

Case Report for TBI (Traumatic Brain Injury) Patient Treated with A Protocol of HBOT (Hyperbaric Oxygen Therapy), Autologous Human Plasma, Cranial Therapy, EEG Biofeedback, IV Nutrition, and Adult Stem Cells

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Keywords: traumatic brain injury, platelet rich plasma, cranial osteopathy, adult stem cells, adipose derived stem cells, bone marrow aspirate, closed head injury, neuropsychiatric disease, post-concussion syndrome, blastomere-like stem cells, totipotent, intravenous nutrition

Abstract

Traumatic brain injury (TBI) is one of the most prevalent injuries in the U.S. leading to death and long-term disability. CDC estimates are that 1.7 million individuals suffer annually with severe to moderate TBI due to blunt trauma or motor vehicle accidents as the biggest causes. Modern medicine proves very efficacious in the golden hour after the injury to save many patients from death. However, memory loss, inability to concentrate, loss of motor function, decision-making, emotional affect, pain, and other brain damage symptoms often confine these patients to a prison within their own bodies or compel them to suicide.

Most treatments for chronically debilitated traumatic brain injury patients have involved pharmaceutical drugs, occupational and physical rehabilitation, speech therapy, and cognitive maintenance. Many patients resign to accept their condition and gain very little improvement in their condition or begin a slow decline of cognitive or motor function. However, some patients gain some improvements using hyperbaric oxygen therapies (HBOT) at specific protocols (as developed by Dr. Paul Harsch—see <http://www.hbot.com/hbot-brain-trauma>).

While HBOT by itself as a treatment for TBI has gained moderate acceptance by the medical community around the U.S., it has been found that an entire protocol utilizing multiple modalities over a 3-9 month period is potentially the most effective way to treat sub-acute and chronic traumatic brain injuries. This protocol is not limited to, but may include, HBOT, autologous human plasma, adult stem cells, and cranial therapy along with the adjunctive therapies of EEG biofeedback, IV nutrition, TMS (transcranial magnetic stimulation), and low-level light therapy. Although several modalities in the protocol have been utilized singularly, the combination of these therapies in a synergistic manner is the novel step towards the long-term remediation of traumatic brain injury. Also, particularly unique to this patent application is the administration of activated plasma (in a proprietary solution of nutrients and drugs) as well as plasma-derived stem cells directly as a drip into the frontal area of the brain.

The following case study describes a male patient with a traumatic brain injury due to a serious motor vehicle accident in August 2012 where he experienced a direct blow to the frontal area of the head and brain. This patient experienced significant post-concussion symptoms secondary to the TBI including insomnia, photosensitivity, hyperacusis, memory loss, decreased ability to concentrate, emotional distress, depression, loss of libido, daily headache pain, loss of executive function as well as other related symptoms.

This patient, who will be referred to as Mr. Chad, after initial evaluation and treatment with neurology and a neuropsychologist continued to experience significant symptoms 11 months after the motor vehicle accident in August 2012. In the late spring of 2013, Mr. Chad had experienced some relief of symptoms with the daily use of a home hyperbaric oxygen chamber and five

sessions of EEG biofeedback in Boulder, Colorado. However, Mr. Chad was still significantly mentally impaired in mid-July 2013 when he presented to Dr. John Hughes in Basalt, Colorado (see Appendix A for Mr. Chad's personal historical review of his experience). Mr. Chad received an evaluation by Dr. John Hughes, D.O. in July 2013 for commercialized HBOT therapy for traumatic brain injury. After an initial 25 sessions of HBOT at 1.5 atmospheres, Dr. Hughes offered cranial therapy and activated plasma to Mr. Chad in the form of injections, intravenous administration, and a intranasal drip. Mr. Chad also was given IV nutrition to assist with his healing and recovery. He continued to receive 25 more HBOT treatments until the end of September 2013. In October 2013, Mr. Chad also received adult stem cells derived from fat, plasma, and bone marrow in Miami, Florida.

