Experiences With The Begg Technique

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The attraction which the Begg technique has for many of us is that his primary treatment objective is similar to that of Dr. Charles Tweed. To put it simply, it is the treatment of a malocclusion that will result in uprighting incisors over basal bone. This, of course, also includes the correction of molar relationships, overbite, rotations, etc. These were my objectives while utilizing the edgewise technique prior to my Australian trip. Although I have changed from edgewise to the Begg light wire technique, my objectives are the same.

Since 1958 it appears to me that the Begg technique has been the object of steadily increasing interest and now is on the threshold of greater understanding by our specialty. With this understanding will come greater acceptance and greater usage.

I shall always be indebted to Dr. P. Raymond Begg for his courtesy, hospitality, and understanding. Introducing me to his light wire technique was a major turning point in my professional career. Dr. Begg has been using it successfully for more than twenty-five years. Those of us who visited his offices saw the hundreds upon hundreds of cases that had been treated over the years. I mention this to emphasize that what is so new and novel to us has been tried and found to be effective and reliable.

It becomes important to define in a general way what Dr. Begg has contributed. It has been called the Begg technique; in my own mind it is not simply a technique. It is a philosophy or a group of interrelated concepts and, in the course of this discussion, I shall attempt to clarify why I believe this is so.

In explaining what something is, it is sometimes helpful to indicate what it is not. My experience with the Begg technique has shown me that:

1) It is not a panacea. It will not cure all orthodontic treatment ailments. Some failures must be expected where light wires are used extensively. I doubt if every well-trained edgewise practitioner, or followers of other appliance techniques, would insist that all their cases attain all objectives sought. This can be anticipated in view of the complex nature of the many problem cases we are called upon to treat and cannot be considered an indictment of this or any other technique.

2) It is not an easy technique. It is an exacting, careful procedure. It is not automatic. Care must be exercised in diagnosis, analysis, wire bending, and observing progress. In working with light wires, if the operator is not precise because he thinks it is easy, trouble will develop from all directions. There is a procedure to be followed and it behooves the practitioner to respect this fact carefully and proceed accordingly.

3) It is not a speed technique although I do think we can move teeth faster with it. However, if final details are to be attained and good finishing procedures are essential, then time must be allotted to permit all tooth movements required to insure attainment of treatment objectives. I cannot treat cases as rapidly as Begg does. Although speed is certainly an advantage, there are so many other advantages in following Begg's technique that rapidity is just

one of its dividends. This fact should be clearly understood and stressed.

Having discussed several "negative" aspects of light wires, we can proceed to the "positive". Let me list some of the advantages that have been observed:

1) Pain. Experience has shown that light wires, when first placed, will cause considerable discomfort from one to four days. Once this initial discomfort has been overcome, there is relatively little pain or soreness throughout the remainder of the treatment. In the transition from edgewise to light wires, the rigidity and inflexibility of heavy wires are eliminated. For this is substituted far lighter tensions and forces. This will naturally be reflected in a decrease in the amount of discomfort, prolonged soreness of individual teeth is no longer a common complaint. Light wires have eliminated ninety percent of the pain my patients used to have.

2) Reduction in the number of archwires and elimination of frequent archwire changes. There is no necessity for preliminary leveling archwires. As an understanding of this type of treatment develops it will become evident that frequent archwire changes are unnecessary, for the standard archwires are designed for action over longer periods of time. Their physical properties regarding tooth movements are more comprehensive than our conventional wires.

3) Since using these longer-acting wires, our treatment routine has undergone a significant change. Many appointments are brief; chair time per patient has been reduced. With edgewise treatment patients were seen at intervals of two to three weeks. Now, using light wires, they are seen at intervals of from two to six weeks. Needless to say, this has enormous administrative implications for the patient load becomes easier to distribute efficiently.

4) Elimination of headgear and bite plates. As one who previously used these auxiliaries frequently, I can assure you that it is a genuine relief to be independent of them, particularly headgear. I had always found cooperation to be more or less of a constant battle.

The following are some of the major problems that have been encountered these past few years since utilizing the Begg technique.

1) Inaccuracies in archwire bending. This has been placed on top of the list because it is the most important. It is necessary to realize that every bend inserted into resilient wires will reflect itself in a proportionate repositioning of the teeth. Hence extreme care is needed to form archwires accurately. Inaccurate wire bending results in poor arch form; there should be a careful check upon the symmetry of archwires or crossbites may be produced. If improper tip-back bends are placed, the molar teeth may rotate into undesired positions. Care must be exercised in placing loops; if located improperly, resting upon the crowns of teeth, they will interfere with tipping. Another common error is the construction of the intermaxillary hook in such a manner that it rests upon the surface of the cuspid band. This is incorrect and can interfere with intended tooth movement.

2) Breakage. This has been a difficult problem. However, it is being controlled better now and the improvement can be attributed to two factors, a) use of more care in archwire formation and b) improved wires. The wires are fashioned by careful bending over the rounded surfaces of the plier beaks. It is wise to warn patients not to tinker with any of the appliances and those who carry out such instructions will have little breakage.

3) Lack of patient cooperation. The success of this type of treatment will depend largely upon the cooperation of

the patient. There are two things required of the patient. Good oral hygiene is necessary for the same reason that it is important in any other type of appliance therapy; where there are loops and intermaxillary hooks, food particles and debris collect easily and rapidly. Adequate toothbrushing is essential to keep the teeth and supporting tissues in healthy condition. The second thing required of the patient is that he wear elastics as directed. Without such cooperation little progress will occur. The failure to wear elastics is a tremendous handicap that affects bite opening, molar correction, and space closure. When it is found that there is laxity in this respect, the parents are informed by letter and their cooperation is solicited to assure that the patient carefully carries out the instructions given him. With this constant prodding the majority of youngsters comply with the specific directions delivered to them.

4) Conversion of a practice. It was a major problem to convert an edgewise practice into one with the modified ribbon arch brackets as used by Dr. Begg. Although it is a tremendous undertaking, those of you who begin to use this appliance will soon get caught in the cycle of change. Upon returning from Australia I started several cases with the ribbon arch bracket. I liked what began to happen. Thereafter every case requiring extractions was strapped up in this new fashion. As these cases progressed and the advantages became apparent, it seemed unfair to continue other patients the way they were. Hence my associate and I have been converting many of our edgewise appliances into light wire appliances. In spite of the numerous man hours this adds to chair time operations, it is our belief that in the long run it is time well invested.

