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Case Report **Orthodontics**

Transverse and Sagittal Arch Development Using Transforce Appliance – A Case Report

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Abstract

Background: The aim of this paper is to illustrate the expansion of mandibular arch using Transforce appliance. ***Case Report:*** Use of Transforce appliance for arch expansion for severely constricted mandibular arch. The patient is successfully treated with arch expansion. ***Conclusion:*** Transforce appliance is a good choice for mandibular arch expansion. Since mandible lacks sutures to open up, light force is required for arch development and Transforce appliance is capable of producing light forces.

Keywords: Mandibular arch expansion, Transforce appliance, arch development.

INTRODUCTION

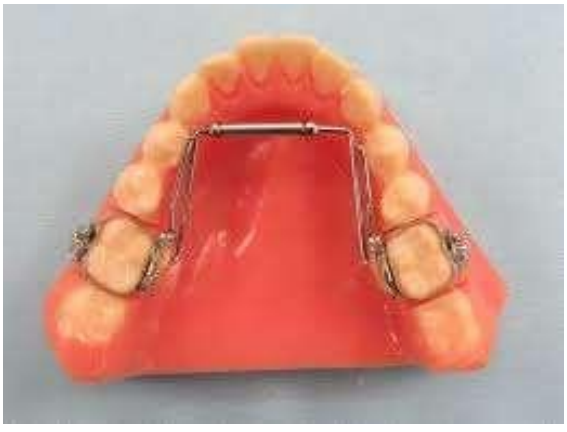
Malocclusions are basically categorized in three dimensions – transverse, vertical and sagittal. Transverse malocclusions are always subjected to early intervention and treatment, since growth tends to seize first in the transverse direction. Over the years, there have been many appliances which have come up for expansion of the maxillary arch especially due to the requirement for expansion in cleft lip and palate patients. Expansion in maxillary arch can be done with various appliances like Quadhelix, W arch, NiTi palatal expander, hyrax appliance and so on.

When it comes to the mandibular arch, the concept of expansion isn't similar to that of the upper arch. This is due to the absence of sutures and light slow continuous forces are required for expansion of mandibular arches, where TransForce lingual expander was one such appliance developed by W. J. Clarke in the year 2004. The advantages of this being that it helps in gaining arch length, and if used during mixed dentition helps in favorable eruption path for canines and premolars. Along with these advantages it is also comfortable to wear.

In this paper we are presenting a similar case report where expansion has favored in conveniently unravelling the crowding and early intervention favoring the treatment progress.

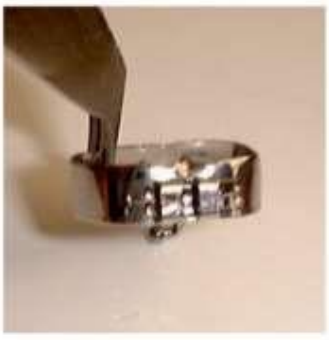
Transforce Lingual Expander

TransForce appliance was introduced by William. J. Clarke in the year 2004. And this appliance was designed to be used in both maxillary and mandibular arches. It also is used in expansion in both anteroposterior and transverse directions. The major advantages being that it is pre activated, and so the patient does not have a role to play in the activation; hence its non-compliant.



Appliance Design, Selection and Fitting

The appliance is inserted into the 0.036-inch lingual sheaths placed on the molars. In the sagittal expansion appliance both unilateral or bilateral expansion is possible. The appliance consists of expansion modules activated by a coil spring which is embedded into a stainless-steel tube. The distal portion of the wire is recurved to turn mesially and adapt to the anterior segment.