From July 2013 to October 2013, Mr. Chad made significant, rapid improvements in cognition, executive function, emotional affect, insomnia, fatigue, fear, and pain along with having a decrease in light and sound sensitivity. In July 2013, Mr. Chad reported living in darkness being only able to "withstand five seconds of sunlight." In October 2013, Mr. Chad was able to fly on an airplane to Miami, Florida after only three months of treatment with HBOT, activated plasma, IV nutrition, and cranial osteopathic therapy. Six months after receiving adult stem cells, Mr. Chad demonstrated continued improvement and stabilization of his mental state in April 2014. His neuropsychiatric evaluation by Dr. Hughes' clinic showed improvements (see Appendix B for Mr. Chad's pretreatment neuropsychiatric testing and Appendix C for post-treatment neuropsychiatric testing). Third party follow-up post-treatment evaluations by neuropsychologist Dr. Mary Ann Keatley, PhD of Boulder, Colorado also demonstrated improvements.

Note: Because Mr. Chad's traumatic brain injury was more neuro-psychological than purely neurological, MRI and CT scans were not relied upon to determine significant effects of the protocol offered by Dr. Hughes.¹ It is noted that Mr. Chad had "fraying of his spinal cord" in the thoracic area as well as a cervical disc extrusion upon initial MRI but no major defects on MRI of the brain were observed upon initial presentation to Dr. Hughes in July 2013. The MRI of Mr. Chad's cervical spine is listed in the case presentation below. Also see Appendix D for Mr. Chad's cervical and lumbar spine studies.

Introduction

This is a case report for Mr. Chad, a 46 year-old male patient who received significant benefit from a novel TBI treatment protocol offered by Dr. John Hughes of Basalt, Colorado. On August 28, 2012, Mr. Chad was involved in a motor vehicle accident in which his automobile was struck at speed by another vehicle. Mr. Chad remembers his head hitting the visor and possibly the windshield before he felt a twisted snap and then "blacked out" and was taken to the emergency room. He reports that his right eye "popped out" of his socket and then having left-sided numbness for awhile with tingling into his left arm. He also reports having pain in his neck, left sacroiliac joint, and left lower extremity. He reports musculo-skeletal pain improvements over

¹ <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2626927/>

Traditional imaging techniques, such as computerized tomography (CT) and conventional magnetic resonance imaging (MRI) have proven to be highly effective in identifying macroscopic lesions, which is a necessary component in managing acute trauma. ...Typically, individuals with mild TBI have normal appearing neuroimaging studies despite manifesting cognitive and behavioral problems. It is possible that enhanced analysis of brain function and anatomy following mild TBI may assist in delineating the neurophysiologic basis of post-concussion symptoms. Given the limitations of conventional imaging technologies, it is not surprising that they are poorly prognostic of outcomes (Diaz-Marchan et al 1996) and offer little information regarding the assessment of efficacy of TBI-related treatments.

time since the injury with use of a home HBOT chamber and intramuscular “stem-cell” injections from another clinic. However, Mr. Chad’s primary concerns upon first seeing Dr. Hughes on 7/15/2014 are the symptoms from his head injury. He reports extreme sound and light sensitivity as well as an inability to do math or other focused exercises such as reading. He also experienced bouts of depression, anxiety, physical and mental fatigue. He also reports memory loss, space and time recognition, loss of libido, inability to carry on conversations as well as daily, continuous headaches.

Mr. Chad has been evaluated by neuropsychologist, Dr. Mary Ann Keatley, PhD and Dr. Chris Centeno, MD of the Centeno-Schultz Clinic, and many other specialists and therapists since the motor vehicle accident in August 2012. He reports gaining benefit from stem cell and plasma (as PRP) injections into spinal area around his neck.

