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Abstract

Female, 18 years, presented to CAMHS in Autumn 2019, with acute changes in mood and behaviour. She was attending neurology in 2016 due to initial left-sided weakness and co-ordination challenges. MRI brain 2016 demonstrated change in right cerebrum extending from lateral ventricle to involve the right midbrain. Since then, her MRI brain shows more extensive changes and her motor symptoms have improved while her behavioural symptoms have become more problematic. The aetiology of her difficulties remains unknown. Symptom improvement and a close working relationship with neurology is vital.

Introduction

Adolescents undergo many brain changes leading up to adulthood, the brain increases in volume and white matter.¹ Most abnormal MRI brain results in adolescence are related to epilepsy, with neurodegenerative and neuromuscular causes being less common.¹ MRI brain results in this case show changes extending from the thalamus to frontal regions and to the left cerebrum. This patient presented with gait and neurological symptoms, however, she is currently presenting with mood lability, outbursts of aggression, disinhibition and new speech deficit. There is no evidence of hypomania. The cause of this inflammatory process remains unclear. Differential diagnosis includes leukodystrophy, gliosis or ischaemic/vascular event. This case is interesting due to the constellation of changing signs and symptoms, unusual MRI brain results and lack of a clear diagnosis on extensive testing. The patient cannot currently engage in school or social activities due to her deficits. In addition to her neuro-psychiatric symptoms, she has developed anxiety related to the impact this disorder will have on her future.

