

BRIEF ARTICLE

Cutaneous Rosai-Dorfman Disease: A Case Report

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ABSTRACT

Cutaneous Rosai-Dorfman Disease (CRDD) is an uncommon benign histiocytosis of unknown etiology. CRDD is oftentimes misdiagnosed because it has variable clinical manifestations, particularly in the absence of lymphadenopathy. We report a case of a 23-year-old African American woman presenting with clustered nodular plaques on her right thigh, buttocks, back, and chest for the past two years. History, clinical, histopathological, and immunochemistry findings corresponded with CRDD, and as such, she was treated with halobetasol propionate 0.05% cream twice daily.

INTRODUCTION

Rosai-Dorfman Disease (RDD) or sinus histiocytosis with massive lymphadenopathy (SHML) is a benign, self-limited proliferation of histiocytosis, first described by Rosai and Dorfman in 1969.¹⁻³ RDD may involve the skin secondary to multi-organ involvement, or it may solely involve the skin without any other organ involvement. In the latter scenario, the disease is classified as Cutaneous Rosai-Dorfman Disease (CRDD).¹⁻⁵ CRDD is believed to be a distinct entity because of its unique epidemiologic pattern and the absence of systemic manifestations.⁴⁻⁵ It is also considered a rare

entity, with only a few cases reported in the literature.⁵ We report the case of a biopsy and immunohistochemistry proven CRDD, in a young African American woman.

CASE REPORT

A 23-year-old African American woman presented with a growth on her right thigh for roughly 2 years, which had been progressively enlarging and darkening. New lesions developed on her chest, back, and buttocks, though some resolved

SKIN

spontaneously over time. Her personal and family history were unremarkable. She had no fever, weight loss, or gastrointestinal complaints. Upon physical examination, there were clusters of pink and brown, hyperpigmented papules and nodules on her right thigh, chest, back and buttocks. In addition, she had several satellite nodules on her left upper arm and abdomen. All of her skin lesions were slightly tender to palpation (Figure 1). There was no cervical, axillary, or inguinal lymphadenopathy present, nor was there organomegaly present. Her laboratory results were within

normal limits, and her chest radiogram was normal. A skin biopsy from a lesion on her right thigh revealed a dermal histiocytic and lymphoplasmatic infiltrate with fibrosis and telangiectasia (Figure 2). Stains were negative for fungal (GMS) and mycobacterial (Fite) microorganisms. S100 immunohistochemistry highlighted histiocytic proliferation with features of emperipolesis suggestive of cutaneous Rosai-Dorfman Disease (Figure 3). After diagnostic confirmation, the patient was treated with halobetasol propionate 0.05% cream twice daily, only to symptomatic lesions.



Figure 1. Clusters of pink and brown, hyperpigmented papules and nodules in patients with cutaneous Rosai-Dorfman disease

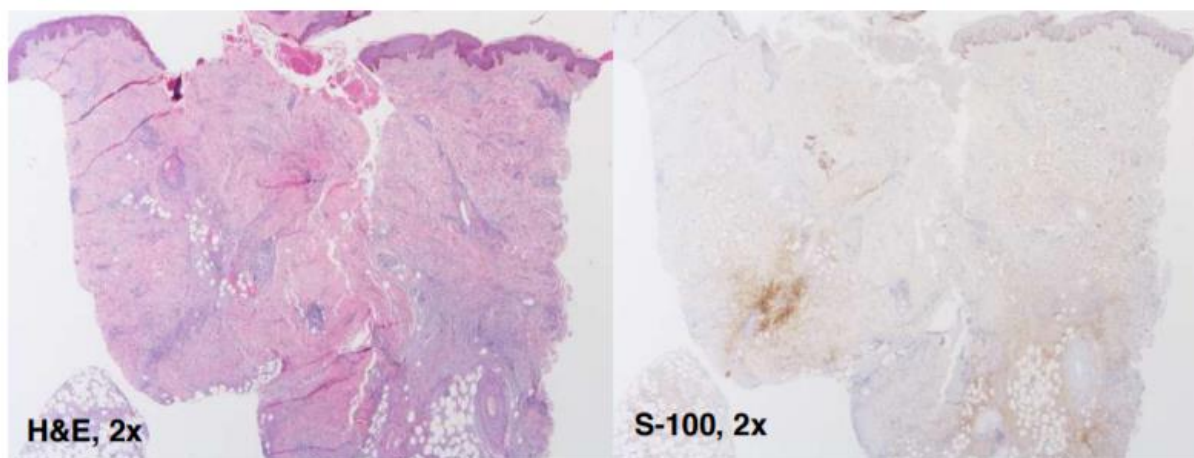


Figure 2. A nodular proliferation of histiocytic cell infiltrates involves dermis with an interstitial and perivascular inflammation.

