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Dermatomyositis and Breast Cancer: A Case Report and Review

Garcia Fuentes Carolina Lisbeth[1], Rodrigo Collado Chagoya[2], Hernández Romero Javier[2], Eliosa Alvarado Gumaro Alejandro[2], Velasco Medina Andrea[2], Velázquez Sámano Guillermo[2], Castelazo Rico German[3]and Isabel Flores Garcia[1]*

[1]Department of Gynecology and Obstetrics, Instituto Mexicano Seguro Social Hospital General Zona, Mexico
[2]Department of Clinical Immunology and Allergy, Hospital General De México, Mexico
[3]Department of Oncological Gynecology, Instituto Mexicano Seguro Social "Centro Medico Nacional La Raza", Mexico

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[*]Corresponding author: Rodrigo Collado Chagoya, Department of Clinical Immunology and Allergy, Hospital General de México, Mexico;
E-mail: rodnova87@hotmail.com

Abstract

Breast cancer is the leading cause of death from malignancy in women worldwide, with nearly 500,000 deaths each year. Its diagnosis must be a priority for world health. Breast cancer is the second tumor that can produce a paraneoplastic syndrome after lung cancer. Dermatomyositis with a diagnosis in later ages correlates significantly with an underlying malignancy. Therefore, you should always rule out the presence of a common disease (breast cancer) with the presentation of a rare disease (dermatomyositis).

Keywords: Dermatomyositis; Breast cancer; Paraneoplastic syndrome.

Introduction

Dermatomyositis is an idiopathic inflammatory disease that mainly affects the skeletal muscle and the skin with characteristic skin lesions (heliotrope, Gottron papules). The estimated incidence of dermatomyositis is approximately 1/100,000, can affect children and adults, and is much more common in women than in men (2:1) [1,2]. Initial presentation follows a bimodal distribution between ages 5-15 and 45-64 and tends to progress over a 3 to 6-month period before the patient will seek medical attention. Most cases are idiopathic, dermatomyositis (DM) is associated with an underlying malignancy in 6-60% of cases, and in which case, it is considered a paraneoplastic syndrome [3]. The types of cancer most associated with dermatomyositis in adult women are breast cancer and ovarian cancer, reporting a frequency of 20-36% in adults with breast cancer in dermatomyositis [4]. In the mini review, we try to shortly review the recent developments and applications of carbon-based magnetic and fluorescent nanohybrids as multi-modal imaging agents.

The pathogenic relationship between dermatomyositis and cancer is not completely explained. Apparently, the regeneration cells that appear in muscles with myositis express high levels of myositis-specific antigens, and it is these same antigens that are expressed in several types of cancer associated with inflammatory myopathies. The union between cancer and dermatomyositis seems to be the expression of antigens common to cancer and muscle tissues in some patients with dermatomyositis [5].

DM typically presents with progressive, symmetrical, proximal muscle weakness and characteristic skin lesions such as helitrope rash, Gottron's papules, Gottron's sign, the V-sign and shawl sign. Additional cutaneous manifestations that have become more commonly recognized include vasculopathic changes (i.e. telangiectasias and livedo reticularis), cuticular overgrowth ('mechanic's hands') and poikiloderma [6]. In the cases of typical DM associated with breast cancer, it has been established a parallel course with breast

cancer evolution after surgery, local radiotherapy and systemic therapy with cytotoxic agents or hormones [7].

Contrary to this typical presentation, the presence of rapid progression of symptoms over a much shorter period and skin manifestations without development of muscular deterioration can suggest an underlying malignancy. These atypical presentation so-called amyopathic DM, is associated with breast cancer, characterized by the absence of muscular symptoms. It has been suggested that amyopathic DM is not responsive either to steroid treatment or to specific treatment of the underlying malignancy [8,9].