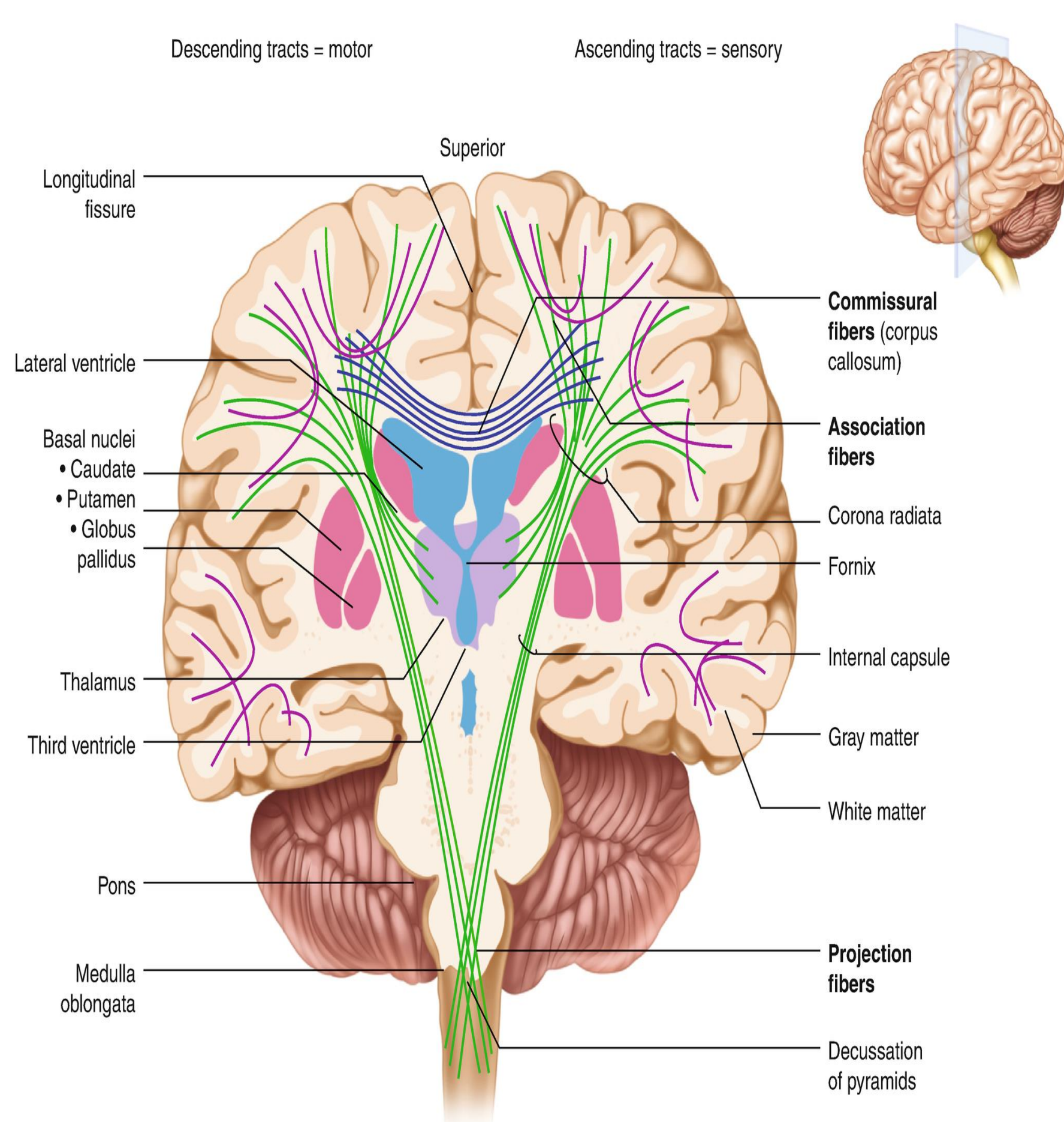


Figure 1. Anatomy of the brain and brain stem. https://link.springer.com/chapter/10.1007/978-3-030-12281-2_7.

Case report

Female, age 14 years, presented to neurology in 2016. She was experiencing left sided weakness, poor co-ordination, gait changes and fatigue. There was no reported history of relevance. No instances of trauma, infection or developmental issues. There is no family history of neurological illness. MRI brain showed high signal change in right cerebrum extending from lateral ventricle to involve thalamus and posterior limb of right internal capsule to involve the right midbrain. Neurological testing resulted in a positive result for NMDA receptor antibody. Nil else evident on exam or testing. Repeat testing of weakly positive NMDA- R test was negative.

Her symptoms and gait improved, however her concentration and academic ability deteriorated over the following years. She developed delays in her speech and anomia. In 2019, her symptoms had changed to include an improvement in motor symptoms but increased inappropriateness, emotional lability and a new sleep deficit. Psychology referred her to psychiatry in late 2019. Psychiatry contacted neurology for their input. Neuro-psychiatric symptoms are dominating her presentation since 2019. Such symptoms are becoming difficult for her and her parents to manage. In November 2019, she was admitted for investigation and received a course of IVIg and IV steroids. There was no objective improvement following same. On a trial of fluoxetine with CAMHS, the patient suffered further lability of mood. Fluoxetine has been discontinued and a trial of quetiapine will be started in an attempt to improve her mood and sleep difficulties. Caution must be taken when choosing medications for this patient due to the unclear aetiology of her deficits/symptoms.

Results

Past testing performed by neurology in 2016 had resulted in a weakly positive result for anti-NMDA receptor antibody, ACE and anti-VGKC- relevance of these results is unknown. Following IVIg the patient felt subjective improvement in speech and anxiety (not seen objectively). Psychiatry is restricted at present with regard to pharmacological management due to unclear aetiology (vascular cause is not ruled) and awaiting outcome of further IVIg. The patient is due to receive three-monthly courses of IVIg. Awaiting review with liaison psychiatry team.

