Differentiation of Functional and Structural Dental Malocclusion and its Implication to Treatment

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The emphasis in orthodontic analysis has been on morphology and we might say that we have been morphological orthodontists. We have been concerned with the anatomical relations of the teeth, the relation of the mandible to the maxilla, the relations of the teeth to the entire facial component, but this is not enough. We must enlarge our scope of knowledge and responsibilities to be equally concerned and competent as physiological orthodontists.

To become physiologically oriented one must no longer be content with examining static records. The beginning case and the finished case must be evaluated functionally, done directly on the patient. The basis for functional analysis is the understanding of the anatomy, growth and function of the stomatognathic system.[1] This system includes the teeth and their supporting tissues, the mandible and maxilla proper, the musculature, the two temporomandibular joints, the nerve and vascular supply, the tongue, the perioral structures and other related structures. In function the parts are all interrelated and an abnormality in structure and/or function of one part will have an adverse effect on the function of the other parts.

All orthodontists should be well founded in the classical teachings of Broadbent,[2,3] Brodie[4,5] and Sicher.[6,7] These three dental scientists have clearly portrayed how a face grows but their explanations, while so logical, are so simple that they are sometimes rejected. Broadbent and Brodie working with serial cephalometric radiography and Sicher with the microscope found that one investigation complemented the other. Wherein Broadbent and Brodie showed the pattern of growth, Sicher explained the mechanism whereby the pattern was enlarged. Brodie showed that incremental growth proceeded slowly and evenly with little evidence of spurting until the circumpubertal growth period; this varies considerably in respect to chronological age among individuals. From this came the concept of stability of the growth pattern.

In the circumpubertal growth period, spurting and differential mandibular and maxillary growth become characteristic. Downs recognized this in his classical cephaloradiographic studies and it is in Sicher's work that we see the explanation. He showed that, while the mandible and maxilla both grow by apposition of bone tissue, they each have, in addition, an individual bone growing method, viz., sutural growth in the maxilla and appositional cartilaginous growth in the mandible. It is the two different mechanisms of growth, sutural growth in the maxilla and appositional cartilaginous growth in the mandibular condyles, that give rise to the differential mandibular and maxillary growth so characteristic of the circumpubertal period. In normal facial growth the mandible grows at a more rapid rate than the maxilla. During the period of the deciduous dentition the mandibular teeth, carried by the body of the mandible, are progressively moving anteriorly in relation

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to the maxillary teeth with a reduction of horizontal and vertical overbite. For this to occur without trauma, occlusal attrition of the deciduous teeth is essential. After the permanent incisors have erupted, overjet or horizontal overbite is present in the dentition of the normal eight, nine or ten year-old child but this is very often overlooked in treatment. Normally the overjet is reduced with the more rapid mandibular growth without trauma to the incisor teeth. It is because of this mandibular growth rate that the leeway space exists in the buccal segments. The maxillary deciduous molars are 1.5 mm wider than the premolars, and in the mandible the difference is 2.5 mm. This allows a latitude of mesiodistal adjustment for the erupting premolars and for the mesial inclination and drift of the permanent first molars to attain the intercuspation of a satisfactory anatomical occlusion.

In the natural, normal development of dental occlusion there is a high degree of correlation with the growth of the face. This is not a measurable ratio but it must exist. As growth and development are concluded, the occlusal relations of the teeth should be such that the normal function of the two temporomandibular joints is possible. With the introduction of orthodontic therapy an acceptable occlusal relation of the teeth may be achieved, but the timing with growth may be lost so that the occlusion is not coordinated with mandibular growth. At first, abnormal function may not be present as the occlusion, established orthodontically at perhaps the age of eleven years, may permit normal function. As mandibular growth continues, the disharmony develops and the same occlusal relationship of the teeth no longer permits the condyles to be in their normally balanced relations to the articular eminences when the teeth are occluded. Clicking and crepitus of the temporomandibular joints is quite prevalent in our teenage retention and postretention patients.

