Case Number 3
Creutzfeldt-Jakob Disease

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Case summary:

A 62-year-old man was admitted in October 2013 due to worsening involuntary movements of his arms and legs. This was confirmed on examination which revealed persistent jerky movements in his left upper limb associated with generalised stiffness and hyperreflexia in his lower limbs. His dystaxia had developed in August 2013 whilst visiting Argentina. An MRI and EEG were consistent with a diagnosis of Creutzfeldt-Jakob Disease (CJD). Over the following weeks, he developed rapidly progressive cognitive decline and myoclonus. The patient was eventually placed on palliative care.

History of presenting complaint:

A 62-year-old man presented in October 2013 with worsening involuntary movements of the left upper limb and dystaxia. These problems developed in August 2013 whilst visiting his daughter in Argentina where he was hospitalised for a few days and eventually discharged on anti-platelet agents for a presumed diagnosis of a posterior circulation cerebrovascular event.

The patient was falling frequently but there was no history of loss of consciousness. He had also lost an appreciable amount of weight possibly due to loss of appetite. He exhibited no psychiatric symptoms and had not been administered any new medications.

His clinical examination on admission revealed bilateral dystaxia, worse on the left, as well as a left alien hand syndrome. He had increased tone, particularly on the left side. Motor strength was normal on the right but difficult to assess on the left. The deep tendon reflexes were increased in both lower limbs but the plantar responses were flexor. Sensory exam seemed grossly intact.

Past medical and surgical history:

Hyperlipidaemia
Bilateral inguinal hernia

Drug history in hospital:

Drug	Dosage	Frequency	Type	Reason
Aspirin	100mg	Daily 0-1-0	Anti-platelet agent	Inhibits the production of thromboxane A2 by irreversibly inhibiting COX-1 enzyme – secondary prophylaxis for ischemic strokes
Lipitor (atorvastatin)	40mg	Daily 0-0-1	Statin	Lowers blood cholesterol by inhibiting HMG-CoA reductase – hyperlipidaemia treatment

Family history:

Strong history of diabetes mellitus.
One sibling succumbed to ischemic heart disease, another suffers from colonic cancer, and another sustained a cerebrovascular event.

Social history:

Retired green grocer, married with two grown children.

Systemic inquiry on admission:

- General Health: Looked cachectic
- Cardiovascular System: Blood pressure: 135/88 mmHg. Pulse: 81 bpm. Heart sounds: S1 + S2+S0
- Respiratory System: Trachea was central. Breathing rate = 16/min. SpO_2 was 96%. Decreased air entry in apices due to poor compliance.
- Gastrointestinal System: Vomiting during vigorous exercise
- Genitourinary System: Nil to note
- Central Nervous System: Nil to note
- Musculoskeletal System: No calf tenderness and no dependant oedema
- Endocrine System: Nil to note
- Mental State: Normal
- Temperature: 36.7 °C

Differential diagnosis of CJD

- Infectious: viral encephalitis, HIV dementia, progressive multifocal leukoencephalopathy, aspergillosis, syphilis, lyme disease, balamuthia, Whipple's disease.
- Toxic-metabolic: hepatic encephalopathy, porphyria, bismuth toxicity, heavy metal toxicity, uraemia.
- Autoimmune: Hashimoto's encephalopathy, paraneoplastic limbic encephalopathy, non-paraneoplastic autoimmune encephalopathy, lupus cerebritis, sarcoidosis.
- Metastases/neoplasm: non-autoimmune paraneoplastic conditions, metastasis to CNS, primary CNS lymphoma, lymphomatoid granulomatosis, gliomatosis cerebri.
- Iatrogenic: toxic exposure history or medication use.
- Neurodegenerative: Alzheimer's disease, dementia with Lewy bodies, frontotemporal dementia, corticobasal degeneration, progressive supranuclear palsy.
- Systemic: sarcoid, mitochondrial disease

Diagnostic procedures:

Blood work: Within normal limits.
Brain MRI: The diffusion-weighted sequence revealed increased signal along the fronto-parietal cortical ribbon, especially on the right side, as well as the right lentiform nucleus and head of the caudate (Figure 1).
EEG: Abnormal record showing generalised theta activity and periodic sharp wave complexes compatible with a diagnosis of Creutzfeldt-Jakob disease (Figure 2).

