Case Presentation 14

Juvenile Dermatomyositis presenting as an Elbow and Knee rash

Dermatopathology

Weill Cornell Medical College

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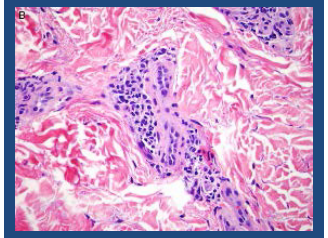

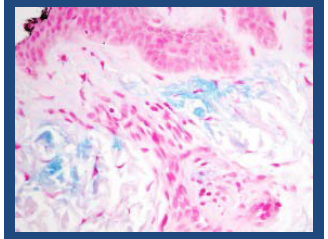

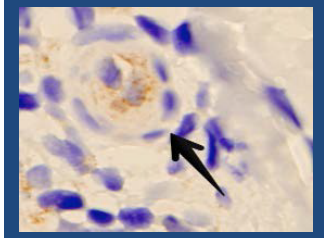

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Introduction

Autoimmune diseases in pediatric patients are heterogeneous, including juvenile dermatomyositis (JDM), systemic lupus erythematosus and juvenile rheumatoid arthritis. Juvenile dermatomyositis is a rare idiopathic inflammatory disease of the muscle, skin and blood vessels affecting approximately 2-3 cases per million children per year and accounts for 85% of idiopathic inflammatory myopathies in children.[1,2]

Involvement of heart, lungs, and gastrointestinal tract have been also reported, which are associated with uncertain prognosis. Long-term complications such as joint contracture and muscle wasting could potentially result in childhood disability or even may lead to death [3] and therefore, correct diagnosis, clinicopathological correlation and investigations into the important prognostic factors for guiding the treatment of JDM are crucial.

Case Presentation

Patient was a 16-year-old female who presented with erythematous and annular plaques localized to the elbow and knee for few months (Fig.1A). Additional clinical exam showed discrete erythematous papules over the interphalangeal joints (Fig.1B). No muscle weakness was reported and the muscle enzymes including aldolase, creatine phosphokinase (CPK) and lactate dehydrogenase (LDH) were within normal limits. A skin biopsy of the right knee was performed and the light microscopic findings were correlated with immunohistochemical and immunofluorescent studies.

The biopsy showed a low-grade lymphocytic vascular inflammation along with a significant endothelial cell swelling defining a low-grade lymphocytic vasculitis (Fig. 2A, B). A background of interstitial mucin deposition was noted and confirmed by an Alcian blue preparation (Fig. 3). There was also evidence of an enhanced type-I interferon microenvironment with localization of myxovirus protein (MXA) to the endothelium and perivascular inflammatory cells (Fig. 4). In addition, significant deposits of C5b-9 was detected by immunohistochemical and direct immunofluorescence assessment (Fig. 5 A, B).

The constellation of the clinical presentation of these aforesaid microscopic findings was highly characteristic for a Gottron's papule/plaque-like presentation of amyopathic dermatomyositis.

Discussion

JDM is an immune-mediated inflammatory disease involving the microvasculature of skin and muscle. The clinical features are mostly associated with systemic vasculopathy and are critical to the diagnosis. The most common initial presentations are Gottron's papules and muscle weakness. While the Gottron's papules are most commonly found on the hands, in juvenile dermatomyositis an atypical distribution over the knees and elbows is highly characteristic. Autoantibodies may be potentially useful biomarkers to classify patients into homogeneous subgroups and inform on disease prognosis. Age at disease onset has also been shown to influence the clinical phenotype and overall prognosis in JDM.4 The prognosis of amyopathic DM, unlike that in adult groups with the increased risks of interstitial lung disease and malignancy, has a generally good prognosis among pediatric patients. [2]
Dermatomyositis is a C5b-9 mediated microvascular injury syndrome triggered by anti-endothelial cell antibodies in concert with endothelial cell up-regulation of the type-I interferons revealed by MXA expression. While the typical vasculopathy of dermatomyositis is paucicellular, a lymphocyte rich vasculopathy is commonly seen in virally triggered dermatomyositis.[5]

In childhood dermatomyositis, there is an important link with endotheliotropic viral infection most notably parvovirus B19 and hence the lesions in dermatomyositis of childhood can be inflammatory with a prominent lymphocytic infiltrate noted around vessels as noted here.
There is no standard treatment protocol for JDM to date. Since the introduction of corticosteroids to treat JDM, significant improvements in clinical and functional prognosis have been achieved, and therefore, they remain the mainstay of treatment. However, systemic corticosteroids are associated with significant side effects after long-term use. Either immunosuppressive agents or intravenous immunoglobulin is a supplemental therapy for JDM patients with poor treatment responses. Biologic drugs, which are synthesized within a biologic system, are designed to target specific molecules involved in cytokine signaling or cell-cell interactions. The major targets of these biologic drugs are cytokines, immune cells, and some costimulation molecules

Figure Legend

1

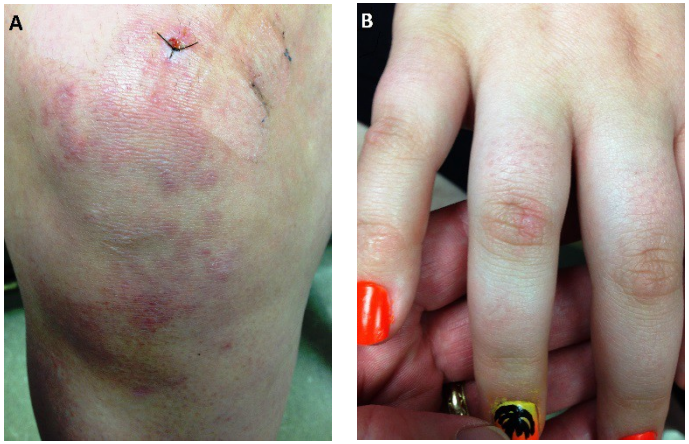

Figure 1: Erythematous and annular plaques and papules localized to the knee (A) and interphalangeal joints (B)