Relapse or failure in treatment should encompass more than the recurrence of tooth irregularity and unsatisfactory facial contour and should include excessive functional forces on the teeth that are conducive to pathology of the vital structures, abnormal function of the temporomandibular joints, and abnormal function of the musculature.

During the circumpubertal growth period the pattern remains quite the same in its individual components, but the differential growth of mandible and maxilla and the spurt of total facial growth become significant. Often, more facial growth can occur in one year, at say age thirteen years, than took place in the previous two to four years. Such a spurt of growth is highly beneficial to orthodontic therapy for the correction of structural dental malocclusion because much of the tooth movement becomes relative rather than actual. Although orthodontic therapy does not influence the facial growth, it behooves the orthodontist to time the therapy in order to utilize this period of maximum growth. A spurt before the orthodontic therapy does not correct the malocclusion, and a spurt after the attainment of an ideal anatomical occlusion may result in trauma to the supporting tissues and the temporomandibular joints.

Useful as mandibular growth is during the orthodontic treatment, it may produce functional disharmony in the years after treatment. Differential growth of mandible and maxilla is characteristic of pubertal growth. It is not uncommon to see in straight type faces that, as the SNB angle increases and the SNA angle remains the same, a traumatogenic relation of the incisors is introduced. This is prema-

ture contact of the incisors and in time it produces a lengthening of the clinical crowns. In the more pronounced differential growth cases, the superior posterior mandibular condylar growth may produce posterior condylar displacement if the incisal relation of the teeth prevents the forward movement of the mandible in response to condylar growth and muscle growth. It is the condyle that moves upward and backward away from the eminence instead of the mandibular body moving downward and forward. This would not impede the anterior positioning of the muscular rest position of the mandible so an upward and backward path of closure is exhibited from rest to occlusion and this is now a condition of posterior mandibular displacement. Translatory movement between condyle and disc, not present normally, represents flaccidity of the joint structures with the resultant clinical symptoms of clicking or crepitus, irregular mandibular movement, and even pain.

The question regarding early treatment is not that maxillary teeth can or cannot be moved a considerable distance by actual tooth movement and/or by restraining maxillary growth, but rather should they be moved at this early age. The attainment of an excellent anatomical or esthetic occlusion is not a sufficient criterion to justify the early treatment. The real test comes after the differential facial growth in the middle and late teen years. At this time the excellent dental occlusion must function in harmony with the two temporomandibular joints and musculature. The important matter is the spatial position of the maxillary denture in the face not only at the time of completion of treatment but also after mandibular differential growth is completed. I have cases treated too early that now have clicking of the joints. I would like to move the entire maxillary denture one or two millimeters forward but this is not possible. Recovery now is very difficult and sometimes not at all possible.

Precisely the same incisal interference problem causing posterior mandibular displacement can be created in maxillary extraction cases and congenitally missing maxillary lateral incisor cases. The maxillary incisors may be positioned too far lingually in the face for the mandible to assume its normal functional position after growth.

I see no advantage in treating structural problems early in order to take advantage of growth, and I see considerable disadvantage from the functional point of view in deciding too soon in the growth period of the face where maxillary teeth should be positioned.

Many malocclusions have excellent function and no doubt we have all unknowingly been guilty of converting an excellent physiological occlusion, but one that was in malocclusion, into a better anatomical occlusion but to the detriment of the physiological occlusion. In other words, function was better before treatment. These treated cases may exhibit excellent anatomical occlusion of the teeth but at the same time be responsible for abnormal function of the temporomandibular joints and of the musculature with their attendant symptoms of abnormal function. Look closely for there are many of these in our practices. It is simply a matter of recognition.

Concerning the occlusion of the teeth there are two concepts to be recognized. The first is the morphological or anatomical concept with which we are all familiar. As the name implies, this is an occlusion based on the forms of the teeth. Ideal occlusion has been taught to dental students for many, many years. It is an important phase of the learning process and must be in mind at all times, but it is static and

shows us only the esthetic arrangement of the teeth in occlusion. While one must strive for excellent or ideal anatomical occlusion in orthodontic treatment, this again is not enough and the physiological or functioning concept must be appreciated and be given at least equal consideration because it is in function that the health of the teeth and supporting tissues, the two temporomandibular joints and the musculature, is determined.