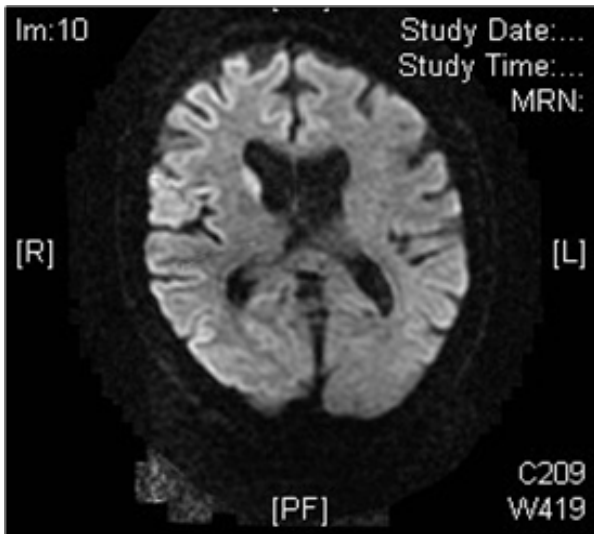

Figure 1: The brain MRI

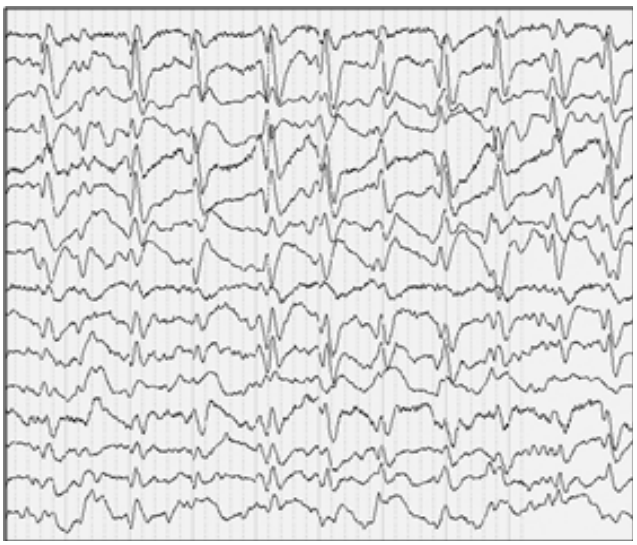

Figure 2: The EEG

Diagnosis:

During his hospital stay, the patient's cognitive function declined rapidly and the myoclonic jerks increased significantly. This together with the MRI and EEG findings confirmed the diagnosis of Creutzfeld-Jakob Disease (CJD) (refer to Fact Box for CDC Criteria).
This diagnosis was discussed with the wife and relatives, who were made aware of the grim prognosis. The Public Health Department was also notified.

Final treatment and follow ups:

Towards late October 2013, the patient was placed on palliative care and it was agreed with his relatives to strive for comfort measures only. The physical therapists helped with bedside therapy and upon the recommendation of the speech-language pathologists a nasogastric tube was inserted for feeding purposes. The medical treatment during his hospital stay comprised sodium valproate and clonazepam to control the myoclonic jerks as well as lorazepam, hydroxyzine and haloperidol to help calm him down. Pain was controlled with paracetamol which was eventually changed to codeine and ultimately he was put on a morphine infusion until he succumbed to his illness.

Fact Box 3:

Name of Condition: Creutzfeldt-Jakob Disease (CJD)

TCJD is a rare transmissible encephalopathy with prominent cerebral and cerebellar cortical spongiform degeneration and the presence of prions. It is mostly prevalent between the ages of 50 and 70 years.

Classification:

- Sporadic CJD, which occurs for no known reason.
- Familial CJD, which is hereditary.
- Iatrogenic CJD, which occurs from contact with infected tissue, possibly following a medical procedure.
- Variant CJD, which is transmitted via meat contaminated by CNS tissue affected by bovine spongiform encephalopathy (BSE) ('mad cow disease').

Clinical Features: CJD results in rapidly progressive cognitive decline with memory and/or personality changes, focal neurological signs, myoclonus, ataxia, akinetic mutism, visual disturbances, depression, and coma and death within one year of disease onset.

Diagnosis and Management: CJD can be diagnosed in patients with rapidly progressive dementia and at least two out of the four signs: myoclonus, visual/cerebellar signs, pyramidal/extrapyramidal signs, akinetic mutism and a positive result on at least one of the following laboratory tests:

- typical EEG findings with periodic sharp wave complexes;
- presence of protein 14-3-3 in the cerebrospinal fluid;
- characteristic MRI changes in the caudate nucleus and/or putamen on diffusion-weighted imaging (DWI) or fluid attenuated inversion recovery (FLAIR).

Treatment: There is as yet no effective cure or treatment for CJD. Preventive measures are in place in cases of bovine spongiform encephalopathy and iatrogenic CJD.

Prognosis: CJD is a rapidly progressive neurodegenerative condition often resulting in death within 6 months.

References:

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