

CREATE THE SPACE

The pendulum appliance

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The dilemma to extract or not to extract teeth continues to haunt orthodontics today. The extraction of teeth during Angles' era was considered a sin.¹ With the revolt of Tweed and the influence of Begg the extraction of teeth became commonplace where indicated.² Statistically, it is difficult to state how many cases require the judgment of the orthodontist to discern whether or not extractions should be done. There are, however, many cases where the decision is borderline. This article is not intended to justify extraction or non-extraction of teeth. Rather, the aim is to present another armament; the "pendulum appliance" to create space for the orthodontic patient who has crowding to their maxillary dentition; and the decision has been made not to extract teeth.

Throughout the 20th century, a number of ingenious and creative appliances have evolved to create space in the crowded dentition to alleviate the need for extractions. Some of these methods would include the use of:

- a) headgear appliances;
- b) various types of springs;
- c) the jones jig;³
- d) transpalatal arches;
- e) quad-helices.

Recently, a space-creating appliance has emerged showing great promise and success — the "pendulum appliance".³ The "pendulum appliance" should be added to this list, for someday it will also be recognized as a clever and effective method of creating space.

DESIGN AND METHOD

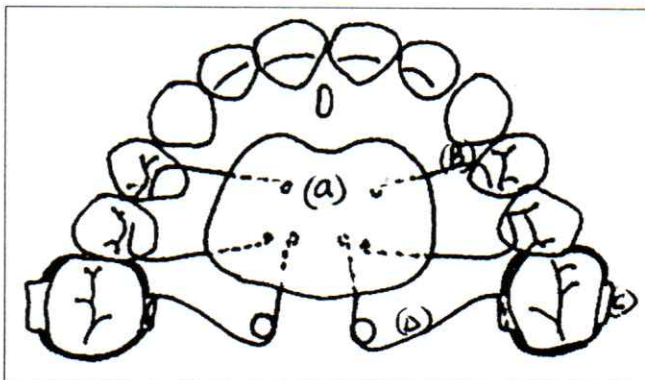
The pendulum appliance is one of simple design and

high efficacy. The appliance (Figure 1) consists of the following:

- a) nance button;
- b) occlusal rests for bicuspid, molars or primary molars where applicable;
- c) molar bands; and
- d) TMA wire arms (0.30mm) which act to distalize molars using the nance button and bonded bicuspid occlusal rests for anchorage.

No single appliance should be considered a panacea. However, in cases where distalization of molars with subsequent anterior retraction is being considered, the pendulum appliance should not be overlooked.

Figure 1



The methodology for the pendulums' fabrications and insertion is simple:

- (i) separators are placed three to seven days prior to the placement of bands for the teeth to be distalized (molars);

Figure 2

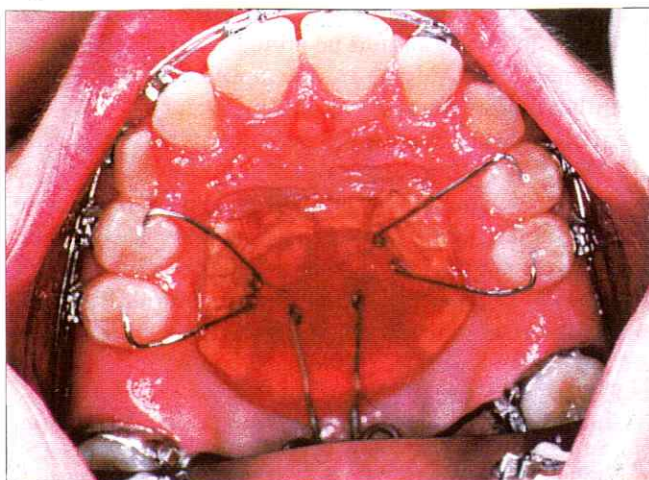
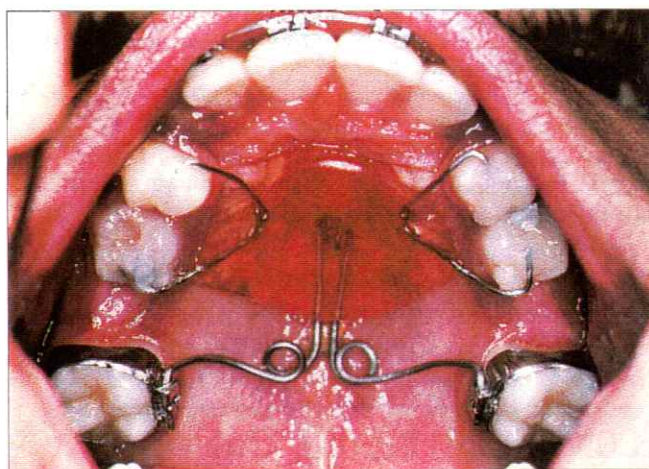