It has also been observed that myopathy may relapse in the setting of recurrent malignancy, further supporting a paraneoplastic origin of malignancy-associated DM [10]. Paraneoplastic dermatomyositis can precede, coincide or develop after the diagnosis of cancer. The diagnosis of paraneoplastic dermatomyositis should be made under medical suspicion and especially in patients with delayed presentation dermatomyositis [11,12].

The risk factors of malignancy in the series of patients with dermatomyositis and/or polymyositis had been studied by many clinicians from various countries. An extensive meta-analysis of clinical trials found older age, male sex, dysphagia, cutaneous necrosis, cutaneous vasculitis, rapid onset (<4 weeks), elevated CK, higher ESR, and higher CRP as factors to be associated with higher risk [13]. Currently, the association between anti-155/140 antibodies and paraneoplastic dermatomyositis has been reported, finding a sensitivity of 50% and a specificity of 96% for the detection of cancer associated with dermatomyositis. It has been similarly correlated that the presence of "routine antibodies" (antibodies against Jo-1, Anti Ro-52, U1-RNP, U3-RNP, Ku and PM SCL) increase the relative cancer risk of 6-7 in contrariety with patients with negative antibodies [14,15].

We present this case as a reminder that a common disease (breast cancer) may have an uncommon presentation (Dermatomyositis as paraneoplastic syndrome), which is why an underlying neoplastic process should always be considered in patients with delayed presentation dermatomyositis.

Case Report

A 53-year-old woman with 6 weeks with progressive proximal muscle weakness (scapular and pelvic belt) of symmetric distribution, as well as skin lesions categorized violaceous rash of the upper back, chest, the orbital region and in the neck region (Figures 1 and 2).

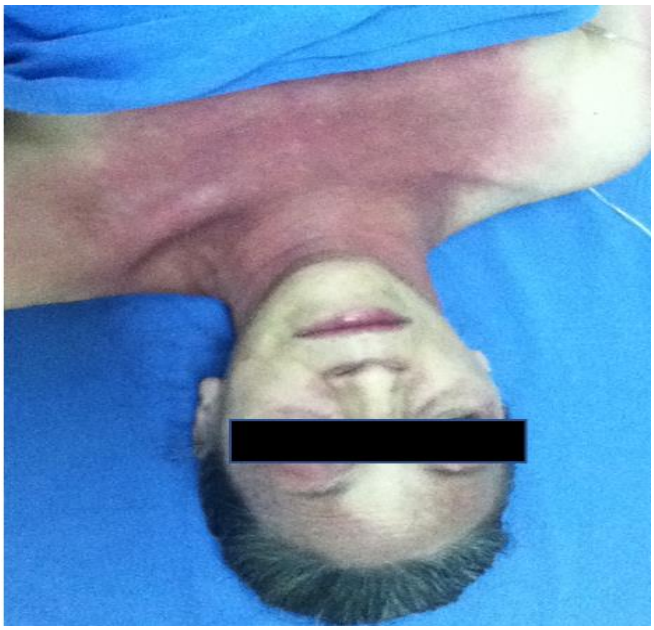

Figure 1: Helitrope rash, the V-sign and shawl sign: violaceous rash of the upper back, chest, the periorbital region and in the neck region.

Within 8 weeks also referred weight loss of 10 kilograms. Within 1 week began with dysphagia and increased muscle weakness.

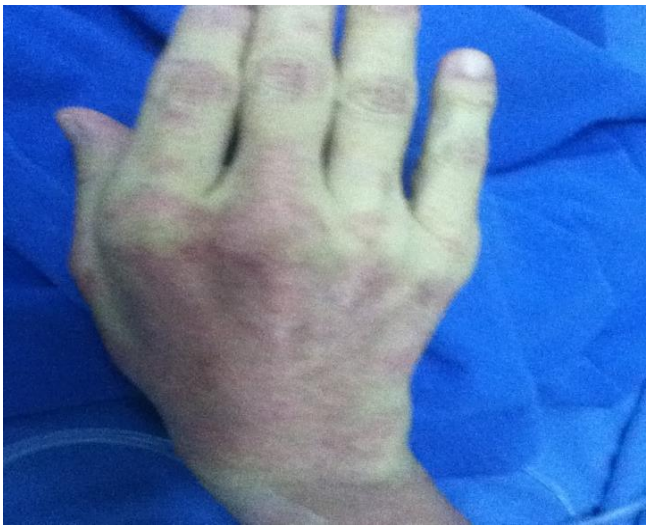

Figure 2: Gottron papules: Purple papules or plaques are found on bony prominences, especially the knuckles.

