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Tutorial

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# *TMJ Dysfunction From A Myofunctional Prospective*

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**Editor's Note**

The authors are orthodontists, whom, in addition to treating both children and adults, orthodontically and or myofunctionally, are referred many patients for the treatment of TMJ DYSFUNCTION AND CRANIOFACIAL PAIN. This article describes how they apply MFT to the treatment of TMJ patients. A subsequent article will describe how they apply MFT to orthodontic patients in their practices.

Beginning with its founding at the start of this century by Edward H. Angle, the orthodontic profession's primary concern for its first forty years was the relationship of teeth. Orthodontists' efforts were directed towards how the teeth interdigitated. Since the early 1940's, due to the influence of Doctors Tweed, Brodie, Steiner, Margolis, etc., emphasis has been placed upon the effects of orthodontics on the patient's profile, and the profession was then concerned with both esthestics and tooth function. There are two final areas into which the bulk of the orthodontic profession has yet to move, and they are the areas of the tempromandibular joint myofunctional therapy. Orthodontists must now begin to incorporate TMJ function and the results of myofunctional therapy into their thinking and into their treatment plans and realize the effect they have upon improving the skeletal muscle, neurology and physiology of the patient's face as well as his facial esthetics and the cuspal interdigitation of his teeth. The dental profession as a whole must not only realize the role myofunctional therapy has in attaining these goals, but the role it plays in maintaining their subsequent stability.

The authors wish to particularly acknowledge Dr. Robert M. Ricketts 1-7, and Dr. John R. Thompson 8, 9.

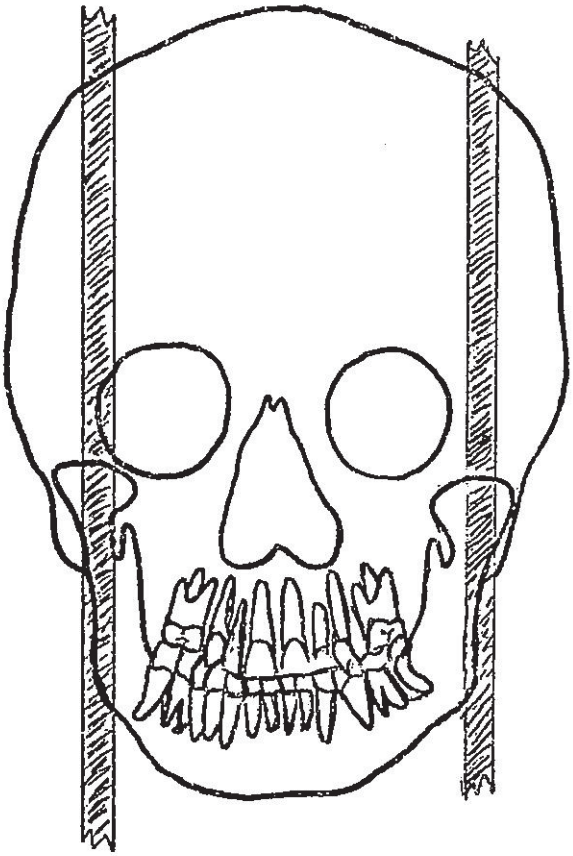

Fig. 1 Diagnamatic frontal view through the condyle heads illustrating the sections x-rayed for TMJ viewing.

Cephalometric laminography was introduced to the orthodontic profession in 1953 by the genius of Dr. Robert M. Ricketts 7, 11. Dr. Ricketts designed a laminograph which enabled the clinician to take 4-6mm sections through each TMJ (Fig. 1). The x-ray source and film cassette holder were movable while the patient's head was firmly positioned in a headholder at a fixed distance from the x-ray source. The x-ray source and the cassette holder move in opposite directions. During a continuous one second exposure, the specific cranial depth at which the x-rays from a moving x-ray source converge will be in focus while the rest of the cranial structures will be blurred out due to the movement of the cassette and the x-ray source. (Fix. 2).

