Pleural Effusion as an Initial Presentation of Dermatomyositis: A Case Report

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Abstract

Introduction: Dermatomyositis is an autoimmune inflammatory process typically presenting with symmetric proximal muscle weakness preceded by skin lesions. We report a case of dermatomyositis initially presenting with pleural effusion before developing rashes and proximal muscle weakness.

Case presentation: A 46-year-old female with no known comorbidities presented with four weeks of anorexia. On work-up, she was found to have bilateral pleural effusion. Diagnostic and therapeutic thoracentesis done draining one liter. Pleural fluid analysis showed exudative character with no presence of bacteria or malignant cells. Intravenous piperacillin-tazobactam 4.5g every eight hours was given for one week but effusion persisted. After 10 days of intravenous antibiotic, antibiotic was shifted to oral cefixime 400mg tab once daily and levofloxacin 500mg tab once daily. However patient developed maculopapular rashes over the face, neck and arms two days after starting the oral antibiotics. The antibiotics were withheld and antihistamine was given for possible drug reaction. No improvement thus oral prednisone 20mg/day for six days was given. After 14 days of oral prednisone, rashes persisted, now with proximal muscle weakness in all extremities associated with the 'V-sign' and 'shawl sign'. The patient was readmitted and work-up showed resolution of pleural effusion. ANA was positive and CKMM level was markedly high. Other rheumatologic tests were unremarkable. Patient was started on Intravenous hydrocortisone 200mg/day and methotrexate 7.5mg/day once a week. Nine days after initiating intravenous glucocorticoid and methotrexate, patient's symptoms resolved. Patient was advised for malignancy work-up on follow-up but was lost to follow-up.

Discussion: Dermatomyositis initially presents with rashes (100%) and proximal myopathy (95.2%). Interstitial lung disease (ILD) may occur (28.6%), but pleural involvement is rare with only three reported cases and all were associated with ILD. There are no reports of pleural effusion as the initial manifestation. Dermatomyositis is confirmed using the Bohan and Peter Criteria and our patient fulfilled a definitive diagnosis. Glucocorticoids and immunosuppressive drugs are mainstay treatment. Pleural effusion involvement was observed to have good response to treatment, in contrast to ILD which was associated with higher mortality thus should be ruled out in patients with pleural effusion.

Conclusion: Autoimmune diseases are known for classic manifestations, but may rarely mimic common clinical manifestations thus high index of suspicion is warranted to provide prompt management.

Keywords: dermatomyositis, pleural effusion, case report, autoimmune disease

Introduction

Dermatomyositis is a rare inflammatory myopathy with an annual incidence estimated between 1 to 10 new cases/million population/year, and prevalence between 1/50,000 and 1/10,000.[1]

Dermatomyositis presents with an insidious onset of muscle weakness, typically symmetric and proximal on initial presentation but later on may progress to the distal muscles. A characteristic rash also occurs before, shortly after or at the same time as the muscle weakness.[2]

Pulmonary involvement is a common complication in Dermatomyositis and this is usually associated with worse outcomes and increased mortality. Interstitial Lung Disease has a prevalence of 19.9-78% in Dermatomyositis patients with its presentation ranging from fulminant to subclinical.[3]

Pleural diseases are rarely seen and have only been observed with a 5% prevalence and this is often associated with interstitial lung disease or pericardial effusion.[4]

This is a case of a patient initially presenting with massive pleural effusion preceding the classical symptoms of dermatomyositis. We report this case to emphasize the

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need for a high index of suspicion in patients presenting with common signs and symptoms to avoid missing the correct diagnosis and delaying proper management.

Case

A 46-year old female with no known comorbidities or history of heredofamilial diseases, presented with four weeks of anorexia described as having a metallic taste when eating. There was no fever, cough, night sweats, weight loss, easy fatigability. Three weeks prior, consult was done at a tertiary hospital where she was found to have bilateral pleural effusion on chest x-ray (Figure 1). Thoracentesis was done on the right hemithorax draining 1000mL of pleural fluid yellow, hazy character. Pleural fluid analysis showed a white cell count of 5,000 cells/mm^3, predominantly segmenters. The pleural to serum LDH ratio of 1.16 and pleural to serum protein ratio of 0.8 suggested an exudative process. The fluid was negative for AFB, gram stain, and malignant cells.