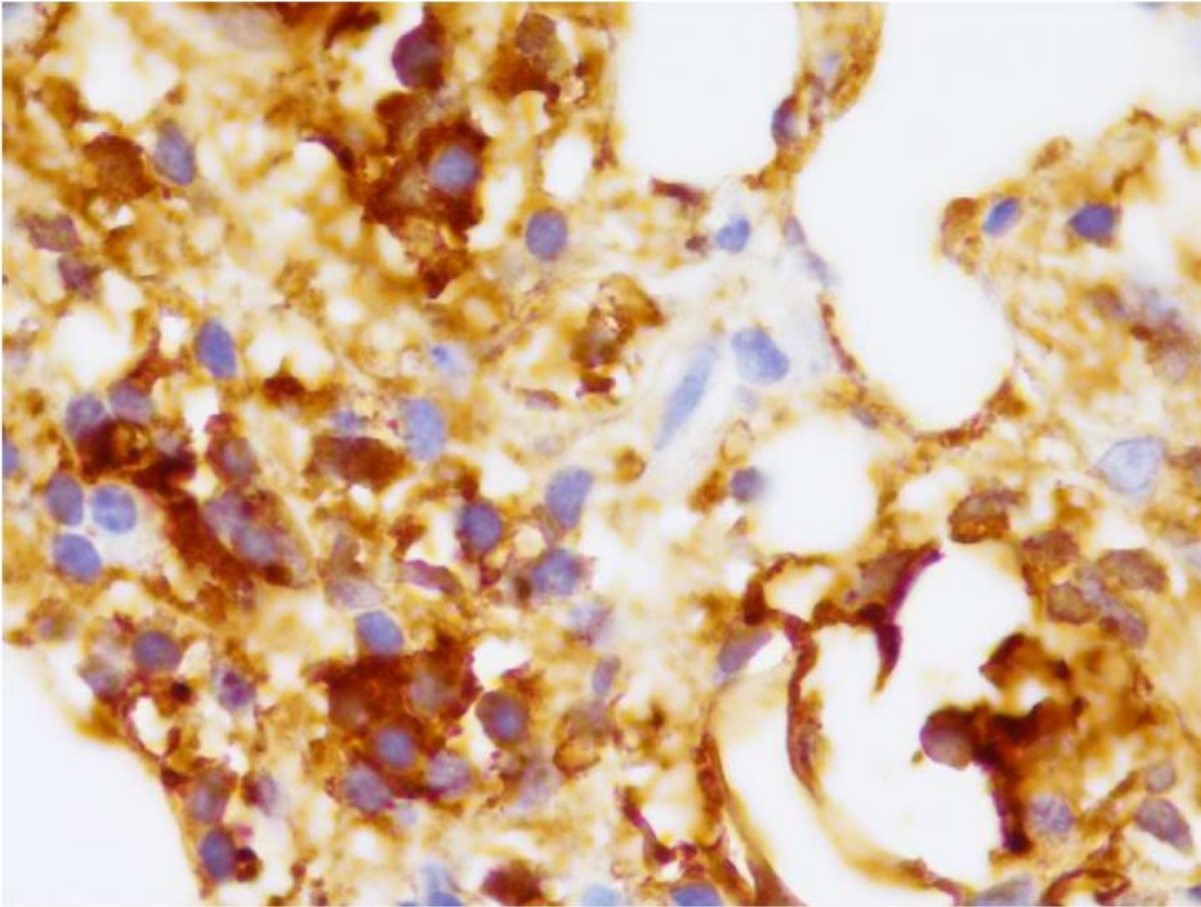


Figure 3. Emperipolesis

DISCUSSION

Rosai-Dorfman Disease (RDD) is a benign disorder of proliferative histiocytosis, that most often presents with lymphadenopathy.¹⁻⁵ RDD typically affects cervical lymph nodes and is accompanied by fever, leukocytosis, elevated erythrocyte sedimentation rate (ESR), and polyclonal hypergammaglobulinemia.^{1-2, 5} Extranodal involvement may occur, with the skin being the most common site.¹⁻² When RDD is limited to the skin, it is considered a different and rarer entity known as cutaneous Rosai-Dorfman Disease (CRDD).^{1, 5} CRDD may manifest as nodules, papules, pustules, plaques, and patches without specific

