CASE REPORT

Paraneoplastic vertigo as the presenting symptom of a testicular seminoma

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SUMMARY

Vertigo is a common presenting symptom, but rarely may be caused by a malignancy. We present a case of a 44-year-old man who presented with nystagmus and vertigo precipitated by movement, with accompanying nausea and weight loss. Diagnostic workup revealed a right testicular mass that was resected and found to be a seminoma. The patient's symptoms resolved after surgical resection and treatment with corticosteroids.

BACKGROUND

This case highlights the need to recognise the possibility of a paraneoplastic syndrome for even common neurological symptoms that do not have a clear aetiology after initial workup. Many neoplastic conditions are highly treatable, and identifying the malignancy at an earlier stage may lead to improved outcomes.

CASE PRESENTATION

A 44-year-old previously healthy man presented with 11 months of vertigo and nystagmus, accompanied by 6 months of nausea and vomiting and a 30 pound weight loss. Symptoms began several months after a dirt bike accident that resulted in loss of consciousness. The patient reported frequent 7–10 s episodes of nystagmus which he perceived as his eyes flicking back and forth, and vertigo, described as his surroundings moving in a counter-clockwise direction. These symptoms were triggered by movement and loud noise. He later developed severe nausea and vomiting, and his vertiginous symptoms progressed to the point that he became bedbound. Workup included a normal audiogram, and vestibular testing showing an increase and decrease of nystagmus with caloric stimulation. He had negative serum antinuclear antibodies, Lyme serology, and anti-Hu, anti-Yo, and anti-Ri antibodies. Neuroimaging comprised a brain MRI (including gadolinium, fluid-attenuated inversion recovery and diffusion-weighted imaging) and a brain MR angiogram which showed non-specific, minimal white matter disease and a congenital cerebellar developmental venous anomaly (DVA) that was considered to be incidental and unrelated. The patient was given a diagnosis of periodic alternating nystagmus but did not respond to baclofen, the standard therapy for that condition. Because of unremitting symptoms, he was admitted for further workup. On examination, he had fast beating nystagmus to the left on left lateral gaze, upward gaze nystagmus and rotatory nystagmus with rightward gaze. Nystagmus extinguished

within a few seconds and was less pronounced with fixation.

INVESTIGATIONS

Cerebrospinal fluid (CSF) showed mildly elevated protein, normal glucose, no pleocytosis, no oligoclonal bands and negative flow cytometry. Anti-Ma, anti-Ta, anti-CRMP5 and anti-NMDA antibodies were negative. Imaging studies were performed because of concern for a paraneoplastic syndrome. A chest, abdomen and pelvis CT scan was negative for malignancy. A scrotal ultrasound revealed a right testicular mass. An α fetoprotein level was normal, and a β human chorionic gonadotropin level was undetectable.

DIFFERENTIAL DIAGNOSIS

Vertigo is a common presenting symptom. Our patient presented with nystagmus with features of both peripheral and central causes of vertigo. Peripheral causes of vertigo such as benign paroxysmal positional vertigo may be provoked by position such as head turning, but would not typically be associated with varying directions of nystagmus on examination, and would not have an unremitting course associated with weight loss. Vestibular neuritis is usually spontaneous but may have a positional component, is frequently preceded by a viral syndrome, and also would not have had such a prolonged course. Meniere's disease is associated with tinnitus and hearing loss, absent in this patient; its bouts often last hours. This patient's severe, persistent symptoms prompt suspicion of central causes of vertigo. Tumours such as acoustic schwannomas may present with associated hearing loss and headache and are readily seen on neuroimaging. Multiple sclerosis may present with vertigo, and typical imaging findings may be seen on brain MRI. Vascular causes such as a pure cerebellar infarction or brainstem ischaemia may cause vertigo, although the latter typically presents with additional neurological symptoms. This patient was found on neuroimaging to have a DVA of the cerebellum, but most DVAs are asymptomatic unless accompanied by cavernoma with microhaemorrhage.¹ His history of trauma from an accident may produce postconcussive symptoms or traumatic brain injury, but neither would be expected to produce this degree of persistent nystagmus and vertigo.

Paraneoplastic syndromes may rarely cause vertigo, and do not always present initially with symptoms from the underlying tumour. In this previously healthy male patient in his 40s who does not smoke, lymphoma and germ cell tumours would be

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the more likely aetiologies of a paraneoplastic syndrome, although other malignancies may still occur atypically at a younger age.

TREATMENT

The patient underwent unilateral orchiectomy for a stage 1 testicular seminoma followed by 3 days of intravenous methylprednisolone.

OUTCOME AND FOLLOW-UP

In the month following surgery and immunosuppressive therapy, the patient's symptoms improved dramatically. Three months later, the patient returned to employment and had only rare symptoms if he turned his head sharply to the right.

DISCUSSION

This case illustrates the importance of considering an evaluation for a paraneoplastic syndrome in a patient with persistent, unexplained vertigo and nystagmus. Several malignancies, including testicular germ cell tumours,^{2 3} small cell lung cancer,^{4 5} adenocarcinoma,⁴ Hodgkin's lymphoma⁶ and pancreatic cancer,⁷ have been associated with paraneoplastic vertigo and nystagmus.

Patients with testicular germ cell tumours have a wide range of reported paraneoplastic syndromes, from isolated neuro-ophthalmological findings as in our patient, to fatal limbic and brainstem encephalitis.^{8 9} The germ cell tumour is often not symptomatic on initial presentation, highlighting the need for clinical suspicion of a paraneoplastic syndrome.

Paraneoplastic syndromes due to autoantibodies are thought to arise from the immune response to tumour proteins.¹⁰ These autoantibodies then react to normal tissues, of either similar origin or containing shared antigens, causing a myriad of clinical syndromes. Antibodies associated with paraneoplastic nystagmus, vertigo and encephalitis include anti-Ta, anti-Ma, anti-Yo, anti-Hu anti-Purkinje cell antibody, and may be isolated from the serum and CSF.^{4 6 7 9 10} These antibodies may be associated with a variety of neurological symptoms.¹¹ Patients may also have associated inflammatory findings on neuroimaging and in CSF. The precise mechanism for nystagmus or vertigo, even in the presence of autoantibodies, is unknown.¹²

Despite the numerous autoantibodies that have been identified to date, in many cases patients with paraneoplastic syndromes test negative for known autoantibodies.¹⁰ Diagnostic criteria have been proposed, including addressing cases in which antibodies are not detected.¹³ In this case, the presence of cancer and resolution after cancer treatment is consistent with a paraneoplastic syndrome. Patients should receive ongoing surveillance for the cancer and for the recurrence of the paraneoplastic syndrome.

The cornerstone of therapy is treatment of the underlying tumour. Corticosteroids and intravenous immunoglobulin have also been beneficial in some patients. Outcomes vary from complete symptom resolution to progressive neurological disease.

Prognosis is generally better in patients who are younger and have treatable tumours.

Learning points

- ▶ A paraneoplastic syndrome should be considered in the differential diagnosis of a patient who presents with persistent, unexplained vertigo and nystagmus.
- ▶ Testicular germ cell tumours, small cell lung cancer and Hodgkin's lymphoma have been associated with paraneoplastic vertigo and nystagmus.
- ▶ Presentations of paraneoplastic syndromes due to testicular germ cell tumours vary from isolated neuro-ophthalmological findings to fatal limbic and brainstem encephalitis.
- ▶ Anti-Ma, anti-Ta, anti-Hu and other antibodies are associated with neurological paraneoplastic syndromes, but are not always present.

Competing interests None.

Patient consent Obtained.

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