

The Labiobuccal Retainer

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In the past several years many phases of orthodontics have received increased attention, such as appliance technics, cephalometric diagnosis, and treatment planning, to mention but a few. This certainly is as it should be — it is advancement, it is progress — and few, if any, would have it otherwise. The study of retention, however, has hardly kept pace. Emphasis has not been placed upon the problems of retention, and maybe that is why it has been rather aptly called the “step-child” of orthodontics.

A study of the problems of retention has long been of special interest to the writer. Foremost among retention problems are how to maintain the teeth in function and in their new positions, and how to prevent relapses. How to do this successfully is what I would like to discuss with you, and I hope you can benefit from some of my experiences. Do we always get perfect results? No, naturally not, but the percentage of stable end results has increased markedly.

Retention is a subject that can generally be discussed in most orthodontic circles because, regardless of whether one is a one hundred per center or occasionally extracts bicuspid, retention of one's cases is a problem to most of us. It is one of the so-called “facts of life” that eventually faces us in the majority of our cases.

Someone once said that orthodontics is a science but retention is an art. That

the science of orthodontics can be taught is quite self-evident, but I have felt for a long time that the art of retention cannot be taught easily but is something that has to be tried again and again by most men before it is understood and mastered. It is a constant battle — making teeth remain in new positions and function there after bands and appliances are removed.

Quite recently a good orthodontic friend of mine asked me, “Why is it that my cases, which look so good to me as they become ready for retention, too often look so poor in retention when it should be just the reverse?” Years ago I heard an old orthodontic saying that went like this, “I'll treat the case, you retain it, and I'll give you half the fee.” Many of you, I am sure, can recall having heard this and, even though it is a little unrealistic, it still expresses well the apprehension that men have had and continue to have for this very important but often neglected phase of our work.

There is more than one school of thought regarding the subject of retention. A poll taken at a recent meeting showed the older members as favoring formal retention for their cases while the younger men present were less interested in retaining cases after treatment. Was this because the older men, who had practiced more years, had witnessed too many of their own well-treated cases relapse from little understood or careless retention on their part?

Let us discuss for a few minutes what I feel are fallacious lines of reasoning with regard to this subject. The first

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one is this, "If malocclusions are ideally corrected, the forces of the inclined planes will be sufficient to balance the denture, and formal retention will not be necessary."

I do not believe that many of the younger men, and surely none of the older, will accept this one-time rather popular theory. To anyone inclined toward this line of thinking, one has only to remember that osteoid-type bone is a very poor substitute for mature bone in holding teeth in their proper places while withstanding the muscular stresses and forces of occlusion that are always present even during retention. Some form of support or splint is necessary in most cases after band removal to support the teeth until bone tissue is reorganized.

The second line of reasoning is this, and again I am addressing myself principally to the younger men. Why retain, is the attitude of some men whose rather logical argument is, "If the teeth are going to relapse sooner or later why not have them do it sooner? In short, let's get on with the relapse and see how bad it is going to be." That actually was the attitude of a group of men I talked with not too long ago. I think in general we would agree that this is faulty reasoning. Why go to all the trouble and expense of doing the work just to let the teeth relapse? Too many successfully treated and retained cases testify to the benefits of well planned and carried out retention to accept such a faulty argument.

For many years there has been a need for something better than what we have had for maxillary retention in certain types of cases. I refer more specifically to the treatment of Class II cases in which a considerable amount of intermaxillary elastic traction has been necessary. Retention is most generally a problem with the child who has had a Class II malocclusion, a hypotonic upper lip, and

who, because of habit or allergy, cannot or will not use his lips correctly. In such cases Class I molar relationship, attained through the use of rubber elastics and headgear wear, is often impossible to hold or maintain during retention. During retention, the maxillary teeth too often move forward again following the removal of the distal restraint, and are followed by the mandibular teeth which attempt to remain in Class I relationship. The lower teeth fit better in a forward position, and the patient may also realize he looks better with his lower jaw forward; thus a convenience bite is started, a dual bite is created. Many times in these once protrusive cases, the best of ordinary retainers are not capable of holding the maxilla in Class I occlusion.

