



## Case report

# Inflammatory myopathy associated with a thymoma: A case report<sup>☆</sup>



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### ABSTRACT

Inflammatory myopathies, especially dermatomyositis, can be associated with tumor formation. The case is reported of a rare combination of dermatomyositis and thymoma in a patient with no risk factors of paraneoplastic myopathy. The patient progressed slowly despite resection of the mediastinal mass.

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### Miopatía inflamatoria asociada a timoma: reporte de un caso

#### RESUMEN

Las miopatías inflamatorias y, principalmente, las dermatomiositis se asocian en un porcentaje significativo de los casos a procesos tumorales. Presentamos un caso de asociación poco habitual de dermatomiositis con timoma en una paciente sin factores de riesgo de miopatía paraneoplásica, en ausencia de miastenia gravis y con una evolución tórpida a pesar de la resección de la masa mediastínica.

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## Introduction

Inflammatory myopathies are autoimmune diseases of unknown etiology, infrequent, with female predominance and

a maximum incidence between the fifth and sixth decades of life. They are characterized by the presence of proximal muscle weakness, skin lesions in the case of dermatomyositis and evidence of muscle inflammation.

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There is a well-known association between inflammatory myopathies and cancer, especially in patients with dermatomyositis. We present a case of dermatomyositis associated with a mediastinal mass compatible with thymoma.

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### Clinical case

A 47-year-old Nigerian woman, assessed in the outpatient clinic of Rheumatology in July 2015 due to symmetrical inflammatory arthralgias in the hands and knees, of one year of evolution, edema of the hands, morning stiffness during 15–30 min, myalgias and mild muscle weakness in lower limbs, Raynaud's phenomenon without ischemic lesions, alopecia and dyspnea of great efforts.

On the exploration highlighted the presence of heliotrope erythema and Gottron's papules, edema of the hands without evident arthritis and diminished muscle balance in lower limbs (right 20 s; left: 15 s), preserved in upper limbs, without cervical weakness. The rest of the exploration was normal. Laboratory tests were performed with CK of 1222 U/l, AST 54 U/l, ALT 56 U/l, normal troponins, ESR 40 mm and CRP 0.19 mg/dl; the autoimmunity study with ANA, ENA, rheumatoid factor and complement, was negative.

Suspecting inflammatory myopathy, the patient was admitted to Rheumatology to complete the study and it was started steroid treatment with 1 mg/kg/day with initial clinical improvement and normalization of CK. The following complementary tests were performed: Mantoux and Booster which were negative, serologies for HIV, HBV, HCV, EBV, syphilis and toxoplasma, which were negative; normal chest X-ray and respiratory function tests, and electromyogram with mild non-mixed myopathic pattern. It was performed a muscle biopsy which was reported as follows: skeletal muscle with preserved global architecture, without connective endomysial thickening or replacement by adipose tissue; muscle fibers of homogeneous size, without structural alterations; a single necrotic fiber with myophagocytosis and some isolated fiber of basophilic cytoplasm and enlarged nucleus suggestive of regenerative fiber were observed; no inflammatory infiltrates were evident; some small group of fibers both of type I and type II was observed in the distribution by types. Two COX negative fibers (less than 1% of the total fibers) were seen with oxidative techniques; PAS and oil red stainings without evidence of pathological deposits; histochemical technique for the enzyme phosphorylase normal; immunohistochemical study for HLA (MHC-1) normal. It was concluded: skeletal muscle with findings suggestive of reinnervation, without data of active denervation.

In order to screening for neoplasia it was performed a mammography, without alterations, and a thoracoabdominal CT scan which detected occupation of the anterior mediastinum by a mass compatible with thymoma, without interstitial lung involvement. To rule out myasthenic component it was performed a determination of anti-acetylcholine antibodies, which was normal.

This led to the diagnosis of dermatomyositis secondary to mediastinal mass suggestive of thymoma. On an outpatient basis after discharge it was started treatment with methotrexate until reaching 20 mg per week, orally, and later

was added azathioprine until reaching a dose of 150 mg/day due to cutaneous worsening and elevation of CK up to 600 U/l. Subsequently, a thymectomy was carried out and, 2 months after the intervention, the patient remained with clinical muscle weakness and high CK; for this reason, monthly cycles of intravenous immunoglobulins were added to the treatment at doses of 2 g/kg of body weight, monthly, distributed into 2 days. At this time she has completed 6 cycles, with improvement in muscle strength on the physical examination, stabilization of the CK around 200 U/l and with progressive reduction of the dose of steroids. At this time the patient continues under treatment with prednisone in descending doses, methotrexate 20 mg weekly, azathioprine 150 mg daily and intravenous immunoglobulins at doses of 2 g/kg of body weight monthly, she remains clinically and analytically stable, and there is no evidence of relapse of the mediastinal mass in pulmonary imaging tests.

