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Orthodontics in a Quantum World IV: Balance, Posture and Oral Function

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Abstract: *Loss of balance and postural adaptation are discussed in the context of temporomandibular disorders. Two examples are given of how orthodontic treatment in adults can lead to a recovery of balance and postural improvement. In children, spontaneous postural improvement can occur following simple dental intervention. The results of examining this observation in a sample of 100 children are discussed. The findings indicate the need for an orthodontic assessment to include a standing postural examination. Criteria for a larger investigation are outlined and techniques to assist in this are suggested.*

In previous articles in this series,[1, 2] it was suggested that there is a strong association between the sense of balance, posture and bruxing. The sense of balance is the predominant factor. The consequences for posture and for bruxing follow from this. Preston,[3] an orthodontist, has stated that "although the posture of the head may be related primarily to efforts expended in resisting the force of gravity, nevertheless the physiological requirements associated with respiration, deglutition, sight, balance and hearing also must affect cranial deportment." However, in practice, to the limited extent that the orthodontic specialty concerns itself with posture, it has been almost exclusively in relation to problems of the airway and swallowing.[3, 4] Concerns with bruxing have mostly been associated with temporomandibular dysfunction or psychological stress.[5]

A loss of balance can be caused by many factors, both local and systemic. If it is identified as a problem when taking a history, referral to a physician may be appropriate to rule out the possibility that it is an indication of an underlying systemic condition. This is especially the case if the loss of balance is of rapid onset and there is no obvious trigger such as an automobile accident. In older individuals it is sometimes possible to improve equilibrium by specialized exercises used by ear, nose and throat specialists. Once a specific medical cause has been ruled out then a possible dental etiology should be considered.

A number of terms have been used to describe a loss of balance.[6] These include a loss of equilibrium, dizziness, giddiness, loss of proprioception and vertigo. Strictly speaking, vertigo describes a condition where the sufferer has a sense of spinning around or that the room is spinning around him or her.[6] Personal experience, gained from several thousand patients, suggests that vertigo, in this narrow sense, is uncommon. In this article the terms "loss of balance" and "loss of equilibrium" are used interchangeably. Posture has been defined as the position of the limbs and carriage of the body as a whole.[6] It is established in several ways: by the sense of balance from the vestibular apparatus of the inner ears; by the visual righting reflex; by proprioceptive feedback from the supporting musculature of the head and neck, especially the sternocleidomastoid muscles, to the vestibular nucleus in the brain.

Fonder[7] was among the first in dentistry to recognize that a loss of equilibrium could accompany temporomandibular joint (TMJ) dysfunction. In a large group of patients (>1500) he identified what he called a Dental Distress Syndrome (DDS). This was modeled on the General Adaptation Syndrome of Selye.[8] Hans Selye was a world authority on stress who encouraged Fonder in his work and wrote an introduction to his book. In one sample of 247 patients with severe malocclusion and TMJ dysfunction, Fonder found that in addition to a wide range of other symptoms, 74% experienced some loss of equilibrium. This varied from an occasional mild episode through to a severe, continuous, debilitating condition. He also showed radiographic evidence of postural improvement as he treated his patients.

Gelb[9] extended on Fonder's work. He collaborated with clinicians from other disciplines, a necessary step towards achieving an understanding of the complex mechanisms involved in TMJ disorders. He called the type of splint he used a Mandibular Orthopaedic Repositioning Appliance (MORA). Gelb has been particularly interested in the position of the mandibular condyles in the glenoid fossae. Both Fonder and Gelb, along with outstanding clinicians

such as Travell,[10] a physician, Magoun,[11] an osteopathic physician and Goodheart,[12, 13] a chiropractor, have all recognized that oral factors, in particular the position of the mandible, play an important part in the maintenance of balance and subsequent postural adaptation.

Stack,[14, 15] an orthodontist with extensive experience in the treatment of TMJ disorders, has recorded a series of videos of individuals with severe loss of equilibrium. After placement of a MORA-type of appliance these individuals showed an astonishing immediate recovery of equilibrium, providing a dramatic example of how much this could be affected by the mandibular position. Stack, like Gelb and Fonder, first stabilizes the patient with the mandibular appliance then provides a long-term solution by reorganizing the dentition, usually by orthodontic means, or by an orthodontic/prosthetic combination. In some cases, surgery of the temporomandibular joints is also undertaken.

