Transauricular and then invasive successful Vagus Nerve Stimulation treatment in drug resistant epilepsy: a case-report

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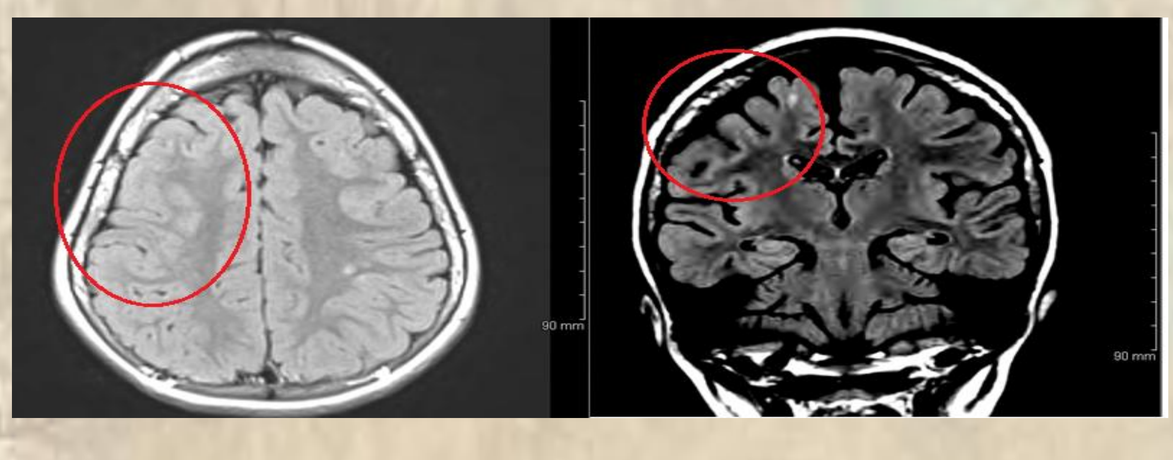
Introduction

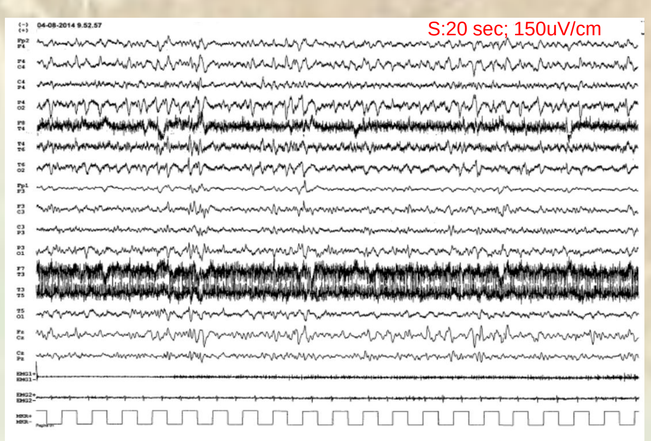
Vagus nerve stimulation (VNS) has a proven efficacy as an adjunctive therapy for patients with drug-resistant epilepsy. Nonetheless no predictive factors for efficacy have been identified. We report the case of a 16-year-old girl with a right frontal cortical dysplasia who underwent surgery without benefit, and then she used successfully transcutaneous VNS (t-VNS) with a good control of seizures. VNS was subsequently implanted.

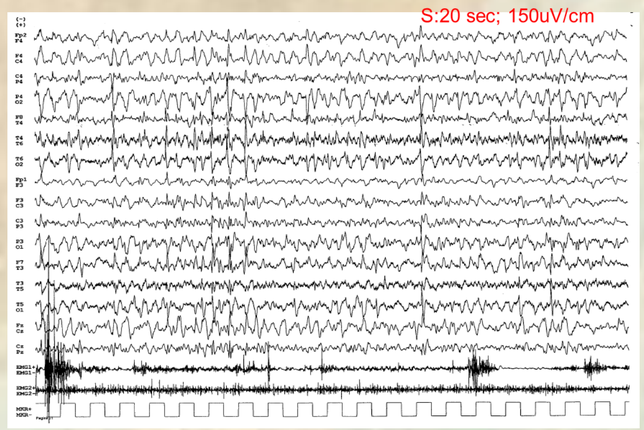
Case report

Onset of seizures dates back to the age of 4 months; at 10 months she had spasms while waking up and falling asleep. The first EEG, at the age of 12 months, showed hypsarrhytmia with a dominant right hemispheric focus (not shown). At the age of 13 months a brain MRI revealed a right frontal cortical dysplasia.