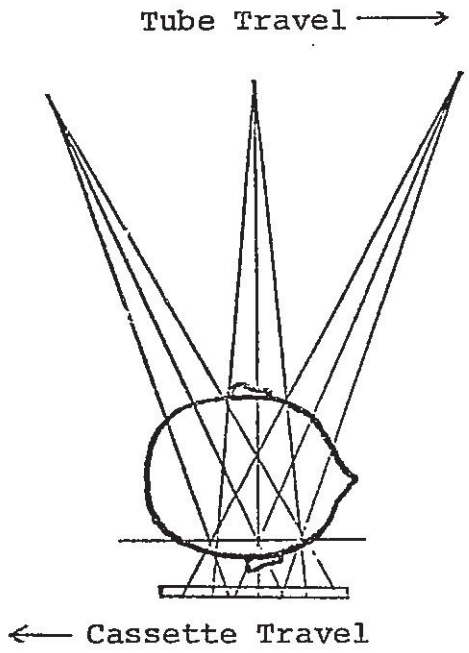


Fig. 2 Superior view of right TMJ laminograph. X-rays converge at a prescribed depth in focus. Other areas are out of focus and do not register on film.

The depth of cut can be varied by as little as one-quarter cm. increments for instance where the clinician might want to take several cuts through different areas of a structure, i.e., the lateral pole, the center and the medial pole of the condyle (Fig. 3).

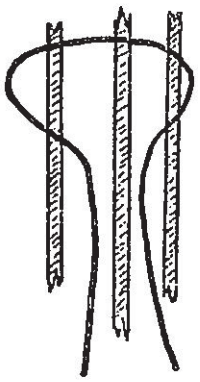

Fig. 3 Laminographic sections through the lateral pole, center and medial pole of let condyle.

Today's orthodontist must be highly cognizant of the influence the TMJ has over his clinical treatment and his final results. Unbeknowns to most

orthodontists, 65 percent of all the children he sees prior to any orthodontic treatment will exhibit subclinical signs of TMJ dysfunction or pathology. 10 Most of these will also have an associated myofunctional disorder. As these patients undergo treatment, TMJ symptoms such as headache, pain, clicking, etc., may arise in a few instances. The great majority, however, will not exhibit symptoms because their growth and vitality are overriding any symptoms that might be expressed. They usually will begin to exhibit symptoms in their twenties and thirties, and when relief is sought from their dentist, they are asked, "Did you have orthodontic treatment as a child?" If the answer is in the affirmative, they are frequently told that "their current TMJ problem extends directly from their previous orthodontic treatment". If the answer is in the negative, they are usually told, "Well, you should have had orthodontic treatment as a child because if you did, then you would not be having the problem you have now". In such a dichotomous situation the orthodontist is the one who receives the blame and since he cannot prove that he is not responsible, he too believes the accusation. The point the authors are trying to make is that the great majority of potential TMJ problems are more likely to be recognized early by using cephalometric laminography.

The authors take these laminographs at the initial appointment in addition to the usual orthodontic diagnostic records. A frontal head film is also taken to check for facial symmetry, deviated nasal septum, nasal patency and midline deviation. A lateral head film is taken and wil show the depth of the pharyngeal airway, the size and position of the soft palate, the presence or absence of adenoid tissue, tonsils, etc. All of these conditions must be evaluated as predisposing or contributing factors to an existing myofunctional abnormality.

The laminographs are taken on the right and left sides in centric occlusion and with the mouth wide open. In centric occlusion the normal joint will appear to have the condyle heads located somewhat mesially and inferiorly to the center of the fossa. There will be a space around the head of the condyle representing the space occupied by the meniscus which does not show on the x-ray. The thickness of the space in 100 "normal" cases 7 was found by Ricketts to be 1.5mm anteriorly, 2.5mm superiorly and 7.5mm posteriorly to the center of the external auditory meatus (Fig. 4).

Fig. 4 In 100 "normal" cases the space between the condyle and the glenoid fossa was 1.5mm anteriorly, 2.5mm superiorly and 7.5mm posteriorly to the center of the auditory meatus.

Gelb 12 determines the normal position of the condyle by drawing lines tangent to the roof of the fossa and the eminentia and a third line halfway between these two (Fig. 5a).

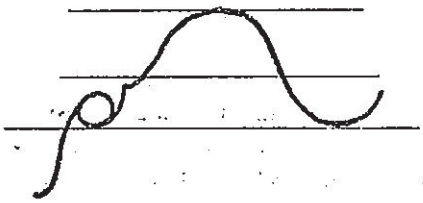

Fig. 5a

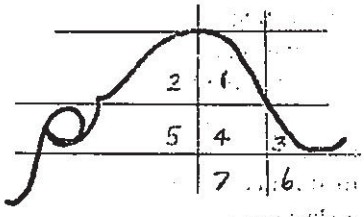


Fig. 5b

Next he draws two vertical lines, one from the highest point of the roof of the fossa and the other from that point where the midle horizontal line intersects the descending slope of eminence (Fig. 5b). This arbitrarily divides the area of the fossa into eight areas which can be numbered. Gelb 12 states that the bulk of the condylar head and neck will be found in areas four and seven (Fig. 6).