A detailed discussion of the actual appliances will now be described. Tipping of the teeth is the easiest type of tooth movement to produce. Thereafter, finishing procedures such as uprighting, root paralleling, and torquing are carried out. Special wires are, of course, utilized for these specialized tooth movements. In order for tipping to occur without interference, brackets and buccal tubes (sheaths) that will not cause binding of the archwires must be used, for it is binding that prevents effective tipping action.

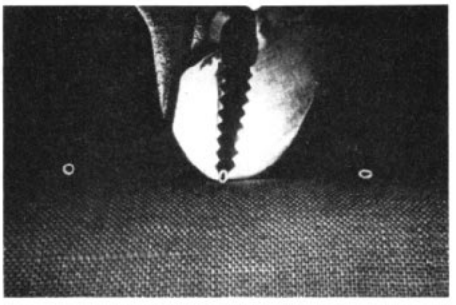

Fig. 1

The tubes or sheaths used are partially flattened .045 tubes that had been formerly used for the reception of the headgear (Fig. 1). They are compressed by pliers so that they are elliptical and are soldered upon the buccal surface of the molar bands close to the gingival margin, with mesial tipped slightly towards the gingivae. It is necessary to have big tubes to insure free sliding of the archwires. The wires would bind quite readily in edgewise

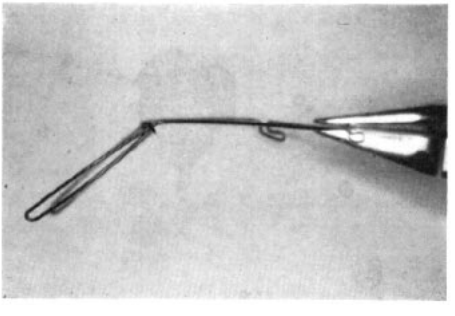

Fig. 2

sheaths. Tubes are made elliptical to receive a doublebacked archwire (Fig. 2). This is a wire that is bent back on itself for the length of the sheath, is primarily used in first molar extraction cases, and improves control in the molar area, but is not usually employed in first or second bicuspid extraction cases.

Edgewise brackets cannot be used successfully in the Begg technique. If this is attempted it indicates that the practitioner lacks the knowledge and understanding of the basic concepts of the technique. Clinical experience has shown there is just no comparison in the type of response one gets in using a looped archwire plus elastics from a one point contact bracket, as opposed to the same type of wire, plus the same type of elastics in an edgewise appliance setup. In Begg's technique each tooth helps the adjacent teeth to move in the direction they are supposed to go. So, as a lingually-locked lateral incisor is moved labially, the nearby central moves lingually and the cuspid begins to tilt distally. This typical reciprocal action is to be expected when looped archwires are reacting properly and inserted into ribbon arch brackets, having a point contact relationship to promote free tipping. In an edgewise strapup as the central, lateral and cuspid attempt to move, the wire in these bracket slots will jam and must bend if these teeth are to move at all. If the jam persists, then the anterior teeth will become anchor teeth and, instead of tipping, will cause drag on the molars and bicuspids. It does not matter how wide or narrow the edgewise brackets are, if the wire lies in a slot and touches both the incisal and gingival walls, there can be no further tipping.

Therefore, if this technique is to be evaluated properly, it must be utilized properly. Dr. Begg was an edgewise practitioner for several years; he tried light wires many, many times with edgewise brackets and found them harmful. It would therefore appear that anyone using his technique in any other way than that prescribed by Dr. Begg is being unfair to patients, the technique and himself.

My first experience with one point contact brackets was the original Angle ribbon arch bracket. In time some definite objections were developed to these units. These are:

1) They tend to break. When the bracket breaks away from the band material it usually occurs at a most inopportune moment. This objection can be overcome to some extent by soldering the bracket to the band with gold solder. However, this is time-consuming and frequently the flux or solder will flow into the opening.

2) The bracket material is relatively soft, being a bronze alloy. In malocclusions with deep overbites, we note the incisal edges wear down relatively soon. This tends to weaken the bracket and increases the tendency for it to break. As the bracket becomes worn, it tends to close over the gingival opening. This, in turn, interferes with free passage of the locking pin.

3) Finally, and perhaps most important, it is difficult to exercise control over the axial inclinations of the incisors. If such control is desired, auxiliaries have to be added to the bracket, or springs added to the archwire.

In an effort to overcome the aforementioned disadvantages, a stainless steel, one point contact bracket completed with or without eyelets was developed. The slot will receive up to an .018 wire which is retained in position with a soft metal locking pin. The eyelets are attached far enough gingivally to prevent interference with any tipping movement. When these eyelets are tied to the archwire, control over axial inclination is readily secured (Fig. 3). It is handy to have the eyelets large

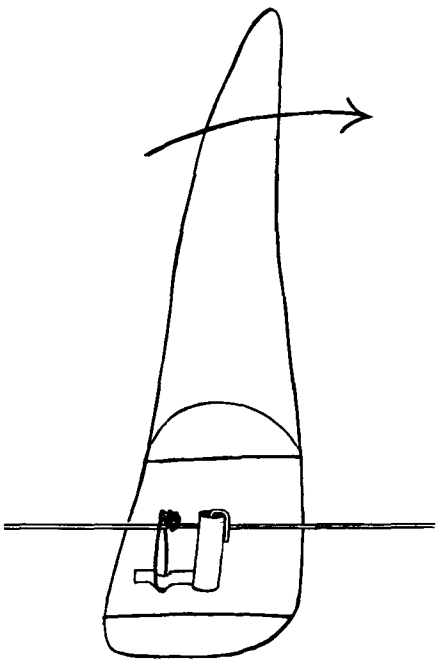

Fig. 3

enough to allow passage of an .016 wire. The reason for this will become evident when discussing uprighting and root paralleling of cuspids and bicuspids. The locking pins can be of either brass or a dead soft steel; they should yield and flatten under ordinary stresses and the normal forces of mastication, so that the archwire will not be bound rigidly within the bracket.

As has been mentioned earlier, accurate archwire formation is perhaps the most important requirement of this technique. It is quite amazing how readily teeth respond to the slightest bend, regardless of whether or not the bend was inserted on purpose.

