



## INTRUSION AND RETRACTION OF INCISORS IN ADULT PATIENTS WITH MARGINAL BONE LOSS

### Dental Science

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### ABSTRACT

A common problem in adult patients suffering from periodontal disease is the migration, elongation, and spacing of incisors. Disjunction of the equilibrium between the available periodontal support and the forces acting on the teeth may result in positional changes. This frequently leads to trauma from occlusion, a situation that might enhance destruction of the periodontium if plaque-associated inflammatory lesions of the gingiva are present<sup>1</sup>. Anterior teeth are specially prone to elongation since they are not protected by occlusal forces and have no anteroposterior contacts inhibiting migration. Masticatory forces are predominantly anterolaterally directed and little resistance exists, particularly if there is already an increased overjet. With progressive bone loss, the center of resistance moves apically<sup>2</sup> and the forces acting on the crowns generate a larger moment, adding to the progressive displacement.

Intrusion, retraction, and/or uprighting of incisors seem to be the logical solution to the orthodontic problem of these patients when considered from causative, esthetic, and functional points of view. However, orthodontic correction of malaligned, tipped, or spaced teeth with horizontal and vertical bone losses may also be related to improvement of bone support. Ceraci<sup>3</sup>, and Brown<sup>4</sup>, even suggest that orthodontic correction may contribute to regeneration of periodontal tissue. On the other hand, orthodontic treatment, especially that involving intrusive movements, does include a risk of aggravation of the periodontal condition<sup>5,6</sup>.

The following case report describes the interface between orthodontics and periodontics in the treatment of an adult patient.

### KEYWORDS

#### Diagnosis and Treatment Plan

A 21-year-old female presented with the chief complaint of incisor spacing and severe protrusion and consequent speech difficulties. The mandibular left first molar had been extracted at an earlier age. Maxillary right first molar showed poor class II silver filling.

Clinical examination revealed generalized gingival recession with 3mm pockets, no bleeding on probing, no incisor mobility. The patient displayed bimaxillary dental protrusion and convex profile with potentially incompetent lips. She had a Class I buccal occlusion with proclined, spaced, and elongated incisors.

Radiographic analysis showed generalized horizontal alveolar bone loss and no furcation involvement of the mandibular molars.

#### Extra Oral Examination: -

\* Face in front view her facial form is dolichofacial with apparently symmetrical facial features and increased lower anterior facial height. Nose is of normal size. There is 4 mm exposure of maxillary incisors when are at rest. Lips are incompetent when examined together at rest and are hypotonic. Upper lip is short and lower lip is everted.



(PRETREATMENT PHOTOGRAPH AND RADIOGRAPH)

#### Cephalometric Examination

Reveals higher angle FMA, SN Go-Gn and lower Jarabak Ratio indicating vertical growth pattern. Angle SNA (810), SNB (800) and ANB (10) showing normal maxillomandibular relation. There was severe bimaxillary dentoalveolar protrusion. Mandible was rotated downward and backward.

#### The Treatment Plan:

1. Extraction of both maxillary first premolars and mandibular right first premolars.
2. Reinforcement of anchorage with a mandibular lingual holding arch and a Nance's palatal holding arch.
3. Intrusion and retraction of the mandibular incisors and maxillary incisors in the extraction space with Begg Technique.
4. Maintenance of periodontal health by home care, under the supervision of a specialist.
5. Finishing and detailing.
6. Upper lower Hawley's retainers were placed to hold the teeth in their corrected position Treatment Mechanics and Progress

The mandibular lingual and maxillary Nance's palatal holding arch was cemented to the first molars. Canine to canine Begg's brackets bonded. Patient was instructed to brush their teeth after every meals. Both maxillary and mandibular .016" plane arch wires with intermaxillary circles just distal to lateral incisors with 300 anchor bend was placed. Since patient was a vertical grower she was advised to wear intramaxillary elastics on both the arches and not class II elastics. After the mandibular incisors had been retracted and bite is opened .018" upper and lower arch wires were placed to close remaining space. During treatment, the patient received monthly reinforcement of plaque removal, as well as sub gingival debridement at three-month intervals After space closure torquing and uprighting was done with 0.012" PP wire auxiliaries. Upper lower Hawley's retainers were placed to hold the teeth in their corrected position. Total duration of treatment was 22 months.



(Photograph and radiograph during treatment)

#### Treatment Results

After orthodontic treatment, the patient showed an improvement in lip competence. The dental midlines were coincident with the facial midline, both arch forms had improved, and the good buccal occlusion was preserved. The incisor relationship was normalized, with proper overjet and overbite. Intrusion of the incisors was evident both clinically and radiographically, and the periodontal condition had improved. The maxillary and mandibular spaces were eliminated by the orthodontic retraction. Because of the improvement in esthetics and speech, the patient reported a higher level of self-confidence and self-esteem and was generally happier and more cheerful.



#### Discussion

Orthodontic tooth movement is seldom routine in periodontally involved patients<sup>7</sup>. This paper describes a team approach to the management of such patients, with treatment planning carried out by the orthodontist, and the periodontist. The patient was referred to the

periodontics department for vigorous preparation of root surfaces and gingival tissues<sup>8</sup>. Before orthodontic intrusion was initiated, deep pockets were eliminated to prevent apical displacement of plaque that could have produced periodontal lesions<sup>9</sup>. Once the patient had demonstrated the ability to maintain a high level of oral hygiene, orthodontic treatment was begun. During treatment, the patient received monthly reinforcement of plaque removal, as well as sub gingival debridement at three-month intervals, as recommended by Vanarsdall. Favorable changes in osseous topography can be accomplished by moving teeth into an area of the arch with greater bone volume and by repositioning periodontally involved teeth<sup>10</sup>. The finding of Melsen and colleagues<sup>6,9</sup> that incisor intrusion in adult patients with marginal bone loss has a beneficial periodontal effect was substantiated by the present case, where the post-treatment radiographs showed positive bone remodeling (fig.3). Melsen also reported that a new connective tissue attachment could be formed during the intrusion of periodontally involved teeth if gingival inflammation is eliminated and root surfaces are adequately scaled<sup>11</sup>. Other researchers, however, have found only pseudo or hemidesmosomal attachment rather than a new periodontal ligament attachment<sup>12,13</sup>. A given force applied to the crown of a periodontally compromised tooth produces greater pressure on the periodontal ligament than it would on a normally supported tooth, because of the diminished periodontal ligament area<sup>14,15</sup>. In this case, Begg appliance allowed us to keep orthodontic forces to less than 20g per incisor. It was considered crucial for treatment results that the gingival inflammation is kept at a minimum during treatment.

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