Mr. Chad denies current medications but reports using amino acids, 5 HTP and a supplement known as Neuroreplete. He reports an allergic reaction to Codeine. His past medical history includes a tracheal cyst and stomach ulcer. His family history is noncontributory. He denies the use of alcohol, tobacco, and drug abuse (with the exception of medical cannabis for headache pain). He lives alone in a warehouse.

Mr. Chad’s review of systems is significant for the following. He reports daily headaches. He reports trouble with temperature changes. He reports loss of peripheral vision that has improved since using HBOT at home. He reports seeing dark spots in his vision. He reports hyperacusis. He reports constant neck pain and stiffness. He reports indigestion and reflux. He reports pain in low back and sacro-iliac area; he reports right knee pain secondary to hitting on dashboard in the motor vehicle accident. He reports having no medial collateral ligament. He reports having trouble initiating words, actions; trouble following through with plans; trouble with concentration. He reports depression, anxiety, and insomnia.

Physical Findings and Assessment

On physical exam on July 15, 2013, Mr. Chad has stable vital signs and presents with no acute distress. He is tender to palpation in the frontal area and temporal areas of his skull. He is wearing sunglasses and noise-canceling large headphones. He is able to hear in both ears. He has loss of vision peripherally, particularly significant in the right lower quadrant. His neck has a loss of range of motion and he is most tender to palpation at C5-C6 vertebral area bilaterally to the spine as well as C0 at the splenius capitis attachments. His lungs are clear to auscultation. His heart has a resting rate and regular rhythm with audible S1, S2 and no murmurs and no clicks. His abdomen is soft, with mild tenderness to palpation in the mid-epigastric area. He is mildly obese. His upper back is tender to palpation at the bilateral rhomboid attachments near vertebral areas of T7-T8. He is tender to palpation at the left L5-S1 lumbro-sacral ligaments. He has tenderness to palpation the left SI ligament. His upper extremity and lower extremity reflexes are intact and 2/4 bilaterally. He has tenderness to palpation at the right medial knee. He has decreased grip strength of 3/5 in left hand. There are no obvious skin lesions. His affect is mildly depressed but he feels some hope about his HBOT treatments.

Mr. Chad’s MRI study of the brain with and without contrast (dated October 11th, 2012) is unremarkable for bleeding, mass, or appreciate insult to any area of the brain. CT-scan nor PET/CT imaging studies were not performed. See Appendix D for more information.

Mr. Chad’s MRI study of his neck (dated October 11th, 2012) demonstrates a left sided cervical disc extrusion at C5-6 on the left.

Mr. Chad's assessment on July 15, 2013 is moderate traumatic brain injury with post-concussion syndrome with a wide neurological array of symptoms (See Appendix B for his neuropsychiatric assessment). He has cervical disc extrusion with possible radiculopathy into his left hand. He has sciatica, vision loss, and daily headaches.

Mr. Chad's plan on July 15, 2013 is HBOT treatments with the Colorado Center for Hyperbaric Medicine at the standard TBI protocol of 1.5 atmospheric pressures for 40 sessions. He is given a neuropsychiatric evaluation to be completed in one week. He is to report about his sciatic pain and neck pain to Dr. Hughes in 2-3 weeks. He is advised to take a baby aspirin daily and continue long-term follow with neuropsychology, neurology, PT, and consider manual therapy to this head.

Management and Outcome

Mr. Chad's personal historical account of events is found in Appendix A. Mr. Chad's neuropsychiatric testing in July 2013 is below in Appendix B. His actual course of treatment is below.

From July 15, 2013 to October 2013, Mr. Chad was treated initially with HBOT for 50 sessions at variable pressures ranging from 1.5atm to 2.9atm. He received activated plasma injections by Dr. Hughes on August 26th, 2013. He received activated plasma injections in the neck (composed of autologous human plasma, dextrose 5%, and calcium chloride (1/2cc)) and activated plasma infusions (composed of autologous human plasma, dextrose 5%, 1cc glutathione (200mg/cc), ½ cc methylcobalamin (5000mcg/cc), 20 units of insulin, and 4cc O3 at 12 ug/cc) intra-nasally via pipette to the cribriform fossa. He received IV nutritional therapy two times over the course of three months. He received cranial therapy eight times over the course of 12 weeks. In October 2013, Mr. Chad received autologous adult stem cell treatments derived from the adipose tissue harvesting from his abdomen and bone marrow from his ilium.