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### Discussion

Patients with inflammatory myopathies have a higher risk of developing tumors: they occur in around 9.4% of patients with dermatomyositis and in 4.4% of patients with polymyositis.<sup>1</sup> The neoplasia can appear at any time: before the diagnosis of the inflammatory myopathy or, as in our patient, at the same time when the myopathy is diagnosed, but the maximum incidence is during the first year after the diagnosis of myopathy.<sup>1</sup> The risk factors for the diagnosis of this entity are: evidence of capillary damage in the muscle biopsy, cutaneous necrosis, leukocytoclastic vasculitis, advanced age at diagnosis, and presence of dysphagia, none of which was present in our patient. Interstitial lung involvement secondary to the myopathy appears to be associated with a lower risk of developing cancer.<sup>2</sup>

The exact relationship between inflammatory myopathies and cancer is not entirely clear, however, it has been postulated that the relationship between both diseases is based on the expression of common autoantigens in the muscle tissue and the tumor tissue of some patients with inflammatory myopathy. As a result of such association, the immune response targeted to the tumor cells could also be targeted to similar autoantigens in the muscle tissue and cause muscle damage.

The types of tumors most frequently associated with inflammatory myopathies are: cervical adenocarcinoma, cancer of the lung, ovary, pancreas, gallbladder and gastric.<sup>3,4</sup> However, in our case, we found an unusual association between inflammatory myopathy and thymoma. The thymus is a primary lymphoid organ whose main function is to regulate the T-cells, it is the place where the positive and especially the negative selection of the T-cells occurs, ensuring the immunological tolerance.<sup>5-9</sup> For this reason, multiple autoimmune diseases can be associated with the presence of thymoma, of which the most frequent is myasthenia gravis, but there are also other less frequent such as the inflammatory myopathies.

There are few cases of inflammatory myopathy associated with thymoma described in the literature. It is more frequent in the case of polymyositis, not so much in

dermatomyositis, unlike our patient, and the majority of the described cases are associated with myasthenia gravis<sup>5-7,10,11</sup> and greater involvement of the respiratory and oropharyngeal muscles<sup>7,10,12-14</sup> (probably due to the myasthenia gravis), which is not the case of our patient, in whom the determination of anti-acetylcholine antibodies was negative.

As for the prognosis, in general terms, the presence of tumor does not seem to affect the severity or the duration of the muscle weakness and neither the levels of CK, however, they do have a worse response to treatment than the myopathies non-associated with tumors. In general, the radical treatment of the cancer usually causes partial or temporary remission of the myopathy, whereas the failure of the anti-neoplastic treatment or the relapse is usually associated with persistence of the myopathy.

In the concrete case of inflammatory myopathies associated with thymoma, the majority of cases described exhibit clinical improvement after treatment with corticosteroids,<sup>6,7,11-13,15</sup> immunosuppressants such as methotrexate<sup>12,15</sup> and intravenous immunoglobulins.<sup>11,13</sup> However, there have been described cases of severe respiratory failure requiring invasive mechanical ventilation despite the aggressive immunosuppressive treatment, including pulses of corticosteroids, rituximab, immunoglobulins and plasmapheresis,<sup>7,11,12</sup> even though it is true that the majority of these cases are associated with myasthenia gravis with bulbar involvement, which is the cause of the poor evolution rather than the inflammatory myopathy.

## Conclusion

We highlight the importance of performing the screening of tumor processes as part of the diagnosis of inflammatory myopathy, since there are atypical clinical expressions that could be a form of presentation, as it is this case of atypical association of dermatomyositis with thymoma in the absence of myasthenia gravis.

## Ethical disclosures

**Protection of human and animal subjects.** The authors declare that no experiments were performed on humans or animals for this study.

**Confidentiality of data.** The authors declare that no patient data appear in this article.

**Right to privacy and informed consent.** The authors declare that no patient data appear in this article.

## Conflict of interest

The authors declare they do not have any conflict of interest.

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