



Listening to the Brain/Recovering the Brain: A Case Study

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Abstract

This article presents the case history of a young woman suffering from an unrecognized concussion and post-concussion syndrome (traumatic brain injury) following a car accident. Despite being in the ER immediately following the accident and seeing her own PCP (primary care physician) several weeks later, there was no recognition that she had sustained a traumatic brain injury that accounted for her severe symptomatology. Of the 4 baskets of symptoms following a concussion (physical symptoms, cognitive decline, social and emotional issues, and sleep disturbances) Ms. M suffered the most from Cognitive Decline. ("Listening to the Brain"). The article explores what is driving her symptoms, and why, through the lens of a unique model of the neurodegenerative progression of a TBI, developed by the author. This article looks specifically at Architecture One as it related to her symptoms and establishing treatment.

The 4 Architectures addressed in the model are:

Architecture One: Shock Trauma/Traumatic Shock.

Architecture Two: Electrical and Chemical Disruptions in the Brain.

Architecture Three: Disruptions to Homeostasis and the Problem of Allostatic Load.

Architecture Four: Problems with the Perfect Storm in the Brain.

The article concludes with guidelines for establishing a treatment protocol for these kinds of injuries ("Recovering the Brain").

Keywords: Traumatic brain injury, Chemical disruptions, Recovering the brain

Introduction

Several months ago (2023) a young, female patient was referred to me following what appeared to be a not-so-serious car accident. She had broadsided a car which turned in front of her,

while she had the right-of-way going through a green light. While she did hit the brakes, the impact of hitting the other car knocked her car backward, even though she was traveling 40 miles per hour when she entered the intersection. I believe it is important to note

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that the airbag in her relatively new SUV did NOT inflate during the collision.

In shock, by her own admission, she had the presence of mind to step out of her car and call the police, while the other driver was yelling at her for having caused the accident. In recalling what had happened she noted that her neck was in extreme pain, but otherwise she thought she was okay. After a trip to the emergency room in an ambulance, the doctors there thought the same: she was fine. A neck MRI didn't reveal anything damaging and she was sent home. But within several days she began to experience a series of bizarre symptoms that frightened her to the point where she thought she was having a stroke, a seizure, or about to die!

Approximately every hour throughout the day she would experience what felt like an electric shock/rush traveling through her head. These rushes would come in waves accompanied by headaches, tingling in her extremities, cold hands and feet, anxiety and periods of dissociation. The same electric rush would occur during the night waking her up every 2-3 hours. In addition, she began to experience additional symptoms that I understand as evidence of Cognitive Decline from TBI. Including:

- Word finding problems (she knew the word was "somewhere," but she couldn't access it).
- The need for social withdrawal and isolation (life in general was too stimulating).
- Difficulty focusing while driving to work and while at work.
- Her thinking process had slowed down considerably (her mind/brain was running like a slow computer).
- She found that her speech was often slurred.
- She had a fear of dying that would crop somewhere every day.
- Her tolerance for anything irritating was diminished considerably.
- She was experiencing frequent, daily panic attacks.

At times she felt completely numb, and at other times she knew that she was dissociating.

Music on the car radio that had previously been soothing and enjoyable was now irritating and she needed to shut off the radio.

When she couldn't find the right words to express herself, she would burst into tears and begin sobbing.

At times, she would see stars and sparkles at the edges of her vision, and she found this very distracting, especially when she was driving or at work.

Overall, she felt that she was NOT the same person she was before the accident.

I note that no one she saw in the ER right after the accident raised the issue of concussion. Instead, the ER concentrated on her neck pain. And when she went to her PCP, he diagnosed her with PTSD. Which is true in my opinion, but the result of a TBI that it appears was never considered. On a further note, the information I gathered at the World Brain Conference (Los Angeles, 2023) points to the fact that all neck injuries are also head injuries, and all head injuries are also neck injuries. I have found this to be true across the board!

Concussion and Post-Concussion Syndrome

In my experience over the past 7 years, concussions and post-concussion syndrome are very under-diagnosed. Later in this article I will present my answer as to "why not?" But for now, I will ask 2 questions: "What accounts for the range and bizarre symptoms my patient was experiencing?" And "What happens as a result of concussion/post-concussion syndrome that leads a person to experience these wide ranging and bizarre symptoms?"

