



## **BrainAdvantage TBI Client Case Report #2**

This patient is a 36-year old female. She came into BrainAdvantage following a traumatic brain injury from a car accident in April 2008. She was having trouble sleeping and had constant migraine headaches and neck pain. She cried easily and couldn't remember places or directions. She got lost even going to places like her husband's office which she had managed for years.

Patient had previously spent 4 months at Barrows Neurological Institute with no success. She was currently seeing a neurologist with also no success. The neurologist had tried to dissuade her from coming to BrainAdvantage saying it was "untested". She was on Cembalta 120mg, Neurotin, 800mg, Topomax 100mg pm, 25 am, Ultram 100mgam, 100mg pm, Enjuva .3 mg am.

### **Assessment**

The patient arrived at the office unable to walk on her own. She was helped in by a family friend. We tested the patient using an industry-standard test for mild cognitive impairment. On this test, results were in the low normal range, with her memory score markedly lower than fluency and executive function.

We then tested her cognitive function, recall, memory and sequencing skills. Out of a possible score of 3175, she scored 775.

The client was then assessed using a tool that measures focus, attention, control of impulsivity, overall coordination and reading/language processing. The purpose of the task is to clap both hands right on the beat as they hear a steady beat of a bell in their ear. She scored 6% on the accuracy scale. We then used a second task with guide sounds cue his focus on the beat. However, his accuracy scale was still 4%.

The client was assessed for visual insufficiencies. This test shows whether a patient's eyes are tracking and working together. It also assesses visual processing and reading level. The client showed the possibility of a fixation stability problem. She read at 8<sup>th</sup> grade level, her correct response level was 70%. Recommendations were made to seek further assessment from a behavioral optomistrist.

We used HEG neurofeedback to assess oxygen blood levels in the frontal lobe. The right was markedly lower than the left. Baseline on left was 88. Baseline on the right was 45.

She had a qEEG (Brain Map) completed. Results showed abnormal Bipolar Relative Power in Alpha, abnormal Bipolar Relative Power in Beta and abnormal, Bipolar Asymmetry Combined for Posterior.

### **Recommendations/Training**

We recommended the client train with BrainAdvantage for 20 sessions. Re-assessments were scheduled following the 10<sup>th</sup> session and at the end of training.

Her training protocol included:

- Audio Visual Entrainment starting in Beta frequencies (7.8-14.2 Hz) targeting both frontal cortices
- HEG Neurofeedback 3x/week for 20 sessions focusing on increasing the activity on her right side.
- Psychoacoustic sound treatment for vestibular exercise, balance and auditory processing, 30 minutes a day, 5 days a week, for 10 weeks.
- Training for rhythm, coordination, visual and auditory processing 30 minutes, 3x/week
- Cognitive software 3x/week for cognitive, memory, recall and sequencing.

After the first training session, client returned to say she had already noticed improvement although she had her mother with her to assist. After only a few sessions she stated she had been able to help her high school-aged son with his trigonometry homework, something she hadn't been able to do since the accident. During the course of her first 10 sessions, the client showed remarkable improvement. She was driving herself in for trainings without anyone to assist her. She began to remember more and stopped crying. Her headaches lessened. She started weaning herself off medications with the help of our medical doctor.

### **10th session Reassessment**

The client was retested using the Mild cognitive impairment test and her scores improved. Her score for probability of MCI rose from <20% to <10%. Memory performance rose from .37 to 1.21. Fluency performance rose from 1.52 to 1.96 and executive performance rose from .90 to 1.21.

Her performance on the rhythm, coordination, visual and auditory processing tests showed significant improvement from her initial score of 6% accuracy to 28% accuracy without guide sounds and 13% with guide sounds.

Her "Brain Speed" score rose from 775 to 800.

During the next several sessions she took a week off for vacation which set her back significantly. However, she made it up quickly. She continued to make great progress. She returned to work part-time to give herself a chance to heal completely.

She returned to her neurologist to show him her remarkable progress. His response was to say, "Well, you were just ready to heal." He then referred her to a pain clinic, which she declined.

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**After 20 Sessions** her Brain Speed rose to 1375.

Her oxygen levels on HEG rose to 105 on Left and 109 on Right. She maintained an average of 5-10% oxygen gain each side for each session.

She continued to show improvement on rhythm, coordination and visual processing. Her initial score of 6% accuracy went to 52% accuracy without guide sounds and 48% with guide sounds.

### **Final Observations**

This client made a remarkable recovery in a very short period of time. She continues to use the technology at home every day. By the end of her treatments, she no longer got lost and she has stopped crying. Her migraine headaches are gone. She is no longer on any medication except an occasional Ibuprophen.

When last we spoke, she was planning on writing a book to let others with traumatic brain injuries know there is help.