To attain objectives of good archwire construction, adequate instruments, good quality resilient wire and careful planning of the archwires needed for treatment of the case in question are required. Careful wire bending will result in accurate archwire construction. The wire is bent only on the rounded surfaces of the plier beaks. When loops are used there should be uniformity of size except, possibly, at the midline. The loops should be as long as possible. As a rule, the mucobuccal fold in the lower arch is shorter than in the upper, hence most loops constructed for the lower arch are shorter. It is also essential to have uniformity in shape. If there are several sizes and shapes of loops on the same archwire there will be differing responses. Each operator should standardize loop formation for it is important to anticipate the response. The operator's experience in the responses will determine the adjustments to be placed in the loops.

.016 wire is the size most popularly used. Many operators are using .012 and .014 particularly in those malocclusions exhibiting marked crowding and overlapping of incisors. These lighter wires will reduce the discomfort when placed for the first time. It is quite obvious that it does not take much force to move teeth; .016 is very light compared with what we used before. As better products are produced the dimension of the wires will probably be reduced.

When treatment is initiated an analysis is made to determine archwire design. Tooth movement initiated by loops, when needed and properly placed, is more gentle and effective, and better controlled than any other method thus far attempted by the author. It must be noted whether any anterior is rotated, malposed labially or lingually. Where such a condition is found, loops are constructed mesially and distally to each and every malposed tooth. Adjustments are then made on these loops to correct that which is wrong. Offsets or bayonet bends are sometimes used when incisal malpositioning is slight. Loops are usually preferred as they are more positive in their action and cause less discomfort. In certain

instances, loops may also initiate distal tipping of cuspids but there is disagreement on this phase of the technique. When there is a crowded arch, a looped archwire that has had its cuspid to cuspid distance increased, is inserted. As the incisors tend to align themselves, they help one another into more favorable positions and in many cases it has been noted that the cuspids begin to tip distally. This is comparable with the action of a cuspid to cuspid push coil. However, in using cuspid to cuspid push coils the archwires are securely tied back, in this technique hardly anything is tied back. The wires are lying loosely in the buccal sheaths and the intercuspid forces unleashed from the loops tends to tip these teeth distally. The archwire causes no strain on the anchor molars at this time. This fits beautifully with the concept of all teeth moving at the same time in the general direction they will eventually assume. This type of cuspid tipping seems to be more prevalent in the mandibular arch. The operator's clinical experience will dictate the extent of opening the cuspid to cuspid loops.

Another major item in the assemblage is the elastic force. The commercial product you select, the amount of pull it exercises, and the degree of patient cooperation in its use will determine where and how the teeth will move. This discussion will center exclusively upon rubber elastics as I prefer them to latex. Their reactions and potentials can be anticipated; they closely approximate the size, shape and appearance of what Dr. Begg used when I visited him. Consideration in using an elastic is the amount of pull it exerts and how long this pull remains. All of this depends upon the distance it is stretched. A large number of malocclusions were measured before treatment and practically all exhibited the same span from the mesial of the lower molar sheaths to the intermaxillary hook of the upper cuspid, one to one and an eighth inches. Opening the elastic I use to one and an eighth inches will usually cause a pull of ninety grams, about three ounces. Our patients are instructed to wear their elastics for five days. Since the span over which the elastics extend is short, a twist or two is incorporated at the moment of insertion. This will enable the elastic to stay neater and without opening. Elastics have been measured after they have been worn four to five days; the force drops to from fifty to sixty grams, two ounces or less. This does not reflect the only pressure on the teeth for there is the additional pressure of the archwires. It is emphasized that the elastic pressure now used is but a fraction of that formerly used with the edgewise appliance. There are several other important things to remember in using light forces. All cases, Class I, or Class II, are started with Class II elastics. The distance between the upper cuspid and lower molar will become progressively smaller as treatment proceeds. This, of course, causes the elastic to stretch less and thereby decreases the force. When intramaxillary pull is used for space closure, the distance is usually less than one inch, and the tension is below two ounces when a fresh elastic is used. One of the problems in using a rubber elastic is that it falls off frequently. This has resulted in the construction of larger intermaxillary hooks than had been made previously.

There should never be any fear of using too light an elastic force. One minor disadvantage of this light force is that the patient, not feeling much pressure, frequently is unaware that an elastic is not present and in this way retards advance in treatment. Using these forces makes it mandatory to exclude second molars in the assemblage. When second molars are banded and

Class II mechanics are initiated from these distal teeth, the pressure of the elastics becomes quite strong comparatively. It then appears as if the anterior teeth maintain themselves relatively stabilized while the buccal segments tilt forward. This has been seen time and time again. This same phenomenon can occur when only the first molars are banded and the elastic force is too strong.

One of the most common questions regarding clinical experience using this technique involves the stability of molars. It is most fair to emphatically state that molars are less prone to slide forward than with an edgewise appliance. However, it is also very fair and proper to clearly indicate that molars will slide forward. They are not immovable. They can and will come forward, particularly if the operator is careless; control over these anchor teeth can be lost within a short time. The following are the reasons why the author feels molars are more stable using Dr. Begg's treatment and therefore have less of a tendency to come forward than with edgewise:

1) There are no tie-backs. For all practical purposes, hardly anything is tied back to the molars. Think how radically this differs from the edgewise where almost everything is securely tied to the anchor molars. Over an extended period of time this lack of pull on molars as opposed to a constant pull as with edgewise can obviously have a tremendous difference in forward displacement of these teeth. Several years ago the author did a study upon the actual amount of force expended in adjusting looped edgewise archwires. It was found that in some instances up to six hundred grams, about twenty ounces, were used in opening an edgewise loop to the amount of a "thin dime". It does not require a mathematician to realize the tremendous difference in force expended in an edgewise as compared with light wires.

2) The reciprocal action of the anterior teeth where crowding is present. As the incisor teeth move one against the other, they align themselves with a minimum drag on the anchor molars since there are no tiebacks to the posterior teeth.

3) The rapidity of movement in the anterior segments is another factor. There may not be scientific significance in this phenomenon upon molar stability, yet it appears to be important. Space closure is quite rapid and the cuspids become tipped into extraction spaces very soon. Therefore, from clinical evaluation, it may be valid to state that space closure occurs almost before the molars have time to glide forward perceptibly.