Figure 2



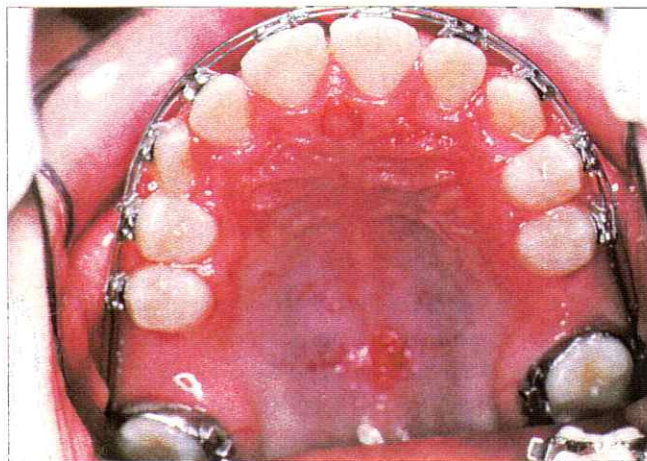
- (ii) molar bands are fitted following removal of separators;
- (iii) an impression is taken using alginate and is sent to a lab with the appropriate prescription for appliance fabrication;
- (iv) teeth are pumiced clean and the bands to the appliance are cemented to the molars;
- (v) the TMA arms of the appliance are activated outside the mouth bending them distally an appropriate amount to achieve the desired amount of molar distalization;
- (vi) the cleansed occlusal surfaces of the bicuspid are etched and the arms are bonded to the teeth;
- (vii) the activated TMA arms are then inserted into the sleeves of the molar bands;
- (viii) the appliance is monitored until the desired amount of distalization is achieved;
- (ix) the appliance is removed and the bicuspid and anterior teeth are retracted by a means desired by the operator.⁴

ADVANTAGES AND DISADVANTAGES

As with any appliance there are both advantages and disadvantages in the use of the pendulum appliance. The advantages include:

- a) easy and cost-effective construction;
- b) great patient acceptance and relative comfort;

Figure 3



- c) excellent distalization of molars (and/or bicuspid if desired);
 - d) simple insertion and maintenance; and
 - e) elimination of the need for patient cooperation.
- On the other hand, the disadvantages include:
- a) cost of an additional appliance;
 - b) use restricted to dento-alveolar cases with no growth modification application requirements;
 - c) possible irritation to the palate;
 - d) less effectiveness in cases where the second molars have erupted; and
 - e) patients with long lower anterior face heights.

DISCUSSION/CONCLUSION

Clinically the pendulum appliance is most efficacious in the correction of dento-alveolar Class II malocclusions (divisions I, II or 0), where molar distalization to a Class I relationship is desired. Diagnosis is a critical issue in deciding to use the pendulum appliance. This appliance works to distalize molars/bicuspid and their dento-alveolar complex. There is no growth modification effect to be gained from this appliance. Hence in cases whereby growth modification is required such as in Class II skeletal deficiencies the pendulum appliance would not be the appliance of choice.

The results achieved by the pendulum appliance have been astounding and rewarding. The effectiveness of the appliance in the treatment of Class II dento-alveolar crowding has allowed for triumphs in cases which may have otherwise required the extraction of teeth in order to achieve the same ideal success. Distalization of up to 10 mm of space has been achieved with the appliance and examples of the results may be observed (Figure 2). The results exhibited in Figure 2 are representative of the kind of distalization which has been achieved in various cases, using the pendulum appliance. The amount of distalization shown by no means represents the limits attainable, thus clinical judgment is required. (Note: the clinical views shown represent situations whereby the distalized tooth was abutted against the mesial tooth before the insertion of the pendulum appliance).

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Figure 3 represents the clinical view following the removal of the pendulum appliance. At this point, an appropriate means should be added to retain the space which has been gained by the appliance and subsequently distalize the anterior dentition.

Experience and individual preference usually guides our choices and treatment decisions. However, once a decision to create/achieve space has been made, the pendulum appliance should not be overlooked. The appliance is simple in design and is highly efficacious. If one should require space creation the pendulum appliance should be considered. ♦

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Credit for appliance design should be given to Dr. James Hilgers and Dr. Randall Bennett.

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