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## Case Report

### AN UNUSUAL EMBEDMENT OF TRANSPALATAL ARCH (TPA) APPLIANCE IN THE PALATAL MUCOSA TREATED BY DIODE LASER- A CASE REPORT

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#### ABSTRACT

Traditionally fabricated Transpalatal Arch (TPA) Appliance often create grooves on the tongue and certain degree of discomfort on the palate of the patients. Moreover, this appliance poses the risk of coming close to the palatal tissue and less commonly, getting embedded in the palatal tissue. The purpose of this clinical report was to describe a treatment modality to remove an embedded TPA appliance from the palatal mucosa using soft tissue diode laser. Other alternative appliances that may be considered for use is the modified TPA appliance with either different location of U-shaped loop or incorporating an archwire sleeve over the loop.

##### Key Words:

Orthodontic appliances, Transpalatal arch, Lasers, Space Maintenance, Wounds and Injuries.

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#### INTRODUCTION

Untimely loss of multiple primary molars in the primary or mixed dentition, leads to disturbances of the developing dentition. In such cases, removable or fixed appliances are constructed to maintain the relationship of the remaining teeth and to guide the eruption of the developing teeth (Dean, McDonald, & Avery, 2004). Sequelae of non intervention following loss of the primary maxillary molars may include drifting of the permanent molars and a resultant posterior crossbite (Kupietzky & Tal, 2007).

The Transpalatal Arch (TPA) is an appliance which connects the lingual of contralateral molars horizontally following the contour of the palate (Proffit, 2000). It is also called transpalatal bar, palatal bar or palatal arch bar. TPA appliance has become an integral part of orthodontics. This auxiliary appliance is used widely to change or stabilize the position of the maxillary molars in all three-dimensions following treatment (Kumar, Gopal Krishna, Shammur, & Mithun, 2014). The traditional TPA appliance is fabricated from a heavy gauge

stainless wire. The original design consists of a straight bar across the palate, thus, it is sometimes called transpalatal bar. This design links the left and right buccal segments together.

Whilst transient effects of orthodontic appliances on the oral mucosa are well recognized, chronic lesions, persisting post therapy are unusual (Noar, Woods, & Hodgson, 2015). In this case report, we present an unusual case of a TPA appliance embedded in the palatal mucosa which was removed by soft tissue lasers. During the last few years, the advent of Laser (Light Amplification by Stimulated Emission of Radiation) techniques has dominated dentistry as any other speciality. Mainly, due to its wide use as an alternative to different traditional methods of dental treatment. They have the considerable advantage of providing bloodless field, minimal damage and lessened swelling & pain post operatively (Bornstein, Winzap-Kälin, Cochran, & Buser, 2005).

##### The Case

An 18-yr old female patient reported to a private clinic with the complaint that she cannot remove her orthodontic appliance.

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She was referred to the clinic by the treating dentist. She revealed that she had worn the appliance for a year and never removed it. She also gave a history of some ulceration on the palate when she had started using the appliance. On examining her palate, it was quite apparent that the “U-shaped loop” of the appliance was partially embedded in the palatal mucosa. Partial epithelialization of the palatal mucosa was noted over the loop. There was inflammation surrounding the loop (Fig.1).

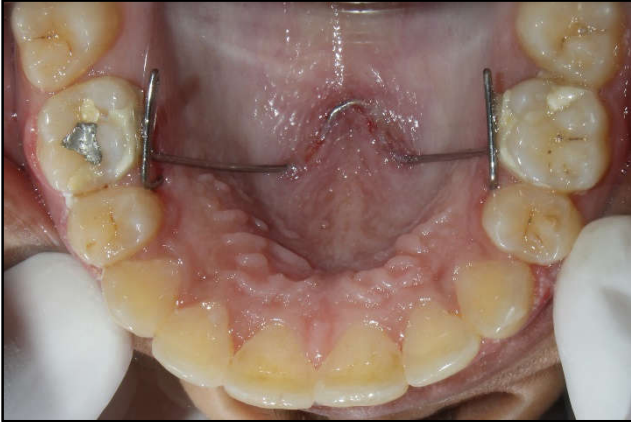


Fig 1 Preoperative Photograph: Partial Epithelialization of the palatal mucosa seen on the U-shaped loop of the TPA appliance.