Her dermatology exam showed heliotrope rash, Gottron papules, periungual erythema, abnormal nail-fold capillaries, and diffuse violaceous rash throughout her body. On breast exam, she had a mass in the right breast of approximately 1.5 × 2 cm not mobile, stick to deep

planes located in the upper external quadrant and presence of positive axillary nodes in the right axilla, with a size of 0.2 to 0.5 cm.

Based on the data of proximal myopathy and the skin lesions found, a diagnosis protocol of inflammatory myopathy was initiated, presenting an alteration in muscle enzymes with TGO (78 U/l), TGP (73 U/l), CPK (450 U/l), LDH (860 U/l), myopathic pattern in electromyography study, histopathological study of skin biopsy (perivascular and perimysial inflammatory infiltrate with predominance of lymphocytes) (Figure 3). The immunological profile showed (ANA 1:640 fine mottled pattern, Anti Ro-52 Positive^{+++}, Anti Jo-1 Neg., Anti Ku-2 Neg., Anti SSP Neg., Anti Mi-2 Neg.,) performing the diagnosis of dermatomyositis and was prescribed prednisone 50 mg daily.

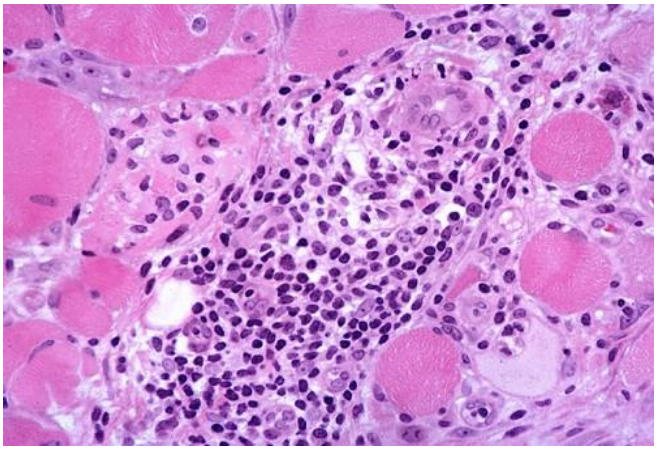

Figure 3: Inflammation, vasculitis and peri-fascicular atrophy with lymphocytic infiltrate.

Based on gynecological findings, a mammogram was performed, finding calcifications suggestive of malignancy in the right breast and an area of focal asymmetry in the upper outer quadrant (Figure 4). A right breast biopsy showed a multifocal invasive ductal carcinoma with axillary affectation, counting with negative estrogen receptors, negative progestin receptors, negative Her2/neu. Making the diagnosis of breast cancer and staging as T1N1MO. Based on the stage of the tumor, a modified radical mastectomy was performed and sent to medical oncology for the initiation of chemotherapy with docetaxel.

In the control review 3 months after the surgical procedure, her skin rash and muscle weakness have improved, but are not yet back to normal. She was started on oral weekly methotrexate as a steroid-sparing agent and continues in surveillance by the service of immunology, oncological gynecology, rheumatology and dermatology.

