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CASE REPORT

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Advanced lung adenocarcinoma detected by choroidal metastasis in a patient with amyopathic dermatomyositis: A case report

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Abstract

A 63-year-old Japanese man with amyopathic dermatomyositis treated with immunosuppressants became aware of distortion of his left visual field, and a metastatic choroidal tumor was suspected. His chest computed tomography (CT) showed a pulmonary nodule in the right upper lobe and mediastinal lymphadenopathy, and he was diagnosed with advanced lung adenocarcinoma with choroidal metastasis. Malignancies associated with dermatomyositis (DM) are often rapidly progressive and, in choroidal metastasis associated with lung cancer, a choroidal lesion is often diagnosed prior to lung cancer; therefore, CT performed at the time of diagnosis of choroidal metastasis may show lung cancer lesions. When ocular symptoms are observed in DM patients, metastatic malignancies should be suspected, and systemic examinations, such as positron emission tomography (PET)-CT, should also be performed.

KEYWORDS

adenocarcinoma, choroidal metastasis, dermatomyositis

INTRODUCTION

Dermatomyositis (DM) is one of the most common autoimmune diseases that can be complicated by malignancies.[1] DM with malignancy is often rapidly progressive, affecting patient prognosis.[2–5]

Metastatic choroidal tumors are the most frequent form of metastatic ocular tumors,[6–8] and the primary sites of metastatic choroidal tumors are breast (40%–53%) and lung cancer (20%–29%).[6,8–10] Compared to patients with breast cancer with metastatic choroidal tumors, ocular symptoms and metastatic choroidal tumors tend to be found and diagnosed before diagnosing in patients with lung cancer.[7–10]

There have been no reports of lung cancer with choroidal metastasis in patients with DM so far. Herein, we present, to the best of our knowledge, the first case of rapidly progressive lung adenocarcinoma in a patient with amyopathic dermatomyositis (ADM) complicated with interstitial lung disease (ILD) presenting with choroidal metastasis.

CASE REPORT

A 63-year-old Japanese man noticed left visual field distortion and was evaluated in the ophthalmology department. He was diagnosed with ADM complicated with ILD when he was 62 years old and treated with prednisolone (5 mg/day) and tacrolimus (3 mg/day). One year later, computed tomography (CT) performed during a routine visit revealed bilateral peripheral pulmonary interstitial reticular opacities with no obvious shadows suspicious of malignancy (Figure 1a). At the ophthalmology department, fundoscopy showed a 6 × 6 mm choroidal tumor with petechial white spots in the lower part of the left optic nerve papilla, and optical coherence tomography showed mild serous retinal detachment in the left macula (Figure 2). His systemic CT revealed a nodule in the right upper lobe with mediastinal lymphadenopathy, and multiple bone metastases that had not been seen 2 months prior (Figure 1b). Upon admission to the Respiratory Medicine department, his laboratory

