Case Report: Facial Pain/Dental Connection

JM suffered with facial pain for twenty-two years despite extensive medical, dental, chiropractic evaluations and even surgical intervention. JM's saga began in her twenties, when she had seventeen crowns fabricated to restore her posterior teeth. The dentist who performed the restorations was competent from a mechanical perspective, that is, the anatomical crown forms, porcelain shade and marginal fit all fell within the standard of care as defined by the dental schools. Unfortunately the dental schools, both in the past and present, have not discovered the functional link between the teeth and the craniosacral system. There is a delicate balance between the meshing of the teeth and stability of the twenty-eight skull bones. Not only do the tooth rebalance the cranium but also maintains balance of the muscles, ligaments, cervical vertebrae and pelvis. The functional link that ties the entire system is a membrane system, the dural tube, which surrounds the brain, passes out the base of the skull, attaches to the upper three cervical vertebrae and continues down to the second sacral tubercle. This reciprocal system functions like a slinky and any distortion from above can effect changes below and vise versa.

Reconstructing a patient's teeth involves a high skill level. Not only must the dentist possess the abilities to prepare the teeth properly, make good temporary crowns, take accurate bite registrations and impressions but equally important is his ability to adjust the biting surfaces of the crowns to balance the skull bones when the teeth come together. This latter task is not taught in the dental schools and is only learned in post-graduate courses. The integrated concept is not taught as a unified package. Osteopaths and chiropractors that specialize in cranial concepts teach the basics of the cranial mechanism. Most dentists are unaware of the existence of this knowledge base. Only through studying both functional dental orthopedics as it relates to the cranium and the cranial mechanism as it relates to dental structures can one begin to recognize how closely knit these two specialties really are. Unfortunately there are very few dental practitioners who have mastered integrating these two fields and capable of providing this type of service.

JM had undergone sinus surgery in an attempt to resolve the facial pain. The ENT specialist made a diagnosis of sinusitis and believed it to be the underlying cause of the patient's problem. Reality soon set in when the post-surgery did not produce the anticipated results. The cause of the chronic facial pain was the inaccurate contact made by the posterior crowns. Improper contact resulted in jamming sutures between skull bones as well as tension placed on the dural membranes within the skull. Treatment involved manually manipulating the skull and judiciously adjusting the bite. The process took four months to complete. The facial pain of twenty-two years resolved.

An ideal occlusion or balanced bite provides even pressure to the skull bones and balances the muscles and ligaments. The upper teeth are set in the maxillae, which represents the anterior two-thirds of the cranial base. If the upper component is distorted (crooked teeth, one side higher than the other) then the forces generated by the teeth will distort the skull. In addition, bite interferences often trigger off muscle spasm, which in turn can jam sutures and distort cranial bone alignment. One of the principal functions of a balanced bite is to serve as a self-correcting mechanism for rebalancing the skull. This rebalancing occurs every time one swallows which is two to three times per minute.

An integrated approach involving osteopathic, chiropractic and dental concepts is absolutely essential for properly restoring the bite and treatment for correcting structural deformities which are one source for chronic pain and dysfunction. The healing professions must recognize the existence of these functional relationships if they are to evolve to the next level of healing.
Figure 1. The posterior crowns had biting interferences, which caused jamming of cranial sutures, and placed strain patterns within the patient's skull.

"...tugging on the venous sinuses, damaging the tentorium or stretching the dura at the base of the brain can all cause intense pain that is recognized as headache." "...almost any type of stretching stimulus to the blood vessels of the dura can cause headache."

"...pain impulses from beneath the tentorium enter the CnS mainly through the second cervical nerve, which also supplies the scalp behind the ear. Therefore, subtentorial pain stimuli cause occipital headache referred to the posterior part of the head."