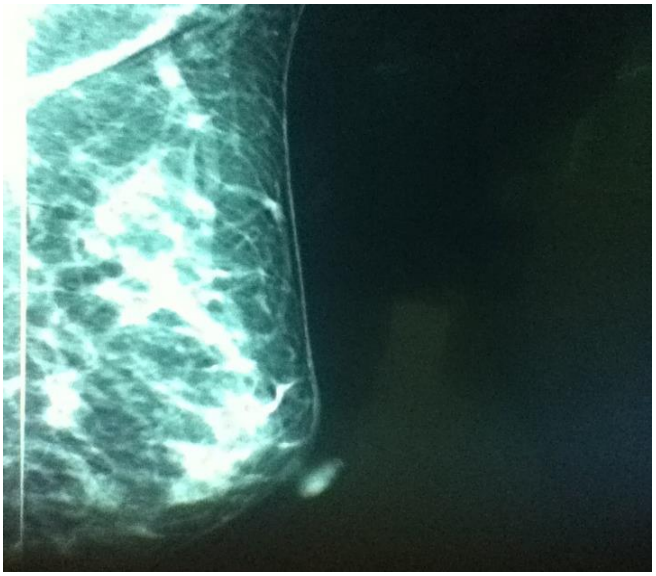

Figure 4: Amorphous or indistinct macrocalcifications, distribution grouped (two groups), architecture distortion, nodule with irregular morphology, blurred and dense margin.

Discussion

Dermatomyositis is an idiopathic inflammatory muscle disease of autoimmune component characterized by the presence of cutaneous lesions such as heliotrope rash and Gottron nodules accompanied by the presence of proximal muscular weakness, being able to find other symptoms such as dysphagia, regurgitation or bronchial aspiration pneumonia [16].

The association of Dermatomyositis (DM) or polymyositis (PM) with malignant tumors was suggested since 1916. Dermatomyositis is associated with an underlying malignant disease in 6-60% of cases, being considered in this case a paraneoplastic syndrome. The risk of malignancy is higher in patients aged between 45 and 74 years old at the age of diagnosis [16].

The presence of positive antibodies has been more associated with the presence of underlying malignancy. The AntiRo-52 antibody is the most frequent of the antibodies associated with myositis (>30%), being frequently accompanied by specific antibodies of myositis (Anti Jo-1) or other antibodies (ANA). It has been reported that similarly it has been associated with an increased risk of cancer and interstitial lung disease. [17]. The relationship between DM and cancer has been described in different retrospective studies. It is

estimated that the incidence of cancer in patients with DM is between 15-30% of the total of cases. The tumors most commonly associated are breast, ovarian, gastrointestinal, lung and lymphoma, varying in frequency in the series reviewed [17].

Paraneoplastic dermatomyositis can precede, coincide or develop after the diagnosis of cancer. Most patients were diagnosed with cancer before they were diagnosed with DM and normally the presence of DM was associated with late-stage tumors; but there are cases in which the presentation of dermatomyositis may precede the onset of breast cancer the so the diagnosis should be based on a previous suspicion of the disease and subsequent surveillance [5,18]. The most common type of breast cancer associated with dermatomyositis was invasive ductal carcinoma. The distribution of triple-negative, her2-positive, and estrogen or progesterone receptor-positive breast cancers was relatively even [18].

The ultimate treatment of paraneoplastic dermatomyositis is to remove the primary neoplasm. This will result in the resolution of dermatomyositis in most cases, and in a minority of cases additional immunomodulatory therapies are required [19]. Malignancy associated dermatomyositis has a poor prognosis. Cancer significantly decreases survival, as one study found patients with DM and malignancy had a 5-year survival of only 10% [19].

Conclusion

Breast cancer is the leading cause of death from malignancy in women worldwide, (nearly 500,000 deaths each year). Its diagnosis must be a priority for world health. Breast cancer is the second tumor that can produce a paraneoplastic syndrome after lung cancer. Dermatomyositis with a diagnosis in later ages correlates significantly with an underlying malignancy. Therefore, you should always rule out the presence of a common disease (breast cancer) with the presentation of a rare disease (dermatomyositis).

Conflict of Interest

None declared.

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