Clinical Overview of Deep Bite Management

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ABSTRACT

The excessive overbite is a complex orthodontic problem that may involve a particular group of teeth or the whole dentition, or the maxilla and mandible. The correction of deep bite is one of the primary objectives of orthodontic treatment and one of the most difficult to treat successfully. Innumerable methods have been developed to treat deep bite but no single approach is best. Each approach has its own advantages and disadvantages and optimal correction of deep overbite requires accurate diagnosis, individualized treatment planning and efficient execution of treatment mechanics. This clinical review article is an attempt to enlist various modalities of deep bite correction presently available to the clinician and also gives a brief inside into the diagnostic and selection criteria to be applied for successful and stable deep bite correction.

Key Words: Absolute intrusion, Relative intrusion, Skeletal deep bite, Dental deep bite, Vertical malocclusion

Introduction

Deep bite is one of the most common malocclusion seen in children as well as adults that can occur along with other associated malocclusions. It is said to be one of the most deleterious malocclusion when considered from the viewpoint of the future health of the masticatory apparatus and the dental units. Correction of deep overbite and its maintenance poses a great challenge to the orthodontist and a wide variety of techniques have been developed to achieve this. Each technique of deep overbite correction has advantages and disadvantages , and must be carefully selected in light of the specific etiology of the individual's malocclusion and the desired treatment outcome. The effects of the various treatment modalities, when employed for deep bite correction overlap each other and cannot be clearly differentiated. A casual approach for deep bite correction without proper application of diagnostic methods and irrational use of mechanotherapy can lead to relapse.

CLASSIFICATION:

A) Developmental deep bite

1) Skeletal deep bite

- horizontal growth pattern

2) Dento alveolar deep bite

- supra erupted incisors

- infra eruption of molars

B) Acquired Deep Bite

1) Lateral Tongue Thrust

2) Early loss of Deciduous Teeth

3) Wearing of Occlusal Surface

DIAGNOSTIC CONSIDERATIONS IN MANAGEMENT OF DEEP BITE

Successful treatment requires careful analysis of the several possible contributing factors and this warrants a detailed clinical and cephalometric examination.

1)Soft tissue considerations[1,2]

a)Interlabial gap :

2 to 3 mm is normal. If interlabial gap is excessive, molar extrusion should be avoided.

b)Smile line :

In case of gummy smile , intrusion of maxillary incisors should be done.

c)Lip length :

In cases of short upper lip, intrusion should be carried out.

2)Dental considerations[1,2] :

Incisor intrusion is ideal to treat deep bite in cases of supraeruption and gummy smile. It maintains the vertical dimension. Upto 4 mm of incisor intrusion can be achieved.

3)Skeletal considerations[1,2] :

In case of decreased lower anterior face height , extrusion of molars is acceptable but it should be attempted only in growing children. If the same is attempted in adults, the stability of the result will be questionable. In patients with increased face height, intrusion of anteriors should be considered.

CLINICAL MANAGEMENT:

1) Relative intrusion: It is achieved by preventing eruption of the incisors while growth provides vertical space into which the posterior teeth erupt.

2) Absolute intrusion: There is pure intrusion of the incisors without extrusion of the posterior teeth.

3) Extrusion of molars[4].

RELATIVE INTRUSION:

A)Reverse curve of Spee : It mainly causes extrusion of the posterior teeth. However there may be undesirable changes in the axial inclinations of the buccal teeth and flaring of the incisors[5].

B)Anchor bend: This is an intrinsic part of the Begg technique. These bends are incorporated in the archwire, just mesial to the first molars and are used in conjunction with Cl II elastics[6,7].

C)Utility arches :It is a continuous wire that extends across both buccal segments but engages only the first permanent molars and four incisors and is most commonly made of rectangular Elgiloy. It causes intrusion and possible torquing of the incisors as well as tipping back, of the molars[8,9,10].(Fig 1)

D)Three Piece Intrusion Arch[11,12,13] : It was introduced by Burstone. It consists of a heavy stainless steel (0.019x0.025" or larger) archwire in the anterior brackets the distal extensions of which end 2 to 3 mm distal to the centre of resistance of anterior teeth.The intrusive force is applied with 0.017x0.025" TMA tip back springs. Distal force delivered by a Class I elastic to the anterior segment is used to alter the direction of the intrusive force on the anterior segment.(Fig 2)

