Do You Have a Grain Brain?

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1. WHO IS DR. PETER UNGAR AND WHY ARE OUR TEETH A BIG DEAL?

2. WHAT DID GRAINS DO TO OUR BRAIN AND SKULL?

3. WHAT IS A CHIARI MALFORMATION AND HOW MIGHT IT BE TEETH RELATED?

4.. WHAT MIGHT BE THE REAL CURE OF SIDS (sudden infant death syndrome)?

5. WHY PHYSICIANS NEED TO ASK QUESTIONS ABOUT YOUR DIET IN A HISTORY AND PHYSICAL EXAM?

I saw a very interesting case in the clinic last week, and I decided I had to write a short blog on it because I think it makes and elegant point of some of the evolutionary changes we have seen in Hunter Gather skulls and modern skulls as we have continued to eat grains. If you are not aware of the work of Dr. Peter Ungar, you should read some of his work. My fourth cite is his masterpiece book on mammalian teeth. It is quite interesting and helps tie what our diets have done to shape our skulls and our occlusions. He is an expert on the study paleolithic teeth. Since I am a past dentist, and a present neurosurgeon, his work really resonates with me. It has allowed me to think about current diseases in neurosurgery that have no known etiology using an evolutionary prism. I bet even he would not see the cross-connectivity in this clinical case I just saw in clinic last week. It was a great case for us to consider. He holds a PhD in Anthropology, and is the current chairman of the University of Arkansas department of Anthropology. There are several major things that have occurred to the human skull over the last 15,000 years that we should be mindful of when we consider some neolithic diseases that are tied to them in for today’s healthcare practitioner.

The first one, it appears as agriculture became more prominent, the skull case shrunk in the occipital area as the jaws shortened. This means the entire posterior skull base has been facing constant natural selection pressures with the advent of agriculture. The effects of these things have left modern man with changes that can cause a smaller posterior cranial fossa where our cerebellum now sits. This is a part of our brain that allows us to perform coordinated complex movements of our motor and sensory tracts. It allows you to track and catch a ball in the air as you run for example. As this part of brain has gotten smaller, we lost the ability as a species, to climb trees well and do some of the things that our ancestors were masters of. Those of us who retain these capabilities usually are athletically quite gifted.

Another thing that has happened is that our teeth had to shrink to fit our smaller jaws as our skull base shrank. This has left modern man with a neolithic disease many do not often consider a disease. That is impacted wisdom teeth! This neolithic disease used to help support me in my former life as an Oral and Maxillofacial Surgeon. Today, it helps most orthodontists making them very effective at separating you from your dollar to get your kids teeth straight. If you follow the paleolithic occlusal records of Dr. Ungar, you will find straight and worn down teeth were very normal on an ancestral diet. Crooked teeth in the human skull was a very rare finding in the fossil records. This should make you wonder why this happens, but that will be another blog down the road. It also changed the mechanics around the tempro-mandibular joint as well, that used to keep me quite busy. This is another neolithic disease we face as a species.

The most interesting consequence to present day neurosurgeons is the consequence of what a shortened occipital bone might cause clinically. So I decided that I wanted to share with you another new neolithic disease that I see today as a neurosurgeon. That is called I call GRAIN BRAIN. That disease

is called Chiari malformation by medicine today. You can see a picture of the MRI of a person with Chiari on the link provided.

This is a situation where the posterior cranial fossa is too small to accommodate the size of our cerebellum. It can cause headaches, fatigue, muscle weakness in the head and face, difficulty swallowing, dizziness, nausea, impaired coordination, and, in severe cases, paralysis. The most common feature, however, is the presence of a headache that has some special features. Headaches aggravated by Valsalva maneuvers, such as yawning, laughing, crying, coughing, sneezing or straining, makes a physician think that maybe there is a congenital skull base abnormality present.

What happens as the person grows into adult hood is that the cerebellum actually tries to push itself out of the skull and into the foramen magnum, which is the hole in the skull base where the spinal cord exits the skull. Part of the cerebellum, called the cerebellar tonsils, push down and try to exit with the spinal cord. This begins to put pressure on the spinal cord, and can cause some significant symptoms that bring the patient to see a physician. Most people do not realize that this condition is tied to a smaller and flatter occipital bone. There does not seem to be much evidence that this condition occurred much before the dawn of agriculture in the paleolithic fossil record. So this is another neolithic disease that rarely gets a lot of press.