4) Control over axial inclination should be firm. There is no reason why the anchor molars cannot be kept upright and perhaps actually tipped distally. In assembling our appliances, several important steps are carefully followed: the buccal sheaths are mildly angulated, tip-back bends are incorporated into the archwires, and the directional pull of elastics is carefully handled. Patients are frequently directed to wear Class II elastics from the lingual of the lower molars. From time to time the attachment is moved to the lower buccal surfaces. The decisions are made based upon clinical inspection. By carefully applying the sheaths, tip backs, and elastics, molars can be kept in their proper axial relationship. Therefore, if these buccal teeth do come forward they will do so upright. Also if it is a fact that molars that are tipped distally are more secure, then we have that advantage too.

When active treatment is instituted in our office, bands are inserted for all the incisors, cuspids, and first molars. Bands for the cuspids and upper lateral incisors are swaged. These bands are

completed with narrow, one-point contact brackets. The bicuspids are banded as space closure nears completion. Whenever it is at all possible, both the upper and lower archwires are seated and Class II mechanics instituted at the same sitting. This is important because it will take care of all the patient's discomfort in one appointment; the patient and parent are notified and assured that future discomfort will be minimal. Aspirins are prescribed to help ease the soreness for the child over the first day or so.

Archwires are constructed for each individual case and not stockpiled in various sizes. It is essential that the loops be placed interproximally and constructed in accordance with the malocclusion at hand. The archwire is constructed passively to proper form. The loops are adjusted for individual rotations and tooth repositioning. For example, if there is a lingually-locked lateral incisor, loops will be placed mesially and distally. The adjustment will be made by positioning the loop for this tooth into a labial relationship. If a neighboring central incisor is rotated with its distal border towards the labial, the adjustment on the loop would be with the distal towards the lingual. Tip back bends are inserted in the molar areas. Then the cuspid to cuspid distance is increased by opening the loops to the distance desired. The amount of the opening will be dictated by the malocclusion being treated. Thereafter the wire between the loops will require readjustment to restore a continuous level. Finally everything is checked for symmetry and the archwire is then ready for insertion.

A set procedure is usually followed in placing a looped archwire. Both upper buccal sheaths are entered first. One cuspid is locked into position and then the other cuspid. The four incisors are then engaged in the brackets. In the event that a tooth is so far lingual that bracket engagement is too difficult to attain, it is tied with a steel ligature to the loop; no more than two such ties will be required to complete full bracket engagement. Ligature ties are next placed around the cuspid brackets and intermaxillary hooks. This is essential if the six anterior teeth are to be treated as a unit. If for any reason it is desired to move the cuspids individually, these ligatures are omitted. When such ligatures are omitted by accident the operator will usually note that spaces will open between the incisor teeth. If the canines tip distally to the degree that spacing occurs, the loops open and tend to act as an incisal contraction archwire.

The bicuspids are next tied to the archwires with steel ligatures to keep the archwires from digging into the cheeks and from coming out of the buccal sheaths. This is important for it insures that the bite will open on eight instead of four teeth. Finally, it has a tendency to keep the molars from rolling and rotating.

After the archwire is secured there are several important check areas that must be routinely inspected by the operator: 1) Examine the intermaxillary hooks to see that they do not touch the labial surfaces of the cuspids. 2) Inspect the positions of the loops to see whether they are apt to irritate the lip or gingivae. Where several loops are compressed between cuspids, it is almost inevitable that they will stand away labially from the teeth and cause considerable discomfort. This can be controlled in two ways. The simplest and most expedient manner is to place an optical loop plier upon the offending loop and bend until the correct position is obtained. In the second manner, finger pressure is exerted on each loop, one at a time. It will usually be noted that pressure on one or two loops will cause all the loops to assume a more

satisfactory position. When this is determined, a ligature is passed around one arm of the loop, then around the tooth, and tied snugly so that the other loops will move also. This ligature should be removed at the next sitting since it is acting as a torquing force. 3) Inspect the distal ends of the sheaths, upper and lower, to be sure there are no projecting ends to irritate the soft tissues. Keep in mind that as the teeth react and, in many instances, within a short time, the wire begins to extend distally as the spaces close and can cause considerable discomfort. 4) A final over-all inspection is made for items mentioned and an assurance from the patient that there are no irritations. If one or more loop appears to be on the surface of a crown, make a note to construct a new archwire.

The patient is then dismissed for a period of from four to six weeks. It is important not to see the child too frequently; allow the archwires and elastics to express their directive forces. Tell the parents to contact your office if there is continued discomfort; this is usually due to sharp edges of ligatures, locking pins, or loops that are in need of additional adjustment.

When all this has been accomplished the case has really begun. Our objectives now are to follow Dr. Begg's three stages of treatment in order to attain a successful result.

First Stage

Class II elastics are used to the fullest cooperation possible, whether the malocclusion is Class I or Class II variety. The necessity for complete cooperation is emphasized. No other type of directional elastic pull is used at this time. The purposes of the archwires and elastics at this point are as follows: a) reduce any protrusion, b) align crowded incisors, c) reduce cuspid and molar relationships from Class II to Class I where indicated, d) open the bite, and e) begin generalized space closure.

The bite will open quite readily. The archwire, with its tip-backs sliding through mildly angulated sheaths, will cause the molars to upright and tip distally, opening the bite. At this stage the bicuspids are not included in bracket engagement to the archwire. These teeth, if banded, are bypassed. In our office the term we use to identify an archwire that is not engaged in the bicuspid brackets is "free wheeling". In any such situation the wire is free from the distal of the cuspid to the molar sheath. Hence, the molars can be brought forward if that is the intention of the operator or it might be that the anterior segment is to be brought back. Whichever is desired, when "free wheeling" is referred to, it means that the bicuspids are bypassed and these teeth are not impeding the free action of the archwire. Treatment proceeds with Class II elastics in constant use. Appointments are still based upon intervals of from four to six weeks. At these times we check the positions of the teeth, the relationships of the loops to the teeth and correct sharp edges. Careful attention is given to the possibility of the archwire extending too far out of the sheath and irritating the mucosa.

