

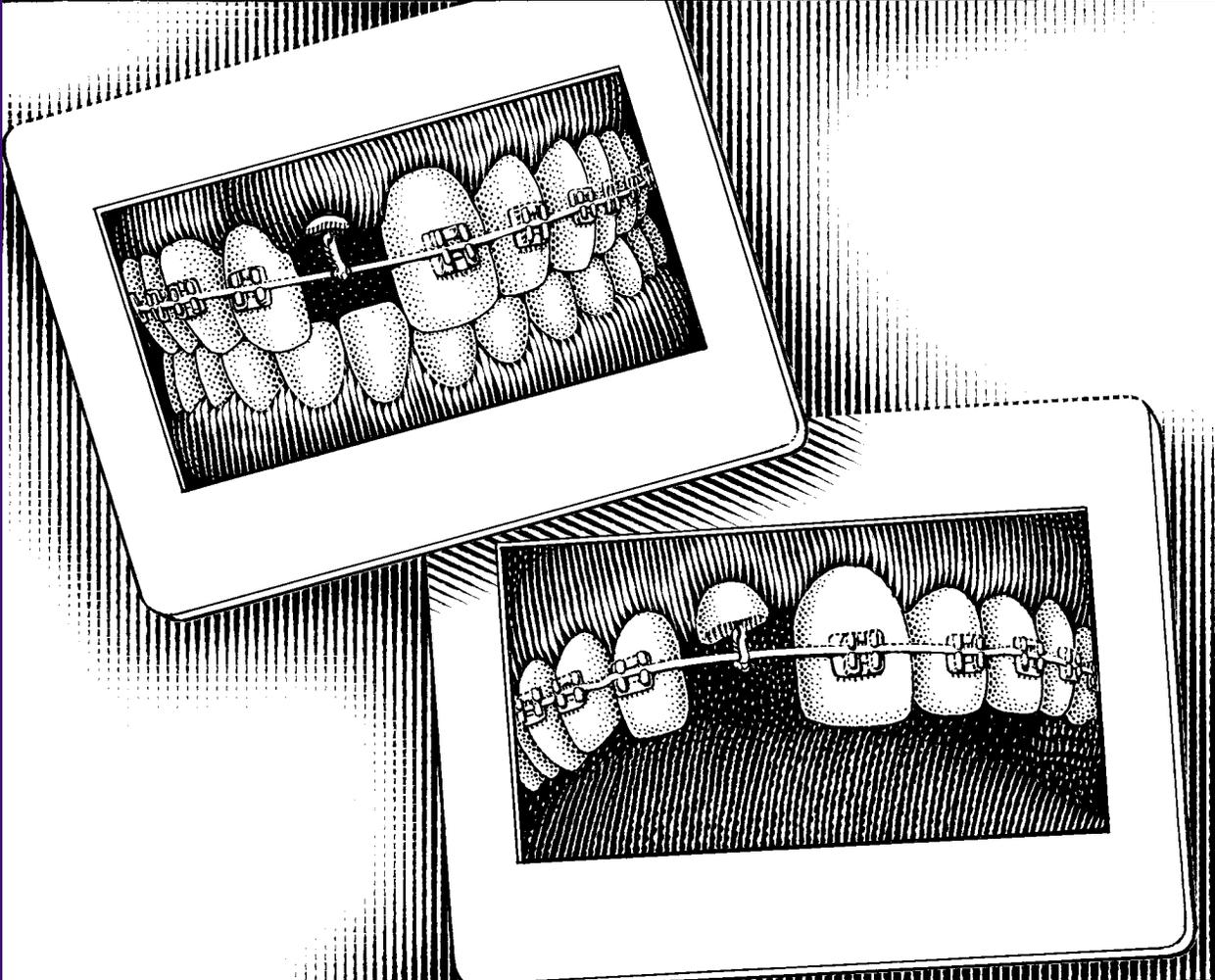


American Association of Orthodontists

VOLUME TWELVE

NUMBER THREE

FALL 2000



ORTHODONTIC FORCED ERUPTION IN MULTIDISCIPLINARY TREATMENT

ORTHODONTIC FORCED ERUPTION IN MULTIDISCIPLINARY TREATMENT

Which of the following best describes forced eruption?

- (A) Drilling "venting" holes in the side of Vesuvius
- (B) Uncorking a warm bottle of champagne
- (C) Explaining to your office staff that you will be starting evening hours for your patients
- (D) Using orthodontic force to extrude teeth
- (E) All of the above

If you answered positively to any of the above, you are entitled to continue reading this issue. If you did not, we hope you will enjoy this issue of *Orthodontic Dialogue* anyway!

