed appliance therapy in permanent dentition.

The mandibular lingual arch (MLA) is a very useful auxiliary appliance for early treatment in the mandibular arch and for critical anchorage cases treated with fixed appliances.

Two types of mandibular lingual arches can be used:

1) Fixed type - which has an arch wire soldered to the lingual surfaces of the lower molar bands. The fixed MLA has limited application as it does not allow frequent adjustments.

2) Removable type - which has a lingual sheath with a locking mechanism, attached to the lower molar bands on the lingual surfaces and an arch wire.

Using a removable type of MLA is advantageous as it allows frequent adjustments and brings about various tooth movements such as buccal and antero posterior expansion of the lower dental arch, and derotation and uprighting of lower molars.

The most preferred removable MLA is Wilson's Lingual Modular Arch[1]. It consists of twin vertical lingual sheaths welded to the lower molar bands and a lingual arch which has two vertical projections at the distal end which fit into the vertical sheaths in a friction grip lock.

This appliance, however, is not freely available in India and it is very expensive. To overcome these difficulties, a modified mandibular lingual arch is suggested here.

Description

The modified MLA consists of a pair of sheaths used with a transpalatal arch (TPA) and a double-backed lingual arch wire. The TPA sheaths are easily available and economical.

The sheath is welded onto the lingual surface of the molar band. It has a horizontal slot formed by a base and two vertical segments on the opposite side. One of the vertical segments has a latching indent. This helps to lock the double-backed archwire into the slot (Fig. 1). When the sheath is used for a TPA the latching indent is kept distally as the TPA is inserted from the mesial to the distal. But for the MLA, it is difficult in many cases to insert it into the slots of the sheaths from the mesial to the distal because the lower anterior teeth obstruct the anterior segment of the MLA while inserting. Hence the distal end of the arch wire has to be modified as shown in (Fig. 1) to get an easy access into the horizontal slots of the sheaths from the distal to the mesial. Therefore, the indent on the sheath is kept mesial while welding the sheath to the lingual surface of the molar band.

The lingual arch extends from the anchor molar on one side to the anchor molar on the other side of the mandibular arch (Fig. 2). It should be formed in such a manner that it does not impinge on the soft tissues. The anterior segment of the lingual arch should touch the cinguli of the anterior teeth when arch length has to be maintained or gained. Otherwise it may be kept away from the anterior teeth. The distal ends of the lingual arch are modified to facilitate the entry of the lingual arch into the sheaths from the distal side (Fig. 3). The free ends are bent towards the teeth to prevent injury to the tongue. The segments anterior to the distal ends may be straight (Fig. 4 B) for a passive MLA or may have loops (Fig. 4 A,C) for an active MLA. The loops can be activated to carry out different movements. Widening the loops can increase the arch length. Buccal expansion of the distal segments can expand the molars

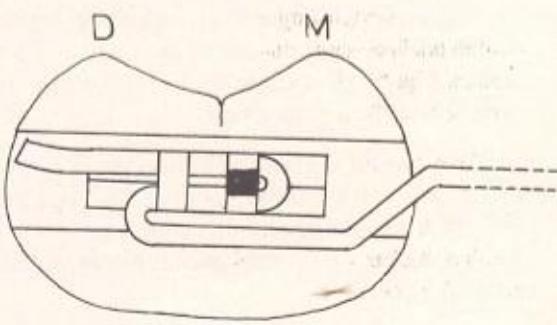

Fig. 1 : Shows doublebacked distal end of the lingual arch in the sheath with the locking indent placed mesially.

* Private Practitioner
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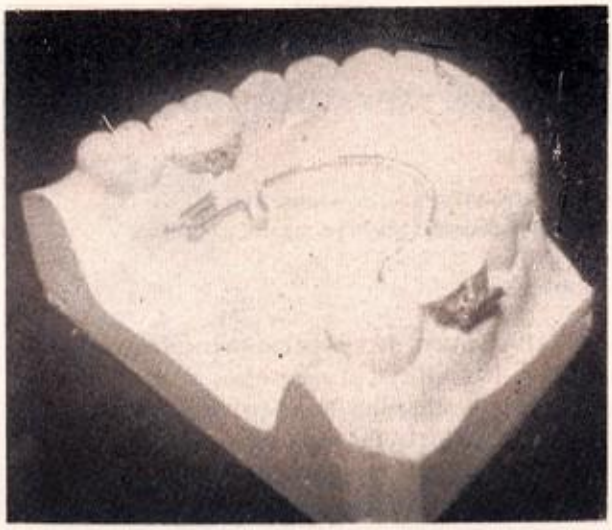

Fig. 2 : Shows modified MLA on a model.

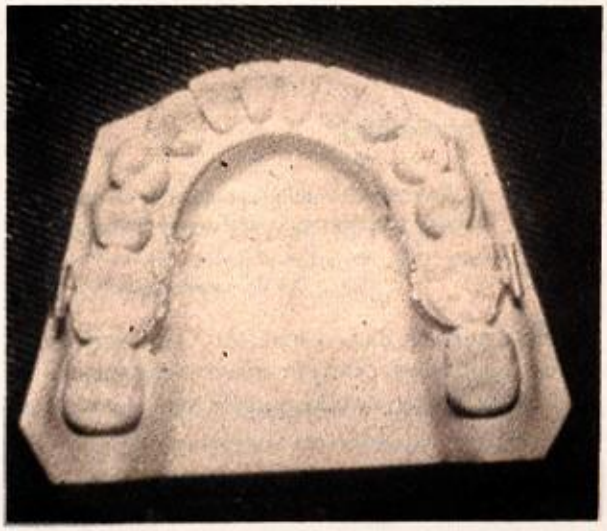

Fig. 3 : Shows disto mesial entry of the modified MLA.

