症例報告

Polymyositis associated with Primary Cerebral Malignant Lymphoma:
A Case Report

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Abstract

We present the case of a 70-year-old man with polymyositis associated with primary cerebral lymphoma, who was hospitalized for evaluation of headaches, dizziness and visual disturbance. Imaging studies revealed an enhanced cerebral mass. Following treatment with steroids, the mass regressed. However, the patient was subsequently readmitted 22 months later, and histologic analysis of a biopsy specimen confirmed a diagnosis of large-cell lymphoma. Approximately 23 months following his initial presentation, the patient developed muscle weakness and atrophy. A muscle biopsy specimen revealed polymyositis. Despite therapy, the patient died within 1 month. To our knowledge, this is the first reported case of polymyositis associated with primary cerebral lymphoma.

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Introduction

Polymyositis has been associated with various malignant tumors, with an estimated incidence of 5-10%[7]. Among them, lung, uterine and gastric cancers are frequently cited[10][11]. There have been reports of polymyositis associated with malignant lymphoma, all of which have involved systemic malignant lymphoma, mostly Hodgkin's disease[1][4][8]. To our knowledge, there has been no previous report describing polymyositis associated with regional malignant lymphoma of the brain.

Case Report

A 70-year-old man presented with complaints of double vision, mild headache, and dizziness.

There was no significant past medical history. Family history was unremarkable. A mild headache had appeared in early November 1993, followed by the appearance of diplopia and dizziness. The patient was admitted to our department on November 6, 1993. At admission, he had left abducens paralysis, left deviation of the tongue, and mild left facial paralysis. There was no disturbance of consciousness or cognition. Sensory, motor, and cerebellar functions were intact. Computed tomography (CT) of the brain performed at admission revealed a small, high-density mass surrounded by a low-density area on the left side of the fourth ventricle, which was homogeneously enhanced by a contrast agent. Magnetic resonance imaging (MRI) following admission indicated that the mass noted on CT was located in the juxtaependymal body. The mass...
A: B: Magnetic resonance imaging (MRI; axial) demonstrates that the mass is hyperintense on T2-weighted images (A), and shows uniform enhancement with Gd-DTPA (B).

C: Approximately 20 months following initial presentation, the mass completely regressed, but reappeared on MR images obtained during the second admission. An enhancing mass is seen near the left lateral ventricle.

was of low signal intensity on T1-weighted images, of high intensity on T2-weighted images, and of uniform intensity on Gd-DTPA-enhanced T1-weighted images (Fig. 1A, B). A cerebral angiogram revealed no abnormal findings. A $^{67}$Ga scan demonstrated focal activity at the site of the cerebral lesion but no other focal areas of uptake. Laboratory values were within normal limits except for a slightly increased serum ferritin concentration. An HIV-1 antibody test was non-reactive. Although the beta-2 microglobulin concentration in the cerebrospinal fluid (CSF) was high, the results of tests for oligoclonal bands and myelin–basic protein were normal. Steroid therapy was initiated for a presumed diagnosis of primary cerebral malignant lymphoma. Dexamethasone was started at 12 mg/day, and this dosage continued for 5 days. We tapered the dose by 4 mg at intervals of 4 days, and kept the dosage at 2 mg/day since then. Symptoms markedly improved, and the mass seen on CT and MRI diminished in size over time. The patient was discharged on February 4, 1994 and was followed as an outpatient. The mass on CT and MRI completely resolved within 1 year, and there were no neurologic deficits. The patient was readmitted for diabetes thought to be steroid-induced on July 12, 1995.

About 2 months following readmission to the internal medicine unit for diabetes control, the patient developed right partial paralysis, predominantly involving the lower extremity, and right facial hypesthesia. A cerebral CT scan revealed a high-density, 1 cm mass close to the left ventricular body, that was homogeneously enhanced by a contrast agent. MRI revealed that this area produced an iso-intense signal on T1-weighted images, a high signal intensity on T2-weighted images, and uniform signal intensity on T1-weighted Gd-DTPA images (Fig. 1C). On September 20, 1995, the patient underwent a stereotactic biopsy. Histologic examination of the biopsy specimen indicated non-Hodgkin's lymphoma of B-cell type (Fig. 2A), and radiotherapy was initiated. Serum ferritin and beta-2 microglobulin concentrations in the CSF were both within the normal ranges. There were no findings suggestive of systemic malignant lymphoma.

One month following the second episode, the patient began to complain of generalized myalgia. The symmetric proximal muscles had very severe myalgia, and atrophy occurred at the same time. Blood biochemistry studies revealed a markedly increased creatine phosphokinase (CPK) concentration, and fractionation indicated that this was mostly of muscular origin. Furthermore, serum aldolase, glutamic oxaloacetic transaminase (GOT) and glutamic pyruvic transaminase (GPT) concentrations were also markedly increased. Arthralgias, myalgias, and deteriorating muscular strength progressed rapidly, along
Fig. 2  Histologic examination of the cerebral lesion and muscle biopsy specimen

A : Photomicrograph demonstrating a diffuse, large-cell type, non-Hodgkin’s lymphoma (B-cell type) (H & E stain, ×200)
B : A biopsy sample of the muscle revealing a moderate inflammatory cell infiltrate with irregular muscle cells and evidence of necrosis. This pattern is characteristic of polymyositis (H & E stain, ×100).