Figure 1a - Patient P.R Pre-orthodontic profile view showing increased lordosis and kyphosis plus forward head posture.

To a great extent, dental awareness of a loss of equilibrium and postural adaptation has been as an incidental finding during TMJ diagnosis and treatment. Patient P.R. (Fig. 1a) is typical of this approach. This 39-year-old male presented with a history of chronic lower back discomfort but with acute facial pain following a recent blow to the face. He had extensive temporomandibular joint discomfort, including restriction on attempting to open the mouth. Among the signs and symptoms following the trauma there was a loss of equilibrium to the point where he could no longer ski or skate and occasionally had to sit down to recover his balance.

Figure 1b - Patient P.R. Post-orthodontic profile showing improvement of the upper quadrants of the body.

After a brief (two months) period of conservative first phase therapy with a full coverage mandibular splint, the position of the mandible for maximum physiological benefit was in an incisal edge-to-edge relationship (Fig. 2). This position was established by Applied Kinesiology (A.K.) testing, as described previously.[2] His malocclusion was an Angle Class II, division ii type, reflecting an underlying hyperflexion cranial strain.[16] Active orthodontic treatment was begun soon after the initial symptoms were controlled. This consisted of a maxillary Advanced Lightwire Functional (ALF) appliance[17] to mobilize the maxilla and pre-maxilla and then advance the maxillary anterior teeth. The mandibular full-coverage splint was changed to a MORA. As the maxillary arch was aligned the posterior pads of the mandibular appliance were adjusted at intervals, resurfacing them with self-curing acrylic resin. A.K. testing was used to indicate when this was appropriate. In this way, the height of the splint was steadily reduced as the maxillary incisors were advanced and the mandible was able to move forwards. Final alignment of the maxillary teeth and the mandibular anterior teeth was completed with fixed appliances and light arch wires.

Figure 2 - Patient P.R. Position of mandible for maximum advantage after two months of splint therapy.

Figure 3 - Patient P.R. Final occlusion after alignment of the maxillary arch and build-up of the mandibular posterior teeth.

When this was done there was still a residual space between the posterior teeth when the anterior teeth were in maximum intercuspation. This was as expected from the original malocclusion. In this case it was decided to close this by having his general dentist replace the deteriorating amalgam restorations in the mandibular posterior teeth. This gave the opportunity to increase the height of the posterior dentition thus closing the posterior spacing by prosthetic means rather than by additional orthodontic treatment (Fig. 3). Retention was with a night-only Hawley type of appliance which was phased out over one year. Eight years later the patient has remained stable. He is symptom-free except for some residual joint crepitus. His sense of balance was restored early in treatment and he was able

to return to skiing and skating. Figure 1b shows the obvious improvement in posture.

Subject L.W., a 68 year-old female (Fig. 4a), also presented with TMJ dysfunction as her chief complaint. The symptoms included occasional inability to close the mouth, facial stiffness and pain over the left TM joint. She also suffered from chronic sinusitis and had a lengthy history of a poor sense of balance. Her dental history included extraction of maxillary first bicuspids in childhood and the mandibular first molars at a later date. There were extensive well- constructed restorations present. There was also a history of there having been a prolonged period of treatment with a maxillary splint in an attempt to relieve the TMJ symptoms. This did not seem to be any benefit and was eventually abandoned by the patient and the dentist. The lateral skull radiograph (Fig. 5) shows a concavity of the lower face, with retroclination of the maxillary anterior teeth. The P-A film (Fig. 6), shows that there was a lateral slope of the occlusion up to the left.

Figure 4a - Patient L.W. Pre-orthodontic profile view showing backward inclination.

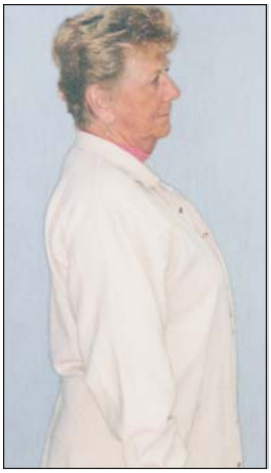

Figure 4b- Patient L.W. Post-orthodontic profile showing uprighting of body after proclination of the maxillary teeth and leveling of the maxilla.