E) K-SIR arch[15] : It was introduced by Dr. Varun Kalra and is a modification of the segmented loop mechanics of Burstone and Nanda. It is a continuous 0.019x0.025"TMA archwire with closed 7mmx2mm loops at the extraction site. Simultaneous intrusion and retraction can be achieved with this.(Fig 3)

Fig 1: Utility arch

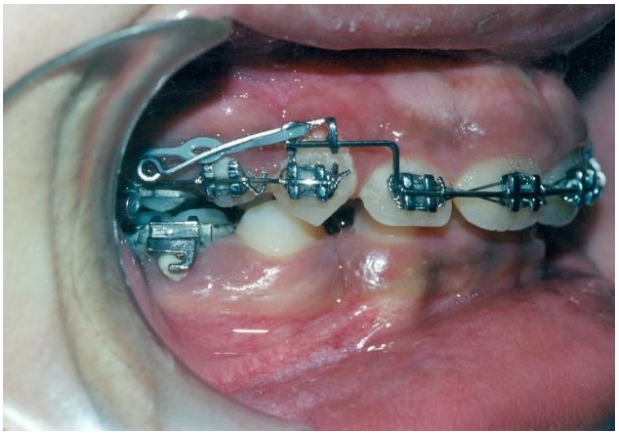

Fig 2: Three Piece Intrusion Arch

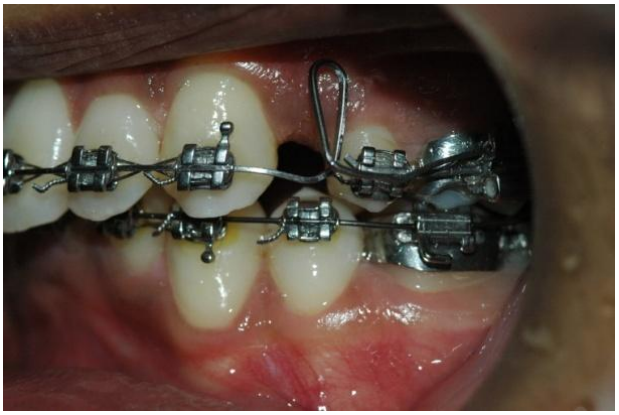

Fig 3: K-SIR arch

ABSOLUTE INTRUSION :

A) Implants: Implants can be used for true intrusion of anteriors or a combination of intrusion and retraction depending upon the site of implant placement and direction of force delivery. For effective intrusion the retraction hooks are soldered facing occlusally[16].(Fig 4)

B) J-Hook headgear: J-Hook headgear can also be used for intrusion of the anterior segment and it produces absolute intrusion.(Fig 5)

C)Surgical correction: Anterior segmental osteotomies and mandibular advancement can also correct skeletal deep bite[17] .

Fig 4: Micro Implants for Intrusion and Retraction

EXTRUSION:

Anterior bite plate : This disoccludes the posterior teeth and hence causes their extrusion. It can be used in growing patients. Stability of bite opening by extrusion will be questionable in adults especially those who have brachycephalic and horizontal growth pattern[18,19,20]. (Fig 6)

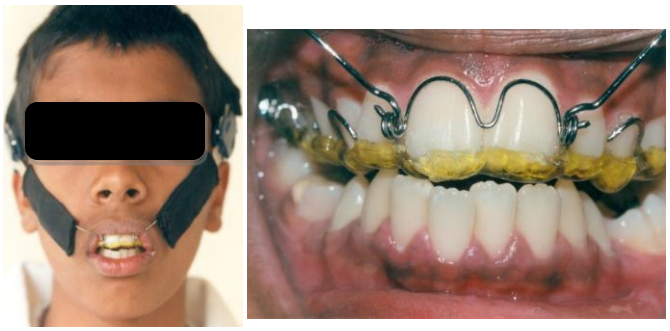

Fig 5: J-Hook Headgear

Conclusion

Deep bite has been an enigmatic puzzle in orthodontics, the nature of this malocclusion to relapse has been of great concern to the clinician. The successful treatment of deep bite correction depends on, an elaborate clinical examination, thorough cephalometric analysis, judicious treatment planning among the various available options and by using appropriate mechanotherapy followed by a proper retention protocol.

Deep bite corrections achieved during periods of active growth have been found to be more stable than those in adult patients. The stability of deep bite correction has been a challenge to the orthodontist. In most of the cases it requires a prolonged retention protocol, which usually constitutes use of a removable appliance with a potential biteplane incorporated on to it.

Fig 6: Anterior Bite Plate

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