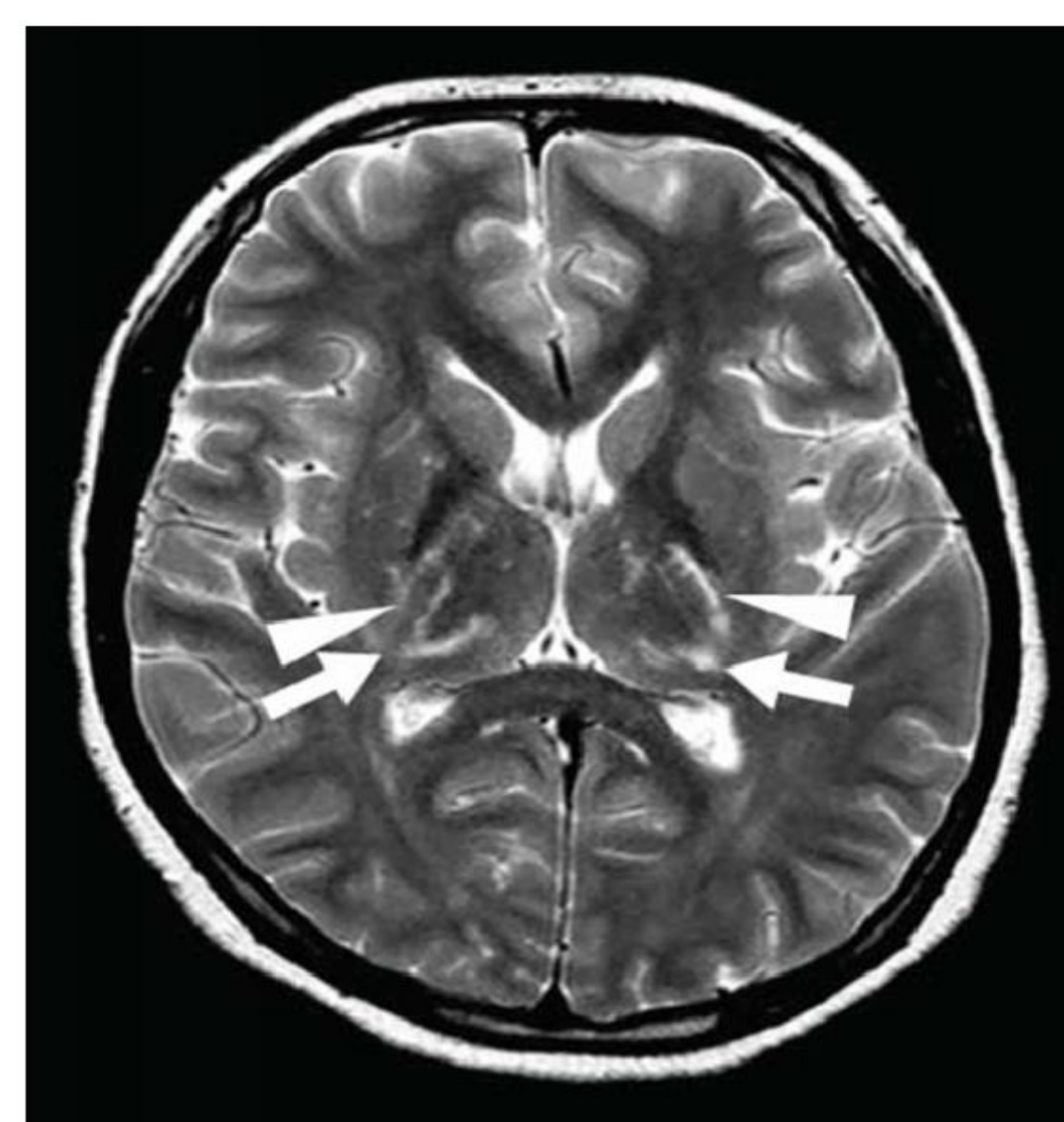


Figure 2: Example of a comparative MRI brain scan displaying thalamic changes. <https://www.hindawi.com/journals/bn/2014/154631>

	Year	Result	Further results
MRI brain	2016	High signal change in right mid brain	new FLARE in post. frontal lobe, left thalamus and cerebral peduncle. MRA brain was normal.
NMDA R	2016	Weakly positive	Further negative tests
Neuropsychological tests	2019	Low-average working memory	Low processing speed
CT TAP	2019	Liver lesion	Further U/S and BX nil significance.
EEG	2019	slowing in the right fronto-temporal region	
Autoantibody / viral/ metabolic/ thrombolytic screens	2019	Negative	ACE and anti-VGKC mildly positive

Table 1: Tests and scans performed.

Discussion

Despite extensive tests and a trial of IVIg, the cause of this patient's abnormal MRI brain is unclear. Careful follow up for deteriorating symptoms, new signs on exam and progression on MRI brain is important. Her presentation and the pattern of developing symptoms do not fit any clear aetiology. Many of the most common causes have been ruled out.

This teenager's second presentation due to this organic brain disease process in 2019 was to CAMHS. She had improved in terms of motor symptoms and speech, however, slowed speech, emotional lability and behavioral disturbance remained troubling for the patient and her family.

It is important to note that many neurological conditions can present with or involve behavioral or mood changes. Neurology and psychiatry need to have a close working relationship and a baseline knowledge of each others specialist work in managing such cases. This is difficult when there is limited neuro-psychiatry services in Ireland.^{3, 4}

Conclusions

An interesting presentation of neuropsychiatric symptoms with unclear aetiology including transient positive NMDA receptor result and structural MRI brain changes.

Teams require a cohesive approach to this challenging case resulting in neurological and psychiatric disorder.

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