At the 1952 Tweed meeting in Chicago, during a symposium on retention, I described the use of the .045 archwire, with an auxiliary spring and headgear, showing its restraining effect on the teeth of the maxillary arch. This was termed active retention. Though not perfect, this approach proved to be a step in the right direction because it employed the use of a distally directed force on the maxillary teeth as the initial step of retention after band removal. The effect of this archwire on the teeth anterior to the molars was not ideal in all cases because it was sometimes difficult to close open contacts in the bicuspid and cuspid region, even in conjunction with a headgear. Neither did the combination of wearing a maxillary retainer by day and an .045 archwire with headgear by night seem to be the answer in some of these once protrusive Class II cases. The problem was: how to get these stubborn retention cases out of one's practice.

In an effort to prevent the creation of a dual bite from developing and to assist in maintaining the Class I buccal

relationship established during treatment, I would like to discuss with you a method or approach to retention I have been using for quite some time. When basic treatment of a case has been completed, that is, when the case appears to be practically finished, an inspection tour is started before any bands are removed to determine if the case is ready for retention. The following points are checked:

1. Has the overbite been adequately reduced?
2. How about the mesiodistal relationship of the teeth in the buccal segments? Are these teeth really in Class I occlusion?
3. Have the maxillary cuspids been carried fully back to the bicuspid spaces so that they are in their correct relationship to the lower cuspids?
4. Examine the upper six year molars — have they been rotated sufficiently, or are the mesiobuccal cusps still rotated to the lingual?
5. Do bicuspid spaces, cuspids, or incisors need more rotation?
6. If our case has been one in which teeth had to be removed, it is wise to check to see if the roots adjacent to the extraction areas are parallel.
7. Check also to see if the roots of the upper centrals and laterals have been torqued lingually an adequate amount.
8. Is there a dual bite?

If all these points check out favorably, then retention is started. It takes only a few minutes to make this inspection tour and you may be sure it pays to do it before many bands are removed because these same steps are difficult and, in some instances, impossible to do with retainers after the bands have been removed.

It will probably be conceded that Class II extraction cases, as a rule, present more problems, both in treatment and retention, than non-extrac-

tion cases. Therefore, let us discuss some of the preliminary steps in the retention of a Class II case in which it was necessary to remove four first bicuspid spaces.

Generally, the lower second bicuspid bands are the first bands to be removed. The bands on the six anterior teeth are lightly stripped with lightning strips to reduce band thickness at the contact points. Small coil spring sections ($\frac{1}{4}$ " in length) are placed on the archwire mesial to the second molars and are tied back. Light Class II elastics are worn to move the first and second molars forward, closing the second bicuspid band spaces. Next, the first molar bands are removed and again the coil spring sections are tied back to the second molars, and light Class II elastics are worn closing the first molar band spaces. When the cuspid bands are removed at the next appointment, Class II elastics are discontinued and the coil spring sections removed from the archwire.

The archwire at this point is usually retied for at least one week before the lower incisor bands are removed. The Class III elastic hooks may be bent distally until they rest lightly on the lower cuspids if expanded intercanine measurements prove this to be necessary. Just a very little pressure is needed at this time to narrow these two teeth toward the original intercanine width.

The four lower incisor bands are finally removed and only slight spaces remain between these four teeth. The lower archwire is checked for arch form and then is ligated lightly to the second molars. The archwire is bent away from the cuspids to prevent moving these teeth too far lingually, but rests lightly against the four incisors. The spaces between the anterior teeth close very quickly and the contacts between the cuspids and second bicuspid spaces are maintained by this slight

pressure from the archwire. We are in no hurry at this time to make a lower retainer. The archwire remains on from one to three weeks before a lower impression is taken and sometimes another week before the retainer is placed. This is as good a way as I know to keep extraction spaces from opening, help contacts to close, and maintain lower cuspids at their proper intercanine widths.