Teeth touch and intercuspate when the mandible is at the occlusal position. Normally the teeth are passive and do not dictate this position; rather it is determined by the temporomandibular articulations and the musculature. Should the teeth be dominant, then the mandible is proprioceptively and neuromuscularly directed into a pathologic position of mandibular displacement.

Certain teeth touch in tooth contact functional movement of the mandible, but again they are passive and it is the temporomandibular articulations and the musculature that determine these paths. Should the teeth be dominant, then the pathologic tooth-directed paths are followed and this is functional interference. The movements are difficult and sometimes painful to perform. Normally the teeth are passive, but passive contact can perform the function of mastication for which the teeth are designed. Abnormally, the teeth may be dominant and cause mandibular displacement or force the mandible to follow tooth-dictated functional paths.

In morphologic diagnosis the sagittal relation of the mandible to the maxilla is evaluated by measurement on cephalometric radiographs. The presumption of the degree of morphologic normality or abnormality is determined by the degree of harmony or disharmony of the subject with mean values of selected groups. As useful as this may be, it must be realized that it has nothing to do in determining the functional normal or abnormal position of the mandible. This can be done only by functional analyses of the two temporomandibular joints, musculature, and dentition done directly on the patient. Such analysis consists of observing the speech of the patient to detect restrained mandibular movement or deviation laterally in those sounds normally requiring direct protrusive movement of the mandible. The fingers are placed lightly over the joints and/or in the ears to detect crepitation or clicking as the mouth is opened and closed. At the same time one must observe any irregularity or deviation of the mandible during these movements. It may be noted that the opening is primarily a hinge opening with the gliding movement restrained. One may observe hinge opening in one joint only, hence there is deviation of the mandibular midline toward the side of hinge-only movement. The hinge and gliding movements may be differentiated, whereas, in the normal it is a smooth combined movement.

The clinical evaluation of muscle function is done by placing the fingers over the masseter and temporal muscles and asking the patient to occlude the teeth. The bulging of the muscle should be simultaneous. If not, the bulging will occur first on the side of first tooth contact. Such asymmetrical muscle response can be observed.

The clinical evaluation of the teeth is done by having the patient sit upright and tap the teeth together. As the operator listens, a single, solid tap of uniform contact should be heard. On the other hand, a double or crunching tap may be heard signifying the abnormal functional condition of premature tooth contact. Teeth in premature contact have excessive mobility and facets of wear.

With these guiding thoughts on function and growth as criteria, I favor early treatment of functional malocclusion and late treatment of structural malocclusion. While the treatment of a functional problem requires a relatively short period of time and is most always restricted to the maxillary teeth, structural treatment, on the other hand, requires more time as it is related to the nature of the skeletal pattern and to the amount and timing of facial growth. The structural malocclusion that is free of functional problems may be best treated at the time of pubertal growth spurt. Very often more may be accomplished in one year at this age than in the previous two or three years of treatment. Another point favoring late structural treatment is that, subsequent to the pubertal growth period with the slowing of the growth process, the termination of orthodontic treatment is occurring at a time of stabilization of the various parts of the stomatognathic system. Treatment that is completed too soon because it was started too early may produce a dentition that is only temporarily harmonious with the joints and muscles, and future disproportionate growth may introduce such disharmonious functional conditions as premature contact of the incisor teeth or incisal interference causing posterior mandibular displacement. All may be well when the patient is twelve years of age but, following the pubertal growth spurt, abnormal function may exist thus necessitating additional orthodontic treatment, occlusal equilibration, and/or restorative dentistry in various combinations.