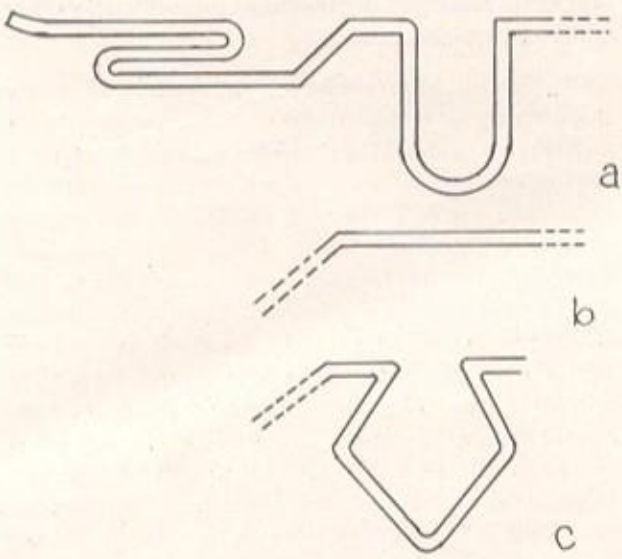

Fig. 4 : Shows segment of the lingual arch anterior to the distal end **A)** with 'u' loop **B)** straight **C)** with diamond shaped loop.

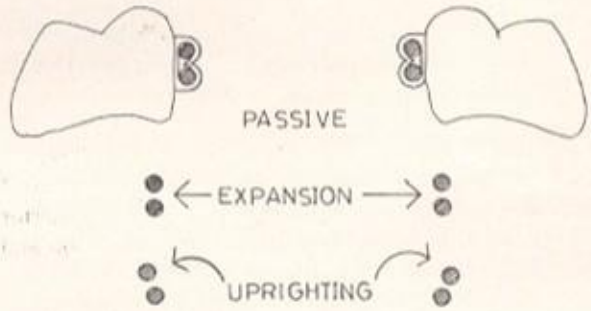

Fig. 5 : Shows movements of molars with the lingual arch in buccolingual direction. **A)** Passive retention **B)** Expansion **C)** Buccal uprighting/torquing

Fig. 5 B) and upright lingually tipped molars, (Fig. 5 C). The double backed segments can be activated to derotate the molars (Fig. 6). The lingual arch exerts a 3-dimensional control over the anchor molars.

For active movements, a flexible, thinner wire is preferable. (e.g. 0.020", 0.022" or even 23 gauge S.S. Wire 0.028" Elgiloy wire would be most preferable). For passive MLA a thicker wire would be acceptable (e.g. 21 or 22 gauge S.S. Wire).

Uses

The mandibular lingual arch can be very useful during mixed dentition period for an early treatment of developing crowding in lower anteriors[2]. It can be used

1) to maintain arch length by preserving 'E' space,

2) to gain arch length by uprighting retroclined lower incisors and by uprighting mesially tipped lower permanent first molars,

3) to expand the lower arch by uprighting lingually tipped permanent first molars.

Some of the borderline cases can be treated non-extraction by early treatment in the mandibular arch.

The MLA can also be used during permanent dentition period to reinforce anchorage in critical anchorage cases being treated with fixed appliances. A passive MLA would hold the anchor molars and prevent their mesiolingual tipping during retraction of lower anteriors. An active

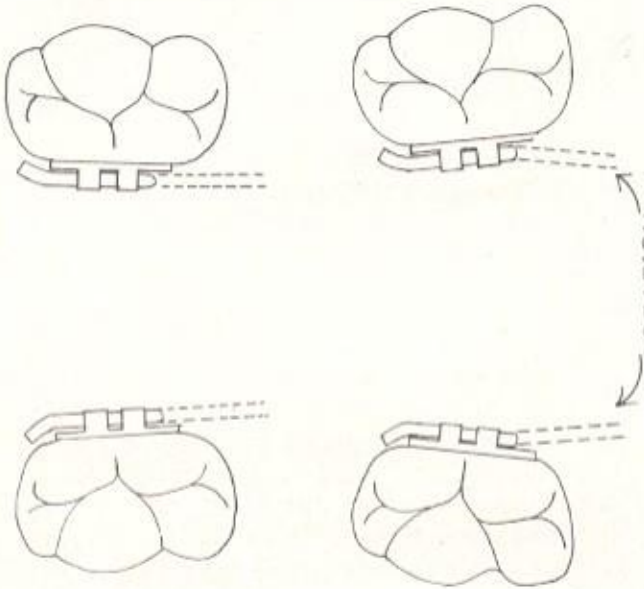

Fig. 6 : Shows mesiobuccal derotation of the molars.

MLA can be used to upright, derotate, expand and torque anchor molars. The active MLA can be replaced with a passive one after corrective movements of the anchor molars are completed. The use of MLA is particularly advantageous in second premolar and first molar extraction cases. It can also be used in asymmetrical, unilateral first molar extraction cases.

Advantages

1) It is easy to fabricate,
2) It exerts 3-dimensional control over the anchor molars,
3) It can be used for mixed dentition and permanent dentition treatment,
4) It can be inserted, adjusted and changed anytime during treatment,
5) It is economical.

REFERENCES :

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2. Shivshankar V., and Prakash M.K. : : Early treatment in the mandibular arch. J.Indi.Orthod.Soc., 1992, 23; 27-30.

Reprint requests to :
Dr. Nikhil Vashi
2/13, Madhav Nagar, S.V. Road,
Andheri (W), Bombay-400 058.