Let us recap for a moment. When Class I occlusion has been attained and our case appears ready for retention, a thorough inspection is made. Next, the lower bands are removed in pairs so that band space can be gradually closed by light elastics worn between appointments. When band removal is followed this way, correct arch width can be regained in the molar, bicuspid and cuspid areas. This procedure also allows the mandibular buccal teeth to return to a more favorable buccolingual inclination. Lower arch form is improved, contacts are closed, and intercanine width corrected before the impression is taken for a lower Hawley retainer. In short, over expansion, open contacts, band spaces, and the too vertical axial positioning of the buccal teeth are not maintained and perpetuated by placing a lower retainer too soon.

During the time lower band removal is under way the headgear is being worn against the maxillary teeth fourteen hours per day. This is very important and cannot be overemphasized. The second bicuspid are the first upper bands to be removed and follow very shortly the removal of the lower bicuspid. As in the lower arch, the upper first molar bands are removed next, in the event the second molars carry the anchor bands. At a later appointment the cuspid bands are removed and finger springs are soldered to the archwire to tuck the cuspids in and back in contact with the second bicu-

pids. When the upper anteriors have been carried back as closely as possible to the retained lowers by the action of the headgear, the four upper anterior bands are removed and upper and lower impressions are taken for the purpose of making a new type of maxillary retainer which I have called the labiobuccal retainer.

The technic for the construction of this new type of retainer is as follows: Upper and lower alginate impressions are taken, together with a wax bite in centric occlusion. All loose and open contacts in the maxillary arch are recorded in writing. When the models are poured and trimmed, Fig. 1 above, a typical positioner set-up is made on the upper model only. Generally, a minimum number of teeth have to be changed on the maxillary set-up due to the care with which band removal and space closure has been followed in both upper and lower arches. (Fig. 1 center).

Wire clasps are bent to lay across the labial of each central and to engage their distal surfaces above the contact points. Similar clasps engage the labial and distal of the laterals. (Fig. 1 bottom) The clasps gripping the distal of these four anterior teeth afford retention for the appliance when it is fitted and worn on the maxillary teeth.

The retainer is constructed on the labial and buccal surfaces of the maxillary model, using fast-setting acrylic. Two small squares of plexiglass are imbedded in the acrylic as it is setting on the labial surface, just distal to the centrals. Holes are bored in these plexiglass blocks to receive the headgear hooks later. After setting one-half hour the retainer may be removed from the model, trimmed and is then ready for a try-in. (Fig. 2)

In December, 1954, a positioner set-up was made for a retention patient who had once been very protrusive. It was a non-extraction case, and the

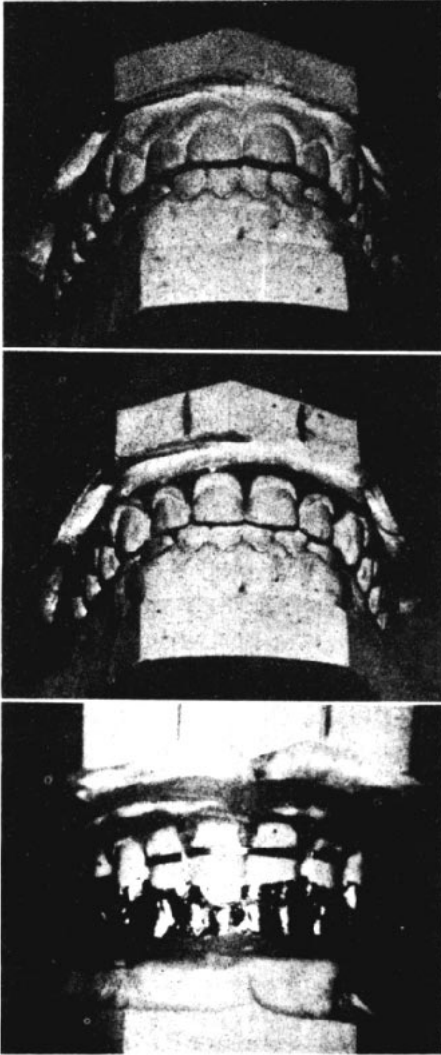


Fig. 1 Above, Casts after band removal. Center, resetting of some maxillary teeth, reducing overjet. Black lines indicate approximate position of plexiglass hooks. Bottom, models waxed together with wire clasps distal to upper laterals and across centrals. Tinfoil is cemented to prevent acrylic from seeping between teeth.