Figure 5 - Patient L.W. Pre-treatment lateral cephalometric radiograph showing retruded maxillary anterior teeth and concave soft tissue profile.

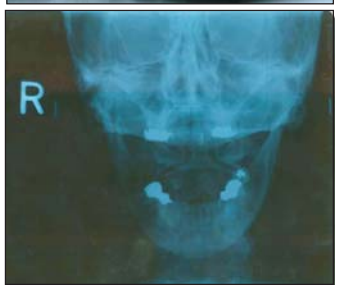

Figure 6 - Patient L.W. P-A radiograph showing tilt of the lateral occlusal plane up to the left.

Active treatment was begun with a maxillary ALF appliance to advance the maxillary anterior teeth and free up the maxilla. In the mandible an ALF appliance was fitted but with a posterior pad on the right side only. This was to correct the lateral slope of the occlusion which was up to the left. The occlusion is opened just enough to separate the teeth on the opposite (high) side from the pad. As the teeth on the high side began to come into occlusal contact after several weeks, acrylic was added to the pad on the low side to separate them again. If the space on the high side is made too great, the patient will develop a unilateral tongue thrust. Leveling of the maxilla in this way has been discussed previously in the article on torsion.[18] One consequence of unilateral treatment like this is usually an open bite on the low side once the maxilla has been leveled. This is resolved by elevating the mandibular posterior teeth on the low side one at a time against a fully banded maxillary arch. In this particular instance, a posterior open bite did not develop. The maxillary anterior teeth were proclined, by 5º as the maxillary arch was being leveled, i.e. only a slight advancement was needed (Figs. 7a,b). The treatment time was 13 months.

Figure 7a - Patient L.W. Pre-treatment view of dentition.

Figure 7b - Patient L.W. Post – orthodontic anterior view of dentition. Only minor change in alignment of anterior teeth is visible. Patient did not develop a unilateral right-sided posterior open bite despite use of a unilateral occlusal pad on the right to level the occlusal plane.

Figure 8a,b - Patient L.W. Pre-treatment and post-treatment facial views. There has been relaxation of the facial musculature and slight increase of the vermilion borders of the lips.

Retention was with a night-only retainer in the maxilla. This was phased out over six months. Seven years later, the patient is still comfortable and reports that among the benefits she continues to experience, the improvement of her sense of balance has been very gratifying. The improvement in posture is obvious (Fig. 4b). There has also been cessation of her chronic sinusitis. This is a common finding after treatment with an ALF appliance in the maxilla. The facial views (Figs. 8 a, b) show a general relaxation of the musculature and a slight increase in the amount of vermilion border of the lips after treatment.

In both these cases, A.K. testing was used throughout in diagnosis and treatment. Both patients continue to test strongly with their present occlusion. The use of A.K. testing provides a means of assessing the appropriateness of each treatment procedure and whether the desired goals are being achieved in a physiologically balanced way. It is used as a way of testing the body's response before an adjustment by imitating its effect. In A.K terminology this is called a challenge. After the adjustment, it is used again to ensure that the resulting force and the direction of its application are favorable. If it is not, the level or direction of the force is modified until it is within the body's physiological tolerance. This process respects the body's ability to respond. It is not a matter of how many grams of force but rather what is sufficient to stimulate the body to react in the most effective way. This approach to orthodontic force levels is the logical outcome of the argument that the body is a self-regulating system, reacting as a single entity to an external or internal stimulus. Further examination of force application in orthodontics will be discussed in a later article.