In diagnosis, analysis and treatment planning it is important to classify our cases as structural and/or functional (Chart 1). The structural malocclusion is a malocclusion because the tooth arrangement deviates from the ideal anatomical occlusion for that particular age. The position of the mandible, while the bone itself may be large or small and thus be structurally disharmonious with the maxilla, may still be harmonious functionally as characterized by normal joint and normal postural muscle function. Also, the teeth, while malrelated, may be functioning under normal tooth contact forces.

In functional malocclusion the intercuspation of the teeth may cause the mandible to be displaced in one direction or other thus causing abnormal joint and muscle function or there may be displacement of certain teeth in the occlusive mandibular position. These may be symptomatic as clicking and crepitus of joints, tension or pain in the muscles, gingival tissue recession and pulp irritation, excessive tooth mobility — all representing pathogenic conditions. A classification of abnormal function is given in Chart 2.

It is important to treat functional malocclusion as early as possible, for the early treatment is usually of a simple nature which requires little time. This is not the most important reason, however. Functional malocclusions become progressively more severe and many that persist throughout the developmental period of the dentition are almost impossible to correct. This is not the case in structural malocclusion. I believe that structural malocclusion may not necessarily become worse but only more apparent as time goes on. While early treatment of a functional problem usually involves treatment of the upper arch only, late treatment of an early, untreated functional problem that has become structural as the dentition has developed at the incorrect functional mandibular position, now involves the movement of all teeth.

Many cases involve combinations of functional and structural aberrations. In these it is desirable to treat the

CHART 1

DIFFERENTIATION OF FUNCTIONAL AND STRUCTURAL DENTAL MALOCCLUSION

A. Functional

1. Displacement of certain teeth more than normal amount by functional tooth contact forces. Such displacement is pathogenic to the supporting tissues.
2. Displacement of mandible by proprioceptive direction due to maxillary dental malocclusion. Involves teeth and supporting tissues, musculature and/or temporomandibular joints.
3. Combination of 1 and 2.

Treat functional dental malocclusion as early as possible. Usually treatment is confined to the maxillary dental arch.

B. Structural

Morphological deviations from the anatomical norm.

1. Normal functional tooth contact forces causing only normal tooth displacement. These forces are nonpathogenic to the supporting tissues despite the dental malocclusion.
2. Normal muscle function.
3. Normal temporomandibular joint function.

Treat late, at time of pubertal growth spurt. Usually maxillary and mandibular dental arches are involved.

C. Combination of functional and structural dental malocclusions.

Treat the functional problem early and the structural problem late.

functional problem immediately and the structural problem (such as arch length or Class II or Class III tooth relationships) later when the most can be accomplished in the shortest period of appliance therapy possible for the individual case. As one delves deeper into the complexities and variables of growth of the face and development of the dentition, early structural treatment becomes less attractive. With a deeper appreciation of the genetic basis of malocclusion, prevention and interception become subjective judgments that are popular to talk about but, realistically, are of little value. The only significant interceptive procedure is the early treatment of functional malocclusion. Structural malocclusion cannot be intercepted and, when it is of any consequence, it very likely could not have been prevented.

It has been cited that Class III malocclusion can be intercepted if treated at an early age. The term pseudo Class III that is used to describe such cases is a poor term. Actually such "interception" of a Class III is the treatment of a Class I with a functional anterior mandibular displacement. A true Class III is of genetic origin and, as you know, it exists in varying degrees from mild to severe. Orthodontic treatment will not inhibit condylar growth and in the pronounced cases orthodontic treatment will not alter the facial contour without surgical intervention. In diagnosis one must differentiate between structural Class III malocclusion and functional Class I with anterior mandibular displacement and Class I with functional mandibular overclosure.

In functional Class I anterior displacement cases the mandibular incisors are displaced labially on occluding. The attrition pattern is on the labial of the maxillary incisors and lingual of the mandibular incisors. A double tap is heard on repeated closures. In structural Class III the incisors are not displaced and there is no attrition on these teeth. The closure is joint and not tooth directed.