Prior to the treatment, patient was explained about the procedure using laser. Blood investigations were done. All safety guidelines were taken into consideration before starting the procedure. A written consent was taken from the patient. Local infiltrations were given in the palate, until blanching was seen. Incisions were given on either sides of the U-shaped loop carefully using Diode laser (Doctor Smile SIMPLER laser® with following specifications: wavelength-980nm; output energy-1.0-1.5W). A disposable straight tip of 300 micron diameter was used in continuous mode and in contact with the tissues. Incisions were given little away from the U-shaped loop with gentle and sweeping brush strokes (Kravitz, 2012). Precautions were taken not to touch the wire with the laser tip. Wet gauze was kept on the remaining part when not lased. High-speed suction was used to remove laser plume and burnt tissue smell, as well as to maintain a clear field of vision. The appliance was removed from the palate (Fig.2 and Fig.3).



Fig.2 Immediate Postoperative: The TPA appliance was removed using Laser. Lasing was done carefully only on the tissues on either sides of the wire bend.



Fig 3 The removed TPA appliance.

Post treatment analgesics were prescribed. Patient was recalled the next day for a follow up. Healing was uneventful. After 1 week, only slight inflammation and erythema was seen (Fig.4).



Fig 4 1 Week Postoperative: Partial healing seen with slight inflammation.

There was a complete healing after a month with no signs of inflammation (Fig.5).

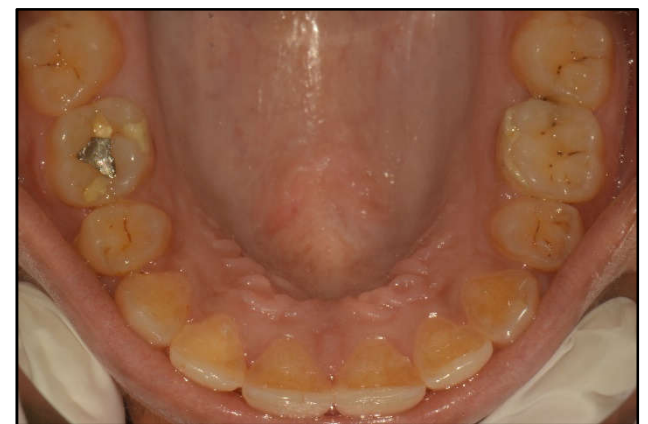


Fig 5 1 month Postoperative: Complete healing of the wound with normal palatal mucosa seen.

## DISCUSSION

Orthodontic treatment is very challenging. Soft tissue irritation is one of the most common problem encountered with the application of a TPA appliance. Ideally, the transpalatal wire should not encroach either on the tongue or on the tissue of the hard palate. During an intrusion of maxillary molars, if the TPA appliance comes close to the palate, the appliance may

become embedded in the palatal tissue causing pain and discomfort (Fig.1) (McNamara, Brudon, & Kokich, 2001). If this happens it should be removed to allow for the sufficient healing of the palatal tissues. Minor surgeries can be done to remove the appliance surgically. The advantages of laser application are that it provides relatively bloodless surgical and post surgical courses with minimal swelling and scarring (Azma & Safavi, 2013 Autumn).

Kumar ND *et al.*, introduced a modified TPA appliance design with U-shaped loop on either sides of the arm. The U-shaped loops are constricted to keep the transpalatal arch away from palatal tissues (Kumar, Gopal Krishna, Shamnur, & Mithun, 2014). Another modification of TPA appliance was given by Gupta A *et al.*, where an arch wire sleeve of 1 inch length with 0.31" (internal diameter) was passed over the 0.9 mm wire before fabrication of TPA U-shaped loop. This avoided indentations of the U loop on the dorsum of tongue and on the palate thus, minimising discomfort and irritation to the patient (Gupta, *et al.*, 2013).

## CONCLUSION

Orthodontists routinely use the TPA appliance to increase posterior anchorage in maximum anchorage cases. The traditional TPA appliance provides a lot of advantages such as arch width maintenance, correction of molar rotations, root torquing, intrusion of molars, distalization of molars and reinforce anchorage. At times, TPA appliance may cause pain, discomfort and can get embedded into the palatal mucosa. In such cases, it is crucial to remove the appliance and allow for healing of the palatal tissues. Lasers plays a vital role causing minimum discomfort and better patient acceptance.

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