Sputum exam was requested to rule out the presence of pulmonary tuberculosis however patient was unable to provide samples. Patient was managed as a case of community-acquired pneumonia and was started on Intravenous piperacillin-tazobactam 4.5g every eight hours for one week but no clinical improvement. Patient was starting to develop an increase in abdominal girth.

The patient was transferred to our institution and was further worked up. Blood chemistries were done to rule out the presence of organ failure but revealed normal liver and kidney function tests. Laboratory only showed hypoalbuminemia with the persistence of pleural effusion, measured at 990mL on the right and 45mL on the left using sonography. A whole abdominal ultrasound was done to rule out an abdominopelvic mass but was negative. Intravenous piperacillin-tazobactam 4.5g every eight hours was continued for three more days with concomitant albumin infusion and diuresis.

Antibiotic was then shifted to oral cefixime 400mg tab once daily and levofloxacin 500mg tab once daily. However, patient developed erythematous pruritic maculopapular rashes on the face, neck and arms. Hypersensitivity reaction secondary to medications was entertained thus antibiotics were discontinued and antihistamine was started. Patient was sent home after one week with an antihistamine and oral prednisone 20mg tab/day for six more days despite no resolution of rashes.

Two weeks after discharge and three weeks off antibiotics, there was further progression of the erythematous maculopapular rashes now involving the anterior chest over the neck line and the upper back. Patient was also complaining of myalgia and weakness over the upper extremities described as difficulty getting up in the morning and persistent throughout the day. She denied any sensory

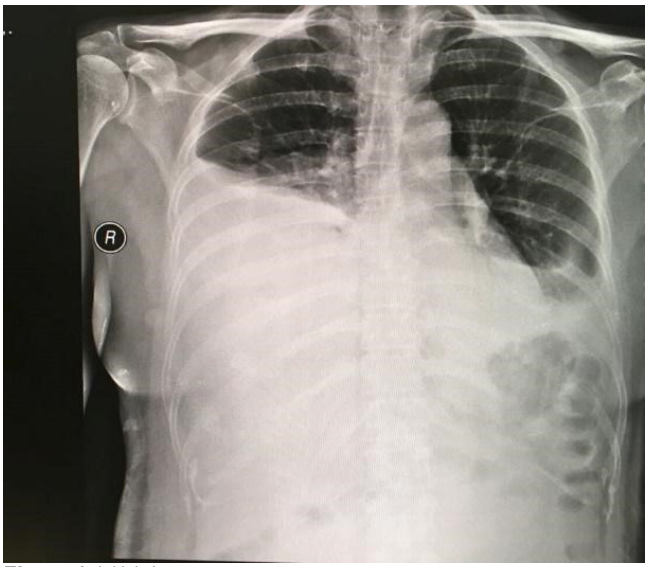

Figure 1. Initial chest x-ray

Figure 2. Shawl sign and V sign (respectively)

abnormalities or arthralgia over both upper and lower extremities. This prompted the patient's readmission.

Upon admission, physical examination revealed stable vital signs with no remarkable chest and lung findings.The abdomen likewise was negative for ascites or organomegaly. There were erythematous to violaceous macular rashes on the periorbital areas and maculopapular rashes with excoriations on the malar areas of the face, nape, anterior chest, and upper back forming the characteristic shawl sign and V sign (Figure 2). Tenderness and decreased muscle strength of 4/5 was observed on the proximal muscles of the upper and lower extremities associated with inability to keep arms raised upward and difficulty to sustain a standing position for ten seconds. Sensory and deep tendon reflexes were normal.

A repeat chest x-ray was done and was noted to be cleared of effusion (Figure 3). Laboratory tests to rule out possible causes of muscle weakness including an electrolyte imbalance and a thyroid pathology were done and were unremarkable.