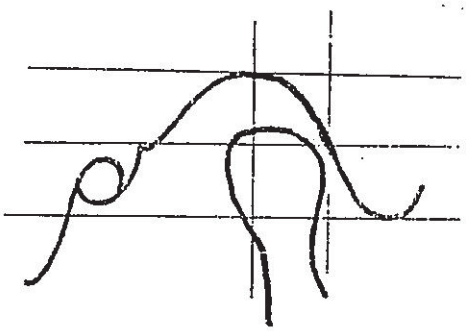

Fig. 6.

In examining the fossa condyle relationship, it is extreme variations from this position, such as superior or posterior condylar displacements, that are clinically significant.

The cortical layer of bone forming the outer surface of the condyle, the roof of the fossa and the eminence should appear smoothly contoured, intact and well defined (Fig. 7).

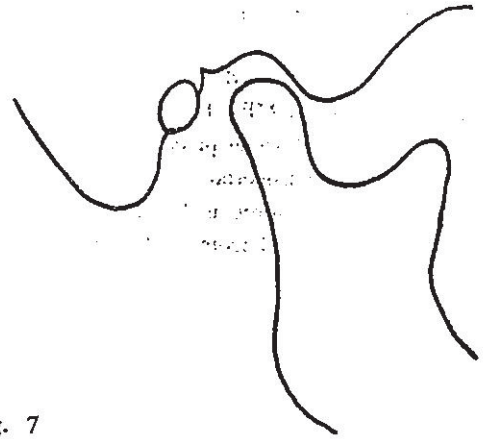

Fig. 7

Quite frequently there will be seen a situation where one condyle is located too far mesially and the other condyle too far distally (Fig. 8) instead of being properly positioned in the fossa. If the patient presents with a Class I occlusion, it is apparent that in order to get maximum occlusal contact, he is habitually dislocating the condyle mesially on one side and jamming the other condyle distally. To not know this and to proceed with treatment as if it were the usual Class I malocclusion, results in a finished case with a normal occlusion dentally and the potential for severe TMJ problems at a subsequent date, because the condyles remain in abnormal positions. This may give rise to osteoarthritic changes in the joints due to abnormally displaced function. Additionally, the muscles attached to the condyle, i.e., external pterygoids, will be under stress resulting in spasm and pain.

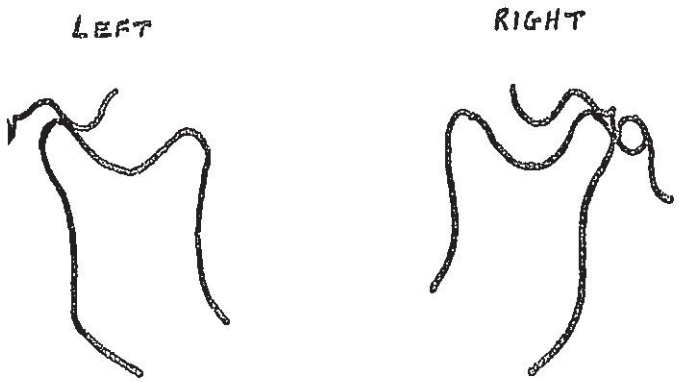


Fig. 8 Left condyle is located too far mesially functioning on the descending slope of the eminence. Right condyle is located too far distally against the petrotympanic fissure.

The usual sequella when it occurs will be preauricular pain from the joint jammed distally and resorption of the eminentia and condylar head on the side dislocated mesially.

Another very common occurence is to see a patient with a severe Class II, division 1 malocclusion and an overjet of 8-10mm, and to find upon examination of the laminographs that his condyles are located mesially on the slope of the eminentia, 4-6mm forward of where they should be (Fig. 9). To lessen the unesthetic appearance of his receeding chin and to achieve a labial seal when swallowing, this patient tries to habitually hold his mandible forward and in reality his problem is of much greater severity than initially appears upon dental or model examination. This results in rapid fatigue and then spasm and pain of the muscles which protrude the mandible. During MFT this type of patient will be seen to thrust his mandible forward when practicing swallows or placing a cup to his lips. Although this mesial condylar displacement could be discovered upon initial examination by forcibly posteriorizing the mandible, what is not discovered is that the head of the condyle and or the eminentia is moderately to severely resorbed from prolonged function in an abnormal position.