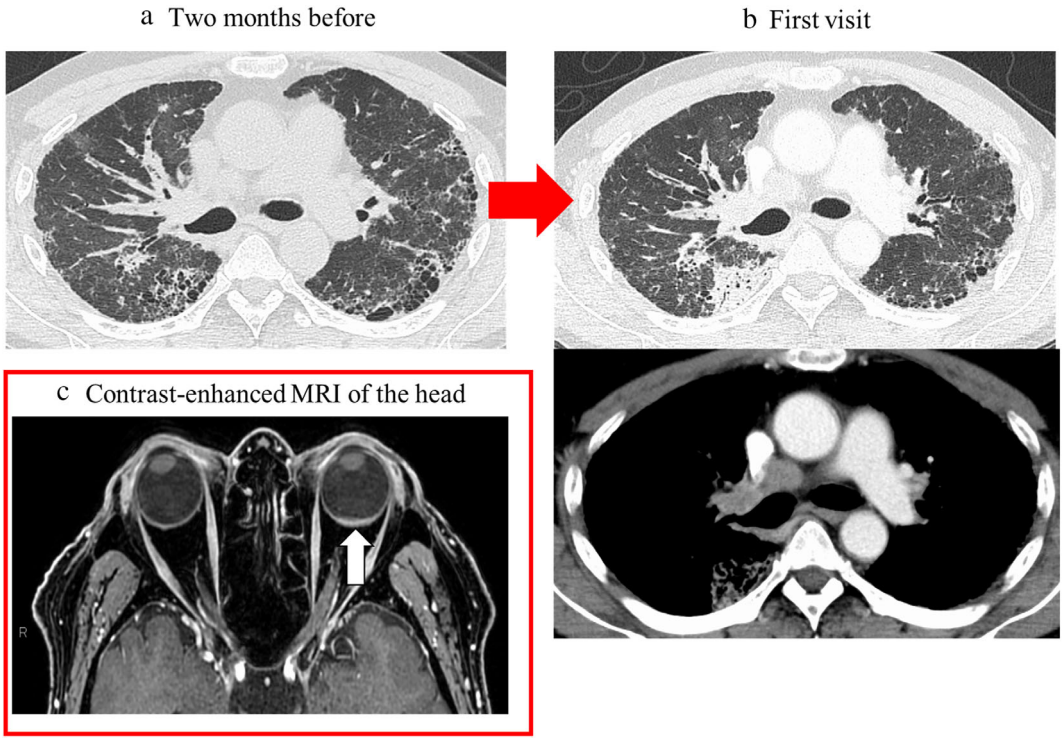

FIGURE 1 (a) Computed tomography (CT) scan image acquired 2 months prior to the first visit to our department and (b) at the time of the first visit to our department (b). (a) Reticular shadows and cystic clusters with a predominance of subpleural areas in bilateral lungs as ADM-associated interstitial lung disease are seen. (b) New mass shadow in the right upper lobe approximately 3.0 cm in length and diameter and mediastinal lymphadenopathies are newly observed. (c) Contrast-enhanced magnetic resonance imaging of the head, showing left retinal thickening (white arrow). Abbreviations: ADM: amyopathic dermatomyositis; CT: computed tomography; MR: magnetic resonance imaging

findings showed increased serum levels of sialylated carbohydrate antigen Krebs von den Lungen-6 (1678 IU/ml) and carcinoembryonic antigen (43.7 ng/ml); anti-aminoacyl tRNA synthetase antibody was positive (Table 1). In addition, choroidal thickening on the left was observed on contrast-enhanced magnetic resonance imaging of the head (Figure 1c). Bronchoscopic mediastinal lymph node biopsies yielded a diagnosis of lung adenocarcinoma without driver gene mutation (clinical stage IVB). After cessation of tacrolimus, first-line chemotherapy with carboplatin and nab-paclitaxel was started. This treatment was chosen because of its low risk of ILD exacerbation.[11] The lung and metastatic left choroidal tumors responded to this treatment, with a 50% reduction in size; furthermore, his serous retinal detachment and left visual field improved (Figure 3).

DISCUSSION

Herein, we present the first case of rapidly progressive lung adenocarcinoma and choroidal metastasis in a patient with ADM complicated with ILD undergoing immunosuppressant treatment, in whom the rapidness of initiation and progression of lung cancer was observed incidentally.

DM is an autoimmune disease with muscular and skin manifestations, and 15%–30% of patients with DM are reported to develop malignancy.[1] In addition, malignancies diagnosed within 3 years after DM are often in the advanced stages at the time of diagnosis.[2–4] Even in our patient, the diagnosis of advanced-stage lung adenocarcinoma was made only about a year after the diagnosis and treatment of DM with immunosuppressants. The prognosis of patients with DM-related malignancies is reported to be poor.[1,3–5,12] However, further data are needed on the prognosis of lung cancer in patients with ADM initially treated with immunosuppressants after discontinuation of immunosuppressants.

Immunosuppressants were also considered as one of the precipitating factors for the rapidly progressive lung adenocarcinoma in this patient. Indeed, our patient used tacrolimus, one of the calcineurin inhibitors, which increases the expressions of several factors related to carcinogenesis, including transforming growth factor-β (contributes to tumor cell invasion and metastasis),[13,14] vascular endothelial growth factor (promotes angiogenesis and vascular tumor growth),[15] and interleukin-6 (induces activation of B cells that promote the development of lymphoproliferative diseases).[16] In addition, while the tumor doubling time (TDT) of the lung tumor was reported to be around 3–6 months,[17] faster TDT was reported in patients treated with immunosuppressants (as fast as 40–70 days).[18] Therefore, tacrolimus treatment might have influenced the rapid progression of lung adenocarcinoma in our patient.