A diagnosis of myositis was considered and confirmed by a high CKMM level of 3437 units/L (normal value: < 145 units/L) and an electromyography showed increase in insertional activity and presence of positive sharp waves/

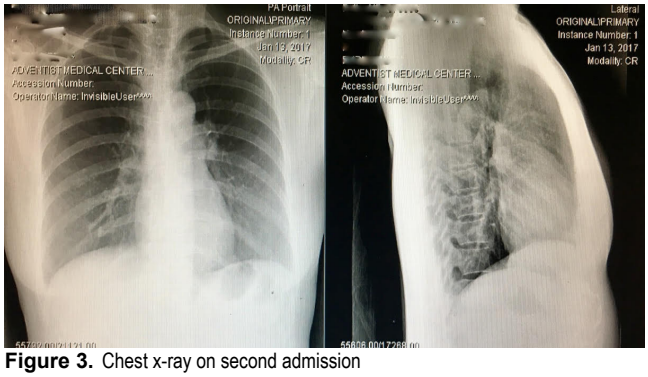

Figure 3. Chest x-ray on second admission

fibrillation potentials from most muscles tested. There were also early recruitment and small amplitude short duration motor unit action potentials recorded. Along with the cutaneous manifestations and the progressive proximal muscle weakness, four out of the five components of the Bohan and Peter Criteria for Dermatomyositis was fulfilled and other possible causes of myositis including steroid-induced were considered unlikely. However, a mixed connective tissue disease was also possible due to the recent history of pleural effusion which was not a common manifestation of dermatomyositis. Immunologic tests were done and ANA was positive at 1:40 with homogenous character but Anti-U1RNP, AntiScl70, Anti-Jo1, AntiDsDNA and Anti-SSA were all negative. ESR of 5 mm/hr (normal value: 0-20 mm/hr) and C-reactive protein of <5 mg/L (normal value: <10 mg/L) were likewise negative but may be due to early initiation of steroid therapy which started since the previous admission. Corticosteroid in the form of hydrocortisone 200mg/day was started since the patient presented with severe muscle weakness. Methotrexate 7.5mg/week was also started as a corticosteroid-sparing agent, supplemented with folic acid. Topical steroids for the cutaneous manifestations was not started on the patient since nine days after initiation of therapy, patient's symptoms had improved. Patient was discharged and advised for malignancy work-up on follow-up, but patient failed to follow-up despite attempts in calling her on her scheduled follow-ups.

Discussion

Dermatomyositis is a rare inflammatory myopathy with inflammatory cells around muscle fascicles and fibers and around blood vessels. In the Philippines, there have only been 4,268 cases of dermatomyositis reported in 2004.[5]

Koh et al. (1993) reported the different clinical features of patients with dermatomyositis and found that the most common presentation is rash (100%), followed by proximal myopathy (95.2%) and arthralgia (47.6%). Lung involvement is not very uncommon in the form of interstitial lung disease (28.6%) but no reports of pleural effusion was noted.[6]

Although high-resolution CT scan has demonstrated pleural irregularities in polymyositis-dermatomyositis, there are only three reported cases of dermatomyositis presenting with massive pleural effusion and all were associated with interstitial lung disease and was postulated to be due to the autoimmunity in the underlying interstitial lung disease.[7] In this patient, a chest CT scan was not done to rule out the presence of ILD, however the chest x-ray done on her second admission had no signs of peripheral reticular, cystic, linear, nodular lesions and ground-glass density which would have suggested an ongoing ILD. Furthermre the pleural effusion that occurred in the reported cases either coincided with the cutaneous manifestations or presented after the diagnosis of polymyositis-dermatomyositis. Currently, there are no reported cases of dermatomyositis presenting initially with a massive pleural effusion followed by the classic symptoms of dermatomyositis as seen in our patient.

In contrast to dermatomyositis, around 50% of mixed connective tissue disease presents with pleural effusion and around 11%-40% of myositis patients have an associated connective tissue disease.[8] Thus this was entertained in our patient. However, our patient did not present with symptoms that fulfilled another concomitant autoimmune disease and was negative for antiU1RNP, a specific marker for mixed connective tissue disease.

