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REVIEW ARTICLE

A critical review of the management of deep overbite complicated by periodontal diseases

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ABSTRACT

Traumatic deep overbite complicated with periodontal problems is a challenging problem for a periodontist as well as for an orthodontist. A thorough and systematic approach to periodontal and occlusal examination, etiological factors, diagnosis and treatment planning is essential for better treatment results. In such cases prevention of disease is better than its treatment therefore.

Key words
Deep overbite, orthodontic treatment, periodontal patients

INTRODUCTION

Occlusal problems are often implicated in the initiation and progression of periodontal disease. An increased overbite is always a challenging orthodontic problem to treat and more when associated with periodontal problems. An excessive vertical overlap of maxillary and mandibular incisors may be traumatic to gingival tissues labial to the lower anterior segment, palatal to the upper anterior segment or in both locations.[1] This is often a very difficult problem that involves prolonged and complex orthodontic treatment and or sophisticated periodontal management. Purpose of this review is to provide an overview of the treatment of periodontal patents which is complicated by deep overbite.

ETIOLOGY

The etiology of increased vertical overlap associated with periodontal problem is complex and invariably resulting from interplay of several factors notably skeletal, dental and growth rotational elements.[2] In adults, patient may present low facial height, displacement of anterior teeth due to periodontal conditions, bruxism habits or injudicious orthodontic treatment.[3]

- A gradual loss or extreme wear of posterior teeth leads to over closure and anterior positioning of mandible with a reduction of vertical height
- When the anterior teeth take the greater occlusal loads, the upper teeth can drift labially. The migration of anterior teeth leads to loss of stable centric stops, which is likely to occur when the dentition is periodontally affected
- The loss of first molar can contribute to the development of a traumatic incisor relationship
- The traumatic overlap can be created or exacerbated by injudicious crown and bridge framework or orthodontic treatment.

CONSEQUENCES OF TRAUMATIC DEEP BITE

An increased overbite associated with periodontal disease may cause severe shearing of gingival tissues and food impaction on labial surface of mandibular incisors and palatal to the maxillary incisors. The sequel is marked gingival recession, dentin hypersensitivity, loss of attachment and tooth mobility. This is often a very difficult problem that involves prolonged and complex orthodontic treatment and or sophisticated periodontal management. The forces associated with a traumatic overbite can accelerate the progression of periodontal disease in the adults who often have past history of dental neglect and poor dental health. Classification of traumatic overlap [Table 1 and Figure 1] given by Ackerly[4] gives more details of possible traumatic consequences of deep bite.

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PREVENTION

Prevention of any problem is always is far better than cure. Diagnosis and treatment of developmental cases of excessive vertical overlap at an early age reduces the prevalence of traumatic tooth relationship later in life. According to Wragg *et al.*[5] recommendations to minimize periodontal trauma are:

- Identify those cases with the potential for trauma at an early age
- Ensure careful orthodontic diagnosis and treatment
- Establish and maintain periodontal health
- Ensure all restorations have stable centric stops to maintain posterior support
- Removable prosthesis should be reviewed routinely and maintained
- Patient should be made aware of the need for regular dental checkup.

Thus monitoring the developing occlusion, careful planning of any orthodontic treatment and regular restorative care contribute to a preventive philosophy and encourage the maintainenece of a healthy periodontium.

Treatment modalities: An understanding of the principles of occlusion and the relationship to oral health and disease is necessary for all dental clinicians. Complex problems such as traumatic deep bite often necessitate an interdisciplinary approach involving periodontal, prosthodontic and orthodontic care.[6,7] When patients presents with periodontal disease complicated by traumatic bite, an appropriate therapeutic sequence must be employed[8] as follows

1. An acrylic full occlusal coverage splint is used as diagnostic splint as well as to relieve to trauma from deep bite.
2. Conventional periodontal therapy: Initially palliative treatment is required to resolve acute symptoms of periodontal problems.[9] Elimination of gingival inflammation by scaling and root planning will decrease the tooth mobility. The physiological gingival contour may be achieved by gingivectomy.
3. Occlusal adjustment and treatment of traumatic bite: Glickman[10] believed that occlusal equilibration should yield normal, functional interdental relationship among teeth, which must be able to maintain a healthy periodontium that does not destroy itself in function. All harmful occlusal forces should be eliminated by reshaping or movement of teeth. An orthodontic therapy can provide benefits to the patients with traumatic deep bite and periodontal problems. In the growing child when the increase in overbite is due to overeruption of the incisors, preventing their further eruption, encouraging supra eruption of posterior teeth usually achieve