Table 1  Criteria of PM/DM

1. Symmetrical weakness of the limb–girdle muscles and anterior neck flexors (progressing over weeks to months)
2. Typical pathology of muscle–biopsy (necrosis of Type I and Type II fibers, phagocytosis regeneration with basophilia, large vesicular sarcolemmal nuclei and prominent nucleoli, atrophy in a perifascicular distribution, variation in fiber size, and an inflammatory exudate, often perivascular)
3. Elevation in serum of skeletal–muscle enzymes (CPK, aldolase, GOT, GPT, LDH)
4. Typical electromyogram (short, small, polyphasic motor unit, fibrillations, positive sharp waves and insertional irritability, and bizarre, high-frequency repetitive discharges)
5. Typical dermatologic features (heliotrope, Gottron’s sign, erythematous dermatitis of the knees, elbows, face, neck and upper torso)

Confidence limits
   definite : 3 of 4 criteria (plus the rash) for DM
   4 criteria (without the rash) for PM
   probable : 2 criteria (plus the rash) for DM
   3 criteria (without the rash) for PM
   possible : 1 criteria (plus the rash) for DM
   2 criteria (without the rash) for PM


with atrophy predominantly affecting the proximal muscles. Clinical findings showed no skin symptoms or other collagen disease. A muscle biopsy of the left rectus femoris was performed and pathologic examination of the specimen indicated polymyositis. A representative pathologic muscle specimen (Fig. 2B) showed infiltration of inflammatory cells and irregularly sized muscle cells as well as degeneration and necrosis. We detected CD8–positive T–cells in the specimen by immunologic staining. We performed MRI of the brain, and cervical, thoracic and lumbar spinal cord, but dissemination of malignant lymphoma was not detected. Despite steroid therapy, the patient died of disseminated intravascular coagulation (DIC) associated with severe aspiration.
pneumonia due to swallowing disturbance, about 1 month following the initiation of therapy. An autopsy was not performed.

**Discussion**

Malignancies frequently associated with polymyositis/dermatomyositis include tumors of the breast, lung, female genitalia and digestive system, as well as systemic malignant lymphoma. The incidence of malignancy in patients over 40 years of age is much higher in association with dermatomyositis than with polymyositis. But the relationship between malignancy and polymyositis/dermatomyositis remains uncertain.

Polymyositis is a diffuse, inflammatory disease with decreasing symmetric muscular strength, involving the proximal limbs and cervical and pharyngeal muscles. It is termed dermatomyositis when associated with characteristic skin symptoms. The diagnosis of polymyositis in the present case was made in accordance with the accepted criteria, and all findings were in conformity with polymyositis, although no electromyographic studies were undertaken. The pathogenesis and pathophysiology of polymyositis remain unknown. Polymyositis associated with malignant tumors has been discussed very little from a statistical standpoint, and some authors question the relationship between these two entities. We speculate that a substance mediated by B-cell lymphoma activates the CD8-positive T-cells, cytotoxic T-cells (CTL) and macrophages. Then the CTLs release perforin, which perforates the endomysium. Finally, the CD8-positive T-cells and macrophages invade the muscle fibers, causing necrosis. In our case, a muscle biopsy specimen showed infiltration of interstitial CD8-positive T-cells by immunologic staining.

**Conclusion**

Although there have been reports of polymyositis associated with systemic malignant lymphoma, this appears to be the first reported case of polymyositis associated with primary cerebral malignant lymphoma. Whether any relationship exists between polymyositis and cerebral lymphoma remains unknown.

**References**

要旨
頭蓋内原発悪性リンパ腫に併発した多発性筋炎の1例
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頭蓋内原発悪性リンパ腫に併発した多発性筋炎の1例を経験した。症例は70歳の男性。主訴は頭痛、めまい、視力障害。CT、MRIにて第4脳室周囲に腫瘍を認め、悪性リンパ腫を疑いステロイド療法を施行し、腫瘍および頭痛、めまい、視力障害は消失した。しかし、初回入院より約22カ月後、顔面を含む右顔面麻痺が出現し、CTにて左側脳室近傍に腫瘍の形成を認めため、生検を行ったところB-cellタイプの悪性リンパ腫であった。また、初回発症時より約23カ月後、四肢の筋力低下と筋痛を訴え始め、血中の筋酵素類の上昇も認めため、筋生検を行ったところ多発性筋炎の所見であった。われわれの経験した範囲内では、頭蓋内原発悪性リンパ腫に併発した多発性筋炎の報告はなく、稀な症例と思われ、ここに示した。