The upper incisors are carried back until they are close to an edge-to-edge relationship with the lowers. Both the upper cuspids and molars should be placed in a Class I relationship. In most instances where the tooth to bone discrepancy has not been too severe, there will be spaces distal to the cuspids. There is no attempt as yet to upright the lower incisors over basal bone. If these teeth had been forward, off basal bone, they will not be carried farther forward, even with Class II mechanics. Light pressure on molars, large buccal sheaths, and free wheeling around bicuspids will tend to take the pressure

off the lower anteriors and confine it to the buccal segments. The lower incisors actually tend to tip lingually in many instances. The reason for this lingual tipping has been the subject of much speculation. It is the author's opinion that this tooth movement is caused by the distal tipping of the anchor molars. As these teeth upright and assume a disto-axial inclination, they will cause the lower anteriors to be displaced lingually. This phenomenon will be more apt to occur if free wheeling conditions are present.

The response is frequently quite spectacular. Within a few appointments it can be noted that the objectives sought for this stage are being attained. It is most desirable to get the upper cuspids well distal to the lowers.

Second Stage

This can be classified as the space closing stage. Class II elastic pressure is usually continued throughout and horizontal, intramaxillary elastics are added. These are usually begun in the mandibular arch. The lower horizontal elastics tend to upright the anteriors over basal bone. As the molar relationship approaches Class III, upper intramaxillary elastics are included. It is not uncommon to have patients wear as many as six elastics at the same time. The patient is carefully supervised during this procedure. After space closure has been completed in any one quadrant, the horizontal elastic in that quadrant is eliminated. Bracket engagement is secured on the second bicuspid. A figure eight ligature is tied from the molar to the second bicuspid and cuspid so that the buccal segment is collected as a unit. This buccal tie is reinforced by a similar steel ligature on the lingual of the same teeth. When this situation has been accomplished in all four quadrants, the patient is ready for the third stage.

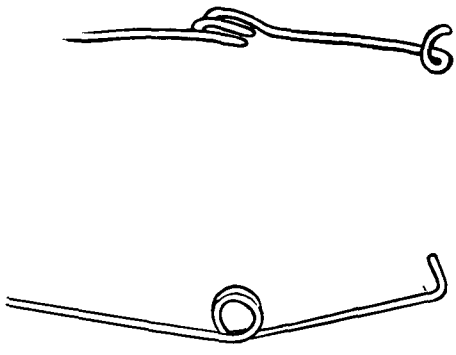

Fig. 4

If treatment has been successful thus far, molar and cuspid relationships are normal and space closure has been completed. The incisors might be quite "rabbitted" or tipped lingually. The cuspid and bicuspid roots need to be uprighted and have their roots paralleled. It must be realized that all teeth have been tipped into their new positions and it is now important to upright them and parallel their roots. Auxiliary wires and springs are used for these purposes.

Third Stage

The third stage is referred to as the "uprighting" stage. It is the most difficult and challenging to complete successfully, also the most time-consuming. Class II elastics are continued throughout this stage. Root paralleling springs of .012-.016 wires are applied to all cuspids (Fig. 4). These springs are inserted from the gingival eyelet through the incisal eyelet (Fig. 5). The excess is bent towards the mesial or distal, snipped, and the cut surface rounded and smoothed. The arm of the spring is then hooked on the archwire between the second bicuspid and first molar or between the second bicuspid and cuspid. Although the spring can be inserted through the bracket, placing it through the eyelets is preferred. When a bracket is used for the reception of an upright-

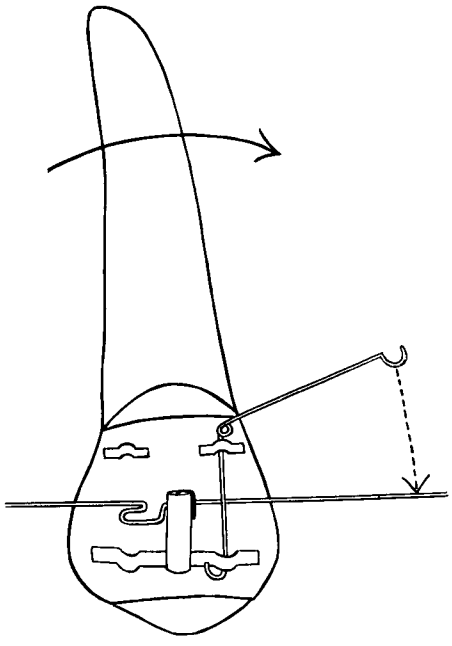

Fig. 5

ing spring, a steel ligature must be placed through the same bracket and tied to the archwire to keep the cuspid from a tendency to elongate. It has been noted that there is less "play" when eyelets are used and the uprighting action appears to be more positive than with brackets. The bicuspids are uprighted with springs inserted through the brackets since placing gingival eyelets on these bands might interfere with the archwire (Fig. 6). A steel ligature is threaded through the bracket and tied to the archwire. The spring is then inserted and hooked on the archwire between the cuspid and second bicuspid. If there is an occlusal eyelet, the ligature is tied through it instead of threading the bracket.

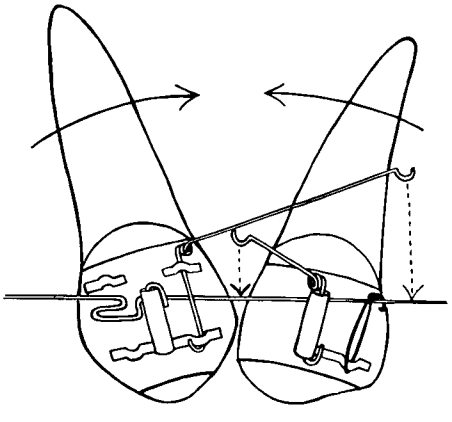

Fig. 6

There is always a tendency for spaces to reappear between the cuspids and second bicuspids when root paralleling is undertaken. It is important that Class II elastics are worn constantly and the buccal segments are securely tied together as a unit when auxiliary springs are used. This step must not be rushed; allow ample time for the springs to express their gentle long-range, long-action forces.