Class I molar relationship in retention was slipping. Due to the unstable occlusion of this case, an attempt was made to fabricate an appliance of acrylic on the positioner set-up, covering the labial and buccal surfaces of

the maxillary teeth. It was placed in the patient's mouth and she was instructed to place it in her mouth and push on it with her fingers for one-half hour before retiring, and, of course, to sleep with it in her mouth as well. Little or nothing was expected of this appliance when it was placed. It was thought of as a one hundred to one shot! The patient was seen at infrequent intervals and, even though the molar relationship improved and became quite stable through wearing this crudely made appliance, little significance was attached to it at first. Months would go by between visits, and yet, this once protrusive non-extraction case that had developed a dual bite improved. It became stable.

Finally, I began to wonder if this

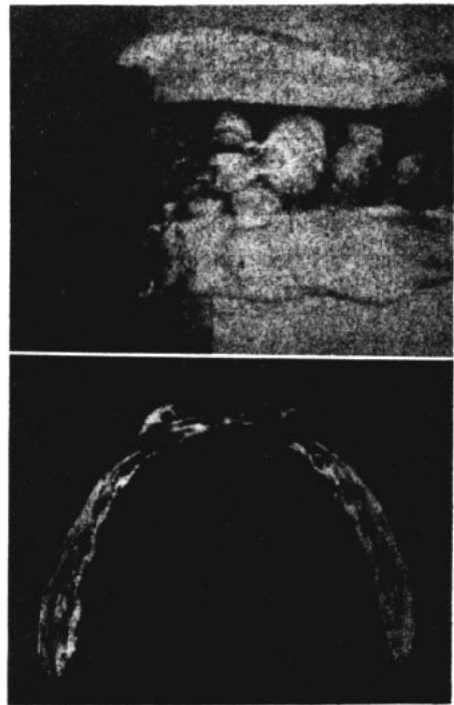


Fig. 2 Finished retainer trimmed so it will not touch mandibular teeth. Correct position of plexiglass hooks should be noted. Below, another view showing plexiglass hooks and lingual position of the wires around centrals and laterals.

rather simple device might not be just as effective on other cases as well. Gradually and cautiously more were tried on different types of cases, extraction and non-extraction, which had definitely slipped during and after retention. Some had slipped a little, others more. All of them were helped by the use of this new type of retainer. Then it was used on cases immediately out of treatment with equally good results.

At first, finger pressure alone was depended upon as the source of power to be applied to this new retainer. It was definitely felt that some sort of power or pressure was necessary to make the appliance really effective. It was also felt that if in some way the headgear could be applied to this retainer, it could become far more effective in its purpose of retaining and restraining the maxillary teeth in these once protrusive cases. Several different ways were tried in attaching the headgear hooks; finally, it was found that two small pieces of plexiglass, imbedded in the acrylic as it was curing, could be shaped later so they would provide suitable hooks from which to attach the headgear. (Fig. 3)

Each time the labiobuccal retainer has been used, molar, bicuspid and cuspid relationships have been maintained or improved to the extent that the teeth have rapidly assumed a finished look about them: Overjet has improved in all cases in which the bands had just been removed; the degree of overjet achieved in active treatment has been maintained by the application of the labiobuccal retainer.