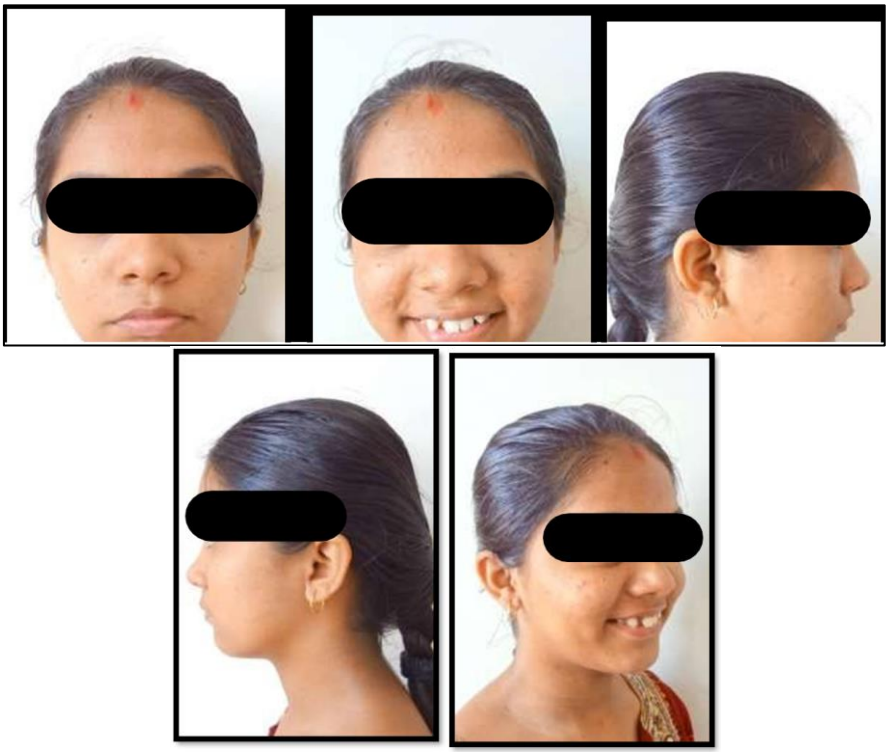


On placement into the oral cavity the sagittal expander increases arch length by having a reciprocal effect on molars and anteriors. Transverse expander is generally available in two sizes for both maxillary and mandibular arches. Clear templates are used to measure the intercanine width and both compressed and passive forms of the appliance are given in the preliminary template, and the compressed form is generally chosen as the size of choice. And the amount of expansion expected is the size in the passive form of the appliance.

Molar bands with 0.036-inch lingual sheath are placed and the pre activated transforce expander is inserted into the oral cavity. Patients are recalled at an interval of 6-8 weeks for checking on expansion.

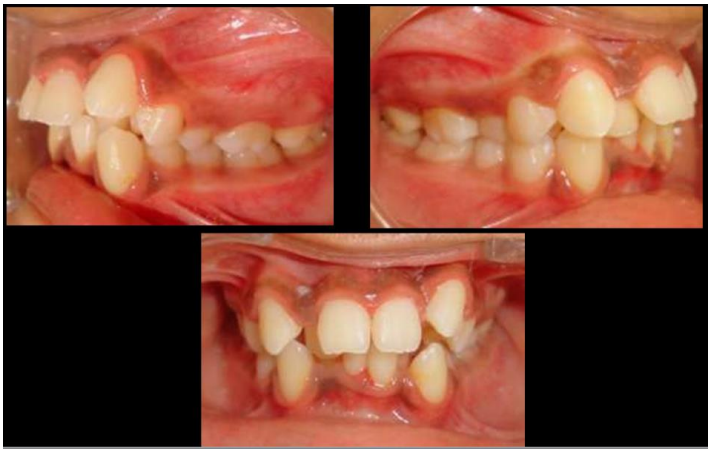
CASE REPORT

A 15-year-old female patient reported to the department with the chief complaint of irregularly placed tooth in the upper front tooth region.



Patient had a mesomorphic built, aesthenic body type and a mesocephalic shape of head.

Patient had an oval facial form, with convex profile, posterior divergence, competent lips, normal malar prominence, normal nasolabial angle and a non-consonant smile arc.



Intraorally, the patient presents with a deep bite in the anterior region, with severe crowding in the anterior region. 23 and 33 are buccally placed and there is a constricted arch w.r.t maxillary and mandibular arches. Patient also presents with a Angles Class II molar relation bilaterally and an end on canine on the left side. Patient also presented with an increased overjet of 8mm and an increased overbite of 4mm.

Cephalometrically patient presented with a Class II skeletal pattern with an average growth pattern, normal maxillary, and mandibular lengths and proclination of upper and the lower incisors and a normal nasolabial angle.

Diagnosis: Class II skeletal base with Angles Class II malocclusion with proclination and crowding in upper and lower anteriors with an average growth pattern.

Treatment Objectives

1. Correction of constriction in the maxillary and mandibular arches.
2. Correction of proclination in the upper and lower anteriors.
3. Correction of crowding in the upper and lower anteriors.
4. Correction of curve of spee.
5. Achieving an ideal overjet and overbite.
6. Achieving a pleasing soft tissue profile.

Treatment Plan

- ✓ Expansion on the upper arch with bonded hyrax appliance.
- ✓ Expansion of the lower arch with transforce appliance.
- ✓ Deciding upon extraction pattern after assessing the arch length gain after expansion.

Treatment progressed as planned and the upper and the lower arch were expanded. The expansion was done with a bonded hyrax expander for 2 months (FIG 1 a, b). After the expansion of the upper arch a Hawley's bite plane with Adams clasp on the premolars and molars was given for retention (FIG 1 c). This was followed by expansion of the lower arch with transforce appliance for 5months, after which the lower expansion was retained with Hawley's appliance with posterior bite blocks (FIG 1 d, e, f, g).

After the expansion the patient was reassessed for extraction and the extraction pattern was decided upon to be 14&24 extractions in the upper arch and extraction of 32 in the lower arch.

The upper arch was strapped up first continuing with the posterior bite plane as the retentive appliance in the lower arch (FIG 2 a, b, c). Open coil spring was placed between 11 and 13, and between 21 and 23. The brackets were inverted and placed w.r.t 12 and 22, and ligature wires attached from the main arch wire.