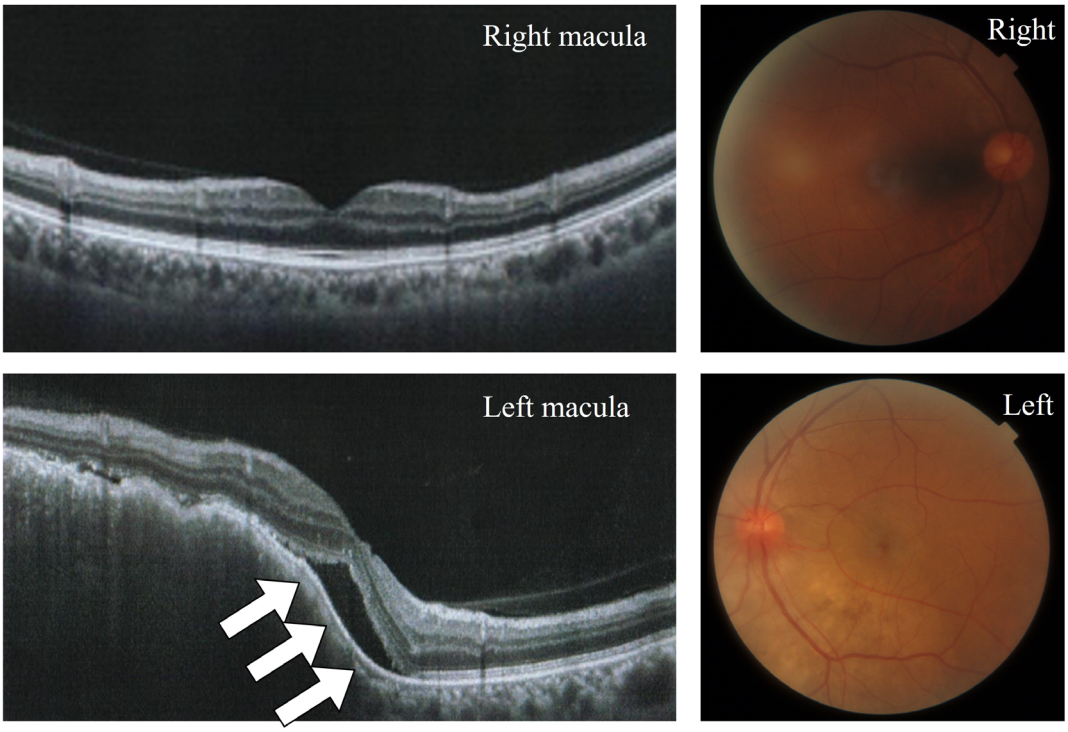

FIGURE 2 Optical coherence tomography, showing mild serous retinal detachment in the macula (white arrows). Moreover, the fundoscopy evaluation shows white spots in the lower part of the left optic nerve papilla (white circle). Abbreviation: OCT, optical coherence tomography

TABLE 1 Laboratory findings on admission

Blood cell counts		Blood chemistry		Serology	
WBC	12 200/μl	TP	7.7 g/dl	CRP	2.19 Mg/dl
Neutrophils	74.9%	Alb	4.0 g/dl	KL-6	1678 U/ml
Lymphocytes	16.4%	AST	15 IU/l	SP-D	312 ng/ml
Eosinophils	2.7%	ALT	9 IU/l	CEA	43.7 ng/ml
Monocytes	6.0%	LDH	253 IU/l	CYFRA	3.3 ng/ml
Basophils	0.0%	ALP	153 IU/l	Rheumatoid factor	8.3 U/ml
RBC	468×10^4/μl	γ-GTP	18 IU/l	ANA	<40 titer
Hb	13.7 g/dl	BUN	14 mg/dl	Anti ARS antibody	60.1 CI
Ht	36.3%	Cre	0.72 mg/dl	Anti MDA-5 antibody	<1.0 U/ml
Platelets	31.6×10^4/μl	CK	37 IU/l	Anti TIF1-γ antibody	<1.0 U/ml
		Na	141 mmol/l	Anti Mi-2 antibody	<1.0 U/ml
		K	3.9 mmol/l	β-D glucan	<6.0 pg/ml
		Cl	102 mmol/l	Aspergilous antigen	0.1 CI

Abbreviations: Alb, albumin; ALP, alkaline phosphatase; ALT, alanine aminotransferase; ANA, antinuclear antibody; ARS, aminoacyl tRNA synthetase; AST, aspartate aminotransferase; BUN, blood urea nitrogen; CEA, carcinoembryonic antigen; CK, creatine kinase; Cre, creatinine; CRP, C-reactive protein; CYFRA, cytokeratin 19 fragment; Hb, hemoglobin; Ht, hematocrit; KL-6, sialylated carbohydrate antigen Krebs von den Lungen-6; LDH, lactate dehydrogenase; MDA5, melanoma differentiation-associated gene 5; RBC, red blood cell; SP-D, pulmonary surfactant protein-D; TIF1-γ, transcriptional intermediary factor 1-γ; TP, total protein; WBC, white blood cell; γ-GTP, gamma-glutamyl transferase.