A concussion occurs when there is a direct blow to the head, and/or the brain is jolted or shaken inside the skull resulting in what I believe is best described as the 4 Baskets of Symptoms including: physical symptoms, cognitive decline, social and emotional issues, and sleep disturbances. PCS (post-concussion syndrome) occurs when the symptoms of a concussion last longer than expected, usually two weeks to several months. The symptomatology of PCS includes chronic headaches, dizziness, difficulties with memory and concentration, and sleep disturbances. These definitions make the assumption that a concussion and PCS are single events that will heal with rest. My experiences tell me an entirely different story: concussion and PCS are always the beginning of a neurodegenerative disease process. These are not single events which heal on their own with time. The situation and the medical issues are far more serious.

Over the past 7 years I have been developing a model for understanding the course of a TBI through "listening to the brain." (See "The Complex Architecture of Traumatic Brain Injuries: Listening to the Brain, Cambridge Scholars Publishing, 2023). My working hypothesis is that the human mind is the subjective experience of what is occurring in the brain. This is the brain/mind connection I see, and I have learned a deal simply by listening to a patient's description of their experiences following a blow to the head, or a jolt or violent shaking. In my model, there are 4 Architectures that develop during the brain/mind's attempt to cope with a traumatic injury:

- **Architecture One:** Shock Trauma/Traumatic Shock.
- **Architecture Two:** Disruptions to the electric and chemical communication network in the brain/mind.
- **Architecture Three:** Disruptions to Homeostatic Balance in the mind, brain, body and the issue of Allostatic Load.
- **Architecture Four:** The Perfect Storm in the Brain, C-PTSD and TBI are opposing forces/influences in the brain/mind/body.

Architecture one

When Ms. M. began working with me, she was still experiencing a “shock trauma” (traumatic shock) resulting from the whiplash she sustained during the accident. Using my model, this is the first “Architecture” the brain uses to response to trauma to the head, in this case the whiplash literally bruising her brain. Under these conditions the brain responses by going into emergency response mode. Literally, the brain/mind is in survival mode attempting to save itself. I follow the idea that the patient’s symptoms tell us the story, and do not need to be medicated away. And this is what her bizarre symptoms were telling us. Her brain/mind went into a “shock mode” and continued to stay that way as she attempted to resume her normal life. But no matter all her efforts to do so, she could not.

I use the term “shock trauma” to describe Architecture One in my model. But I believe it is also useful to use the term “traumatic shock.” Both these terms describe a defense mechanism evolution has given us designed to protect us when mind/brain/body have been traumatized. This process is accompanied by a wide range of physical and emotional symptoms that includes the following: (Notice how these physical and emotional symptoms are exactly what my patient was experiencing.) (See above, pp.2-3)

- Numbness
- Confusion/Brain Fog
- Dissociation
- Dizziness
- Rapid Heart Rate
- The Chills
- Shakiness
- Lightheadedness
- Nausea/Vomiting
- Stomach Pain
- Headaches/Migraines

- Muscle Tension
- Elevated Blood Pressure
- Rapid, Shallow Breathing
- Fear-Anxiety-Panic-Denial
- Increased Irritability, Anger and Helplessness
- Social Withdrawal
- Emotional Outburst/Increased Anger and Irritability
- Inability to Concentrate
- Difficulty Making Decisions
- A Decreased Awareness of One’s Surrounding

I also note that a “traumatic shock” occurs more often when the accident takes the person by surprise and the individual is unable to process the accident. As was my patient’s situation. And since she literally received no validation from the doctors she saw, she began to doubt her own thoughts and feelings, and felt like she was going crazy! This only ended up magnifying her already difficult symptoms.

In summary, I believe the impact of hitting the car that was turning in front of her, caused the violent action of whiplash, which in turn caused the violent action of her brain literally bouncing around in her skull. I note again that since her airbag did not deploy there was nothing to cushion the whiplash she was experiencing. And by the time she began treatment with me, the elements of her traumatic shock were “cruising” through her mind/brain/body at an increasing rate. By then, she had become terrified of all these strange occurrences in her brain, mind and body.

What then can be done to help her?

The Problem

First, I believe we need to understand what is going on in her brain/mind that leads to this kind of symptomatology. Below is an example of what takes place in the consulting room, while she is sharing her terrifying experiences following the car accident.

I note that this is the first of 4 articles describing in more detail each of the 4 Architectures in my model. What follows here is a case example of Architecture One: “Shock Trauma” (also understood as “Traumatic Shock”).

P. “Dr. Reynolds, I’m not doing well at all.”

A long pause. (Brain injuries slow the mind down a lot. Causing the brain/mind to act like a slow computer.)