Treatment Progress

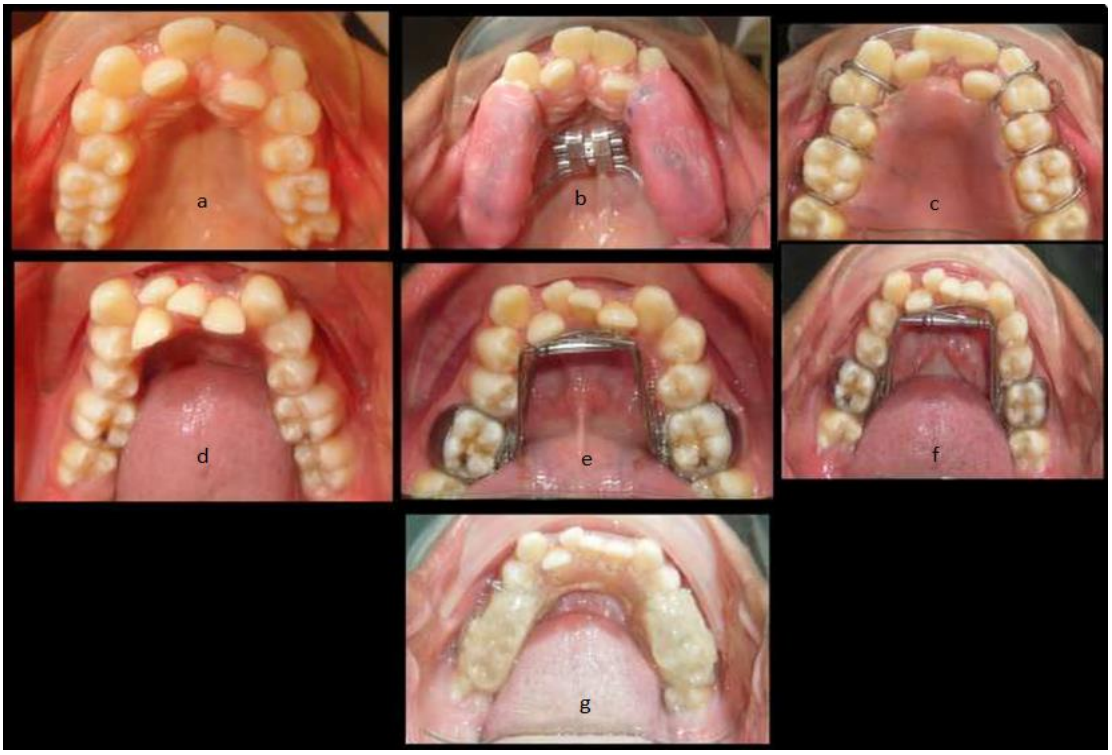


Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

TREATMENT RESULT

At the end of 29 months, desirable expansion was attained in the upper and lower arch, a class II molar relation bilaterally was achieved with class I canine bilaterally with ideal overjet and overbite and a pleasing soft tissue profile.

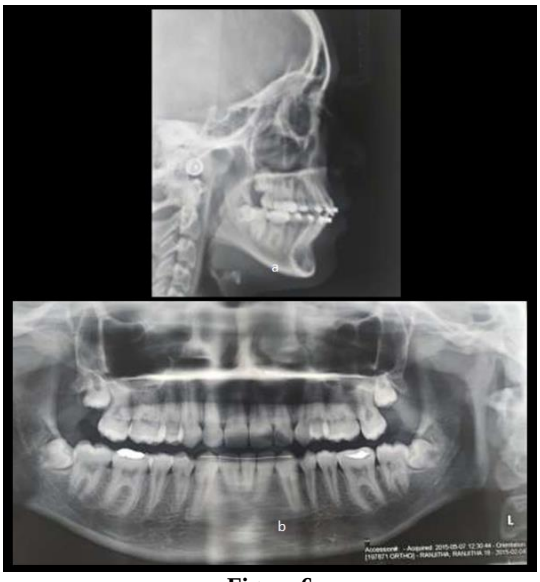


Figure 6

Sl.no	PARAMETERS	MEAN VALUE	PRE TREATMENT VALUE	POST TREATMENT VALUE	DIFFERENCE
1	SNA	82°	80°	80°	
2	SNB	80°	75°	76°	1°
3	ANB	2°	5°	4°	1°
4	FMA	16°-35°	28°	23°	5°
5	JARABAKS RATIO	62-65%	64.06%	64.5%	
6	LAFH	71.6 ± 4.5mm	74mm	70mm	4mm
7	BASE PLANE ANGLE	25	30°	28°	2°
8	UI-NA	22°/4mm	33°/11mm	24°/5mm	9°/6mm
9	UI-SN UI-FH	111.2° ± 5.7° 103.97° ± 5.75°	120° 110°	112° 102°	8° 8°
10	LI-NB	25°/4mm	28°/5mm	27°/9mm	1°/-4mm
11	IMPA	90° ± 3°	103°	104°	1°
12	OVERJET	2mm	8mm	3mm	5mm
13	NASOLABIAL ANGLE	102°± 8°	100°	100°	

CONCLUSION

We were able to correct the severe crowding present in the upper and lower arch with intervention at the correct time, and using the best of potential of the remaining growth with Transforce appliance.

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