Fig. 9 Resorption of condyle head and descending slope of eminence in severe Class II division 1 type cases.

Additionally, patients with severe protrusions, as well as those with anterior open bites have no incisal guidance to disarticulate their posterior teeth when going into protrusive excursion. The resulting posterior tooth interferences cause TMJ symptomology identical to that caused by any other prematurities. Furthermore, the posterior teeth must be disanticulated by the joint instead of the anterior teeth, resulting in abnormal function between the condyle and its eminence under great pressure. This is the specific cause of the TMJ pathology in this type of patient (Fig. 9). To base an orthodontic treatment time or treatment plan on the occlusion presented by the patient, his models and cephalometric x-ray would lead to an unprecise diagnostic conclusion. In both this problem and the previously described one (Fig. 8), treatment should not be instituted until all symptoms are eliminated and the condyles are relocated to their normal positions in the fossae and allowed to recontour simultaneously with the recontouring of the eminentiae. Progress laminographs are periodically taken to assure that this has occurred and not until then is any additional treatment initiated. As would be expected this materially changes the existing dental malocclusion and the original myofunctional problem. Most frequently they are now seen to be less severe.

One speech pathologist and myofunctional therapist of the author's acquaintance states that 80 percent of her patients have TMJ symptoms and the greater majority are due to the problem just described. In her initial examination she looks for (1) pain upon palpation of the Masseter and Temporal muscles, (2)

joint clicks upon opening and closing, (3) limited opening, (4) deviation of the mandible upon opening, (5) fullness or pressure in the ears, (6) tinnitus and (7) the frequent occurance of headaches. These are the symptoms of a beginning TMJ disfunction problem and what a service she renders her patients by diagnosing this problem in its infancy. The existence of this problem is usually unsuspected and undiagnosed inspite of prior examinations by pediatricians, pedodontists, etc. What a wonderful opportunity it would be if each speech pathologist and school nurse were able to make the initial diagnosis. The authors' treat many patients who are routinely sent during the day to lie down in the school nurse's office or are sent home two or three times a week, week after week, due to severe headaches rendering them incapable of coping with their school work. These patients are prescribed analgesics and suffer with headaches throughout the majority of their learing years. Is it any wonder that they perform at less than their capacity. Speech pathologist screening school children should also observe them for mouth breathing and inquire about the presence of allergies. Allergies cause swelling of the nasal tissues and contribute to mouth breathing. The swelling can occur to such an extent that it impinges upon the superior nasal turbinate causing referred paid. When viewing a frontal head film, always look for nasal obstruction, enlarged turbinates, deviated septum, etc.

Mouth breathers, even with severe TMJ pathology revealed by a laminograph, will frequently have no pain because they do not clench their teeth at night. During sleep their facial and masticatory muscles are relaxed because their jaws are apart. Consequently, there is no muscle fatigue or spasm inspite of the presence of pathology.

Additionally, how a child masticates and swallows a solid bolus should be carefully evaluated. Besides looking for the obvious faults, the examiner should keep in mind that children with improper tongue position who bolt their food, swallow large amounts of air giving rise to a great incidence of gastric problems in this age group. Therefore, when a child complains of a stomachache, it may not be due to what he ate but to how he ate it. When checking for improper tongue position, see if the child rests his tongue upon the incisal edges of his mandibular anterior teeth. If he does, a groove matching the alignment of these teeth will be apparent on the undersurface of his tongue. If his resting tongue posture is against the lingual surfaces of his anterior teeth, be aware of this. The older a patient is, the more frequently will be seen a thrust against those teeth with resultant generalized tooth migration and spacing. This thrusting causes the mandible to be carried more mesially than normally. These patients are almost always misdiagnosed as being macroglossic and are frequently mistakenly referred for a surgical tongue reduction, or have suggested to them having their teeth "capped" with oversized porcelain jackets to eliminate the spacing. Amazingly, upon the institution of successful MFT, they discover they need neither the surgeon's knife nor the porcelain jackets as their spacing spontaneously closes due to increased obicularis oris tone and proper tongue positioning. Interestingly enough, several adult patients refused MFT for this specific problem because the solution was just too simple for them to accept. They wanted a more complicated and involved answer, and actively sought surgery and extensive "capping" procedures. Those of us familiar with MFT know that this will avail them nothing and that the original migration and spacing will reoccur. Bridgework, as immovable as it may appear, will be pushed about by an actively thrusting patient.