Posture in Children

The links between balance, posture, oral structures and oral behavior have far wider implications than just possible findings associated with TMJ dysfunction. This is demonstrated in patients L.R. (Fig. 9a,b), M.T. (Fig. 10a,b) and K.T. (Fig. 11a,b). These young patients were seen for an orthodontic evaluation. Placement of a tongue depressor between the teeth has brought about a spontaneous improvement in posture. For many years in my practice a standing examination has been a standard procedure for all patients during the initial assessment. This has included full frontal, profile and rear views. Romberg's test for balance[12] is also done. These patients' histories did not indicate any symptoms of TMJ dysfunction. Subject L.R. (Fig. 9a,b) did have a history of a prolonged and difficult birth. She also complained of occasional lower back pain. Her physician had been consulted regarding this, but had suggested that the condition would resolve with further growth. Her posture was not considered as a call for concern. Subjects M.T. and K.T. did not have any significant medical history and were considered healthy by both their parents and their physicians. Again, the postural distortions were accepted as normal. If asked to stand up straight, most children can do so, but quickly revert back to their previous posture.

Before discussing the findings regarding these three patients, the protocol used in the initial examination and in the taking of photographs should be described. The patients were kept standing for several minutes before any examination or before taking photographs, although the camera was kept pointing at them. This was to offset the natural tendency for most individuals to alter their stance when first faced with a camera. It allows time for them to resume their natural posture. This is an important point, as valuable information is otherwise lost. No instructions were given to the patients regarding their posture, but it was suggested that they let their teeth be slightly apart. After the first photograph was taken, the tongue depressor was then placed between the posterior teeth and the patient was asked to close lightly onto it. The patient was allowed to settle again before the second photograph was taken. The tongue depressor was then removed and the patient was observed for a further short period. In each case, the patient reverted, after two or three minutes, to their original posture. As might be anticipated, when A.K. testing was used, all three children tested strongly with the tongue depressor in place but not when it was removed.

What is happening here is, in my opinion, of major significance. The simple act of preventing these individuals from occluding the teeth, e.g. in swallowing, allows the body's self-correcting mechanisms to come into play. Again, these are: the semi-circular canals of the inner ears; the visual righting reflex; the proprioceptive feedback from the muscles and joints of the head and neck. These are able to bring about the spontaneous improvement in posture seen when the tongue depressor is in place.

In a sample of 100 pre-orthodontic patients examined in this way, 53 showed some change in posture with the tongue depressor. This ranged from subtle through to obvious. Two of the 53 actually showed worsening of their overall posture, but the remaining 51 showed improvement of one kind or another. Admittedly, this was as assessed by an orthodontist (myself) but with a background of many years of working with physical therapists. The other 47

Figure 9a, b - Patient L.R. aged 8 years. Following removal of the tongue depressor, the patient reverted back to her previous posture. No instructions regarding posture were given but patient was asked to let her teeth be slightly apart. Time was allowed to ensure patient was relaxed before any records were made.

Figure 10a, b - Patient M.T. aged 11 years. Patient also returned to previous posture after removal of tongue depressor.

Figure 11a, b - Patient K.L. aged 10 years. Patient returned to previous posture after tongue depressor was removed.

Figure 12a, b - Patient T.T. Marked improvement in head posture 2 days after placement of flat plane, full coverage, mandibular splint adjusted with Applied Kinesiology testing to ensure maximum benefit.

patients of the sample did not show any detectable change of posture with the tongue depressor in place. An ability to read body language is not confined to clinicians such as physical therapists or chiropractors. With careful observation and practice, many postural characteristics can be noted in the dental office. Several authorities[10, 12] have useful descriptions of what constitutes good posture, especially Rolf.[19] All the patients in the sample were considered to be healthy, although it became quite obvious that there are many children whose posture is far from ideal. In fact, a child with good natural posture was the exception. It must be recognized that all the subjects in the sample attended for possible orthodontic treatment. This introduces a bias into the sample. Investigation of a similar sample of children not requiring orthodontic treatment would be of value.