Improvements on physical exam and neuropsychiatric testing formed the primary assessment tool for understanding Mr. Chad's condition and effectiveness of this his treatment regiment. Physical exam findings in April 2014 (approximately nine months after treatment initiation in July 2013) include diminished light and sound sensitivity, decreased tenderness in affected musculo-skeletal areas, reduced fatigue, and calm affect.

Neuropsychiatric findings are located in Appendix B (pre-treatment neuropsychiatric evaluation), and Appendix C (post-treatment neuropsychiatric testing).

Conclusions

From physical exam evidence and neuropsychiatric testing, Mr. Chad, a surviving TBI patient, made significant improvements in his mental capabilities and psychological response to the core treatment protocol involving HBOT, human plasma, cranial therapy, and adult stem cells along with the adjunctive therapies of IV nutrition and EEG biofeedback. Mr. Chad's results demonstrate improvements intellectually, physiologically, and psychologically along with mood and personality improvements. Improvements in Mr. Chad's brain condition and symptoms have been verified by neuropsychologist Dr. Mary Ann Keatley, Ph.D. of Boulder, Colorado. Other patients with mild to moderate traumatic brain injuries have also benefited from a similar treatment protocol with reported findings of "a 37% increase in my Lumosity score, less crying, and more timed thoughts." Another mild-TBI patient who has completed a limited protocol

reported that “my mind is more clear than it has been in years... I am much closer to the vitality and clarity that I used to feel in my mind every day.”

It is clear that Mr. Chad’s case report demonstrates benefit of Dr. Hughes’ treatment protocol with HBOT, human plasma, adult stem cells, and cranial therapy (including the intranasal delivery of the autologous human plasma, nutrient, and insulin cocktail) for patients with mild to moderate traumatic brain injury. Utilization of EEG readings, PET scans, functional MRI scans, and more neuropsychological testing is warranted to further determine the full efficacy of Dr. Hughes’ TBI treatment protocol.

Appendix A

First time I met Dr. John Hughes was to be assessed for HBOT treatment at the Colorado Center for Hyperbaric Medicine. Kirk Hartley, who owns the Hyperbaric Center in Basalt, introduced us. I had arrived in Basalt with the love and support of some dear friends. I was so hypersensitive to light and sound that I had to wear ear plugs, headphones, sunglasses, giant sun hat, and a scarf just to attend the appointment and upon leaving the house. To help better explain, I could not be outside in the light for even 5 seconds. Just the sound of others talking and questioning me about my injury was overwhelming. For a year after the accident I could not drive, I lived in darkness at home, and struggled emotionally. Even the sound of a pipe creaking in the wall would overwhelm me. My three main weaknesses were light, sound, and emotion. My sensitivity to light and sound would elicit unreasonable emotional responses of fear. My memories from the day of meeting Dr. Hughes are limited. I felt like I wasn't even there but I somehow knew that he was going to be able to help me. I struggled through the standard medical questions squinting and winching from the pain that the light was creating. It was hard to communicate but I knew that I had arrived with a DR. that could help me. His demeanor was filled with humor, hope, and confidence. Since hope had pretty much gone out the window it was refreshing to learn about new therapies. HE discussed ozone, prolo, and blood therapy. I left the office relieved that I had passed the testing to allow me to begin HBOT sessions. I felt like a plan was going to develop between Dr. Hughes and I.

