

# Learning Difficulties; A Case Study

## History.

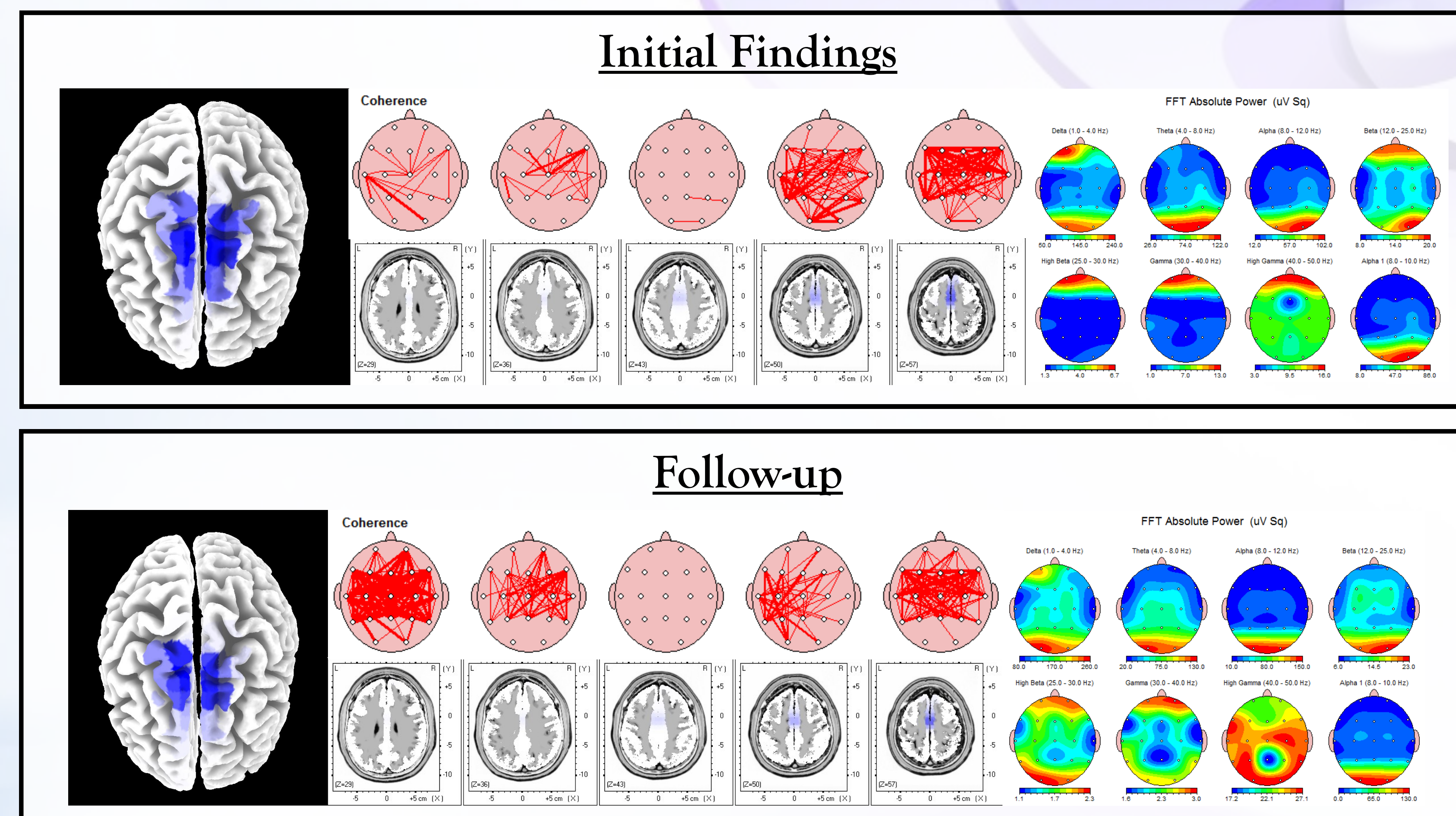
A seven year old male presents with learning difficulties; retaining information, short and long-term memory, as well as difficulty retaining letters and sounds. The patient was born eight weeks premature and was incubated for five weeks. At birth he could not maintain his body temperature and had apnea attacks and jaundice. Hypotonia was present at birth and he was not reaching the appropriate milestones with delayed speech and delayed onset of motor skills from the age of two. At four months he had surgery to correct a double hernia. He was required to repeat pre-primary school and has required speech therapy, occupational therapy and physiotherapy since the age of two. He had previous episodes of croup and chest infections.

## Physical Exam

Physical exam revealed left sway in Romberg test, left dysmetria, right cerebellar optiko-kinetic dysfunction, poor smooth pursuit tracking bilaterally and a faster time-to-fatigue of the left pupil during pupil light reflex testing.

## Initial Finding

Upon initial Quantitative electroencephalographic (QEEG) examination (qEEG) and Loreta assessment areas of hypercoherence predominantly within the delta, theta, beta and high beta frequency ranges were apparent. The individual frequency ranges indicated that there was significant hypoactivity within the frontal, temporal and parietal cortices, consistent throughout all frequency ranges. The LORETA analysis showing the superior frontal gyrus hypoactivation was specifically



located in Brodmann areas six and nine. These areas are typically associated with limb and eye movements, thought, cognition and planning.

## Follow up Findings

After 6 weeks of therapy a second Quantitative electroencephalographic (QEEG) examination (qEEG) was performed. The follow up scan revealed significant improvement globally throughout the brain. The previous areas of hypoactivation started to show significant signs of trending toward normalization. This is consistent with improved normalization within the sensory and motor cortices bilaterally. Loreta analysis showed significant improvement toward normalization in the surrounding areas.

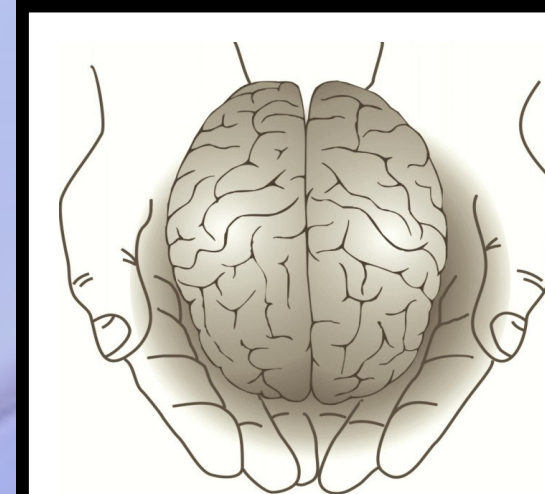
## Conclusion

After five months of treatment the patient has continued to improve immensely. The child's teacher reported that she had been noticing many positive changes including improvements in speech, language, vocabulary, reading, memory, awareness, responsiveness and dexterity. Additional QEEG and Loreta scans demonstrated ongoing normalization throughout the frontal, temporal and parietal cortices. "OT reported progression with right hand dominance, as the patient would not choose a hand prior to therapy. He progressed 3 levels in reading going from a pre reader to a level 3 reader. More confidence with writing and ability to rhyme produce and identify, identify initial and final sounds, break words into syllables, blend and segment with ease and retain this information and transfer across all learning areas. He has become more verbal and able to articulate sentences better."

Report from Educational Psychologist's Auditory Test done after follow up findings:

***"His auditory and switching response improved significantly. The response to narrative, paying attention and remembering in an auditory passage has improved as well".***

This was compared to the same test which was performed before Initial Findings



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