A patient should be questioned to see if he has scoliosis, a previous back injury or one leg shorter than the other. These condisions radically alter back posture, throwing the muscles of the neck and face into spasm. The tongue is also displaced anteriorly.

The great majority of intracapsular TMJ disorders are due to an insufficient vertical deminsion. In patients 7-15 years old this occurs due to the failure of eruption of the bicuspid and molar teeth and their associated structures. In adults this occurs due to the collapse of a previousy sufficient vertical dimension, subsequent to extraction of one or more permanent teeth that were not replaced. In either case, when the mandible is repositioned and the vertical dimension is temporarily restored to its proper overbite-overjet relationship, there will be seen an open bite on one or both sides into which the patient's tongue immediately flows. Although it appears that repositioning the mandible has now caused a unilateral or bilateral tongue thrust, it is the author's opinion that all collapsed bites have a myofunctional problem which has contributed to the collapse and which is then msked by it. Restoring the proper vertical dimension merely makes obvious the myofunctional abnormality.

In both children and adults, therefore, after having restored the proper vertical dimension and eliminating all painful symptoms, definitive treatment should be instituted to make permanent this increased vertical dimension. The orthodontist attempts to do this in children by extruding the teeth in the maxillary and mandibular buccal segments. The restorative dentist attempts to do this by increasing the height of the tooth crowns in the open bite areas by onlay fillings or high crowns. The efforts of both are doomed to failure unless myofunctional therapy is successfully instituted after the restoration of the proper vertical dimension and prior to the institution of permanent dental treatment. Not incorporating this important step would result in an orthodontic relapse and return of a unilateral or bilateral tongue thrust following the removal of the appliances, or the rapid intrusion of the elongated crowns or onlays. This, in turn, would be followed by the return of the original painful symptoms. It is the authors' opinion that almost all intracapsular TMJ disorders need myofunctional therapy to insure the stability of subsequent orthodontic or restorative dental procedures. However, most orthodontists and general dentists feel that if they can create a well-interdigitated occlusion in the face of a blalent bilateral tongue thrust and buccal open bite, that their created occlusion will remain stable and the lateral tongue thrust will disappear because the tongue cannot get between the buccal segments and open them up. This thinking is grossly fallacious. Fixing a malocclusion orthodontically or with dental restorations will not cure a tongue thrust. The authors frequently seen numerous well-treated cases in which buccal segments with good cuspal interdigitation quickly relapse back to an open bite because a lateral tongue thrust went unrecognized or was thought to be insignificant.

Another frequently encountered condition is finding one condylar neck appreciably longer than the other, or one glenoid fossa at a much lower level than the other (Fig. 10). When an elongated condylar neck is found prior to the onset of the patient's major growth activity and both fossae are at the same level, the clinician would be wise to anticipate excessive Class III mandibular growth on the affected side resulting in severe deviation of the chin to the opposite side causing facial deformity, and should forewarn the parents of the necessity of possible Class III surgery at the conclusion of orthodontic treatment.

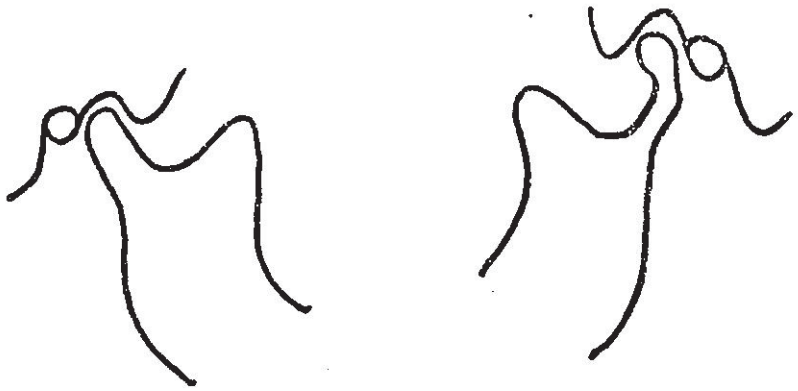

Fig. 10 Left and right glenoid fossae can be located at different levels vertically. Condylar necks are frequently of different size.

With pretreatment laminographs anticipating this end result, the teeth in each arch can be independently treated leaving their final interdigitation to the oral surgeon. When the Class III surgery is done it must be done on both sides of the mandible not solely on the hyperplastic side. To surgerize one side only results in the mesial rotation of the condyle on the unaffected side so that the long axis of that condyle is no longer lined up with the long axis of its fossa.