If a structural Class III malocclusion is treated early and the labial relation of the maxillary incisors is achieved, two abnormal problems will

CHART 2

CLASSIFICATION OF ABNORMAL FUNCTION

1. *Premature contact of teeth.*

Certain teeth may be brought into occlusal contact too soon or slightly in advance of the remaining teeth. As the subject taps the teeth together a double high-toned tap is heard. Teeth in premature contact may be felt to be displaced under light finger contact and they have excessive mobility. The periodontal space is larger to accommodate the tooth displacement. Facets of wear on natural surfaces or shiny spots on restorations are apparent. When tooth contact is released the tooth that was displaced returns to a centered position in the alveolus. On casts these areas will crumble, be worn away or fracture during the cast trimming process. Teeth in premature contact may be sore as a pulpitus or periodontitus.

There is no self-adjustment as teeth do not move or settle away from the premature contact but are displaced in function and are traumatized.

The only treatment is occlusal or proximal equilibration of the teeth in premature contact. A single solid low-toned tap is then heard on occluding the teeth.

The temporomandibular joint function is normal but hypertonicity of the musculature may be simulated.

2. *Functional interference.*

Normally the functional paths of movement of the mandible are dictated by the two temporomandibular articulations and the mandibular musculature. The articular eminences serve the purpose of disarticulating nonfunctioning teeth. If by eruption or migration certain teeth are in the way of the natural functional movements, tooth directed paths are followed. Instead of the eminences d sarticulating the nonfunctioning teeth, the malaligned teeth may disarticulate the joint structures. The symptoms of clicking, crepitus, and irregular or restricted mandibular movement may appear. The musculature may be hypertonic. Facets of wear are seen on the teeth in functional interference.

Treatment consists of one or more of the following procedures: 1. tooth equilibration 2. orthodontic tooth movement 3. reshaping teeth by restorative dentistry 4. tooth removal.

3. *Mandibular displacement.*

Certain teeth or groups of teeth may prevent the mandible from assuming the normal joint and muscular-dictated occlusal position. The mandible is then proprioceptively and neuromuscularly directed into a position of mandibular displacement. This may be anterior, posterior, lateral, superior or inferior in direction. In anterior displacement normal joint function exists but in the other directions there is present abnormal joint function and abnormal muscle function in varying degrees.

Treatment consists of one or more of the following procedures: 1. tooth equilibration 2. orthodontic tooth movement 3. altering the occlusal position of the mandible by means of occlusal splints 4. restorative dentistry 5. tooth removal. Usually a combination of the above procedures is required.

very likely be introduced. The labial relation of the incisors is achieved by labial inclination of the maxillary incisors and posterior movement of the mandible. The maxillary incisors are now in premature contact. A double tap is heard and the incisors have excessive mobility. They are displaced labially on occluding the teeth and then move to their centered alveoli position when teeth are separated. The posterior movement of the mandible introduces clicking and/or crepitus of both temporomandibular joints. This may also occur in a Class I malocclusion wherein the SNB angle is greater than the SNA angle.

The only treatment for the premature contact is equilibration on the lingual surfaces of the maxillary incisors and labial surfaces of the mandibular incisors. Should the posterior displacement of the mandible be present because of the incisal interference, the treatment is more complicated as the mandible must be moved forward with an occlusal splint maintaining incisal contact. This would be followed with restorative dentistry to maintain the normal functional position.

Treatment of the anterior mandibular displacement by retraction of the mandible with a chin cap or posterior extraoral force or with a guide plane cemented to the mandibular incisors will change the tooth relations, but another functional problem, posterior mandibular displacement accompanied by clicking and crepitus of the temporomandibular joints, is substituted. This represents no gain for the patient. Correct treatment focuses attention on the area at fault. It consists of moving the maxillary incisors labially with a maxillary appliance and moving them far enough to create sufficient overjet to permit the mandible to seek its normal anteroposterior functional position. Another treatment plan for the deciduous dentition is to do nothing, since in some cases there is self-correction in the transitional period as the permanent incisors replace the deciduous incisors.

Lateral displacement of the mandible is characteristic of the deciduous crossbite case. Such abnormal functional cases should be treated immediately. Observation is poor treatment because there is no self-correction as in some anterior deciduous displacements during the transition of the incisors.