A headgear has been worn on all but the first few cases on which this retainer has been used. Finger pressure was used on the first cases with good success, but the headgear has proven to be much more effective. When the occlusion settles in good Class I molar relationship and there appears to be no

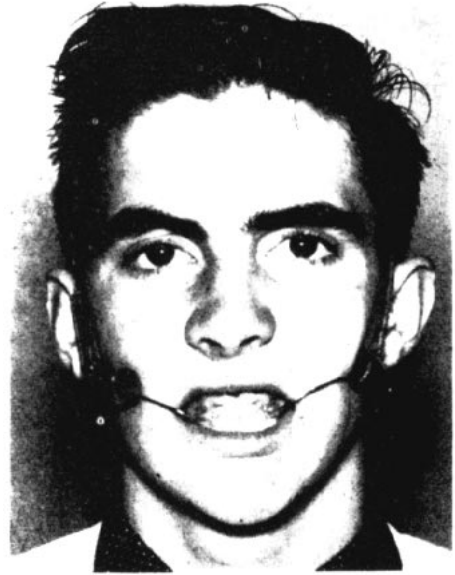


Fig. 3 A retainer in the mouth with headgear attached.

tendency to change, the headgear time is gradually decreased to every other night, then twice a week, etc., then discontinued. Naturally, when treating a Class II case, or any case in which protruding teeth have been a problem, more precaution is exercised and greater length of time is necessary before the headgear may be discontinued.

At the time the labiobuccal retainer is being constructed for the upper, a conventional Hawley type retainer is made and worn on the lower arch. When retention of the lower arch has been approached as has been described, the lower teeth need the lingual support of a Hawley type retainer. It may be a wise precaution after wearing this mandibular Hawley type retainer for six months to change to a cuspid to cuspid fixed or soldered retainer. This procedure is routine in our practice.

It has been our experience that patients do not object to wearing this new type retainer and there is little objection to the headgear either. The patients especially appreciate the free-

dom and ability to talk with this appliance in their mouths, even while wearing the headgear. Another feature worth mentioning is that of cleanliness. Everyone occasionally has had the experience of removing Hawley retainers and, with a sickening feeling, noting the damage to hard and soft tissues in the mouths of some careless patients. The labiobuccal retainer minimizes much of the chance of this damage in the maxillary arch.

The maxillary Hawley type retainer, situated as it is on the inside of the upper arch, many times retains and maintains overexpansion, loose contacts, and spaces, when it is used immediately after band removal unless carefully watched and constantly modified. On the other hand the upper arch is far better when the labiobuccal retainer is used because the restraining action of the retainer, plus the active force of the headgear, is directed from the buccal and labial segments of the maxillary arch, instead of from the lingual, thus inducing tight contacts, better overbite and overjet, and improved occlusion. When one is dealing with an allergic patient or one with a short upper lip and flabby musculature, the labiobuccal retainer ideally supplies the restraining pressure which is so often lacking in these cases.

This method of retention is consistent with accepted descriptions of the forces of occlusion. Moore has described these forces as follows: "The buccinator and the superior constrictor are a continuous band of muscle surrounding the entire denture, being attached posteriorly to the spinal column. These muscles can thus be considered as an elastic force surrounding the entire denture and being responsible for molding the maxillary denture against

the lower contained mandibular arch.

In order to summarize the functional forces of occlusion, it may be stated that generally speaking these forces create a buccal and labial force upon the maxillary denture and a lingual force upon the mandibular denture. It should be emphasized that the mandibular arch form is determined primarily by the lingual forces created by function. The contact of the mandibular teeth with one another produce a contained arch around which the buccinator muscle and the incline plane relationship of the teeth mold the maxillary denture."

This new type of maxillary retention has been used successfully in well over one hundred cases in our office. In some instances it has been the only maxillary retention used. After the labiobuccal retainer has been worn for awhile, after the overjet has been reduced, and the contacts closed, we have found it beneficial in many cases to use a maxillary Hawley type retainer during the daytime to hold the four incisors together and to assist in maintaining the overbite.

What I have attempted to tell you is that if retention is started on the lower arch first, if all the band spaces in the lower arch are closed and held closed as described above, then it is possible to get the maximum from the labiobuccal retainer. The architecture of the lower arch should and can be very close to what is meant for that individual before a lower retainer is made. It is then that the teeth in the maxilla can be moved back and draped around the retained lower most effectively for better retention.

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