One of the final steps is the torquing or uprighting of the upper incisors. In Dr. Begg's original technique the torquing archwire was all one wire with finger spurs incorporated into its construction. Now a double wire is used. First a straight .016 wire with molar tie-back hooks is seated into the brackets. These hooks are securely tied and represent the only time tie-backs are used. The purpose of the base wire is to keep the incisors condensed. A torquing looped archwire sectional with intermaxillary hooks is then constructed (Fig. 7). This

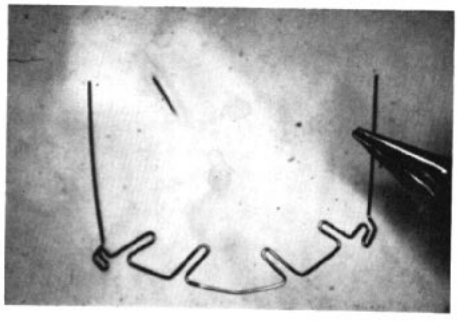

Fig. 7

wire will not extend completely through the buccal sheaths and is not engaged in the cuspid brackets. The loops extend from the distoincisal corner in a mesiogingival direction and end past the bracket of each tooth to be torqued. The loops are bent beginning with a lateral incisor, either right or left. The mesial angle, i.e., the angle formed by the mesial arm of the torquing loop and the horizontal portion of the archwire, should be made deliberately acute. The amount of torque exerted by each loop will be influenced by the acuteness of the angle described. It should be remembered that to be consistent with light forces optimum results are obtained when the torquing loops are exerting minimum pressures. As a final bend, a slight V is placed in the midline, between the centrals, tilting the distal ends very mildly.

During this stage Class II elastics are most essential. This pull will keep the crowns from coming forward as the roots are being repositioned lingually.

This, in brief, outlines the ideal sequence of mechanotherapy as prescribed to me by Dr. Begg. More often than desired, treatment does not follow textbook procedures. There are countless deviations from the normal and numerous unpredictable situations arise. An operator requires good judgment, careful, sound thinking, and development of experience in order to obtain the maximum benefits from light wire technique. Examples of typically treated cases are seen in Figures eight and nine.

It must be emphasized that this technique is most comprehensive in its application. It has simplified many complicated problems for the author. For example, second bicuspid and first molar extraction cases are not the major problems they were formerly. In second bicuspid extractions everything is treated as if it were a first bicuspid extraction case. The first bicuspids are not banded until all space closure is fairly well completed. If they are banded, they are bypassed with archwires. Archwires and elastics are used in the same manner as in first bicuspid extraction cases. I pretend the first premolar is nonexistent. These teeth are carried back very easily ahead of the cuspids as they are guided into more favorable relationship.

The same principles apply in first molar extraction cases. However, there are some significant changes. The elastic pull will be greater than usual because the distance from the second molar to the cuspid is farther than usual. There may be an immediate tendency for the second molar to tilt and begin to slide forward. There is also some effect upon the anterior segment that can be seen clinically. The net effect noted is some procumbency of the mandibular incisors and some mesio-axial inclination of the second molars. It therefore becomes important to exercise as much control over axial inclinations as possible. This can be done in several ways.

Archwire construction with special emphasis on second molars is important; that part of the wire which slides through the buccal sheath is double-backed upon itself. The purpose of the double-back wire is to help keep the tooth upright and influence crown and root torquing, buccally or lingually. In addition to the double-backed wire the attachment of the intermaxillary elastic from the buccal or lingual will aid the operator to keep the teeth in the desired position. For example when a molar has assumed a linguo-version malposition, the archwire is adjusted to reposition that molar into proper position. If the Class II elastic is attached on the lingual of the lower molar it will add impetus towards attaining the desired tooth. movement. When the molar is in proper alignment the attachment

of the elastic can be replaced on the buccal.

There has been much misunderstanding and misconception regarding the Begg technique. There are many practitioners who expect this technique will enable them to finish a case in six months which ordinarily takes two years to complete. This can be done if they merely want to close extraction spaces. However, if treatment objectives include proper finishing procedures such as root paralleling, torquing, etc., then more time must be allowed.

The tooth positioner is used whenever it can be of help in the artistic finishing of the case. This same criterion was applied with my edgewise patients. Positioners were not applied routinely then and they are not now; they are most certainly not used to achieve major tooth movements. The success of the treatment of a malocclusion using the Begg technique does not depend upon the tooth positioner.

Working with light wires requires the same vigilance as with an edgewise. Since most operators are less experienced in using this newer type technique, it behooves them to watch more closely for things going awry. Light forces may move teeth toward other than the posi-

