Hypertrophy of multiple cranial nerves and spinal roots in chronic inflammatory demyelinating neuropathy

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Hereditary motor and sensory neuropathy (HMSN) types I and III and chronic inflammatory demyelinating polyradiculoneuropathy (CIDP) in developed countries are the most frequent causes of enlargement of peripheral nerves, “hypertrophic neuropathy”, with clinically palpable thickened nerves, visible on MRI. They may even be the cause of spinal cord compression.

We report on a patient who developed clinical features that were interpreted elsewhere initially as a Guillain-Barré syndrome, and years later diagnosed as Dejerine-Sottas disease (HMSN III). We discuss the differential diagnosis between HMSN III and CIDP in this patient with a fluctuating but insidiously progressive 26 year history, in whom MRI demonstrated marked enlargement of multiple cranial nerves and spinal roots. We think that this is a dramatic example of cranial nerve and spinal root enlargement in a case of CIDP, and stress the importance of making a correct differential diagnosis when the disease presents in early childhood.

Case report
A 30 year old woman had had an upper respiratory infection at the age of 4; a few days later she had developed a rapidly progressive mixed motor and sensory distal impairment of all four limbs, more pronounced in lower limbs. Seen then in a children’s hospital, she was diagnosed as possibly having Guillain-Barré syndrome on the basis of altered electrophysiological studies, and an acellular CSF with high protein content (1.9 g/l). She remained stable for 3 months, improving slowly with physiotherapy, but never reached normality again.

Two years after the onset, she was again investigated because of progressive kyphoscoliosis, pes cavus, and hammer toes for which she had reconstructive surgery. By then there had been...
clear neurological progression with increased generalised muscle atrophy and weakness distally in all four limbs, more so in the lower limbs, with distal sensory loss (pain, temperature, and light touch), but only lower limb areflexia. Nerve conduction velocities had remained abnormally slow (9 and 10 m/s in the right peroneal and ulnar nerves and considerable delay of distal latencies), and the CSF protein was still high at 2.4 g/l. A nerve biopsy apparently showed a hypertrophic sural nerve, with striking onion bulb formation and occasional inflammatory infiltrates. No genetic studies for demyelinating HMSM I were available at the time.

She was seen by one of us (LEC) for the first time at the age of 8, confirming previous clinical signs, but she now had generalised areflexia and a left extensor plantar response. Electromyographic and nerve conduction findings were in keeping with a severe mixed, predominantly demyelinating polyneuropathy. Protein in CSF was now 1.3 g/l. A short course of oral steroids (8 mg prednisone/day for 3 weeks) was administered elsewhere without benefit.

At the age of 16, further deterioration was noted with an insidiously progressive course, now with more distal involvement of the arms, both motor and sensory. She had developed “pseudoathetosis” distally in both hands, due to more profound loss of joint position sense and associated fine distal tremor. A left miotic pupil, unreactive to light, was recorded for the first time, the rest of the cranial nerves being normal.

Three years later, she developed insidiously bilateral marked proptosis and horizontal diplopia on left lateral gaze. An orbital CT showed generalised marked thickening of the orbital segments of the oculomotor nerves. The proptosis has persisted.

At the age of 22, she developed increasing difficulty in walking and her paraparesis evolved with bilateral extensor plantar response. An L2-L3 laminectomy at another hospital was performed because of spinal conus compression, but only enlarged thickened roots were found at surgery. Slight improvement occurred in the postoperative period, but 6 months later further motor and sensory deterioration occurred. MRI studies were performed before and after gadolinium DTPA administration. The spinal MRI showed thickening and contrast enhancement of nerve roots from their emergence from the spinal cord to the ganglia, both in the anterior and posterior segments (fig 1), with enlargement of the cauda equina, and widening of the intervertebral foramina. Cranial MRI showed both cavernous sinuses occupied by a mass-like lesion with a high signal intensity on the T2 weighted images (fig 2) and contrast enhancement. The first, second, and third divisions of the trigeminal nerves were clearly enlarged as they emerged through widened cranial foramina, with involvement of their frontal, supraorbital, and infraorbital branches. Contrast enhancement was seen in the more proximal segments involving the perineural aspects of the nerves. A 3 month trial of alternate day dexamethasone (4 mg) produced a remarkable motor improvement, which was sustained up to the age of 28 with a maintenance dose of dexamethasone (1 mg/alternate days), she was able to lead an independent life, walking with the support of one stick.

At the age of 28, further electrophysiological studies showed sporadic fasciculation and loss of motor units, surviving units being of increased amplitude. Decreased motor (20 m/s) and sensory conduction velocities (30 m/s), with reduced amplitude of sensory nerve action potentials, increased duration of motor and sensory evoked potentials, and conduction block of motor fibres on proximal stimulation in the tested nerve (median). No F response was registered. Transcranial magnetic stimulation evoked a long latency potential. Central motor conduction time, calculated by subtraction of latencies after vertex and radicular stimulation, was normal. There was an overall improvement in comparison with previous studies in the upper limbs, and a minor deterioration in the lower limbs. A possible diagnosis of CIDP was then considered. Intravenous immunoglobulin therapy (0.4 g/kg bodyweight/day) for five consecutive days was started. Two weeks later, she had improved markedly in both motor and sensory function, being able to walk without assistance, and her tremor decreased in intensity. Electrophys-
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