

Biomechanics of the Sphenobasilar Cranial Fault

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Narrative: Simple mechanical correction of the sphenobasilar fault takes little into consideration of the causative factors that can create and maintain this fault. Here I describe multiple causes that can be the basis of creating this clinical entity.

Consideration should be taken to uncover the underlying cause of the faults.

Indexing terms: Chiropractic; Applied Kinesiology; Sphenobasilar Cranial Fault.

Introduction

For years in the teaching of applied kinesiology, cranial faults have been discussed with little regard to who how they occurred. Unfortunately, many of these problems keep coming back repeatedly, and applying gentle pressure to the skull in their correction is a short-sighted view of eliminating these problems in the patient. This paper will break down the creation of these faults into those factors that affect the sphenoid and occipital bone.

Discussion

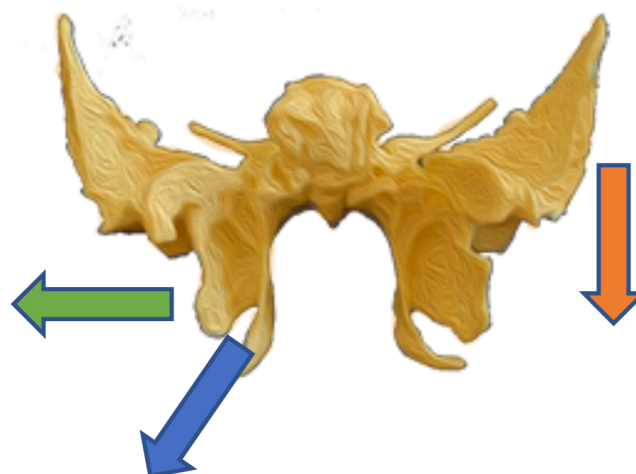
Muscle contraction or lack of is one of the usual causes of imbalances in the *sphenoid*. The muscles that attach here are, of course, related to chewing, swallowing, and talking. The *temporalis muscle* attaches to the *greater wing of the sphenoid*, and the *pterygoid muscles* are on the *pterygoid plate* and inferior on the *body of the sphenoid*.

Contraction, for example, of the temporalis muscle, will cause an inferior shifting and pressure on the *greater wing of the sphenoid*. This obviously will cause torque forces in the skull. The first bone being affected is the frontal bone.

...When considering the temporalis muscle, think of the triad of health and the three factors that can cause problems. Mental or emotional stress can also cause over-contraction of this muscle, which does not have to be bilateral ...'



Fig 1: Temporalis red arrow vector, Lateral pterygoid green arrow, Medial pterygoid blue vector



The *frontal bone* rests on the *sphenoid*, and any imbalance in the *sphenoid* adversely affects the *frontal bone*. One of the clinical signs of tipping of the *sphenoid* is changes in the eyeball, with one retracted and one protruded. Testing a patient's vision often will show a difference in their visual acuity when testing the two eyes.

Fig 2: Inferior sphenoid temporalis contraction

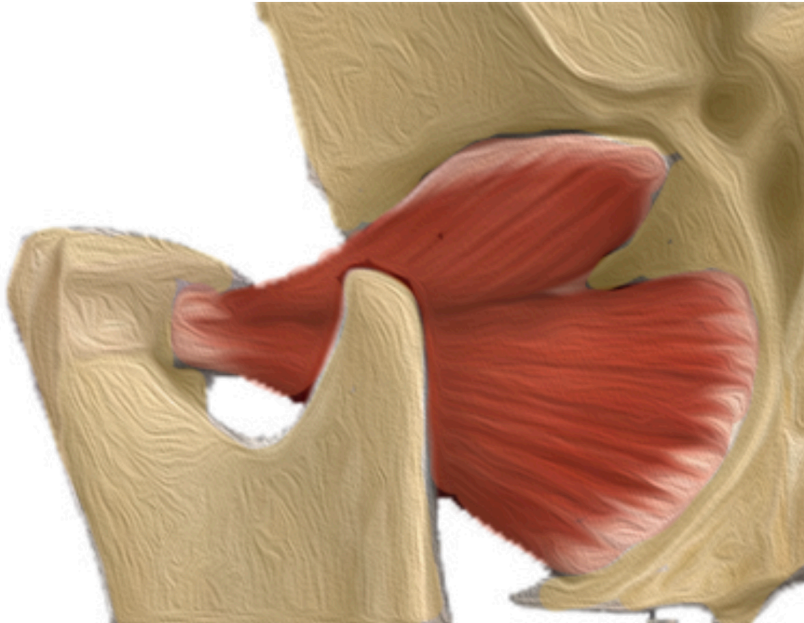


On examination of the *temporalis muscle*, it is often found to be overly contracted. Palpation of it will find it to be incredibly tender and sore, especially the anterior fibres. This contraction not only pulls on the *greater wing of the sphenoid* but can also upset the regular minute motion of the temporal and parietal bones.