A working hypothesis, based on these clinical observations, is that contact of the mandibular teeth against the maxillary teeth can be a significant factor in causing unfavorable postural adaptation. This is hardly a new observation. Fonder[7] vividly demonstrated this more than thirty years ago. However, almost all of his patients were adults with TMJ problems. The beauty of using a sample of children is that the diagnostic process has not yet become so complicated, although TMJ dysfunction does occur, even in this age group.[20,21]

As physical therapists have long recognized, the constant struggle against gravity uses much of our daily energy. The more efficiently we can resist the force of gravity, the better for the individual. This means that children who show an improvement in posture, when the teeth are prevented from contacting, will probably benefit from an appropriate correction being built in to any orthodontic treatment plan. A standing examination and articulator-mounted study models are therefore essential in analyzing the pre-treatment occlusion. In the case of most of the children in the sample, their parents were not aware that the postural distortions might have clinical significance. How we deal with this in orthodontics will obviously vary from one patient to another. If the variation from ideal is minor and appears to respond favorably to a reversible dental intervention, it may only be necessary to note the pre-treatment condition and then to plan to include a similar corrective effect during treatment. Where the postural distortion is more evident, referral for a second opinion may be indicated; preferably to an osteopath or physical therapist who has an appreciation of the dental implications and who can work in conjunction with the dentist or orthodontist.

Ida Rolf's work[19] has been of special interest. She was originally a biochemist, working on the structure of collagen. Eventually, she developed a system of physical therapy (Structural Integration) known popularly as Rolfing. This was based on the idea that the key tissue controlling posture of the body is the fascial network extending throughout the body – she called it a functional matrix – and that manual correction of distortions in this tissue allows the free flow of energy through the fascia. Rolfing also brings about remarkable long-lasting improvements in posture. It is a demanding technique, for both the therapist and the patient, which is why it is not used more widely. However, its principal concept fits very well with the overall hypothesis being developed in this series of articles, namely that the free flow of energy through the body is central to health and that the mouth plays a vital part in this process. The mouth may act as a *means of increasing overall efficiency* as was discussed in the article[2] on maximum muscular effort or it may be a *cause of loss of efficiency* as seems to be the case in the young patients shown here.

As a general observation, with maturation into adulthood, the engrams causing distortions of posture become more established and there is less likelihood of the spontaneous improvement seen in children. However, Patient T.T. (Fig. 12a,b) belies this comment. He presented with a history of bruxing and suboccipital headaches. Placement of a mandibular, flat plane, full coverage splint, correctly adjusted by A.K. testing, brought about an obvious change of posture in two days as well as relieving his headaches. While we do not usually see such rapid improvement in adults the patients P.R. (Fig. 1a,b) and L.W. (Fig. 4a,b), show that posture can improve as the underlying dental problems are resolved in a physiologically balanced way. Adults tend to need more time for the self-correcting mechanisms to be effective, although in Stack's videos of patients with severe disturbance of equilibrium,[14] their recovery was almost immediate after insertion of the MORA.

As regards the children in the sample who did not show any change with the tongue depressor, but who did have significant postural distortion, Walker,[22] a chiropractor, has made a useful differentiation into ascending and descending problems. According to this thinking, the changes following placement of the tongue depressor between the teeth suggest that this is a *descending* problem. When no change occurs with the tongue depressor, the problem is probably an *ascending* one, e.g. from a foot distortion, a leg length discrepancy, a pelvic tilt, etc. This emphasizes the need for the dentist or orthodontist to work with a clinician from an allied health discipline such as osteopathy, physical therapy or chiropractic, to establish the most likely factor or combination of factors contributing to postural distortions.

In the process of obtaining the case histories of many elderly patients, one of their chief concerns has been their increased risk of falling due to a lessening of their ability to balance. This is generally accepted as an almost inevitable result of the aging process. Many individuals in this age group also have significant deterioration in oral function, e.g. loss of vertical dimension due to faulty dentures, a major displacement in the mandibular position or simply general wear of the teeth. The possibility that they would gain some recovery of equilibrium from dental intervention has been suggested,[7] but a major investigation of a geriatric population, including a control group, has not been done, as far as I am aware. This would seem an obvious field for research. The use of A.K. testing provides a very useful means of identifying who would benefit and how much dental intervention is likely to be needed in each case.

One intriguing piece of evidence can be added to the arguments put forward in this article. In a recent book on the plasticity of the brain, Doidge[23] reports on the work of Bach-y-Rita.[24] This was in the treatment of patients suffering from a severe loss of equilibrium following destruction of the cilia of the semi-circular canals as a side-effect from the antibiotic gentamiacin.

