

# Paraneoplastic opsoclonus-myoclonus syndrome as a rare presentation of parotid adenocarcinoma

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## Abstract

Paraneoplastic Opsoclonus-Myoclonus Ataxia Syndrome (POMA) is a rare neurological condition that affects approximately 1 in 10,000,000 people annually. This syndrome is poorly understood and can lead to long-term cognitive, behavioral, and motor complications. Opsoclonus is characterized by involuntary, rapid, repetitive, multi-vectorial oscillations of the eyes occurring in all directions of gaze. It is accompanied by diffuse or focal body myoclonus and may or may not include ataxia and other cerebellar signs. POMA is typically a paraneoplastic syndrome associated with neuroblastoma in childhood and breast carcinoma or small-cell lung carcinoma in adults. Additionally, viral or toxic agents are known to play a role in its etiology, and the immune system is involved in the pathogenesis. We report a case of a 41-year-old man with anti-Ri antibody opsoclonus-myoclonus syndrome and parotid adenocarcinoma involvement. After diagnosing opsoclonus-myoclonus syndrome, the patient underwent multimodal immunotherapy treatment, resulting in partial remission of the neurological symptoms.

**Keywords:** opsoclonus, myoclonus, parotid, adenocarcinoma, paraneoplastic

## Introduction

Opsoclonus-myoclonus (OMS) is a rare autoimmune condition resulting from cerebellar degeneration. It often presents as a paraneoplastic syndrome, where a cancer remote from the brain induces cerebellar dysfunction unrelated to metastases [1-3]. In most adults with opsoclonus-myoclonus, the etiologies can be neoplastic, infectious, metabolic, or idiopathic in nature [5,6]. The symptoms of cerebellar dysfunction in the case presented include opsoclonus, myoclonus, and ataxia, which has led to its colloquial name, “dancing eyes, dancing feet syndrome”. Opsoclonus is characterized by rapid, dysrhythmic, and uncoordinated eye movements [3,7]. The neuronal damage is induced by antibodies typically associated with the primary pathology [4]. Treatment approaches target the underlying cause and may involve using steroids, plasmapheresis, immunosuppressive agents, or other anti-inflammatory therapies [2,4].

In children with opsoclonus-myoclonus resulting from neuroblastoma, neurological sequelae are often retained. In adult cases, opsoclonus-myoclonus can be considered an autoimmune phenomenon with idiopathic or neoplastic origins, often accompanying breast carcinoma or small-cell lung carcinoma [4,5]. There appears to be a genetic predisposition to autoimmunity in these patients, as frequent autoimmune disorders are observed in families of those with Paraneoplastic Opsoclonus-Myoclonus Ataxia Syndrome (POMA), and there is a correlation with the Human Leucocyte Antigen (HLA) class II locus DR B1\*01 [7]. The pathogenesis is thought to be immune-mediated based on the paraneoplastic nature of the syndrome and its symptomatic response to immunosuppressive therapy. Therapeutic benefit has been described with the use of steroids, intravenous immunoglobulins, cyclophosphamide, azathioprine, and rituximab [4-6]. The prognosis of OMS depends on early management and successful treatment, highlighting the importance of promptly identifying the syndrome and its underlying cause [7,8].

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### Informed Consent

The authors stated that the written consent was obtained from the patient presented in the study.

### Conflict of Interest

No conflict of interest was declared by the authors.

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In this case presentation, our objective is to underscore the significance of conducting a thorough investigation for paraneoplastic syndrome in POMA (polymyositis) and to highlight its potential association with rare types of cancer.

### Case presentation

Behavioral symptoms manifested in a 41-year-old male patient, with complaints of bilateral eyeball tremor, staggering gait, and frequent falls beginning 3 weeks after the initial onset. Neurological examination revealed spontaneous, involuntary, arrhythmic, and conjugate rapid eye movements, as well as facial, axial, and appendicular myoclonus, along with gait ataxia. Motor strength and deep tendon reflexes were found to be normal. Routine blood tests, serum B12 and folate levels, erythrocyte sedimentation rate, C-reactive protein, viral scan, vasculitic scan, chest X-ray, brain CT, and MRI all showed normal results. Anti-neuronal antibodies were assessed, and the presence of anti-Ri antibodies was confirmed. The cerebrospinal fluid (CSF) analysis revealed normal cell counts and negative cytology, and viral markers, but there was an observed increase in protein (63 mg/dl) in the CSF. PET-CT did not reveal any pathological involvement. To treat the patient, intravenous methylprednisolone pulse steroid therapy was administered at a dose of 1000 mg/day for 7 days, resulting in a significant improvement in symptoms. During clinical follow-ups, a mass lesion was identified under the left ear, leading to a biopsy, which revealed polymorphous low-grade adenocarcinoma. The patient underwent surgery, and partial improvement was observed at the 6-month follow-up, coinciding with the anti-Ri antibody being reported as negative. Written consent to publish this case report was obtained from the patient.

### Discussion

POMA is a rare autoimmune neurological paraneoplastic syndrome that arises from the distant effects of a tumor. Nevertheless, it is crucial to differentiate it from other neurological manifestations related to metastasis, infection, ischemia, and metabolic disturbances [5,6]. To achieve this, a comprehensive medical history is necessary to identify risk factors, clinical complaints and conduct a thorough physical examination [6]. Despite the unclear pathogenic mechanisms of POMA, specific tumor types have been linked to well-characterized anti-neuronal antibodies [7,8]. In particular, the presence of the anti-Ri antibody has been associated with malignant neoplasms of the breast. This antibody targets the Nova proteins Nova-1 and Nova-2, which play a role in regulating synaptic proteins in the central nervous system.

In patients with paraneoplastic OMS, surgical treatment of the underlying neoplasm has been shown to improve neurological symptoms. Immunotherapy treatment has demonstrated the potential for partial or complete recovery of POMA in some cases and can include the use of steroids, intravenous immunoglobulin, and cyclophosphamide [3,5]. Immunosuppressive therapy should be administered in the early stages of the disease. Recognizing and diagnosing paraneoplastic neurological syndromes is essential since neurological symptoms typically precede direct symptoms of the primary tumor, and early treatment offers a better chance of a favorable outcome [7,8].

### Conclusion

Due to the rarity of adult POMA syndrome, only a small case series and a few case reports link it to breast and small-cell lung carcinoma exist. Currently, there are no reported cases of POMA syndrome associated with parotid adenocarcinoma in the literature.

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