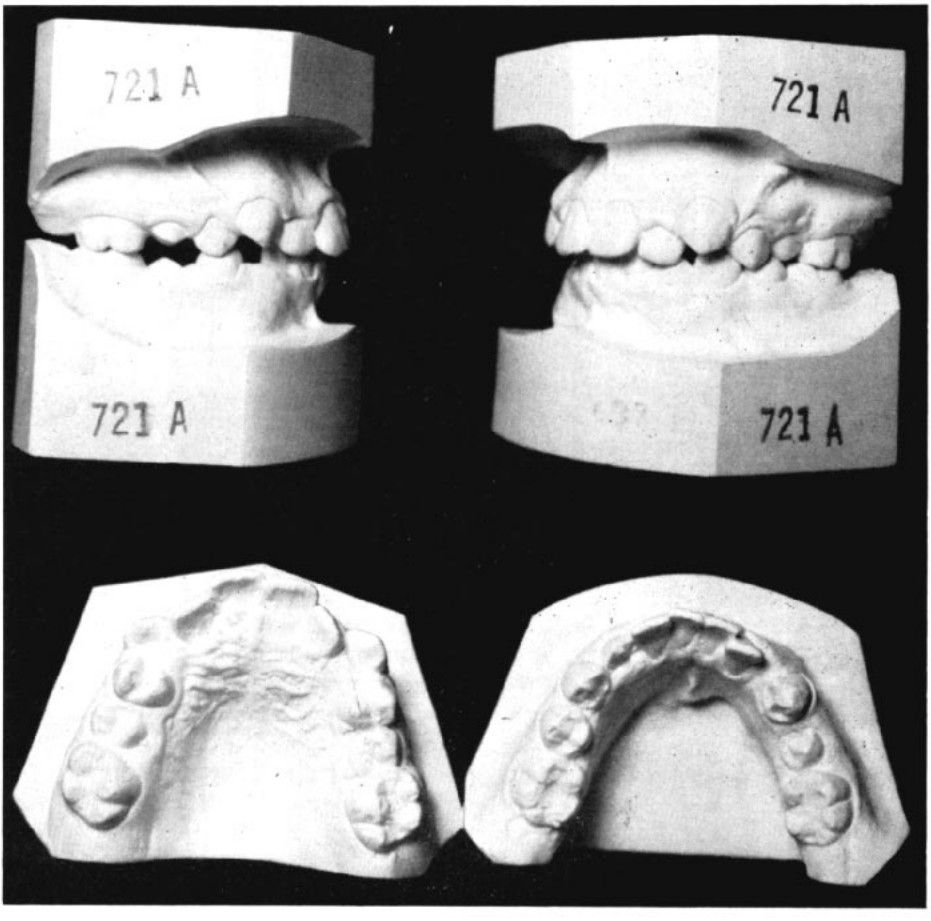

Fig. 8A

tions desired. In my office there is a cardinal rule that is followed: if something is going wrong, stop, correct that which caused concern, then proceed in accordance wth the original treatment plans. For example, if a cuspid moves too far labially, out of its "trough", this is dangerous. In such a situation remove all elastics, construct an archwire that will have one purpose — to reposition the misplaced cuspid into proper alignment. Another frequent problem is molar rotation. When this is observed, stop everything, construct a suitable archwire and when everything has been properly corrected, proceed with the original plan of treatment. In molar rotations, proper use of directional elastic forces may help bring these teeth into proper alignment quite readily. Another precaution concerns arch form. Keep careful watch to detect the development of asymmetry. This may be due to the archwire being bent out of shape. These archwires are light and can be distorted due to the normal forces of mastication. This, of course, will result in the teeth moving toward other than the intended directions. Whenever this is observed, remove the archwire. It should be inspected, reshaped, or a new one constructed, depending upon what the operator finds. I have been changing more archwires

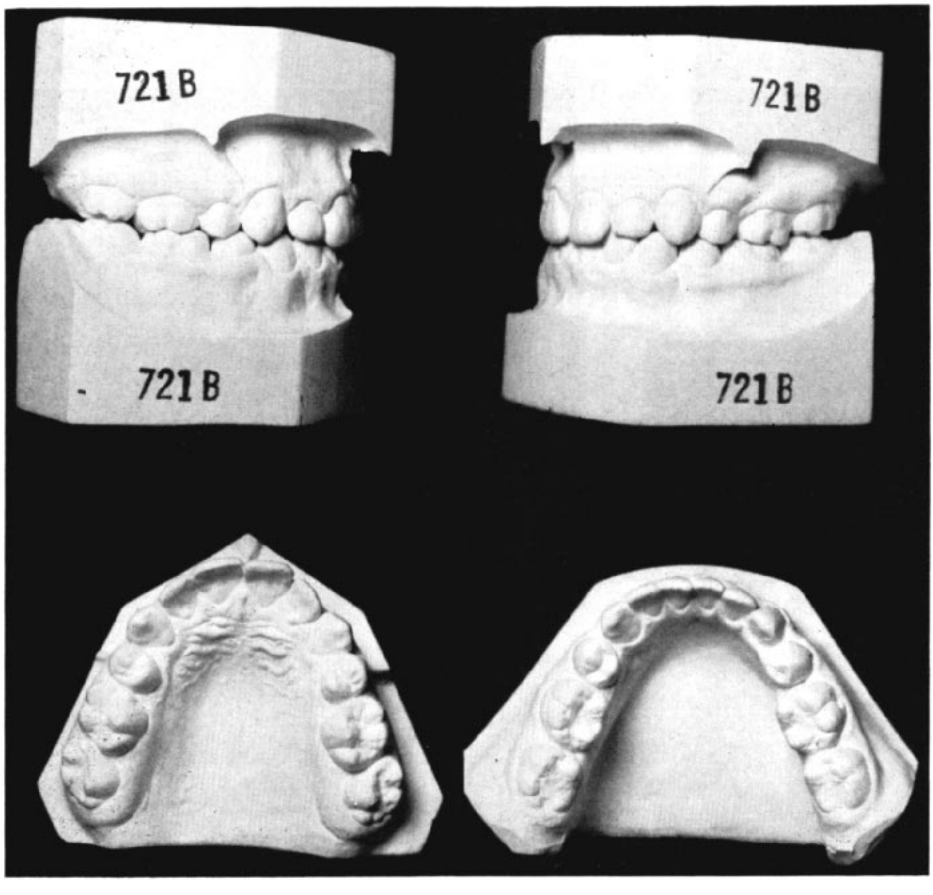

Fig. 8

than when this technique was initially started, for the reasons stated.

It might be noted that incisors do not seem to be uprighting readily under the influence of proper elastic pressures. If this persists there will of necessity be a strain upon the anchor molars since the anteriors are remaining relatively stable. When this untoward condition is diagnosed it is wise to remove the archwire at once. Carefully check the removed archwire for discrepancies in leveling, however slight, and for any lack of symmetry. Either of these conditions can cause binding, and this in turn causes drag on the buccal segments, breaking down the natural resistance.

Another area that should be constantly evaluated is the lower buccal segment. If the lower first molar begins to show mesio-axial inclination, the archwire is to be removed and readjusted with stronger tip back bends. If it is further noted that the extraction spaces have begun to disappear so that the second bicuspids and cuspids are touching or nearly touching, then the continuation of Class II elastics as in the earlier phases of treatment may become a hazardous procedure. If the elastics are continued in the same way, the lower incisors will begin to assume a procumbent position as they will be displaced forward, off the basal bone.

Maxillary incisal roots should be surveyed routinely with intraoral x-rays for possible root resorption. If the tip backs bends are excessive and Class II