Fig 3: Chewing using temporalis and masseter on left and right medial pterygoid



Fig 4: Pterygoid pocket



The question becomes, what are the most common causes of over-contraction of this muscle? The first and most obvious is someone who chews solely on one side of their mouth. Examining the patient's mouth, if there are missing teeth, especially molars, indicates that the patient will most likely chew almost all on the other side of their mouth. As they masticate their food, they contract the *temporalis muscle* on one side and the *internal pterygoid* on the opposite side, thus resulting in abnormal pressure on the *sphenoid*.

For years it has been apparent that when people eat, drink, or smell an obnoxious substance to them, they will end up with increased contraction of the *temporalis muscle*. Usually, this is not bilateral but unilateral. One of the first patients in my office that I found this on was getting migraine headaches at night caused by his wife's *Paul Mitchell's* hair shampoo. Recently, I had a mother and a daughter both getting migraine headaches from a TMJ problem from their hair shampoo.

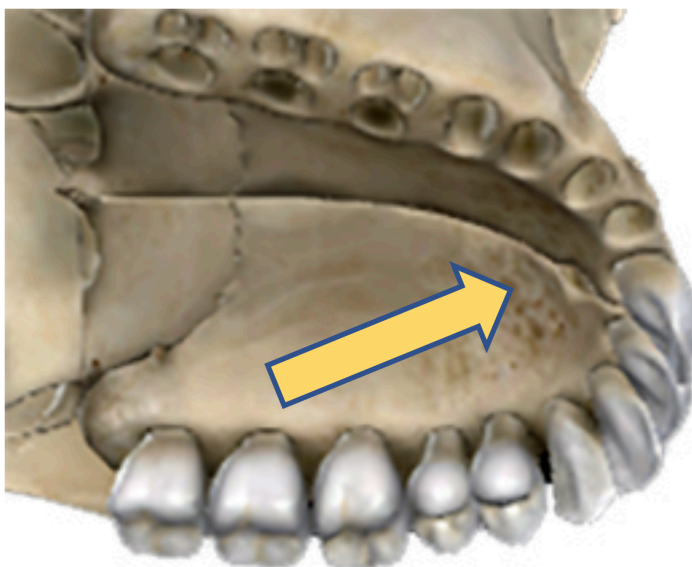
Once you have isolated and found the over-contraction and tenderness in the *temporalis*, you will need to have the patient become the detective to find out what actions they have that cause this to reoccur. I ask the patient to palpate the muscle and check the motion of the condyles when opening their mouth after every meal and throughout the day.

Tenderness in the *pterygoid pocket* is often caused by stress from structural imbalances below the head. This can be from a dropped arch on the side of involvement, a problem with the opposite *innominate*, or an *atlas* imbalance on the side of the tenderness. The patient is asked to invert the foot reducing excessive pronation and the *pterygoid muscles* are palpated for reduction in tenderness. This is repeated with the patient pulling the opposite thigh towards the abdomen. Finally, anterior pressure is applied to the *atlas*. Reduction in any of these cases indicates the need for structural correction.

In these cases, the cranial fault returns after the patient is standing, walking, or sitting, and in their sleep position. Another common problem is improper swallowing. Small forces in the cranial bones are created by normal swallowing. If the tongue is improperly positioned or there is a weak swallowing mechanism, input into the skull from this force will fail to create normal cranial motion. The easiest thing here is to ask the patient to swallow and report where the tip of

the tongue is when they swallow. It should never be touching the teeth. In this case, treatment is directed at normalising the swallowing reflex.

Fig 5: Normal tongue position in swallowing



When considering the *temporalis muscle*, think of the triad of health and the three factors that can cause problems. Mental or emotional stress can also cause over-contraction of this muscle, which does not have to be bilateral. Often in the office, just having the patient think of a stressful situation and palpating the temporalis will result in increased ache, soreness, and tender palpable fibres.

The other bone in this cranial pattern is the *occipital bone*. Abnormal forces on the *occipital bone* can also be a causative agent in creating this cranial fault. Observing the patient for the head level as well as palpating the *suboccipital muscles* and especially the fibres of the *upper trapezius* where it attaches on the *occiput* needs to be done. The other muscle that needs to be considered here is the function of the *sternocleidomastoid*. The *upper trapezius* and *sternocleidomastoid* become inhibited and contracted in normal walking. Failure of the inhibition in gait creates abnormal stress on the *occipital bone*. Another common cause of increased contraction in the *upper trapezius* is a strain of the *acromioclavicular joint*.

In chronic problems of the *occipital bone* there are not only *sphenobasilar* faults but frequently Dr. Goodhart's original *universal cranial fault*.

In these cases, it is common to find problems with balance problems. Perform balance tests with the eyes closed and the head in different positions.

Conclusion

The correction of a cranial fault needs to include finding the underlying mechanical stresses which cause the creation of the faults and then correcting them.

One of the great problems with this is that many times, more than one cause creates this cranial fault. Patients go home looking for a cause, and once they find one, they give up.

It is not uncommon to have a patient have a structural problem like a dropped arch, a pelvic problem, a sleep position, a chewing pattern, a chemical sensitivity, and emotional stress, all of that is causing this cranial fault to reoccur.

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Reference

Applied Kinesiology Flowchart Manual, David Leaf: Privately published Plymouth Ma 2012. Cranial TMJ chapter

Illustrations

All drawings are by the author, Dr Leaf.