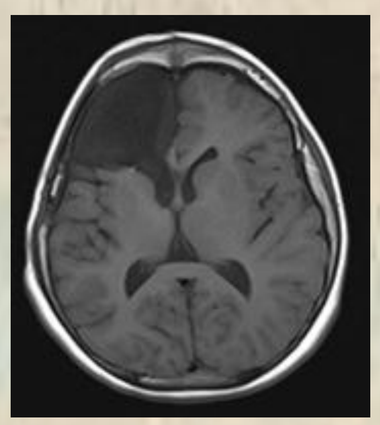
At the age of 2 years she developed focal onset seizures in wakefulness with head fall and version and occasional secondary generalization. At the age of 6 years: in wakefulness seizures as above-described plus grimacing, clinging to mom, upper asymmetric limb tonic elevation; staring seizures; during sleep: left limbs tonic cluster seizures appeared.

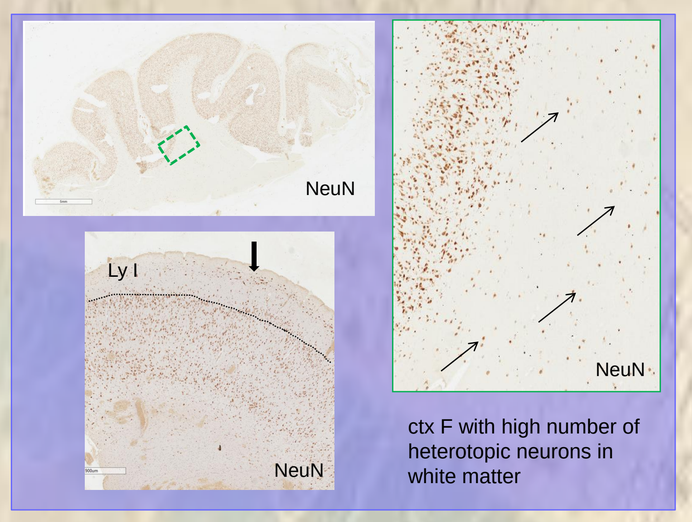




EEG showed multifocal epileptiform discharges with prevalence in right centro-parietal regions. She had uncountable seizures every day despite medical therapy. The most severe were very disabling seizures with falls.

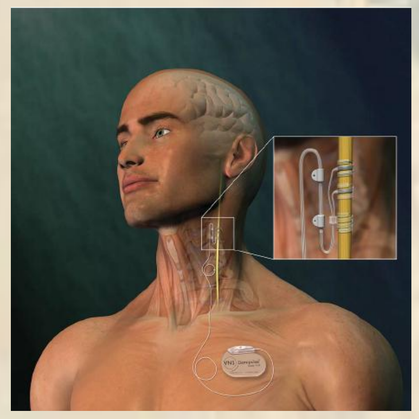
At the age of 8 she underwent a right frontal lobectomy with only a transient (one year) benefit. Histological analysis revealed a IA type focal cortical dysplasia.

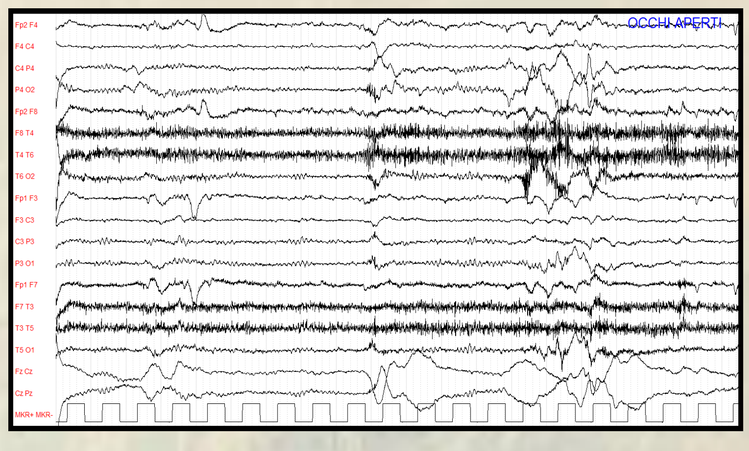




ctx F with high number of heterotopic neurons in white matter

At the age of 13 years she benefited from t-VNS treatment with reduction of seizures with falls and secondary generalization. Subsequently VNS was implanted and is still on. The above-mentioned seizures never occurred again.





EEG three years after VNS initiation:

1. background rhythm improvement
2. reduction of epileptiform discharges

Discussion and conclusion

These results confirm previous data on t-VNS mechanism and efficacy suggesting its use in predicting the effectiveness of an invasive VNS.
t-VNS could be used as a screening tool allowing a better patient selection to VNS implant.

References

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(3)Bauer S, Baier H, Baumgartner C, Bohlmann K, Fauser S, Graf W, Hillenbrand B, Hirsch M, Last C, Lerche H, Mayer T, Schulze-Bonhage A, Steinhoff BJ, Weber Y, Hartlep A, Rosenow F, Hamer HM. Transcutaneous Vagus Nerve Stimulation (tVNS) for Treatment of Drug-Resistant Epilepsy: A Randomized, Double-Blind Clinical Trial (cMPsE02). Brain Stimul. 2016 Jan 20

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