Figure 2. Pterygoid Sling is comprised of the external and internal pterygoids. These four muscles are kept in balanced by occlusal harmony (even horizontal and sagittal planes plus adequate vertical height)

Figure 3. Reciprocal Tension Membranes

Figure 4. Jamed Cranial Sutures cause pain

There are twenty-two cranial bones (excluding the six ear ossicles) which function as a synchronized unit. A distortion to one affects the entire unit. the cranial dura is part of the dural tube which extends through the foramen magnum, attaches to the upper three cervical vertebrae and continues down to the second sacral tubercle where it attaches. Subluxations or fixations anywhere along its path will affect cranial motion. In addition, there are 136 muscles in the head and neck area. Muscle tension or spasm will influence cranial motion. Dental malocclusions in the form of hyper occlusion, deep overbite, crossbite (anterior or posterior), a narrow maxillary arch, faulty crowns or high cant of the maxillae will all have influences on cranial motion.
Neurological Dentistry
By Justin Jones, DDS (Basal Facts, Vol. 9, pp1151-53)

One of the main reasons for much of the existing confusion (aside from ego and economics) regarding "TMJ" or craniofacial disorders is a deficient basic concept of the mouth and dentition. The dental profession generally still conceives and treats the dentition as consisting of mechanical parts in a mechanical frame, the pieces of which can be studied, treated and replaced without regard to the rest of the body. This is not so, as study of the embryologic development of the oral environs will reveal. Embryology demonstrates that the body is essentially one ... i.e., its many parts function in harmony with each other under management of a central control. For convenience and study, the oneness of the body is divided into several systems, which may cause the overlooking of interrelationships and interreactions of the various parts. E.g., the stomatognathic area is seldom considered a vital or dominant part of the neuromusculoskeletal system; however, it is precisely that and more. The neurological aspect of this area is the focus of our immediate attention.

In the third and fourth week after fertilization of the ovum, there is a most instructive stage of development. An area of ectoderm begins to thicken, then to invaginate, forming the neural tube. From this tube develops the central nervous system, which is the central control or management for the entire body. As the ectodermal neuroplate invaginates to form the neural tube, some cells form the neural crest. (See diagram). Note the position of the neural crest cells-between the ectoderm and the management system, where they form the communicating link between outside environs and the inner control system. The derivatives of these cells receive and transmit information; they behave similarly to sophisticated sensors recently developed in the field of electronics.

By referring to standard embryologic works, the eventual derivatives of neural crest tissue may be noted. Among these are sensory cells of the dorsal spinal ganglia, sensory cells of the cranial nerves, postganglionic cells of sympathetic and parasympathetic ganglia, adrenal medulla cells, pia mater cells, arachnoid cells, satellite and Schwann cells, muscles spindle and Golgi tendon receptors, etc. In short, all the somatic and visceral sensory cells of the peripheral nervous system are derived from neural crest cells. Without these, proper information cannot be received by the central nervous system, an implication of significance.

It is generally overlooked that the tissues under the care of the dentist are derived from neural crest cells, except tooth enamel. What is true for other neural crest derivatives functionally is also true for these derivatives in the mouth. Dentists are therefore neurologists in a most important sense; dental treatment is neurological treatment; oral/dental surgery is neurosurgery; orthodontia is neurological in nature; orthognathic and joint surgery and a host of other treatments are neurological or neurosurgical in nature. In treating patients, the attending dentist should ask what is neurologically deficient or wrong in the area under consideration, and what neurological effect would the proposed treatment have on the entire patient.

Two prime functions of neural crest derivatives are proprioception and kinesthesia. These enable the body to relate its position in the external environment and also one part to relate itself properly in space to another part. In other words, they enable an individual to tell where he is in space and also to coordinate body parts in time and space, mostly at a subconscious level. Since neural crest derivatives gather information
which is relayed to the central nervous system and other body parts, conditions and/or treatment which tend to improve or to interfere with the gathering of information is of primary importance. An absence of proper inbound information interferes or causes failure of outbound directions from central control. If inbound information is improper but present, control either does not act or acts in a faulty manner. This is also true of neural crest derivatives in the oral zone. Proprioceptive activity of the periodontal ligaments and the temporomandibular joints is well known, but dentistry tends to ignore faulty proprioceptive information generated by faulty occlusion, jaw malalignment, TM disfunction, etc., in treatment. A prime example is the removal of bicuspid for orthodontic reasons, leading to compression of the arches with resulting constant subtle defecte signaling. Other examples of inhibition of maxillary bone movements by certain rigid appliances or devices, distal displacement of the premaxilla, loss of vertical support between the upper and lower jaws, compression of tongue and airway, functional posterior displacement of the mandible, and improper axial inclination of teeth which in turn produces improper occlusal loading. All should be of concern neurologically.