It is the authors' opinion that well in advance of any Class III oral surgery it is critical that MFT be instituted, that a proper tongue position be firmly established prior to surgery, and that this therapy continue postoperatively until the patient is well-stabilized with his teeth properly interdigitated. This applies equally to Class II maxillary osteotomies in which the anterior section of the maxilla with its six anterior teeth is relocated posteriorly. To relocate the entire mandible or the anterior maxilla posteriorly, encroaching upon the tongue, with absolutely no regard to the role played by the tongue in either establishing or contributing to the original malocclusion is to invite a postsurgical relapse that must usually be resurgerized or salvaged orthodontically. Surgery, alone, or with orthodontics, will not be a tongue thrust cure. In addition to establishing proper tongue position, it is frequently desirable to presurgically increase the tone of the tongue and thereby reduce its size. This can be accomplished by having the patient isometrically exercise his tongue by forceful elevations against a tongue blade or spoon handle which is pressing downward. 13 It may also be desirable to incorporate into the presurgical therapy of these patients a sequence of facial exercises that strengthen the muscles of mastication. These are resistance exercises that consist of (1) placing a first beneath the chin and repeatedly opening against its upward pressure, (2) placing a fist against each side of the chin and going alternatingly into left and right lateral excursions, and (3) hooking the index and middle fingers over the incisal edtes of the mandibular incisor teeth and repeatedly closing against a downward pressure.

When the glenoid fossa on one side is located at a much lower level than that on the other (Fig. 11), the occlusal plane and the inferior border of the mandible will be found at a correspondingly lower level on tha same side.

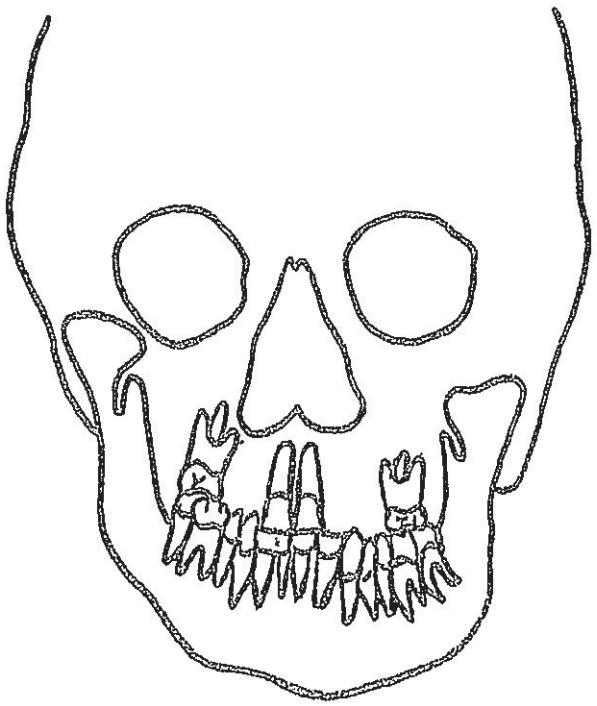

Fig. 11 Occlusal plane is tilted due to glenoid fossae at different levels.

The clinician should maintain this tilted occlusal plane throughout his treatment and should not try to elevate the mandibular buccal teeth on the low side or intrude the mandibular buccal teeth on the high side. However, before the initiation of treatment it should be pointed out to the parents that with the teeth and their associated alveolar process lower on one side than on the other at the completion of treatment, the tongue will have an abnormal environment to which it must adapt and that MFT will be necessary. It should be explained that the palatoglossal seal will be lower on one side and higher on the other and that functional adaptions of the tongue will be necessary to accommodate to this.

A significant numver of patients will be seen with a steep incisal guidance (Class II, division 2 cases) where the initial contact on closuref is between the maxillary and mandibular incisors. To obtain complete closure and maximum cuspal interdigitation the mandible shifts distally, causing a distal displacement of the condylar head against the pterygomaxillary tissue at the rear of the fossa. Unless the mandible is allowed to move mesially during orthodontic treatment by decreasing the incisal guidance, these patients will end up with preauricular facial pain due to muscle spasm if, in fact, they do not already have it. These patients will frequently have an unrecognized bilateral tongue thrust because their customary mandibular position will be with the incisor teeth contacting, the posterior teeth apart, and the tongue flattened and overlying the buccal segments. However, upon complete closure the mandible shifts distally, the bicuspids and molars interdigitate well, the tongue is confined within the mandibular arch and no tongue thrust is suspected. These patients