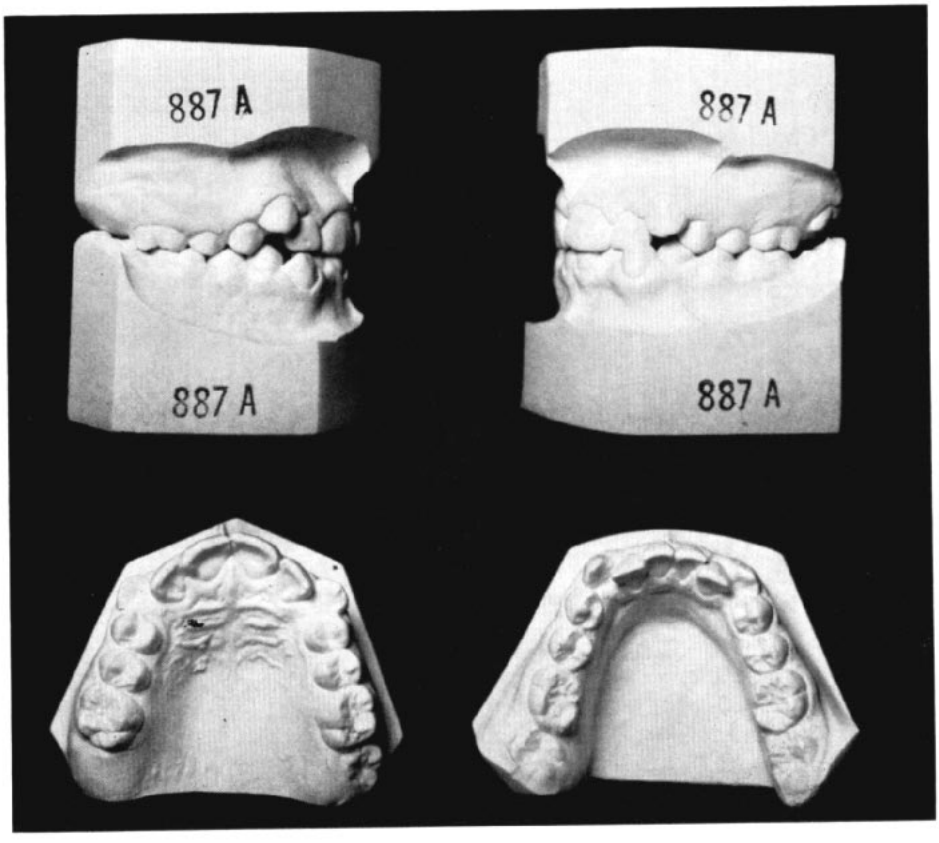

Fig. 9

elastics worn regularly, as directed, the incisal roots may be thrust against the labial plate as the crowns are being retracted. When this occurs the roots may become jeopardized. Ideal tipping of anteriors is attained when the root tips remain relatively stabilized as the crowns are brought back. There may appear to be resistance for the cuspids and bicuspids to assume parallel positions. Where such resistance becomes apparent, it is suggested that it be carefully ascertained that the teeth being uprighted are in the proper "trough" and not too far labially or buccally. If these teeth are out of the "trough", there would naturally be more bone resistance towards the intended tooth movement.

Many of these precautions were not as obvious a few years ago as they are now. Much has been learned from the mistakes that have been made in the past and much is being learned constantly as more experience is gained. As the author looks back at what has been done for patients the past three years it has been for the most part a rewarding experience. The advantages have far outweighed the disadvantages. At this

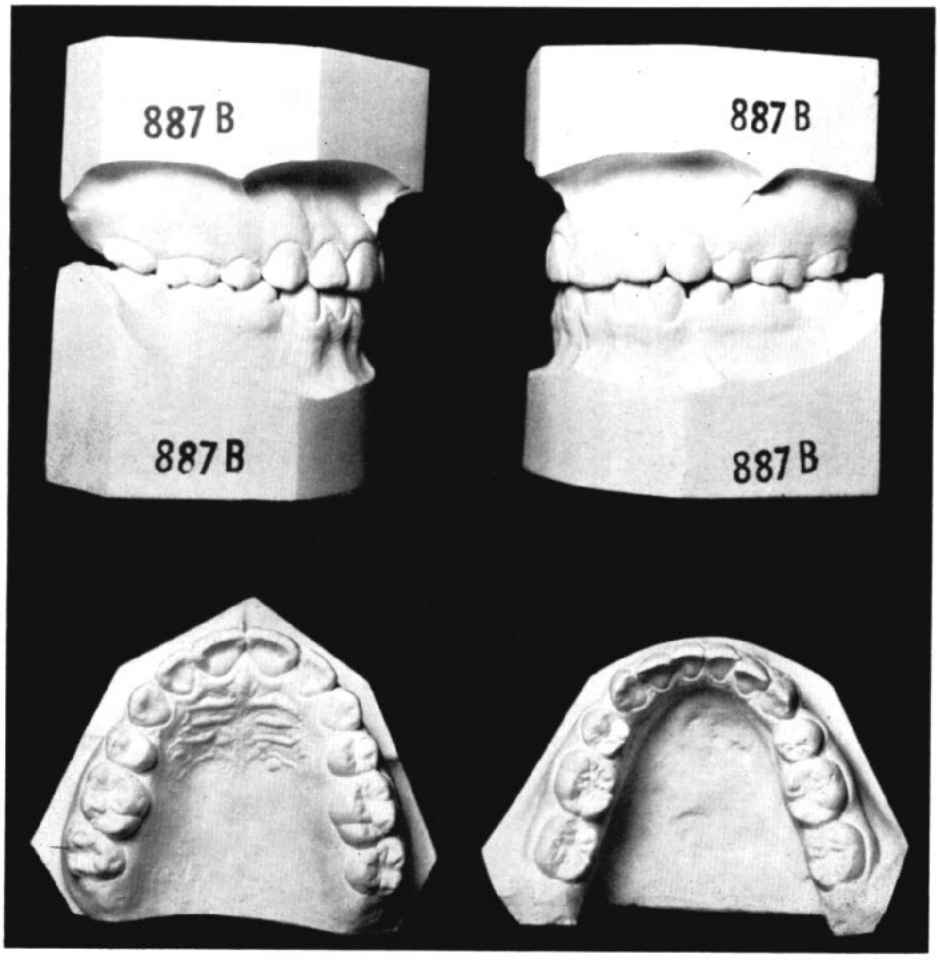

Fig. 9A

time there is no thought of reverting to edgewise, although there will be eternal gratitude for having had edgewise training and experience.

Light wire treatment is not restricted to extraction cases only. Malocclusions that were to be treated non-extraction in an edgewise practice can be attempted the same way with the Begg technique. The teeth respond readily and this type of treatment procedure can be used to great advantage.

Whatever measure of success has been had in using light wires is due to the complete acceptance of Dr. Begg's method of mechanotherapy. His teachings and methods have been closely followed. As more practitioners adopt the technique, refinements and improvements are inevitable. However, to those who will practice the Begg technique, be sure to understand the concepts and philosophies of his treatment and apply the mechanics exactly as prescribed by Dr. Begg. Only after a practitioner has mastered the basic technique should modifications be incorporated.

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