This is a devastating condition. Sufferers can become suicidal due to their inability to function with any degree of normality. Bach-y-Rita devised a helmet with two spirit levels in it, one recording anteroposterior movement and one recording the lateral movement of the head. This was worn by the patient. The information from the spirit levels was transmitted to a computer and then referred to a strip of material about the size of a wide strip of chewing gum. This had numerous small electrodes on one side and was laid on the tongue so that the electrodes contacted the tongue. Movement of the head was then felt by the patient as a tingling sensation on the appropriate part of the tongue. The patient very quickly was able to recover a full sense of equilibrium while wearing the device. This was impressive in itself. However, the fascinating aspect is that when the appliance was removed there was a run-on effect. This was brief at first, but by the end of a year the patient no longer needed the appliance at all and was functioning with full recovery of equilibrium, enabling her to undertake such activities as cycling or dancing. Her recovery was not due to re-growth of the cilia of the semi-circular canals which remained destroyed. This experiment has since been repeated on more than 50 patients.

Doidge's book is strongly recommended as a general source of information on the brain's plasticity. The tongue was chosen by Bach-y-Rita as the area of contact because of the lack of an ectodermal layer of dead cells, but also because of the massive nerve supply to and from the brain. He described it as "the ideal machine-brain interface." In effect, the outcome of the experiment was that the patient was taught, via the tongue, how to recover a sense of balance. The brain develops compensatory mechanisms, with the tongue acting as the means of identifying what is needed for equilibrium. It has been argued in a previous article[1] that the tongue plays a role in the maintenance of cranial rhythm. It has also been demonstrated that it plays an important part in the achievement of muscular effort.[2] To these functions we must add the tongue's possible role in the maintenance of equilibrium. Until now, it has generally been assumed that it was the position of the mandible which was important in relation to recovery of equilibrium. Bach-y-Rita's findings suggest that the tongue may be a crucial factor.

The first step in understanding dental involvement in this field is to stop thinking of loss of balance and postural change only in the context of temporomandibular joint dysfunction. There are too many variables involved in such a scenario, making it very difficult to establish clear cause and effect, which is why the findings in children are so interesting. One approach would be for several clinicians to examine a good-sized sample of children for postural distortion then re-examine the sample, using simple intervention with a tongue depressor, as described earlier. Careful evaluation of these patients, first in a relaxed standing posture from a full face, profile, and rear view and then with the tongue depressor in place could be done as an extension of a conventional orthodontic assessment. Such an investigation would be non-invasive and inexpensive. It would need initial training in reading body language for the clinicians taking part but it does not require any apparatus, other than a camera to record the findings. It would confirm, or negate, in a child population, the claim put forward in this article that in children there can be a change to a more favorable posture in response to minimal separation of the teeth. If indeed this is so, it has consequences for other health disciplines such as physical therapy or osteopathy, as well as for orthodontics. The influence of the mouth on posture has to be recognized in the planning of their treatment procedures as well as being of concern to dentists and orthodontists.