invariably display middle ear symptoms such as earache, tinnitis, vertigo, etc., due to a pathological elevation of middle ear pressure caused by the distally displaced condyle. If the symptoms are limited to only one side, the pressure in the middle ear on that side will be greater than that on the other. Using a Middle Ear Analyzer, the authors can measure and record on a printout this difference in ear pressure prior to the institution of treatment. Upon the successful completion of TMJ therapy, middle ear pressure is remeasured and the ear with the greater pressure is seen to have returned to the level of pressure in the unaffected ear when before and after printouts are compared. If both ears were originally affected due to a bilateral condylar displacement, the printout would show both ears exhibiting a much greater than normal value.s treatment progressed, progress printouts would show decreasing middle ear pressure. The Middle Ear Analyzer is a wonderful screening device, taking only 56 seconds per patient. The authors' would recommend its use to speech pathologists and or school nurses for the annual first week examination of children. It would aid in identifying those children whose hearing problems are linked to myofunctional and tempromandibular disfunctions.

In nonfluoridated areas, patients with mutilated occlusions due to childhood loss of first and second molars are often encountered. This loss of posterior vertical support of the teeth creates an overclosure of the mandible because there are too few teeth in the buccal segments to keep the jaws apart. The vertical dimension on one or both sides is lost due to the upward pull of the masseter, internal pterygoid and temporalis muscles. This results in the superior displacement of the condyle head in the fossa (Fig. 12). The meniscus cannot withstand the increased pressure and it perforates, allowing the condylar head to make contact with the bone of the glenoid fossa. If this bone-against-bone relationship continues for any length of time, the condylar head undergoes osteoarthritic degeneration and this destruction results in a decreased condylar height in an attempt to regain the separation between the bone of the glenoid fossa and that of the condyle. As this occurs the muscles contract further to maintain the bone-against-bone contact. As this vicious cycle continues the mandible, tongue, hyoid, etc., are pulled superiorly decreasing the volumn of the oral cavity. In an attempt to maintain the patency of the oral and pharynpeal airway the tongue and mandible assume a mesial position. The masseter and temporalis muscles that are forcebly pulling the mandible superiorly will be in spasm and painful to the touch. The speech pathologist will discover this upon palpation. This patient will have all the previously mentioned ear symptoms plus lound joint noises upon mandibular opening and closing. Over a period of years this problem, if not diagnosed, becomes increasingly more painful until it is a full-blown Dysfunctional TMJ Arthritis.

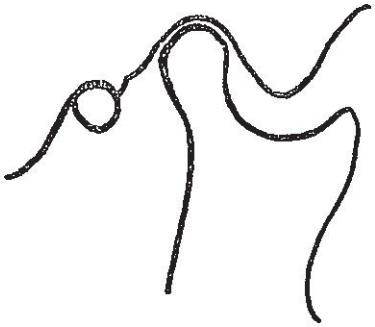

Fig. 12 Superior displacement of the condyle. The meniscus has degenerated allowing intimate contact of the condyle and the glenoid fossa.

In addition to examining the laminographs in centric occlusion in order to ascertain the relationship of each condyle to its fossa, the laminographs taken with the mouth wide open are examined to see that both condyles moved mesially the same distance. The laminograph of a normal joint will show the condyle immediately below the articular eminence or slightly mesially to it (Fig. 13).

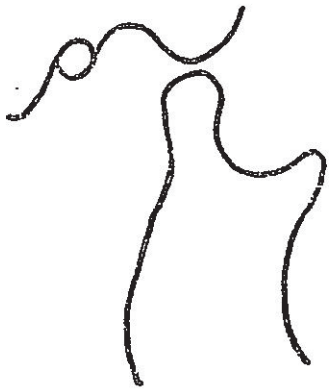

Fig. 13 Normal TMJ laminograph with mouth wide open shows condyle beneath eminencia.

If upon opening wide, one or both condyles move anteriorly and superiorly to the eminencia, the patient has subluxated his mandible..

In rare instances, usually as a congenital birth defect or a sequella to traumatic injury, bony ankylosis of the condyle will be found. Radiographically, the position of the condyle will remain unchanged at centric occlusion, rest position and wide open (Fig. 14). Such a condition gives rise to a whole array of myofunctional abnormalities such as disuse atrophy, etc., but renders MFT fruitless.