Dr. R. "How are you not doing well exactly?" (I often feel that I need to act as an auxiliary mind with my brain injured patients, so I work to move our discussions along.)

P. "Well, I am having a lot of panic attacks lately. They just seem to come out the blue."

Dr. R. "How long do they usually last?"

P. "Honestly, I lose track."

Another long pause while she was processing her thoughts and feelings. Again, her brain/mind is running like a slow computer.

Dr. R. (As the auxiliary mind/brain) "Do you have a guess-estimate?"

Another pause.

P. "I think they are preceded by these horrible electric shocks. They make me feel like I'm dying! It's so, so scary for me!"

P. "Then, I just get lost for a few seconds and I don't remember who I am or where I am (the brain fog setting in). Finally, I just tune back into my life and try to figure things out."

P. "This is really so terrifying for me." It's like I'm lost in my own life."

P. "I look at things sometimes, but I really don't see what I'm looking at. And my memory for finding the right word is really shot."

P. "It's like you said at our last appointment, I wake up every morning believing that something bad is about to happen to me, and I carry this feeling through my entire day."

Dr. R. "No wonder you're feeling terrified all the time. But there is an explanation for what you're going through. I hope this will help."

(How can we understand what is going on in the brain/mind of Ms. M. that has basically ruined her life?)

Dr. R. "Sadly, I don't believe that the effects of having sustained a concussion are very well understood. What I have observed is that following a TBI (concussion) a person's inner and outer worlds become very different."

P. "Like different, how?"

Dr. R. "Just like you are experiencing, there are changes/impacts on your memory, attention and focus, concentration, problem solving abilities, and reasoning skills. All understood as a part of cognitive decline, one of the 4 baskets of symptoms outlined in the assessment form I gave you. And all because the chemical and electrical processes in your brain, how the neurons communicate with each other, have been disrupted."

P. "You know, I really want to be in denial of all this. Like, this can't be happening to me."

Dr. R. "Understood! Because the accident and the resulting concussion/post-concussion syndrome has altered your sense of yourself and your sense of the world around you. And you need to work much harder to be involve in a world that was formerly very familiar to you."

P. "I didn't ask for any of this. And I'm really anger that someone else's mistake is costing me this much! My life has changed dramatically!" And not for the best!"

Dr. R. "My experience in working with TBI patients is that because of the trauma to the brain/mind a person will find themselves with a different thought process and behaviors than before the injury. There are changes to visual and auditory processing that are confusing, problematic, and very difficult to live with. Never mind the chronic fatigue that all my patients are dealing with. No wonder you feel that your life has been ruined!"

"Dr. R. "As you mentioned earlier, you are not the same person, literary, because you are experiencing the world very differently from what you were experiencing before the accident."

P. "I still don't want to believe that any of this is true for me."

Dr. R. "I think about it this way: When the brain receives information, either visual or auditory, it must code this information so the brain/mind can make sense of it, and you can negotiate your life. But when the brain/mind is injured, it has a difficult time interpreting this sensory information. Hence your brain/mind begins to function like a slow computer."

P. "So bottom line, no wonder I'm having a difficult time just simply trying to live my life day to day."

Dr. R. "And making things even more complicated stress levels are heightened with an injury to the brain making the brain/mind system work harder when it has fewer resources to do so."

P. "Am I doomed? Because this is what it feels like!"

Dr. R. "I don't believe you're doomed. There is a lot of hard work ahead, but we're catching this early, and it will be a lot easier to turn things around."

There was a long pause, which I have come to expect with TBI patients as their brains are literally working like a slow computer."

P. "It's hard to be hopeful when all of a sudden almost everything in your life is problematic."

Dr. R. "Understood. But over the years I have come to understand that utilizing neuroplasticity (the literal re-wiring of the neu-

rons in the brain) there can be a solid recovery from a brain injury.”

P. “I just thought of something I wanted to share with you! I’ll describe one more example of what makes me feel terrified: I’m sitting in a coffee shop with my sister, and she is asking me something about our mother. I know the answer but it’s just floating around somewhere in my mind.”

Dr. R. “In other words, you can’t access your thinking?”

There was a long pause.....

P. “Yes, that’s it exactly. You’re right. I really couldn’t access my thinking at that moment. And this is terrifying. Because what if I need to “run out of a burning building” and I can’t access my thinking as to how to do this?” I know the information is there somewhere, but I can’t find it! I can’t access my thinking so I can figure out how to get out of the burning building.”