I began my sessions several days later spending the next 75 days in Basalt doing the HBOT treatment along with Kirk Hartley and taking rides in the hyperbaric chamber as often as possible. A few weeks after beginning my treatments Dr. Hughes came to visit me on my hotel room to assess my progress. He was surprised to find me completely in the dark except TV light. I cannot remember when we first discussed PRP treatment and administering through the nose. I felt like this was science fiction meets the modern world. I agreed to the treatment and we made a plan to begin the PRP treatment. I remember leaning my head back on his table and he began inserting the plastic into my nasal passage to the point where the nose makes a turn. With my heightened sensitivity this was incredibly intense for me. I held the piece high in my nose as he squirted the plasma into my left nostril. I could feel the medicine moving across my brain and spreading around as I moved my head for the next 20 minutes. He then administered the plasma into the right nostril. After this it was like a stream of information had been let loose like a dam that had busted. I saw clips of memories such as faces, numbers, and letters. After 5 minutes the stream of thoughts slowed down. I needed sugar during the process due to slight hypoglycemia. Upon completing the second treatment for the day I had the same reaction and results except the stream of information slowed down and I could

recognize images and conversations I had with people. It was almost like a computer file had been opened full of letters, numbers, and words. I started having expanded thought. I felt for the first time in a year that I had some clarity. The initial feeling of bubbly effervescent seemed to give me life. The light was on in the back of a dark warehouse.

I was excited and able to read more than 2-3 sentences without triggering a migraine. I found that I was able to get back on the computer and learn more about my trauma and recent treatment. Within the following days it was like an awakening. I could turn on lights for a few minutes and keep the TV on. It seemed like a light switch was turned back on inside my head even though it was dim. There was new activity occurring. I did not understand the blood brain barrier discussed by Dr. Hughes but I understood that we had crossed it. The next day while in the hyperbaric chamber at 1.7 ATA for an hour and a half I experienced what felt like men working inside my brain stretching and pulling the tissue. I almost felt like my brain was itching. I discussed this with Kirk Hartley after my session and he stated that any feeling inside the brain after TBI is good because it indicates blood flow where there previously was none. Over the next 7 days I continued to experience healing but the intensity faded a bit each day. After a week, I could spend 15 minutes in the sunlight. I was having memories from childhood return. I experienced music playing in my head. The ability to think and plan returned. Now with a renewed sense of purpose I started doing more research about PRP, stem cells, activating stem cells. It was then that I proposed to Dr. Hughes that we travel to Miami to learn more about stem cell technologies involving bone marrow and stem cells taken from liposuction. We set a date for later that year to pursue further treatments options available in Miami. The fact that I was able to make plans and travel was proof of the leaps and bounds I had experienced after PRP treatment.

Appendix B

Mr. Chad completed neuropsychiatric evaluations before and after his treatment with Dr. Hughes' traumatic brain injury protocol.

A summary of the neuropsychiatric evaluations from Mr. Cook in July 2013 is below. In July 2013, Mr. Chad had the following intellectual impairment symptoms (a rating of "4" beside the symptom indicates "significant impairment")¹

- 1) memory (4)
- 2) concentration (4)
- 3) attention (4)
- 4) easily distracted (4)
- 5) problem solving (4)
- 6) understanding spoken instructions (4)
- 7) understanding written instructions (4)
- 8) decision making (4)
- 9) finding words (including communicating thoughts and feelings) (4)
- 10) misplacing or tracking things (4)
- 11) unintentionally repeating the same activities (4)
- 12) stuttering (4)
- 13) difficulty with executing actions (4)
- 14) difficulty with simple math (4)
- 15) disorientation with changes in routines (4)
- 16) unsure about things he knows well (4)
- 17) difficulty learning new things (4)
- 18) doing things slowly to make sure they are correct (4)
- 19) difficulty caring for himself (4)
- 20) difficulty taking care of pets (4)
- 21) impaired abstraction (4)
- 22) difficulty with sequencing and processing information (4)
- 23) difficulty learning new things (4)

In early July 2013, Mr. Chad was significantly impaired with the following psychological symptoms:

- 1) impaired sense of self (4)
- 2) fear of loss of control (4)
- 3) easily irritated or startled (4)
- 4) feelings of paranoia (4)
- 5) feelings of terror, depression, shame, fear, and discouragement (4)
- 6) persistent anxiety (4)
- 7) feeling that everything is an effort (4)
- 8) feeling inept (4)
- 9) crying without a cause (4)
- 10) worrisome thoughts that won't leave your mind (4)

¹ Neuropsychiatric testing requires evaluation of the patient on a scale of 1-4 with "4" being "significantly impaired", "3" being "moderately impaired", "2", mildly impaired, and "1", no impairment. Mild or no impairments in Mr. Chad's conditions were not reported in July 2013. Improvements in these impairments were noted in April 2014.

11) diminished insight (4)

In early July 2013, Mr. Chad was impaired with the following mood symptoms:

- 1) erratic mood swings (4)
- 2) urges to beat, harm, or injure another (3)
- 3) temper outbursts he could not control (4)

In early July 2013, Mr. Chad was impaired with the following physiological symptoms:

- 1) heart racing (4)
- 2) headaches (4)
- 3) increased sensitivity to touch (4)
- 4) ringing in ears (4)
- 5) easily fatigued (4)
- 6) decreased tolerance to alcohol and drugs (4)
- 7) trouble falling asleep (4)
- 8) awakening during the night (4)
- 9) restless sleep (4)
- 10) decreased libido (4)

In July 2013, Mr. Chad was impaired with the following personality alterations:

- 1) aggressiveness (3)
- 2) apathy (4)
- 3) overly sensitive (4)
- 4) discouragement (4)
- 5) emotional distress (4)
- 6) chronic frustration (4)
- 7) childishness (4)
- 8) irresponsibility (4)
- 9) increased shame or guilt.(4)

In July 2013, Mr. Chad was impaired with the following neurological symptoms:

- 1) sensitivity to temperature shifts (4)
- 2) seeing dark spots in eyes (4)
- 3) blurry vision, especially when fatigued (4)
- 4) diminished night vision (4)
- 5) difficulty relaxing (4)
- 6) twitching (4)
- 7) sensitivity to light (4)
- 8) sensitivity to sound and noise (4)

Appendix C

In April 2014, Mr. Chad had the following intellectual impairment symptoms:

- 1) memory (3)
- 2) concentration (4)
- 3) attention (3)
- 4) easily distracted (4)
- 5) problem solving (4)
- 6) understanding spoken instructions (1)
- 7) understanding written instructions (3)
- 8) decision making (2)
- 9) finding words (including communicating thoughts and feelings) (4)
- 10) misplacing or tracking things (4)
- 11) unintentionally repeating the same activities (3)
- 12) stuttering (2)
- 13) difficulty with executing actions (4)
- 14) difficulty with simple math (3)
- 15) disorientation with changes in routines (4)
- 16) unsure about things he knows well (3)
- 17) difficulty learning new things (2)
- 18) doing things slowly to make sure they are correct (4)
- 19) difficulty caring for himself (2)
- 20) difficulty taking care of pets (3)
- 21) impaired abstraction (3)
- 22) difficulty with sequencing and processing information (3)
- 23) difficulty learning new things (2)

In April 2014, Mr. Chad was significantly impaired with the following psychological symptoms:

- 1) impaired sense of self (2)
- 2) fear of loss of control (2)
- 3) easily irritated or startled (3)
- 4) feelings of paranoia (2)
- 5) feelings of terror, depression, shame, fear, and discouragement (3)
- 6) persistent anxiety (4)
- 7) feeling that everything is an effort (3)
- 8) feeling inept (3)
- 9) crying without a cause (2)
- 10) worrisome thoughts that won't leave your mind (2)
- 11) diminished insight (1)

In April 2014, Mr. Chad was impaired with the following mood symptoms:

- 1) erratic mood swings (2)
- 2) urges to beat, harm, or injure another (2)
- 3) temper outbursts he could not control (2)