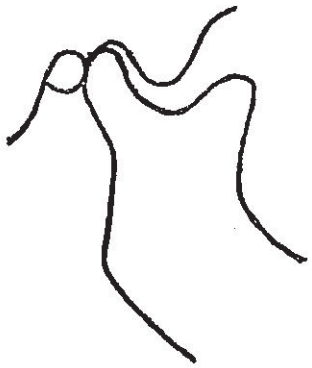

Fig. 14 In condylar ankylosis there is no movement on the affected side while there is limited movement on the other side.

Another rare congenital birth defect is condylar agenesis. The condylar neck appears below the fossa "as if it were the end of a piece of Turkish Taffee that had been pulled apart" (Fig. 15). Patients with this defect usually possess a moderate range of mandibular movement due to the development of a connective tissue "flail" joint between the glenoid fossa and the reminant of the condylar neck. Their condition is similar to those who have one or both condyles entirely broken off due to trauma and pulled completely away from the ramus by the external pterygoid muscles. These patients, too, have a good range of mandibular movement and MFT can be instituted if necessary with every expectation of success.

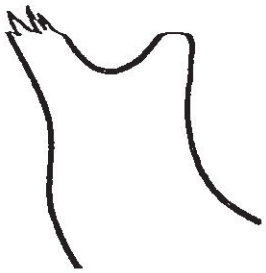

Fig. 15

When the patient exhibits mandibular deviation upon opening, the laminograph will show no condylar movement or partial movement forward on the side towards which the chin deviates. When the patient exhibits limited undeviated mandibular opening, the condyles will be seen to have not moved at all (pure rotation) or to have moved forward only slightly on each side. Both of these conditions must also be eliminated and then the tongue restrained to adapt to its new environment prior to the institution of orthodontic treatment or extensive restorative dentistry.

Quite frequently MFT can be of great benefit to patients of nurisng home age if someone will but take the time to work them. The authors have quite frequently been referred very unusual cases because they treat patients with facial pain. In these elderly patients we have seen cases of Orofacial Dyskinesia in which the tongue moves uncontrollably in and out of the mouth and from side to side. These patients are an embarrassment to everyone around them when they eat and are constantly shunted aside. Then there are patients with glossopharyngeal neurological problems affecting their tongue movements and causing swallowing impairments. We have also seen xerostomic patients whose medications make them incapable of producing saliva, etc.

A largely unrecognized problem in the dental field is the patient with many sets of ill-fitting dentures that constantly become dislodged due to an unrecognized tongue thrust. The reader is referred to "Oral Myofunctional Disorders" (p. 14) for a supurb discussion on how myofunctional problems affect the fit of prosthetic appliances. It should be kept in mind that a patient with an upper partial or complete denture that is constantly dislodged will habitually clench his teeth in an effort to keep his denture up. Thus, the subsequent TMJ problem that develops is seen not to be due to the denture but to the preexisting undiagnosed tongue thrust.

The authors have sought to point out some of the many reasons they use myofunctional therapy in the treatment of TMJ patients diagnosed by cephalometric laminography as well as in the treatment of adult patients managed either orthodontically or by a combination of orthodontics and surgery.

The authors feel that the great majority of these patients require MFT to achieve and maintain functionally stable results. We feel that cephalometric laminography is also of great importance in nonsymptomatic patients in the detection of subclinical TMJ pathology or in insuring the absence of same prior to the initiation of myofunctional and orthodontic therapy.

It is a truism that "anything that malfunctions, malfunctions at its own expense or at the expense of others". We have attempted to illustrate the great cost exacted by a disfunctioning tongue upon various dental procedures. We have always realized the value of MFT as applied to the practice of orthodontics because it makes our treatment easier, quicker, functionally stable and more satisfying to both ourselves and our patients. However, it was in the area of TMJ disfunction that the application of MFT was found to be as especially indispensible.

**Authors' Commentary:**

It is also the authors' experience and opinion that in addition to MFT, an extensive background in differential diagnosis involving the disciplines of otolaryngology, neurophysiology, trauma, anesthesiology, orthopedics and kinesthesiology is absolutely necessary before the diagnosis and treatment of these problems can even be considered. We find that although some TMJ problems are quite obvious, it is our experience that others are rather bizarre and quite complex. We also would point out the many layers of emotional problems that accompany almost all of the TMJ patients that we see. We earnestly hope that at some future date we may be afforded the opportunity to expand this discussion in all of the above areas.

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