Under development of jaws and dentition is epidemic in America. Common also is disharmony between arch size, tooth size, upper and lower jaws, and jaws to cranium. Class 2, Division 2 cases are usually recognized as severe dental and orthodontic problems, but the even more severe neurological effects are usually unrecognized.

The premaxilla and four incisor teeth seem to have additional important neurological function, suggestive of forebrain origin. compression in this area, displacement of teeth and bone or underdevelopment in many instances interferes severely with neurological function for reasons not clear at present. Acupuncture meridian GV (GV 26, 27 and 28) ends this area. The forebrain gives rise to the thalamus, hypothalamus, the pituitary gland and the cerebral hemispheres, in addition to the premaxilla and midline nose and upper lip. This suggests the possibility of other communication paths unknown to us presently.

Improper arch form, occlusion, and jaw-to-jaw relationship affects also the proper movement of cranial bones, which in turn affects cerebrospinal fluid movement, intercranial blood flow, causing subtle pressures on nerves and other tissues. Muscles, the adaptive components of the body-from an alignment perspective, then become unbalanced, further compounding neurological and vascular problems.

TMJ disc dysfunction in a majority of cases is the result, not the cause, of faulty neurological signalling. The most common dysponetic signalling to the TM joint is from improper posterior occlusal support between the jaws. Many joints undergo severe negative remodeling in an adaptive attempt; there may be also mal- or underdevelopment. Unfortunately, many joints have been surgerized without recognizing the underlying condition which initially led to the joint dysfunction. These patients often relapse after surgerizing the result rather than treating the cause.

The stomatognathic mechanism too often has been studied as an independent entity; it is a portion of the musculoskeletal system affecting and affected by other parts. Therefore, proprioception is extremely important. The cerebellum needs proper information via the fifth cranial nerve to proceed with body postural changes; faulty information must affect other portions of the musculoskeletal system negatively. This system is so exquisitely balanced that small changes in occlusive proprioception can easily
reflect into the neck, low back, knees, and vice versa. The entire system is subject to Newton's Third Law of Motion: a given action requires an equal and opposite reaction elsewhere in the system.

Since the advent of the lounge-type dental chair and manipulated forced closure of the patient's jaw, it has been impossible to have a musculoskeletal balanced homeostatic relationship jaw-to-jaw due to abuse of body posture and basic neurophysiologic principles. When occlusion is evaluated, occlusal neurological output should be checked as it affects the musculoskeletal system. This cannot be done in a supine position or by operator manipulation. The patient must be erectly seated or in erect sanding posture, with other parts of the musculoskeletal system in an ideal relationship as possible. Proprioceptive signals generated by the occlusion should reinforce ideal posture. If, however, the occlusion is in harmony with an abnormal postural relationship, that neurologically defective occlusion becomes a dominant factor throughout the musculoskeletal system. In time, sooner or later, ill affects and accumulated damage may occur in other areas and systems as well.

"Software" should produce major advances in dentistry as well as medicine.

**Suggested For Reading and Study**

**Embryology Texts**
Corliss, C.E., PhD., Patten's Human Embryology, 1976, McGraw-Hill Book Co., Chaps V (pp. 48-60), XII, XIII, XV.


**Neurophysiology Texts**


**Summary**
The dentition, mouth and jaws conceived as highly active neurological tissue is a more adequate philosophical basis of dental diagnosis and treatment than present concepts. Study of the origin, derivatives and functions of all neural crest tissue can contribute immensely to better understanding and treatment of many oral conditions as well as problems in other body areas, especially the neuromusculoskeletal system. Similar origins suggest similar functions. Expansion of this concept, plus further investigation of body communication modalities and

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**Embriologically all the structures of the teeth with the exception of the enamel, and the autonomic nervous system both develop from neural crest cells. This provides the neurologic connection between traumatic occlusion, pulpitis, dental foci, abscesses, fractured teeth, dental material toxicity, bacterial, viral and or fungal infections of teeth and symptomatology far removed from the orginal site.**