Previous reports have shown that 4.7% of metastatic choroidal tumors were clinically diagnosed among 213 patients with malignancies, while 12.0% were diagnosed during autopsy in 230 autopsy cases with malignancies.[19,20] The common primary sites of metastatic choroidal tumors are the lung and breast.[6,8–10] Symptoms of metastatic choroidal tumors include distortion or loss of the visual field, and loss of vision.[7,8] However, patients with metastatic choroidal tumors are often asymptomatic as tumors located away from the macula might not lead to ocular symptoms.[7,8,10] Compared with metastatic choroidal tumors of primary tumors such as breast cancer, metastatic choroidal

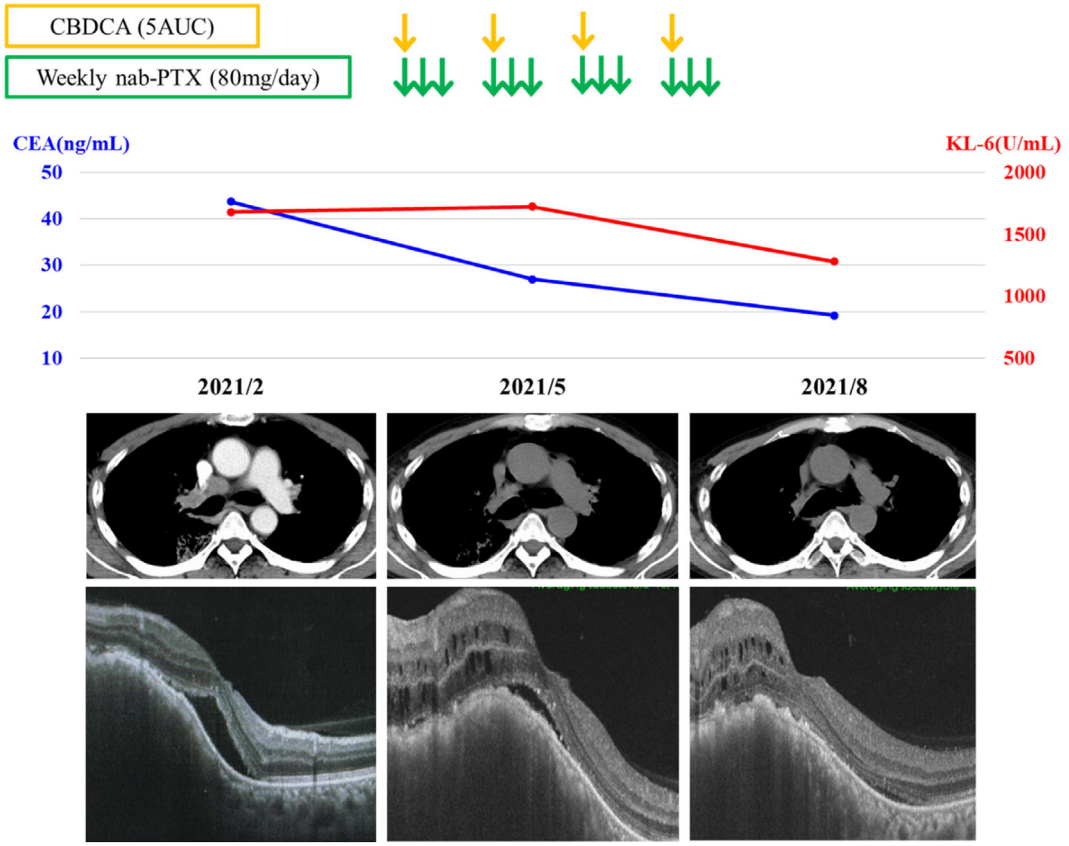

FIGURE 3 Clinical course of the patient. Abbreviations: CBDCA, carboplatin; AUC, area under the concentration-time curve; nab-PTX, nab-paclitaxel; KL-6, sialylated carbohydrate antigen Krebs von den Lungen-6, CEA, carcinoembryonic antigen

tumors of lung cancer are often preceded by ocular symptoms; thus, choroidal tumors can serve as an indication of future lung cancer diagnosis in some patients with lung cancer.[7,8,10]

Our patient showed a good response to systemic chemotherapy for advanced lung adenocarcinoma, with shrinking of the lung and choroidal tumors with improved ocular symptoms due to the resolution of serous retinal detachment. Regarding tumor responsiveness to systemic chemotherapy, the response rate of lung cancer with metastatic choroidal metastasis has previously been reported to be about 68%.[7]

Here, we present the first case of rapidly progressive lung adenocarcinoma and choroidal metastasis in a patient with ADM complicated with ILD undergoing immunosuppressant treatment. Malignancies associated with DM can progress rapidly clinically, have poor prognosis and optic insufficiency, and can be metastatic choroidal tumors from lung and other cancers. If a patient with DM presents with ocular symptoms, systemic evaluations, such as positron emission tomography-CT, should be undertaken to ensure early diagnosis of malignancies.

CONFLICT OF INTEREST

The authors declare that they have no competing interests.

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