Table 1: Ackerly classification of traumatic overlap

Ackerly classification	Incisor relationship	Signs of trauma
I	Lower incisor impinge into palatal mucosa	Inflammation of palatal mucosa with the imprint of lower incisal edges
II	Lower incisors incisal edge occlude into palatal gingival crevices of maxillary teeth	Labial splaying of maxillary incisors Palatal pocket
III	Class II div 2 type of incisor relationship	Stripping of the gingiva in relation to palatal surfaces of upper anterior teeth and labial surfaces lower anterior teeth
IV	Lower incisor causing progressive abrasion of palatal surfaces of maxillary teeth	Abrasion of palatal surfaces of upper anterior teeth Dentin hypersensitivity

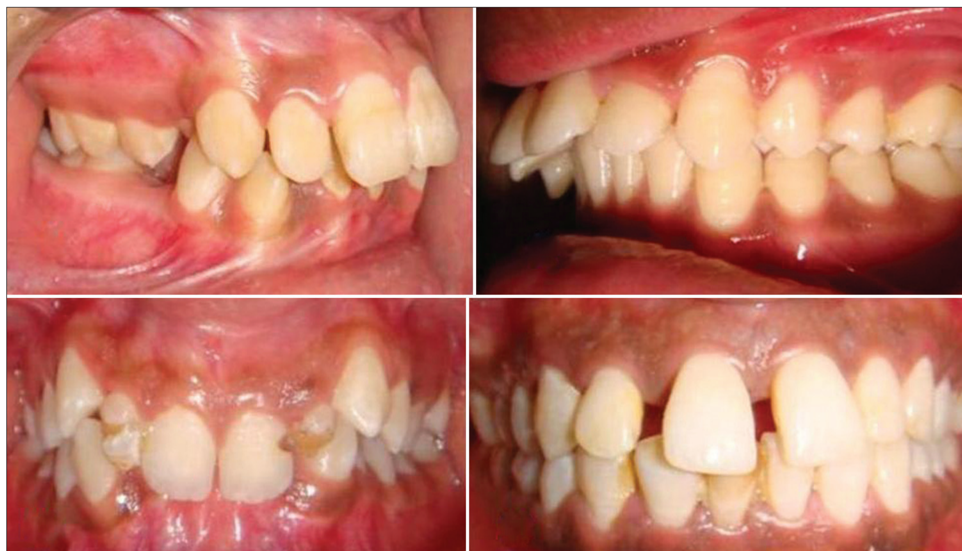

Figure 1: Clinical picture of Ackerly classification (I-IV) of traumatic overlap

overbite reduction. Facial growth then compensate for the resulting increase in facial height. For this an anterior bite plane[11] or inclined plane followed by fixed orthodontic treatment can be given to reduce overbite.

When there is underlying vertical problem, consideration should be given to growth modification with a functional appliance.[12] In Class II Div. 2 cases[13,14] after the alignment of anterior teeth by expansion appliances or by fixed orthodontic therapy, functional appliances can be used for growth modification [Figures 2 and 3].

In adults, if the traumatic incisor relationship is due to over eruption of anterior teeth, after palliative treatment, fixed orthodontic therapy is done to intrude incisors[15,16] and/ or to extrude posterior teeth thus correcting the deep bite [Figure 4]. Permanent retention is needed after fixed therapy. If deep bite is due to skeletal problem with over closure of mandible and decrease lower facial height. Orthognathic surgery[17] with fixed orthodontic treatment is given to correct traumatic bite.

When there has been a reduction in vertical dimension because of over closure of mandible due to loss of posterior teeth, then treatment of choice is replacing the missing teeth. This will restore the vertical dimension and provide stable retruded contact and intercuspal position to prevent further trauma.

4. Re-evaluation of periodontal tissues and their treatment: The periodontal tissues are re-evaluated when the overbite is corrected, the mucogingival surgery can be carried out if required in case of localized recession of gingiva due to traumatic bite either by free gingival graft or by lateral pedicle flap.
5. Maintenance: Patient should be instructed to maintain good oral hygiene. In some cases, hypermobility of teeth persist even after appropriate periodontal treatment and occlusal adjustment have