In April 2014, Mr. Chad was impaired with the following physiological symptoms:

- 1) heart racing (3)
- 2) headaches (3)
- 3) increased sensitivity to touch (2)
- 4) ringing in ears (2)
- 5) easily fatigued (3)
- 6) decreased tolerance to alcohol and drugs (4)
- 7) trouble falling asleep (3)
- 8) awakening during the night (4)
- 9) restless sleep (4)
- 10) decreased libido (4)

In April 2014, Mr. Chad was impaired with the following personality alterations:

- 1) aggressiveness (2)
- 2) apathy (1)
- 3) overly sensitive (3)
- 4) discouragement (2)
- 5) emotional distress (3)
- 6) chronic frustration (2)
- 7) childishness (1)
- 8) irresponsibility (3)
- 9) increased shame or guilt.(2)

In April 2014, Mr. Chad was impaired with the following neurological symptoms:

- 1) sensitivity to temperature shifts (3)
- 2) seeing dark spots in eyes (3)
- 3) blurry vision, especially when fatigued (4)
- 4) diminished night vision (4)
- 5) difficulty relaxing (3)
- 6) twitching (3)
- 7) sensitivity to light (3)
- 8) sensitivity to sound and noise (3)

PATIENT NAME: [REDACTED]
BIRTH DATE: 3/4/1967
MPI#: HI230738
DATE OF EXAM: 10/11/2012



REFERRED BY: Ronald Hanson, MD
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MRI BRAIN WITH AND WITHOUT CONTRAST

HISTORY: Memory loss, history of traumatic brain injury.

COMPARISON: None available.

TECHNIQUE: Sagittal 3-D FSPGR, axial T1, T2, FLAIR, GRE, and DWI/ADC, and coronal FLAIR images were obtained of the head without contrast. After the uneventful administration of 10 mL of Gadavist intravenously, axial, sagittal, and coronal T1 postcontrast images were obtained.

FINDINGS: There is no acute hemorrhage, mass, or an abnormal extra-axial fluid collection. There is no restricted diffusion to indicate an acute infarct. There is mild sulcal and ventricular prominence. An incidental small cavum septum pellucidum is noted. There is no mass effect or midline shift. Gray white matter differentiation is intact. There is no significant atrophy of the bilateral medial temporal lobes and hippocampi. The posterior fossa, brainstem, and basal cisterns are unremarkable. Midline structures are intact. The vascular flow voids are unremarkable.

There is a small area of linear enhancement in the subcortical white matter of the left parietal lobe on postcontrast axial images 15-16, coronal image 24, and sagittal image 48 likely representing a capillary telangiectasia. No other areas of abnormal enhancement are noted. The dural venous sinuses are patent.

The globe and orbits are unremarkable. There is mild mucosal thickening throughout all the paranasal sinuses, most prominent in the ethmoid air cells. There is a small amount of fluid and debris in the left greater than right mastoid air cells. There is hypertrophy of the left middle and inferior turbinates compared to the right.

Please see dictation of MRI of the cervical spine for further evaluation of the cervical spine.

IMPRESSION:

1. Mild cerebral atrophy.
2. Small area of linear enhancement in the subcortical white matter of the left parietal lobe, likely

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capillary telangiectasia.

3. Negative for acute infarct, hemorrhage, or space-occupying mass.
4. Mild paranasal sinus mucosal thickening.

Tanya Tivorsak

Tanya Tivorsak, MD

This document was electronically signed by Tanya Tivorsak, MD on 10/11/2012

PATIENT NAME: [REDACTED]
BIRTH DATE: 3/4/1967
MPI#: HI230738
DATE OF EXAM: 10/11/2012



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***** ADDENDUM #1 *****

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Tanya Tivorsak

Tanya Tivorsak, MD

This document was electronically signed by Tanya Tivorsak, MD on 10/12/2012

***** ORIGINAL REPORT *****

***** ADDENDUM #1 *****

There is a well-circumscribed partially visualized lesion within the left infrahyoid strap muscles adjacent to the thyroid cartilage on sagittal image 13-14 measuring about 2.4 cm craniocaudal by 0.9 cm AP, which is not well visualized on the axial images. This lesion demonstrates bright T2 signal and intermediate T1 signal hyperintense to the adjacent muscle. This lesion does not demonstrate significant internal enhancement on the postcontrast images although it is partially visualized.

