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Case Report

Management of impinging "Nickel titanium palatal expander" in cleft palate cases by "Soft flow" (temporary mucosal protector)

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ABSTRACT

The temperature-activated Arndt nickel titanium palatal expander has been a good choice for cleft palate applications because it creates transverse maxillary expansion, uprights and rotates the maxillary molars, and allows a smooth transition to fixed retention with no requirement for patient compliance and little manipulation by the clinician. But the clinical problem sometimes encountered is the impinging of "Nickel-Titanium" metal component of the Nickel titanium palatal expander on the soft palate. "Soft Flow" is a Temporary Mucosal Protector introduced recently in the orthodontic market which prevents the impinging of micro- implants or hooks of the molar buccal tubes. The following article highlights the clinical problem encountered after placement of Nickel Titanium Palatal Expander and how "Soft Flow" helps to overcome it.

1. Introduction

Correction of a transverse discrepancy usually requires expansion of the palate by a combination of orthopedic and orthodontic tooth movements. Initially, transverse forces will tip the buccal segments laterally. With proper appliance design, 3rd-order moments will induce bodily translation. If the force is strong enough, separation occurs at the maxillary suture. The amount of orthopedic vs. orthodontic change depends greatly on the patient's age. Normal palatal growth is nearly completed by age 6 and increasing interdigitation of the suture makes separation difficult to achieve after puberty. [1–3]

The objective of rapid palatal expansion is to reduce undesirable orthodontic tooth movement and tipping while producing enough force to overcome the tendency of the anchor teeth to move, thereby maximizing the orthopedic response by causing separation at the suture.16-18 RPE appliances require frequent activations and generate heavy forces—as much as 2-5kg per quarter-turn, with accumulated loads of more than 9kg.

Successful cleft lip and cleft palate rehabilitation requires a multidisciplinary approach employing the skills of plastic surgeons, speech therapists, paediatric dentists, and orthodontists. Since the late 1970s, early surgical repair of cleft lip and palate has been able to improve speech, function, and self-esteem in these patients. New bone-grafting procedures, using bone harvested from the mandible, the ilium, or even the cranium, have facilitated reconstruction of palatal clefts and alveolar processes.

The temperature-activated Arndt nickel titanium palatal expander has been a good choice for cleft palate applications because it creates transverse maxillary expansion, uprights and rotates the maxillary molars, and allows a smooth transition to fixed retention with no requirement for patient compliance and little manipulation by the clinician. But the clinical problem sometimes encountered is the impinging of "Nickel-Titanium" metal component of the Nickel titanium

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palatal expander on the soft palate.[4–6]

"Soft Flow" [Figure 1] is a Temporary Mucosal Protector introduced recently in the orthodontic market which prevents the impinging of micro- implants or hooks of the molar buccal tubes. The following article highlights the clinical problem encountered after placement of Nickel Titanium Palatal Expander and how "Soft Flow" helps to overcome it.

2. Case Report

A 12-year-old cleft palate patient reported to the hospital with maxillary deficiency and mandibular prognathism with anterior aspect of maxillary teeth in crossbite with respect to mandibular teeth. Treatment plan for the case was formulated in two phases with the first phase being the insertion of Nickel Titanium Palatal expander as shown in Figure 2.

Fig. 1: - Soft flow(Pic Courtesy: Dentos)

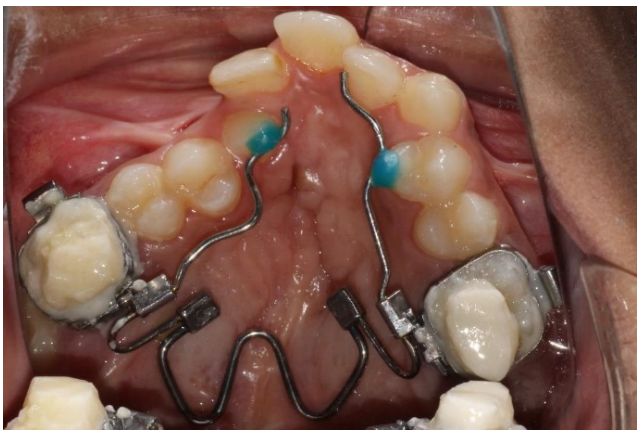

Fig. 2: Insertion of nickel titanium palatal expander in the maxillary arch

2.1. Clinical problem

Two days after the insertion of Nickel Titanium Palatal expander the ends of the Nickel Titanium metal component started impinging the soft palate and there was a slight overgrowth of the gingival tissues over the component. Patient started complaining of discomfort and demanded removal of the expander as shown in the Figure 3.

Fig. 3: Impinging palatal expander on the soft palate causing discomfort to the patient

Fig. 4: Soft Flow (Temporary Mucosal Protector) placed on the impinging ends of nickel titanium palatal expander

2.2. Clinical solution

As "Soft Flow" is biocompatible with living tissues and does not support bacterial growth, we used this for covering the ends of the Nickel Titanium Palatal expander, thus preventing the impingement as shown in the Figure 4.

3. Discussion

1. Transverse intermolar expansion averaged 8.25mm in the mixed dentition patients and 5.75mm in the primary dentition patients. In nearly all the cases, the correction of the posterior crossbite produced a reduction in anterior crossbite.[7]
2. The largest expanders (44mm and 47mm) appeared to be less efficient than the smaller sizes in moving the molars. Their performance might be improved by increasing the diameter of the nickel titanium wires.
3. The acceptance of this device by cleft palate patients who had been traumatized by multiple surgeries suggests that it would be effective in early treatment of non-cleft children requiring transverse expansion of the maxilla.[8,9]
4. Temporary Mucosal Protector thus helps to protect the impingement of Palatal expander on palatal soft tissues and provides relief to the patient.[10]

4. Conclusion

1. Soft Flow are a non-irritating and non- harmful biocompatible compound introduced to prevent soft tissue injury due to metal parts of mini-implants, molar buccal tubes.
2. They are formulated to comply with FDA biocompatibility guidelines for medical products and thus can be an excellent biocompatible material of choice for preventing soft tissue impingement of Nickel Titanium Palatal Expander.
3. The device can rotate molars and expand both posterior and anterior teeth due to its flexibility and to the presence of adjustable stainless steel palatal extensions.

5. Source of Funding

None.

6. Conflict of Interest

None.

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