

# The Amalgamated Technique

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## Abstract

In the last decade of the preceding century, orthodontic practice witnessed the reporting of periodontal ligament distraction for rapid canine retraction<sup>1</sup>, the use of mini screws for anchorage<sup>2-9</sup>, and the resurrection and refinement of corticotomy –facilitated orthodontics<sup>10-15</sup>. These methods added aspects of strength to routine clinical practice. It has been hypothesized that, by “amalgamating” conventional fixed orthodontic treatment with the aforementioned techniques, it would be possible to produce a “layered” treatment regimen that maximizes the patients’ benefit. The advantages of the new techniques should theoretically cancel out the drawbacks of routine fixed treatment (long duration, enamel lesions, root resorption, anchorage problems). This article describes the evolution and clinical application of a new technique, The Amalgamated Technique

**Keywords:** Orthodontics; Shortening treatment time; Amalgamated technique; Periodontal ligament distraction; Miniscrews; Corticotomy-facilitated orthodontics

## The Technique

The candidates for the technique were examined clinically and those who met the inclusion criteria were informed of the procedure, potential benefits, risks, and complications, and a signed consent from the patient or patient’s parent was obtained.

## Inclusion criteria

- Class II div 1 malocclusion
- Class I bimaxillary protrusion
- Class II canine relation
- Maxillary canines centered within the alveolar bone

For the sake of discussion, the technique can be divided into three stages; canine retraction by periodontal ligament distraction, anterior segment retraction and intrusion by corticotomy and mini-screw anchorage, then the final detailing of occlusion. In actual practice, the three stages are superimposed.

For the first stage, bands were fitted on the canines and first molars and alginate impressions made for the fabrication of the distraction devices. The latter were soldered to the canine and molar bands making sure that the line of action of the distraction device is parallel to the dental arch from the occlusal and facial views. A 36 mil transpalatal arch was adjusted to passive fit into palatal sheaths on the first molar bands. The distraction devices were tried in and brackets (American Orthodontics Master Series 22 slot) placed on the incisors. The second molars were banded. Leveling and aligning to 17 × 25 stainless steel archwires was carried out. The patients were then scheduled for extraction [1-5].

On the day of extraction, the mini-screws were placed into the alveolar bone mesial to the first molar (Figure 1). Labial and lingual muco-periosteal flaps were reflected from canine to canine, and root-circumscribing grooves were scored in the labial and lingual alveolar bone using a #2 round bur under copious irrigation. Whenever possible, corticotomy perforations were also made (Figure 2). A resorbable grafting material was mixed with clindamycin and sterile saline into a wet-sand like consistency and placed onto the labial and lingual cortical plates. The flaps were re-positioned and sutured. Then, the first premolars were extracted and grooves made inside the extraction

socket according to the method described by Liou and Huang<sup>1</sup>. The distraction devices were cemented and activated several turns until some resistance was felt.

The transpalatal arch was placed and a three-piece intrusion arch fabricated for simultaneous intrusion and retraction. A nickel-titanium coil spring or elastic chain was attached between the distal extension of the anterior segment and the mini-screw to initiate anterior retraction (Figure 3)[ 6-10].

The patients were instructed to activate the distraction device four quarter turns per day and were followed up every three days. When the canines were sufficiently retracted (distracted) the distraction devices



**Figure 1:** Intra-oral photograph showing mini-screw placed mesial to first molar.

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**Figure 2:** Intra-operative view showing the corticotomy cuts and perforations.



**Figure 3:** Intra-oral photograph showing the distractor and simultaneous intrusion and retraction setup.



**Figure 4A:** Profile view of patient #1 showing lip protrusion and convex profile.

were removed and brackets placed on the canines and ligated to the first molars with steel ligature. Finishing and detailing continued until all treatment objectives were met.

The following are two illustrative cases.

### Case Report 1

The first patient, an 11 year 8 month old female, presenting with a chief complaint of “my front teeth sticking out”. The patient had a symmetric meso-cephalic face, with normal lower face height. Lips were incompetent at rest, with 7mm of upper incisors showing at rest. On smiling, 100% of upper incisors and 2 mm gingival tissue were visible. The profile was moderately convex with protruded upper lip. The lower lip was everted and behind the upper incisors. The mandibular plane inclination was average and the chin button orthognathic (Figure 4a).

Intra-orally, she was in the early permanent dentition, with Class I molar and Class II canine relation bilaterally. The lower right second premolar and lower left first premolar were impacted. There was an overjet of 12 mm and an increased overbite (Figure 4b and 4c).

Treatment objectives were to retract the upper anterior teeth, reduce overbite, and achieve Class I canine relation. The Amalgamated Technique was applied to the patient after having obtained the parents’ written consent. Post-operative photographs show favorable change in profile and occlusion (Figure 5a-5c) [11,12].

### Case Report 2

The second patient was a 20-year-old female, presenting with a chief complaint of “too much front teeth showing”.



**Figure 4B:** Intra-oral frontal view in occlusion.



**Figure 4C:** Buccal view showing the increased overjet.



Figure 5A: Posttreatment profile of patient #1 showing favourable change.



Figure 5B: Posttreatment frontal view of patient #1.



Figure 5C: Posttreatment buccal view of patient #1.

The patient had a symmetric face, with a slightly decreased lower face height. On smiling, 90% of the incisors, and 0% of gingival tissues show. The profile was convex with protrusive upper and lower lips (Figure 6a).

Intra-orally, the patient had a bilateral Class I molar and Class II canine relation. Both upper and lower incisors were protrusive and both arches were moderately crowded. Upper second premolars were in buccal cross bite (Figure 6b and 6c).

The treatment objectives were to restore facial aesthetics and soft tissue balance by correcting the axial inclination of upper and lower incisors and establishing a Class I molar and canine relation. The treatment plan involved the extraction of upper and lower first premolars and application of the Amalgamated Technique. It was decided to carry out the surgical part of the procedure for the upper and lower arches on separate occasions, beginning with the lower arch. Favourable change in profile and occlusion was obtained (Figure 7a-7c) [13-15].



Figure 6A: Profile view of patient #2 showing lip protrusion and convex profile.



Figure 6B: Intra-oral frontal view in occlusion.



**Figure 6C:** Buccal view showing the increased overjet and premolar cross bite.



**Figure 7C:** Post-treatment buccal view of patient #2.



**Figure 7A:** Posttreatment profile of patient #2 showing favourable change.



**Figure 7B:** Post-treatment frontal view of patient #2.

## Discussion

The application of this technique has proved its clinical success. Combining periodontal ligament distraction with corticotomy and mini-screw anchorage effectively reduced treatment time by 25% of conventional treatment time. The points of strength of each of these techniques were successfully employed. Patients did not report excessive pain or discomfort, and stated that the required daily activations of the distractors did not interfere with daily routine activities. Achievement of treatment goals was consistent in all treated case.

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