The bilateral narrowing of the maxillary arch requires that the mandible be displaced to the right or left to occlude the teeth. The mandibular midline is deviated toward the side of the crossbite, creating a functional facial asymmetry with clicking of the temporomandibular joint on that side. A Class II or cusp-to-cusp tooth relationship will often be present on the crossbite side. This occurs because the lateral displacement of the anterior body of the mandible also involves posterior displacement of the condyle on the side toward which the midline is deviated. Treatment consists of bilateral expansion of the maxillary arch only, and the musculature centers the mandible even to the correction of the Class II relationship. Any number of appliance combinations could be utilized, but there is only one correct diagnosis and treatment plan. It is a mistake to view this as a unilateral problem and to use a lower as well as an upper appliance with crisscross elastics. This may correct the crossbite, but the mandible will still be in the displaced position if bilateral maxillary expansion is not effected.

If this condition is left untreated, and we cannot treat those cases that we do not see, there develops a malocclusion that is almost impossible to correct. Superficial observation of the occlusion may suggest that self-correction has occurred, but close examination of the buccolingual axial inclinations reveals that the upper premolars on the crossbite side (the side toward which the mandible is displaced) have erupted with a marked buccal inclination so that the lingual cusps are at a lower level than the buccal cusps. The lower premolars on that side have erupted with marked lingual inclinations. On the opposite side the reverse axial inclinations of the teeth are observed. Thus, while neutroclusion may be achieved buccolingually, it is done by abnormal buccolingual inclinations of the teeth and the mandible is still displaced. The teeth are "reaching" for occlusion. The lower midline is still displaced to the side of the original crossbite, a Class II tooth relationship may exist on that side and, if so, the temporomandibular joint will still be clicking. The orthodontist is now confronted with the necessity of "picking himself up by his boot straps" as he has lost the advantage of reciprocal forces.

The narrowness of the maxillary deciduous dentition may produce a bilateral posterior displacement of the mandible. In this instance there will

be clicking of both temporomandibular joints. Here again bilateral expansion of the maxillary arch is indicated supported with bite plate therapy to assist in moving the mandible forward to a position of normal joint function. These functional Class II malocclusions are usually atypical in that they cannot be classified as Division 1 or Division 2. Any Class II that responds rapidly to any Class II treatment was probably a functional posterior displacement of the mandible.

Abnormal functional incisal interference represents one of dentistry's most serious problems. Incisal interference exists when the incisal guidance, viz., the lingual surfaces of the maxillary incisors, dictates and forces excessive hinge opening as the mandible is moved into the incisive position. Normally only a minimal, if any, hinge opening or rotation occurs in this movement. Also in the normal incisive movement the maxillary incisors are not displaced labially even though they are touching.

Treatment of incisal interference very often necessitates moving maxillary incisors labially in eight or nine year old children to create labial axial inclinations of these teeth and to establish overjet so that anterior growth positioning of the mandible can take place. The mandibular condyles grow in a superoposterior direction and this growth results in an anteroinferior positioning of the body of the mandible. A mandible growing under conditions of incisal interference will result in posterior condylar displacement with clicking, crepitus and possibly pain in the joints, since condylar mandibular growth cannot be inhibited, but mandibular positioning can be altered. If the mandible is not actually displaced posteriorly, it may be restricted in its movements. The incisal interference will cause more than normal mobility of the incisors; gingivitis is often present, and eventually migration of the maxillary incisors and functional crowding of the mandibular incisors may occur. The protrusive functional wax pattern will be perforated in the incisal area. Orthodontists and restorative dentists frequently make the mistake of treating the condition by increasing the occlusal vertical dimension (opening the bite) or by forcing the mandible into a position of pathologic retrusion or a pathological terminal hinge position. If the abnormal condition is solely incisal interference, it is a horizontal problem and vertical treatment will result in failure.