ADDENDUM IMPRESSION: Well-circumscribed partially visualized lesion within the left infrahyoid strap muscle, likely a thyroglossal duct cyst. Comparison with prior studies is recommended.

This addendum was electronically signed by Tanya Tivorsak, MD on 10/12/2012

***** ORIGINAL REPORT *****

MRI OF THE CERVICAL SPINE WITH AND WITHOUT CONTRAST

HISTORY: Neck Pain. Pain greater on the left side

TECHNIQUE: Sagittal T1, T2, and STIR and axial T2 and 2D MERGE images of the cervical spine without contrast. After the uneventful administration of 10 cc of Gadavist intravenously, sagittal and

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axial T1 images were obtained.

COMPARISON: None available.

FINDINGS: There is minimal loss of height of the C6 and C7 vertebral bodies, due to the degenerative disc disease. No fractures are identified. The craniocervical junction and C1-C2 articulation are intact. Cord signal is normal. The prevertebral and paravertebral soft tissues are normal.

There is congenital narrowing of the cervical spine from C3-C4 through C7-T1.

C2-C3: Mild disc desiccation. No annular bulge, central canal narrowing, or neural foraminal narrowing.

C3-C4: Moderate disc desiccation with slight loss of disc height. Mild annular bulge and prominent bilateral posterolateral osseous ridging indenting the ventral thecal sac with mild central canal narrowing. Severe bilateral neural foraminal narrowing. Mild bone marrow reactive change within the left facet joint with mild bilateral facet arthropathy.

C4-C5: Moderate disc desiccation. Mild bilateral posterolateral osseous ridging with mild central canal narrowing. Mild bilateral neural foraminal narrowing. Mild bilateral facet arthropathy.

C5-C6: Moderate disc desiccation. Small to moderate left posterolateral disc extrusion extending inferiorly and which measures about 3 mm AP. The disc and bilateral posterolateral osseous ridging indent the ventral thecal sac resulting in mild to moderate central canal narrowing. Moderate left and mild to moderate right neural foraminal narrowing. Mild bilateral facet arthropathy.

C6-C7: Severe disc desiccation and moderate loss of disc height. Extensive type I endplate degenerative changes which demonstrates enhancement. Small right posterolateral disc extrusion with superimposed disc osteophyte which compresses the ventral thecal sac and slightly indents the ventral spinal cord resulting in moderate central canal narrowing. Moderate to severe right and moderate left neural foraminal narrowing. Uncovertebral degenerative changes. Mild bilateral facet arthropathy.

C7-T1: Mild disc desiccation. No annular bulge, central canal narrowing, or neural foraminal narrowing.

IMPRESSION:

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1. Severe degenerative disc disease at C6-C7 with extensive type I endplate degenerative changes. Small right posterolateral disc extrusion superimposed on disc osteophyte resulting in moderate central canal narrowing and moderate to severe right neural foraminal narrowing. Moderate left neural foraminal narrowing.
2. Small to moderate left posterolateral disc extrusion at C5-C6 with mild to moderate central canal narrowing and moderate left neural foraminal narrowing.
3. Moderate degenerative disc disease at C3-C4 with severe bilateral neural foraminal narrowing. Mild central canal narrowing. Mild inflammatory osteoarthropathy within the left C3-C4 facet joint with mild bone marrow reactive change and facet arthropathy.

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Tanya Tivorsak, MD

This document was electronically signed by Tanya Tivorsak, MD on 10/11/2012