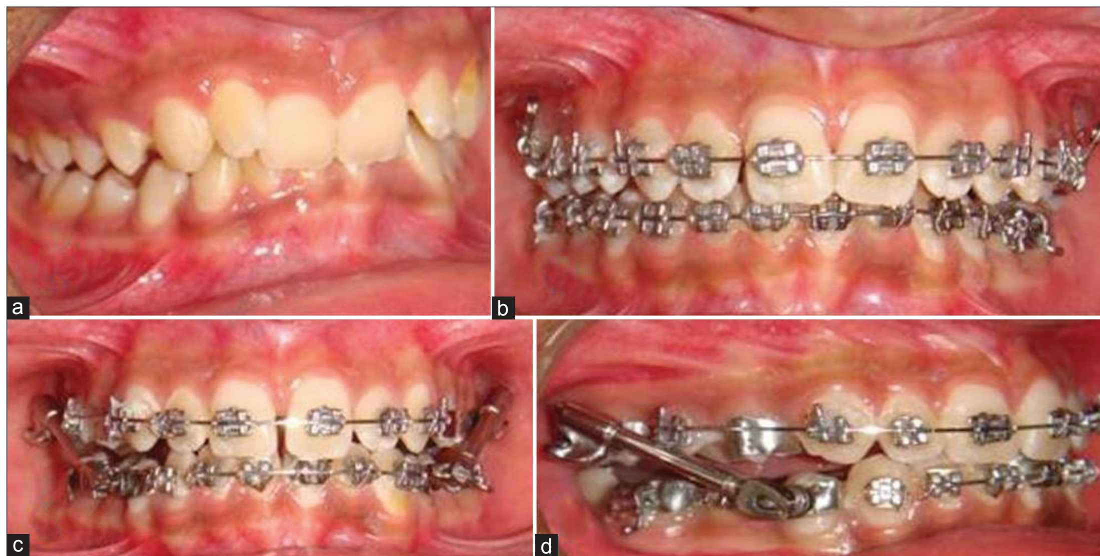

Figure 2: Orthodontic treatment of deep bite patient (A-D) with class II division 2 malocclusion

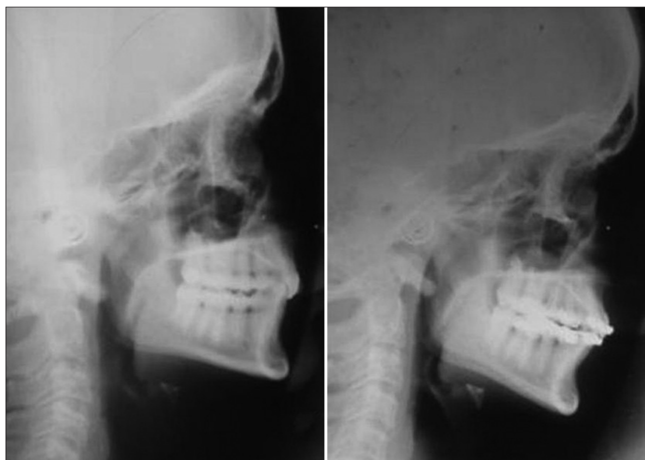

Figure 3: Radiographs of orthodontic treatment of deep bite patient with class II division 2 malocclusion

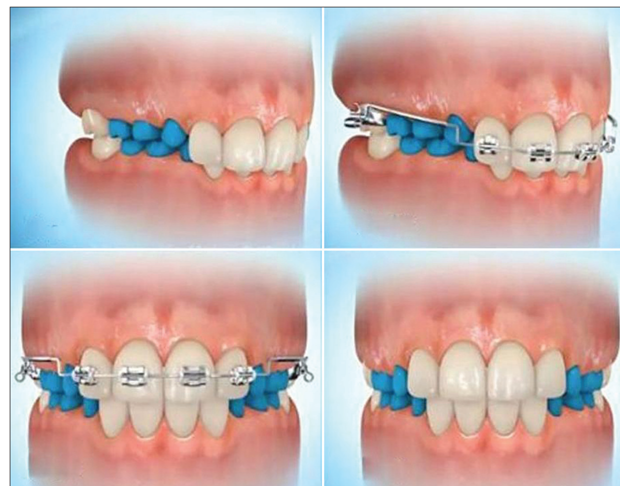

Figure 4: Orthodontics intrusion of incisor in deep bite patient

been administered. Then adjunctive appliances such as night guards and bite plates should be continued along with splinting or the permanent retention.

CONCLUSIONS

Traumatic deep bite is one of the most destructive types when overlap with the periodontal disease so it must be evaluated with care. If the correct diagnosis is made and appropriate therapeutic procedures are employed, dramatic results may be obtained. Monitoring the developing occlusion, careful planning and regular restorative care can prevent the disease to happen.

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