It has long been known that tensile forces placed on the periosteum will create histological and structural changes in the underlying bone. Forced eruption, a.k.a. orthodontic extrusion, is a simple but quite effective means of placing tension on the periodontal ligament (periosteum) in order to precipitate favorable anatomical changes in otherwise unmanageable osseous conditions. Over the last three decades, the dental literature has been replete with studies and clinical trials outlining

the relationship between orthodontic tooth movement and infrabony osseous defects. On the negative side, there was an inability to predictably gain connective tissue attachment when bodily moving a tooth into an infrabony defect.^{1,2} However, on the positive side, it had been demonstrated in earlier studies that favorable radiographic changes result when mesially tipped second molars are uprighted and extruded by orthodontic forces.³ These findings were further expanded to include forced eruption for the treatment of one- and two-walled infrabony defects⁴ and forced eruption for the treatment of otherwise non-restorable teeth.⁵ Without forced eruption, these teeth were destined for extraction or periodontal crown lengthening procedures, resulting in long unesthetic teeth with visible restorative margins. It has been demonstrated that even in the presence of advanced periodontal disease, when teeth are orthodontically extruded, the bony crest will follow the direction of the force.^{6,7} However, initial periodontal preparation to control gingival inflammation prior to orthodontic intervention is highly recommended.

Finally, the literature has shown that forced eruption can be utilized to help prepare otherwise unsuitable sites for eventual implant placement.^{8,9}

Fixed appliances should be used to allow control of the application of a gentle, continuous force. This system should include sufficient dental units to counteract the potential side effects of the eruptive force. A retention period, which may include fixed stabilization for four to six months, is necessary. Proper retention maximizes the esthetic result and/or ensures adequate bone maturation prior to definitive periodontal care.

Orthodontic forced eruption can be extremely useful as part of the multidisciplinary treatment of the following:

- esthetic enhancement of the maxillary anterior periodontium;
- recontouring infrabony periodontal defects in anterior and posterior areas;
- esthetic restoration of subgingival and subosseous dental fractures, carious lesions, and resorbed areas;
- maintenance of osseous integrity

FIG. 1



Esthetic enhancement using orthodontic forced eruption following placement of an autogenous free gingival graft

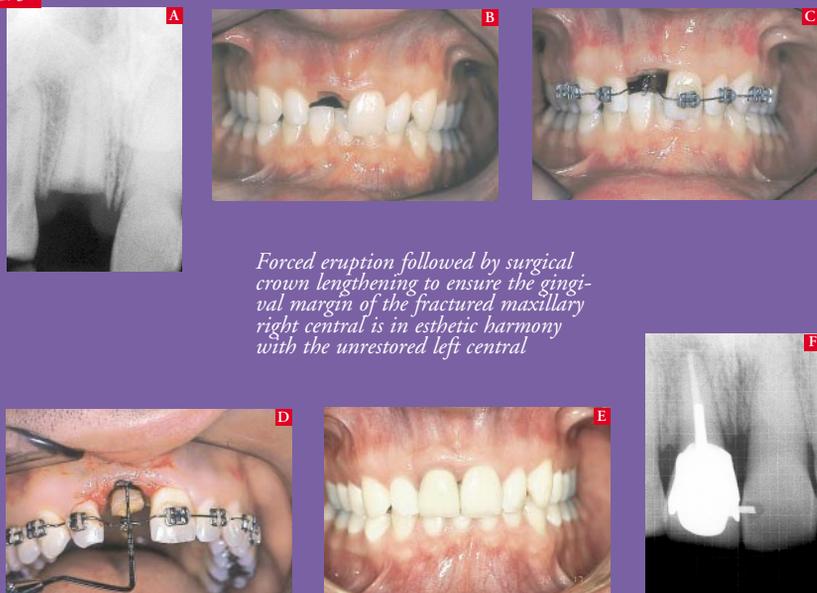
FIG. 2



Mesial osseous defect on maxillary right canine

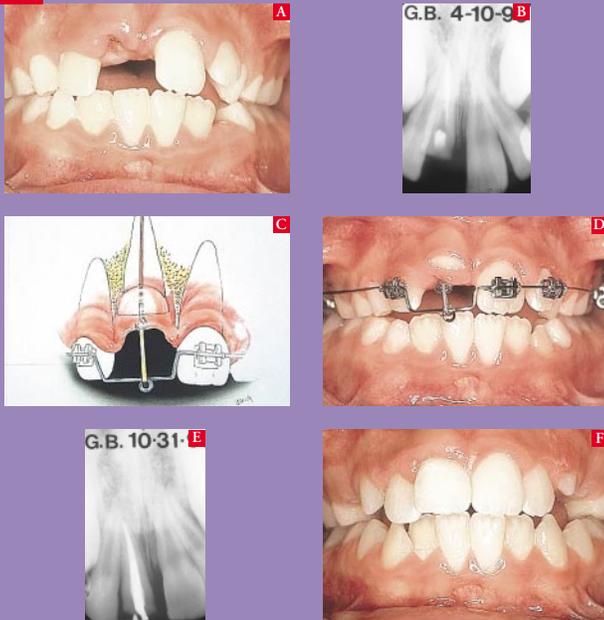
Leveling of bony defect after canine eruption and preparation of teeth #5, 6 and 7