Dr. R. “No wonder you feel terrified so much of the time. And what if this should happen while you are out driving? You can’t access your thinking about whether you should be taking the 405 South Exit or the 405 North Exit. No wonder you panic!”

When I went over the assessment checklist with Ms. M a second time, she again checked off almost all the symptoms on the list. Which indicated to me that she was still struggling with a Shock Trauma/Traumatic Shock and that this explained her frequent, difficult and bizarre symptomatology. In my opinion her brain was establishing Architecture One in response to the trauma and to the disruptions in normal brain/mind functioning, and she had not been able to move on from this brain/mind space.

Here is her symptomatology more than 2 months following the night of the accident and one month after she began treatment. I note that her symptoms had diminished in intensity, but they were all still present in her daily life.

- Numbness in her brain and body.
- Dissociation, she would frequently lose her place in daily life.
- Frequent dizziness.
- Both rapid and slow heartbeat.
- Shakiness during the day and night that she couldn’t control.
- Several episodes of lightheadedness during the day.
- Daily episodes of nausea, vomiting, and diarrhea.
- Daily headaches mostly on the top of her head.
- Muscle tension, especially when driving.
- Increase in Blood Pressure (190/120 and 160/100).

- Rapid Shallow Breathing.
- Fear-Panic-Denial-Anxiety.
- Increased anger and irritability
- Feeling helpless.
- Chronic fatigue.
- Frequent confusion and brain fog.
- Increases in emotional outbursts.
- Inability to focus and concentrate.
- Difficulties with decision making.
- Decreased awareness of one’s surroundings.

Explanations

Here again, the brain/mind responding to being traumatized because the force/impact of the car accident had literally bruised her brain and seriously disrupted its normal functioning. Ms. M’s brain/mind was responding in the interest of survival, and Architecture One is all about the brain/mind being in survival mode in the face of being seriously injured. Perhaps not unsurprisingly, this survival mode can remain in effect for much longer than a few hours, days, or even weeks. It can last months, even years, depending upon the circumstances of the accident and the person involved. And I note that the evidence is here. Ms. M. was still struggling with Traumatic Shock (a Shock Trauma) more than 2 months after the initial accident. This is one of the reasons why concussions and PCS require a lot more medical attention than simply rest for a week or two.

Finally, what exactly is happening such that an individual’s brain/mind responses to trauma by moving into Architecture One? Overall, it is an overwhelming response by the Sympathetic Nervous System sending emergency chemicals (fight or flight hormones) cascading through the mind/brain/body in the interest of the individual’s survival. Almost immediately, the individual is experiencing their inner and outer worlds as very different. Memory is impacted, and attention, concentration, problem solving skills and reasoning skills are all at risk and under-performing. And there are almost immediate changes to the person’s visual and auditory systems, again creating a world for them that is difficult to navigate and negotiate. In turn, a person’s sense of self, and their ability to interact with their world, becomes seriously compromised. And this all happens very quickly, with the added factor of serious, daily chronic fatigue.

In closing I want to revisit the beginning of this case when neither the Emergency Room nor Ms. M’s PCP recognized that she had

sustained a concussion from the original accident. And that the bizarre and frightening symptoms that she brought to her PCP were an aspect of her Shock Trauma (Architecture One), even several weeks after her accident.

Overall, I believe Western Medicine has a serious flaw that leads to missing and not recognizing trauma to the brain. Because Western Medicine does not do a good job of “listening to patients.” And a part of this problem is the consideration that brain injuries are not so obvious. They require time spent with the patient and a willingness to listen to their story. And you can see from the case above that there is a lot to tell! I often see TBI and patients 2-3 times per week. And they will verbalize how helpful it is to them that someone is there to validate their experiences navigating what is for them now a very different world.

A Healing Protocol/Creating Neuroplasticity

Finally, I have an individualized protocol (unique to each patient and promoting neuroplasticity in the brain) that I use to treat Shock Trauma/Traumatic Shock (Architecture One). It includes the following:

- A pharmacology (I prefer nutrients and supplements for the brain over drugs).
- Stimulating the brain (I prefer using music with noise canceling headphones).
- Setting up a total immersion program (a daily schedule designed to reduce demands on the brain allowing for a healing ecology of the brain).
- The use of “flow activities” (when a person is “at one” with their activity it reduces demands on the brain).
- Processing the injury and recovering the brain/mind through

talk therapy (very helpful in creating neuroplasticity in the brain).¹⁻⁹

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Conflicts of Interest

The author declares that there are no conflicts of interest.

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