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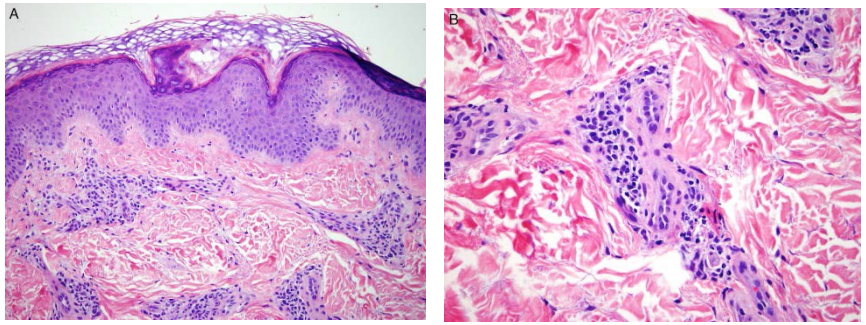

Figure 2: A, B. Low grade lymphocytic vascular inflammation with significant endothelial cell swelling (H&E 20x - 40x)

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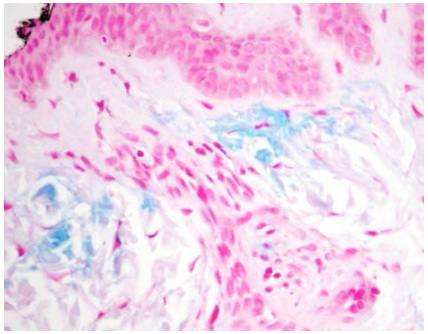

Figure 3: Interstitial mucin deposition confirmed by Alcian blue preparation (IHC 40x)

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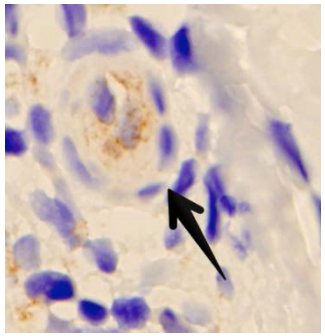

Figure 4: Localization of MXA to the endothelium and perivascular inflammatory cells (IHC 100x)

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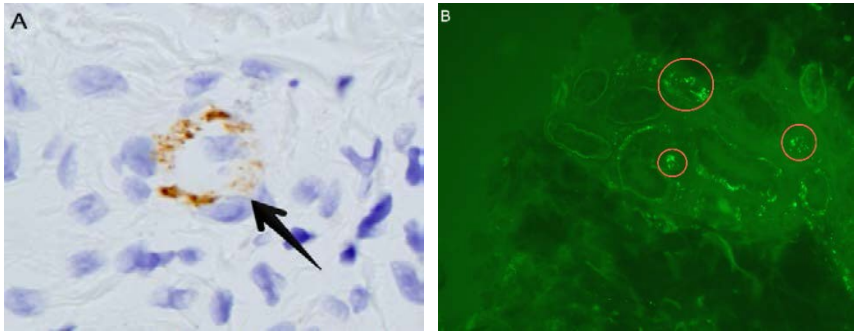

Figures 5: A, B. Localization of C5b-9 to the endothelium of blood vessels (IHC100x) and (IF100x)

Case References

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3. Ravelli A, Trail L, Ferrari C, et al. Long-term outcome and prognostic factors of juvenile dermatomyositis: amultinational, multicenter study of 490 patients. Arthritis Care Res (Hoboken) 2010; 62(1): 63-72.
4. Martin N, Krol P, Smith S, et al. Comparison of children with onset of juvenile dermato- myositis symptoms before or after their fifth birthday in a UK and Ireland juvenile dermatomyositis cohort study. Arthritis Care Res (Hoboken) 2012; 64: 1665e72.
5. Magro CM, Segal JP, Crowson AN, Chadwick P. The phenotypic profile of dermatomyositis and lupus erythematosus: a comparative analysis. J Cutan Pathol 2010; 37(6): 659-71.

Under the direction of Dr. Cynthia M. Magro, the Weill Cornell Comprehensive Dermatopathology Service is a leading edge consultation service and CAP-accredited laboratory for dermatologists, plastic and general surgeons and other dermatopathologists. Dr. Magro is an internationally renowned dermatopathologist, educator and author. She is a Professor of Pathology and Laboratory Medicine at the Weill Cornell Medical College in Manhattan, and is board certified in anatomic pathology, dermatopathology and cytopathology. Dr. Magro is an expert in the diagnosis of complex inflammatory skin diseases. Her areas of expertise include cutaneous manifestations of auto-immune disease, systemic viral disease and vasculitis, atypical drug reactions, benign, atypical and overtly malignant lymphocytic infiltrates of the skin, and diagnostically difficult melanocytic proliferations.The award-winning author of *The Melanocytic Proliferation: A Comprehensive Textbook of Pigmented Lesions*, Dr. Magro has recently completed her second book, *The Cutaneous Lymphoid Proliferation, a comprehensive textbook on benign and malignant lymphocytic infiltrates*. She has co-authored over 280 peer reviewed papers and several textbook chapters. Dr. Magro frequently presents courses on inflammatory skin pathology and difficult melanocytic proliferations to the American Academy of Dermatology, the United States and Canadian Academy of Pathology, and the American Society of Clinical Pathology. Dr Magro has consistently been recognized in Who's Who in America®, Castle Connolly's renowned America's Top Doctors – New York Metro Area® edition and in the Super Doctors® list published in The New York Times Magazine.

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