A positive antinuclear antibody in at least 1:160 titers indicates an autoimmune process. In our patient, the antinuclear antibody was only positive at 1:40 titer with homogenous pattern. However, Soto et al reported that a homogenous pattern can be considered even in as low as 1:40.[9]

Dermatomyositis can be confirmed by elevated creatine kinase (CK) levels, presenting in 80-90% during initial evaluation. Although some conditions may also result in high CK levels, these conditions such as other causes of myositis as well as hypothyroidism have been ruled out in our patient by normal laboratory findings. Autoantibodies can also be measured but only present in 34.4% of patients.[10]

Tissue biopsy is the gold standard in the diagnosis of any myositis and can be done if clinical manifestations are not characteristic of dermatomyositis. Biopsy findings should show muscle fiber necrosis, degeneration, regeneration, and an inflammatory cell infiltrate. There should also be evidence of injury to capillaries and perifascicular myofibers. However, a negative muscle biopsy does not rule out the presence of myositis since it is dependent on the skill of the pathologist and the site of muscle tested.[11]

Aside from a muscle biopsy, there are diagnostic criteria being utilized to aid in the diagnosis of Dermatomyositis. The Bohan and Peter criteria is used to diagnose dermatomyositis (Table I). A definitive diagnosis requires three or four of the muscular components with cutaneous rash. The Bohan and Peter criteria demonstrate a high degree of accuracy and usefulness in research and clinical settings. However, this

Table I. Bohan and Peter criteria for dermatomyositis
1. Progressive symmetrical proximal muscle weakness
2. Elevated creatine kinase
3. Positive muscle biopsy
4. Electromyographic findings
5. Characteristic cutaneous eruption

usefulness is limited by a number of factors, including lack of specification of how to exclude other forms of myopathy and nonexplicit definition of inclusion criteria.[11]

Another diagnostic criteria was developed by the Japanese Committee in Autoimmune Diseases, Scleroderma, and Neuroimmunologic Diseases to address the low specificity of the former criteria (Table II). Patients with at least four findings have a 98.9% sensitivity and 95.2% specificity against all control diseases.[13]

Our patient presented with prominent symmetrical proximal muscle weakness with characteristic rashes, an

Table II. Japanese committee on autoimmune diseases, scleroderma, and neuroimmunologic diseases criteria
1. Skin lesions • Heliotrope rash • Gottron's papule and sign • Shawl sign/V-sign
2. Proximal muscle weakness
3. Elevated creatine kinase/aldolase
4. Muscle pain on grasping or spontaneous pain
5. EMG changes
6. Positive anti-Jo1 antibody
7. Nondestructive arthritis/arthralgias
8. Temperature ≥ 37°C at axilla ESR ≥ 20mm/hr by Westergren Elevated C-reactive protein level
9. Pathologic findings

elevated creatine kinase and a positive electromyographic finding. Biopsy was no longer performed because these clinical manifestations already fulfilled both diagnostic criteria, confirming the diagnosis of dermatomyositis.

The treatment for dermatomyositis with or without lung involvement include glucocorticoids and immunosuppressive drugs. In the cases reported on dermatomyositis patients with massive pleural effusions a good response to corticosteroid therapy was observed.[14] The same outcome was observed with our patient after being given steroid therapy.

On the other hand, in dermatomyositis with interstitial lung disease, overall mortality rate is 7.5%, with 87.5% of deaths attributable to the lung disease. Thus, investigation for an underlying interstitial lung disease should be considered in dermatomyositis patients. A chest CT scan was requested for our patient on follow-up. Unfortunately, this was not done because the patient refused.

Dermatomyositis has also been linked with the presence of malignancies. Hill et al. reported 32% of dermatomyositis patients included in their study developed cancer, with ovarian having the highest association, followed by lung and pancreatic.[15] Thus screening for malignancies should be done in these patients. But because patient did not follow-up, no screening for malignancies was done for this case.

