

Rickett's Utility Arch For Deep Bite: A Case Report

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Abstract

This is a case report of 25 year old female in which utility arch is used for deep bite correction which is the most efficient way of deep bite correction in adults and is a stable method also in adults.

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Introduction

Correction of a deep overbite with incisor intrusion is an important stage during orthodontic treatment because, if deep bite is not treated it can cause various periodontal problems, increase in anterior crowding or TMJ problems. Nonsurgical correction of deep bite involves either extrusion of posterior teeth, intrusion of incisors, or both. The treatment of choice depends on a variety of factors such as smile line, incisor display, and vertical dimension.¹ For intrusion of incisors, utility arch is one of the most effective methods. It was popularised by Ricketts.

Case Report

A female patient of 25 years reported to the Department of Orthodontics and Dentofacial Orthopedics with the chief complaint of spacing in upper front tooth region. Extraoral examination revealed convex profile, normal nasolabial angle and competent lips. The patient presented with a mesocephalic head form and a mesoprosopic facial form.

Intraoral examination revealed class I molar relation bilaterally and class I canine relation bilaterally. Spacing was present in the upper anterior region. There was an overjet of 4mm and overbite of 3mm (50%).

Lateral cephalometric analysis revealed Class III skeletal pattern with retrognathic maxilla and orthognathic mandible and normal lower facial height with a horizontal growth pattern, and proclined maxillary and mandibular incisors.

The Treatment Objectives were

1. Correction of spacing
2. To maintain class I molar relation bilaterally
3. To maintain class I canine relation bilaterally
4. Correction of axial inclination of upper and lower incisors

Treatment Mechanics

A non-extraction treatment plan was decided for the patient, using MBT bracket prescription of 0.018"x0.025".

Banding of all first and second molars in the upper and lower arch was done. Leveling and alignment along with rotation correction was carried out by 0.014" NiTi wire, followed by 0.014", 0.016" and 0.018" Australian wires,

0.016"x0.022" NiTi and finally 0.016"x0.022" SS wire.

Bite opening was carried by intrusion of lower anterior teeth through the use of Ricketts utility arch, which was fabricated from 0.017"x0.025" SS wire.

Consolidation of spaces was done distal to both lateral incisors in the upper arch by the use of ligature wire in a figure-of-eight fashion. Thereafter, closure of spaces distal to lateral incisors was done using friction mechanics, where hooks were soldered distal to lateral incisor brackets on 0.016"x0.022" SS wire and type I module ties were given from the soldered hooks to the upper molar tubes.

Finally finishing and detailing was carried out on 0.016" Australian wires. Debonding was done and upper and lower fixed retainers were placed lingually from canine-to-canine region, along with a wraparound retainer with an anterior bite plane to prevent further bite deepening.

Most of the treatment objectives were met at the end of the treatment with good facial profile and intraoral results. Pre-treatment and post-treatment changes have been shown in table no.1.

Discussion

Deep bite is a complex orthodontic problem that needs to be corrected at the beginning of the treatment. Conventional methods of incisor intrusion usually involve 2 x 4 appliances such as utility arches, 3-piece intrusion arches, or reverse curved arches.¹

Untreated deep bite can cause increased anterior crowding, maxillary dental flaring, periodontal problems, and temporomandibular joint problems and can interfere with lateral and anterior mandibular movements.² Mandibular incisor intrusion is the most suitable deep bite treatment for adults with normal incisor and gingival display and a normal or high mandibular plane angle.² The utility arch is usually fabricated from a continuous rectangular stainless steel arch wire inserted into the edgewise brackets on the incisors and the maxillary or mandibular molars. 17x 25 stainless steel was chosen for the fabrication of utility arch in lower arch. As a matter of convenience and comfort it stepped in a gingival direction between the incisor and

molars to bypass the buccal occlusion.³ Insertion of the utility arch into the incisor brackets will usually result in the creation of a third-order couple at these brackets. The equilibrium force associated with the larger moment of couple at the molar will still result in equal and opposite intrusive forces at the incisor and extrusive forces at the molar.³ For activation care must be taken that the protruding wire does not encroach on the soft tissue of the both cheek and gingiva.⁴ The lateral cephalogram was taken pre-treatment and post-treatment and intrusion can be appreciated on the lateral cephalogram post-treatment. Although deep bite tends to relapse but patient was evaluated and it was stable.

Conclusion

For deep bite correction in adult patients, intrusion utility arch can be considered as an effective treatment option. The results of the treatment were successful and patient was recalled for the monthly evaluation of the treatment.

Cephalometric Analysis

Area of study	Measurement	Mean	Pre-treatment	Post-treatment
Sagittal relationship	SNA	82°	79°	74°
	SNB	80°	81°	71°
	ANB	2°	-2°	3°
Vertical relationship	FMA	25°	18°	21°
	Go-Gn-Sn	32°	28°	30°
	Y-axis	66°	66°	72°
	Lower anterior facial height	69.7±4.3	63mm	65mm
Dental relationship	IMPA	90°	103°	106°
	UI to NA	22°	32°	22°
	LI to NB	25°	29°	34°
	LI to A-Pog	1-2mm	6mm	5mm

References

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Pre-treatment

Post-treatment



Rickett's utility arch in lower dentition:

Pre-treatment

Post-treatment