I decided to post this blog because of a case I saw last week had a very unusual presentation. Generally most neurosurgeons believe this is a congenital defect that a child inherits from their parents. I do not. I believe this is a nutritional disease that humans get from the transgenerational epigenetic signals from our maternal blood lines. It means that grandmother and mother likely ate some things during their respective pregnancies that foreshortened the occipital bone of my patient who came to see me in clinic with this problem.

The cerebellum grows very late in human gestation. So the epigenetics of a foreshortened occitipal bone predisposes modern humans to this malformation. Since the bone growth is stalled due to dietary factors and the underlying brain grows until late in gestation. This is not well appreciated by my own specialty, even today. Recent pediatric data suggests that the growth of the immature fetal cerebellum is particularly rapid during late gestation in the third trimester. However, this accelerated growth seems to be impeded by a premature birth and associated brain injury. Prematurity is also associated with vegan and vegetarian diets. Future mothers need to be made aware of this to prevent future Chiari's in offspring. The long-term neurodevelopmental disabilities seen in survivors of premature birth may be attributable in part to impaired cerebellar development. The reason I want to touch on this case is because we do not have a true etiology for Sudden Infant Death Syndrome. I have often thought that this might be the real cause. If the child is born with a large cerebellum and small brain space, it can increase intracranial pressures transiently in children while they sleep. If they retain enough CO2, this cause an increase of cerebellar blood flow and the child can immediately stop breathing and die. I think if you're a vegan, vegetarian, and female of child bearing age you better think to ask your pediatrician this. I doubt any of them know about this proposed mechanism but it makes too much evolutionary medical sense not to consider it. Moreover, since modern medicine has no good reasons for SIDS it is something that should be studied in my view. My patient last week got me motivated to write about it for you all to consider. We might save a few lives?

The interesting part of my patient's story was that she had not had these headaches since she was a child and her sutures on her skull had fused. For the occipital bone the key sutures close and ossify by age 6. In the occipital bone at birth, there are three primary sutures that can be identified. At the age of 0-3 years, occipital and innominate sutures started to

fuse. These two then ossify completely by 4 years of age. The last occipital suture is the mendosal suture and it persists until 6 years of age, and this is when most brain growth is also complete in this area, after which no primary sutures can be seen in the human skull. So technically, if this was going to be a problem for her, we might have expected her to have headaches from the age of 6 years and onward. This however was not what she reported. Her headaches were at age 29, about a year ago. That bit of history was perplexing to me, so I knew I had to dig a bit deeper.

I asked her what happened to her a year ago that coincided with the headaches. I thought maybe a trauma, a pregnancy, or a medication might have exacerbated the situation to start her symptoms. I got no real answers from her initial history to help me. Then for shits and giggles I asked her about her diet. She told me she recently changed her diet due a church recommendation and had started a fasting diet with use of juices. She reminded me that this just occurred just in the last month, so it likely had nothing to do with her headaches. She then told me a year ago she moved from a standard American diet to a 100{a7b724a0454d92c70890dedf5ec22a026af4df067c7b55aa6009b4d34d5da3c6} vegan diet and I just smiled widely, because I knew I just hit oil!

I told her to stop the history and I had a handle on what had happened to her a year ago. When she began to eat a 100{a7b724a0454d92c70890dedf5ec22a026af4df067c7b55aa6009b4d34d5da3c6} vegan diet she increaseh her inflammatory cytokines in her blood, and this registered by bombarding her posterior fossa circumventicular organs in her “already tight” posterior fossa. That organ is called the area postrema, and is covered extensively by afferent neurologic input from the vagus nerve. This nerve makes up part of the fifth levee in my Quilt called the brain gut axis. It is a portal that will allow a leaky gut to completely bombard our cerebellum with inflammation. I had

no labs sent with her. Just a CT scan, my history, and physical exam. That inflammation likely caused her cerebellum to swell at age 29, when she became a vegan. Then her headaches began. I told her that I did not think she needed surgery at all. She instead, needed to test my hypothesis, with an immediate fuel change to a paleolithic diet for 30-45 days to see if her symptoms went away without any surgery. She was shocked and clearly thinking I was nuts based upon the look on her face. This is how I look at medical problems using a Paleo Prism now. You name the disease and I have a new unique way of hacking it and testing it now. I told her that she should go get another opinion but she should be aware that neurosurgeons make money by cutting, not watching. I was strongly advocating a conservative plan of changing her diet and monitoring her symptoms to see what happened. It made the most sense, because she had none of the more serious findings we see in Chiari patients.

Her husband really seemed to be very interested because it made too much sense…so we will see how the story ends I guess in the next few months.

CITES:

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3.occipital.pdf

4.http://www.amazon.com/Mammal-Teeth-Origin-Evolution-Diversity/dp/0801896681