Conclusion

An autoimmune process usually presents with classical manifestations that distinguish it from other diseases but in some instances, it may mimic commonly encountered diseases thus a high index of suspicion is warranted to avoid a delay in the management of the diseases. In dermatomyositis, the presence of pulmonary involvement may worsen morbidity and mortality thus pulmonary evaluation is an important step in managing the disease. Dermatomyositis is also associated with malignancies thus the importance of prompt work-up and management is crucial.

References

1. **INSERM. (n.d.)**. Orphanet: Dermatomyositis. Retrieved from https://www.orpha.net/consor/cgibin/OC_Exp.php?Lng=GB&Expert=221
2. **Marvi, U., Chung, L., & Fiorentino, D. F.** (2012, September). Clinical presentation and evaluation of dermatomyositis. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3482801/
3. **Hallowell, R. W., Ascherman, D. P., & Danoff, S. K.** (2014). Pulmonary Manifestations of Polymyositis/ Dermatomyositis. Seminars in Respiratory and Critical Care Medicine, 35(2). Retrieved May 18, 2018.
4. **Lega, J. C., Reynaud, Q., Belot, A., Fabien, N., Durieu, I., & Cottin, V. (2015, June)**. Idiopathic inflammatory myopathies and the lung. Retrieved November 09, 2017, from https://www.ncbi.nlm.nih.gov/pubmed/26028634
5. **Statistics by Country for Dermatomyositis.** (n.d.). Retrieved May 18, 2018, from http://cureresearch.com/d/dermatomyositis/stats-country_printer.htm
6. **Koh, E. T., Seow, A., Ong, B., Ratnagopal, P., Tjia, H., & Chng, H. H. (**1993). Adult onset polymyositis/dermatomyositis: Clinical and laboratory features and treatment response in 75 patients. Annals of the Rheumatic Diseases, 52(12), 857-861. doi:10.1136/ard.52.12.857
7. **Light, R. W., & Lee, Y. C.** (2016). Textbook of pleural diseases. Boca Raton: CRC Press, Taylor & Francis Group.
8. **Bouros, D., Pneumotikos, I., & Tzouvelekis, A.** (2008). Pleural Involvement in Systemic Autoimmune Disorders. Respiration Thematic Review Series, (75), 361-371. Retrieved May 21, 2018
9. **Soto, M. E., Hernández-Becerril et al** (2015). Predictive value of antinuclear antibodies in autoimmune diseases classified by clinical criteria: Analytical study in a specialized health institute, one year follow-up. Results in Immunology, 5, 13-22. doi:10.1016/j.rinim.2013.10.003
10. **Cruellas, M., Viana, V., Levy-Neto, M., Souza, F., & Shinjo, S.** (2013). Myositis-specific and myositis-associated autoantibody profiles and their clinical associations in a large series of patients with polymyositis and dermatomyositis. Clinics, 68(7), 909-914. doi:10.6061/clinics/2013(07)04
11. **Oldroyd, A., & Chinoy, H.** (2018). Recent developments in classification criteria and diagnosis guidelines for idiopathic inflammatory myopathies. Current Opinion in Rheumatology,

30(6), 606–613.

12. **Hilton-Jones, D.** (2003). DIAGNOSIS AND TREATMENT OF INFLAMMATORY MUSCLE DISEASES. Journal of Neurology, Neurosurgery & Psychiatry, 74, 25–31.
13. **Dourmishev, L. A., & Dourmishev, A. L.** (2009). Dermatomyositis advances in recognition, understanding and management. Berlin: Springer.
14. **Hallowell, R. W., Ascherman, D. P., & Danoff, S. K.** (2014, March 25). Pulmonary Manifestations of Polymyositis/Dermatomyositis. Retrieved November 09, 2017, from https://www.thieme-connect.com/products/ejournals/html/10.1055/s-0034-1371528
15. **Hill, C. L., Zhang, Y., Sigurgeirsson, B., Pukkala, E., Mellemkjaer, L., Airio, A., Felson, D. T.** (2001, January 13). Frequency of specific cancer types in dermatomyositis and polymyositis: a population-based study. Retrieved September 04, 2017, from https://www.ncbi.nlm.nih.gov/pubmed/11197446