It behooves the orthodontist to recognize incisal interference and treat it accordingly, but he must also take care not to create incisal interference in orthodontic treatment. This may be done by: (1) moving the maxillary teeth too far posteriorly too early in the development of the dentition, (2) early removal of maxillary deciduous or permanent teeth that will inhibit alveolar process growth, (3) extraction in upper arch only, (4) too much lingual movement of maxillary incisors in extraction cases and (5) closure of maxillary lateral incisor spaces in congenital absent cases.

Posterior displacement of the mandible with its attendant symptoms of abnormal function are not always produced orthodontically. Some individuals grow into this condition even with excellent anatomical occlusions. Here again, if condylar growth continues after the intercuspation of the teeth more rapidly than maxillary sutural growth, posterior displacement of the mandible can develop. Treatment consists of positioning the mandible forward to a normal condyle - eminentia relation free of clicking with normal mandibular movements and developing the intercuspation of the teeth to that position by orthodontic treatment and/or restorative dentistry.

The opposite condition, that is, condylar growth lagging behind maxillary sutural and alveolar growth, produces inferior mandibular displacement. The mandible is rotated downward and backward eliminating the freeway space. The molar interference produces abnormal joint function and premature contact of the molar teeth. In the molar interference situation the mandible can be felt to "bounce" over the interfering tooth surfaces as it follows the tooth-directed-path in protrusion. An incisal open bite will probably exist at the incisive mandibular position. Distal movement of the maxillary molars to achieve a Class I tooth relation will only further aggravate the situation. These cases are best treated after the pubertal growth spurt usually with extraction of the maxillary first premolars and occlusal equilibration of the molar teeth.

As in the situation of incisal interference, in molar or premolar interference, the tooth inclinations direct the mandible on tooth-dictated instead of articular eminence and muscular-dictated paths. The tooth-dictated paths are difficult for the mandible to follow. Years ago Brodie stated, "The function of the articular eminence in man is to disarticulate the nonfunctioning teeth." This is an important anatomical fact. In tooth-dictated paths it is the joints that are disarticulated, condyle from the disc, rather than the teeth. There is a conflict between the joints and the teeth. When molar interference is eliminated by occlusal equilibration in the functional mandibular movements, the range and ease of movement increases immediately, always to the amazement of the patient.

A common molar interference situation develops with overeruption of the mandibular second permanent molars. Frequently these teeth are overerupted before the operculum has receded from over their occlusal surfaces. It is almost a routine necessity to band these teeth as soon as possible to level them into the occlusal plane.

When it is observed that the mandibular plane angle is opening, it is the result of one of three abnormal conditions: (1) tooth interference of orthodontic treatment, (2) overeruption of maxillary molars in abnormal suckling function of the facial musculature or (3) injury to a condylar growth site.

The one normal exception is the downward and backward mandibular rotation when a wide freeway space is present. In this instance it is necessary that posterior teeth be directed to erupt in order to increase the occlusal vertical dimension, but even with the mandibular rotation the new occlusal vertical dimension is still less than the rest or postural vertical dimension of the face. This is not traumatic. If, however, a freeway space is small or absent, the rest vertical dimension would be exceeded and a traumatogenic and pathogenic condition introduced. Future condylar growth might or might not be sufficient to recover. If not, a serious functional problem of molar and premolar interference with mandibular displacement exists.

It is subjective judgment to presume that function has improved simply because a dental malocclusion has been changed to an ideal anatomical occlusion. It becomes objective judgment only when function is tested by a functional analysis of the stomatognathic system of which the teeth are one part of the whole.

Our functional problems are here to stay. We must direct our thoughts and modify our treatment as our judgment dictates to treat the problems. Also, we must re-treat later when they occur because of factors beyond our control. The role of the orthodontist in promoting healthy function of the stoma-

tognathic system is important and unfortunately becoming exceedingly more complex.

In conclusion I wish to emphasize that all orthodontic treatment problems that lead to abnormal function are not necessarily the result of incorrect or inadequate orthodontic therapy. It is more the nature of orthodontics particularly since we cannot control the factor of facial growth.

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