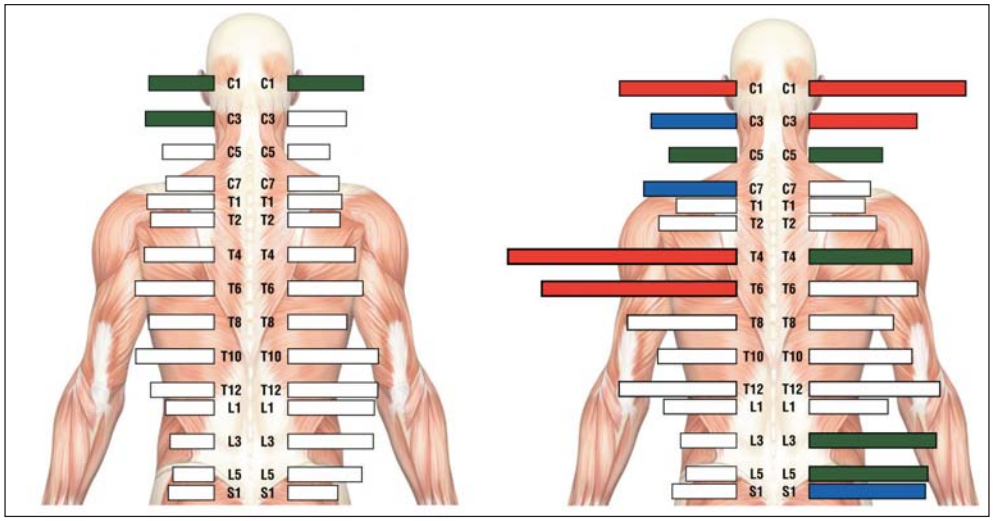

Figure 13a, b - Electromyelographic (EMG) readout of level of muscle activity along spine of patient. After removal of appliances there is a dramatic increase in the level of muscle reaction, shown by the increased color distribution. Patient has return of severe loss of equilibrium as well as recurrence of other symptoms (EMG diagrams courtesy of Drs. J. Ormsby and T.A. Stein).

One objective and non-invasive method of evaluating changes in muscular activity (which controls posture) is Surface Electromyography (sEMG). By placing electrodes on the skin above the paraspinal musculature, a reading of the muscle's frequency and amplitude of resting activity can be obtained. In the clinical setting, these readings are used to asses motor nerve function along the spine. With before and after measurements, clear evidence of the changes made to postural muscle activity by the inter-oral devices can be demonstrated. The subject of the examination shown in Figures 13a and 13b, has a history of severe equilibrium problems after a traumatic head and neck injury. The sEMG reading in Fig. 13a was taken with his splint and ALF appliance in his mouth. The reading in Fig. 13b was taken 60 seconds after the appliances were removed. The white bars are considered normal muscle activity levels in the resting state, with the green, blue, and red colors indicating mild, moderate, and severe increases in neuromuscular activity levels. During the course of this study, both the practitioner and the patient noted a severe and immediate return of symptomology upon the removal of the ALF and splint, most notably his loss of equilibrium and aphasia. Surface EMG seems to offer an excellent objective method of assessing neuromuscular changes effected by the ALF devices, rather than relying on visualization of posture or palpation of muscular activity alone.

If there is an opportunity to work with an osteopath or a therapist with cranial skills, this can contribute very helpful information as to what is happening elsewhere in the body, especially the cranium, when adjustments are being made to dental appliances. This is a learning experience for both clinicians. A.K. testing correlates well with the osteopathic findings as to when a dental adjustment is favorable to the body or unfavorable. However, this combined approach does not lend itself easily to studying a large sample. EMG has the advantage of introducing a significant degree of objectivity thereby reducing the possibility of disagreement when two clinicians, using different criteria, are involved. As was mentioned previously,[2] a SQUID (Superconducting Quantum Interference Device) would also be an effective investigative tool, given its ability to read weak electromagnetic fields in and around the body.

It has not been feasible in this article, for reasons of space, to discuss the question of bruxing, although it has significant diagnostic value in assessing equilibrium problems and in relation to postural adaptations. Bruxing will be examined in depth in the next article.

Conclusions

A loss of balance and/or postural adaptation is not considered to be of direct concern to dentists or orthodontists. However, the work of Fonder,[7] Gelb,[9] and Stack,[15] among others, has demonstrated that they can be found in association with temporomandibular dysfunction. They can be influenced favorably with suitable dental intervention, as the adult cases in this article demonstrate.

The sample of young pre-orthodontic patients, examined for postural factors, suggests that, for some individuals in this population, simply preventing the teeth from occluding brings about postural improvement. The implications of this for orthodontics are considerable. At the very least, it requires a standing postural examination of every patient, whether for orthodontic or TMJ evaluation. You cannot diagnose or treat what you don't know or see. Examination of an orthodontic patient while he or she is sitting in a dental chair is no longer sufficient if we have the patient's total health as our concern. There is a wealth of information available if we are prepared to recognize it, understand its implications and incorporate this knowledge into our diagnosis and treatment. Given these possibilities, orthodontics can become a major contributor in achieving optimal health for our patients

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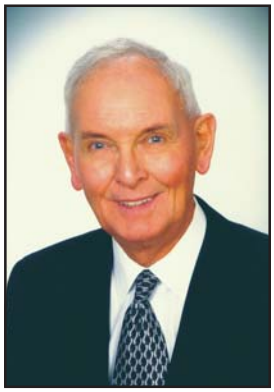

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