FIG. 3



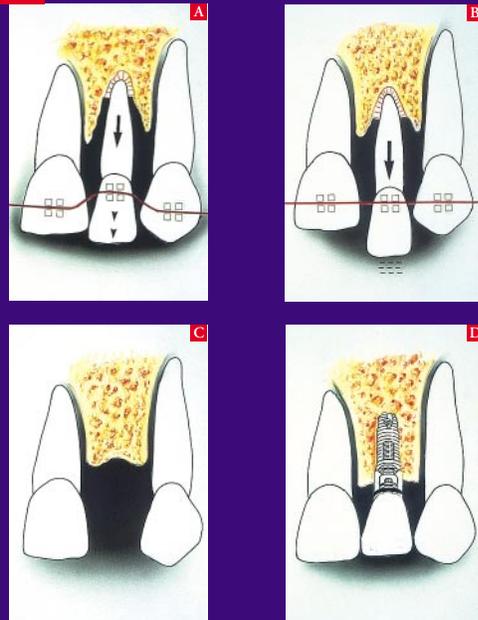
Forced eruption followed by surgical crown lengthening to ensure the gingival margin of the fractured maxillary right central is in esthetic harmony with the unrestored left central

FIG. 4



Forced eruption of traumatized tooth in the mixed dentition stage of development. This procedure to retain this otherwise unrestorable root allowed the orthodontist to preserve the delicate buccal-lingual plate around this tooth during this critical time in development. Premature loss of this tooth could result in atrophy of the bony ridge, making future implant placement difficult or even impossible without extensive bone regeneration surgical procedures.

FIG. 5



Forced eruption of a hopeless periodontally involved tooth to prepare this area for a more ideal implant placement. After eruption, the tooth must be stabilized for four months prior to extraction. Periodontal regeneration can then be accomplished to facilitate placement of an implant with more favorable length, width and esthetics.

in "early" trauma sites (for eventual implant replacements); and

- slow extrusion of hopeless periodontally involved teeth in preparation for implant placement.

ESTHETIC ENHANCEMENT

Case #1: A 30-year-old female patient was not pleased with the appearance of her partially erupted maxillary left canine. The tooth had a lack of attached gingiva combined with a very fragile mucosal attachment overlying an extremely thin plate of buccal alveolar bone. As a precautionary move, a free gingival graft was placed prior to orthodontic extrusion. The graft was expected to prevent the occurrence of adverse periodontal conditions in the area. Orthodontic forced eruption was then used to bring the canine into function with improved esthetics. The orthodontic extrusion enhanced the success of the graft, which resulted in the desired esthetic change. (See Fig. 1.)

RECONTOURING INFRABONY DEFECTS

Case #2: Tension applied via periodontal ligament as a result of forced eruption led to radiographic evidence of improved osseous architecture. The crown may require selective recontouring, or, in severe cases, the extruded tooth may require endodontic therapy followed by prosthetic coverage. (See Fig. 2.)

ESTHETIC RESTORATION

Case #3: This patient presented with a hockey injury that resulted in a subgingival fracture of his right central incisor. Forced eruption was used to move gingival tissues and osseous crest incisally. Periodontal surgical intervention then enabled the restorative dentist to place a full coverage crown. The traumatized tooth was then stabilized by splinting to the adjacent central incisor. (See Fig. 3.)

MAINTENANCE OF OSSEOUS INTEGRITY

Case #4: A very young patient suffered a subgingival fracture of the entire central incisor crown. The placement of a pin in the crown followed root canal therapy. The tooth was then extruded with forced eruption so that a temporary crown could be placed. This multidisciplinary approach was used to preserve the root in order to avoid atrophy of the surrounding bone that normally accompanies a long-standing extraction site.

The preservation of bone will enhance the success of eventual implant replacement if it becomes necessary at a later date. (See Fig. 4.)

EXTRUSION OF PERIODONTALLY INVOLVED TEETH

Case #5: Diagrammatic representation of forced eruption of a tooth with severe periodontal involvement. The bracket is placed gingivally on the involved tooth in order to extrude the tooth by means of an alignment arch wire. Bone and soft tissue are moved incisally as the tooth is forcibly erupted and then stabilized for four to six months. Subsequently, the affected tooth is extracted, leaving significantly enhanced hard and soft tissues in the area for eventual implant placement. Hard and soft tissues can be further improved with the placement of an autogenous or allogenic bone graft combined with gingival enhancement and/or recontouring before or after implant placement. (See Fig. 5.)

CONCLUSION

Evidence has shown that simple extrusion of periodontally involved teeth, traumatized teeth, or normally non-restorable teeth can provide the restorative dentist with more favorable conditions for the placement of functional and esthetically pleasing restorations. The inclusion of orthodontic forced eruption as part of the multidisciplinary treatment approach has the potential to greatly enhance esthetics, recontour periodontal defects, eliminate disfigurement from dental injuries, and facilitate dental implant placement.

The American Association of Orthodontists is a national dental specialty organization that was founded in 1900. The AAO is comprised of more than 13,500 members. Among its primary goals are the advancement of the art and the science of orthodontics; the encouragement and sponsorship of research; and the achievement of high standards of excellence in orthodontic instruction, practice and continuing education.

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The AAO recommends that every child should have an orthodontic screening no later than age 7.

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