predilection of the body site involved.^{1, 6} Our patient presented with clustered satellite nodules, somewhat mimicking keloid (Figure 1). She did not have any organ involvement or lymphadenopathy. The differential diagnosis for CRDD in this patient included: fibrous histiocytoma, xanthoma, juvenile xanthogranuloma, reticulohistiocytoma, mycobacterial or deep fungal infections, and lymphoproliferative disease.¹ The age distribution of CRDD ranges from 15 to 68 years, with female predominance of 2:1.¹ The exact etiopathogenesis of RDD/CRDD is not known, but it is believed to originate from an overactive immune response

leading to histiocyte expansion and activity.⁷ Pathogens such as human herpes virus (HHV), Epstein-Barr virus (EBV), varicella-zoster virus (VZV), and human immunodeficiency virus (HIV) have been reported as possible stimuli for the disease.⁸

The most sensitive and specific diagnostic tool for CRDD is histologic examination, particularly in the absence of lymphadenopathy and other systemic symptoms. Histological appearance of CRDD is indistinguishable from RDD, with both characterized by proliferation of polygonal histiocytes (Rosai-Dorfman cell) showing emperipolesis and a mixed inflammatory infiltrate.¹⁻² The classic Rosai-Dorfman cell is recognized by abundant amorphous cytoplasm, indistinct borders, and a large vesicular nucleus with prominent nucleoli.² These cells uniquely express the dendritic/Langerhans cell marker S-100 and also monocyte/macrophage markers such as lysozyme, Mac-387 and CD68.⁹ Emperipolesis can be evident by observing trapped and intact lymphocytes inside of histiocytes which are not digested¹⁰, a characteristic finding that was also seen in our patient's biopsy (Figure 3). CRDD has a good prognosis and usually spontaneously resolves, although persistent disease can also occur in some.⁸ A portion of the lesions in our patient resolved spontaneously, however others have been persistent for over a year. Various therapeutic modalities have been reported for CRDD including corticosteroids¹¹, isotretinoin¹², thalidomide¹³, cryotherapy¹⁴, radiotherapy¹⁵, and surgery¹⁶. Our patient was treated with the topical steroid halobetasol to symptomatic lesions. We suggested to watch and wait until the lesions resolved spontaneously, since most cutaneous lesions do not require treatment unless cosmetically unacceptable to the patients.

CONCLUSION

Purely cutaneous Rosai-Dorfman disease is a very rare and difficult diagnosis to be made, because it has no characteristic features of the skin disease. Nevertheless, a dermatologist should be able to diagnose this disease with the use of histopathological examination and immunochemistry.

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References:

1. Brenn T, Calonje E, Granter SR, Leonard N, Grayson W, Fletcher CD, et al. Cutaneous Rosai-Dorfman disease is a distinct clinical entity. *Am J Dermatopathol*. 2002;24(5):385-91.
2. Wang K-H, Chen W-Y, Liu H-N, Huang C-C, Lee W-R, Hu C-H. Cutaneous Rosai-Dorfman disease: clinicopathological profiles, spectrum and evolution of 21 lesions in six patients. *Br J Dermatol*. 2006;154(2):277-86.
3. Rubenstein MA, Farnsworth NN, Pielop JA, Orenge IF, Curry JL, Drucker CR, et al. Cutaneous Rosai-Dorfman disease. *Dermatol Online J*. 2006;12(1):8.

4. Farooq U, Chacon AH, Vincek V, Elgart GW. Purely cutaneous Rosai-Dorfman disease with immunohistochemistry. *Indian J Dermatol.* 2013;58(6):447-50.
5. Hinojosa T, Ramos E, Lewis DJ, Angel Ld, Vangipuram R, Peranteau AJ, et al. Cutaneous Rosai-Dorfman disease: A separate clinical entity. *J Dermatol & Dermatol Surg.* 2017;21(2):107-9.
6. Jia J, Tian Q, Zhang H, Zheng Y. An unusual case of multiple cutaneous Rosai-Dorfman disease involving two separate parts of the body. *Int J Dermatol.* 2017;56(5):576-8.
7. Kinio AE, Sawchuk MA, Pratt M. Atypical primary cutaneous Rosai-Dorfman disease: A case report. *J Cutan Med Surg.* 2017;21(5):460-3.
8. Khoo JJ, Rahmat BO. Cutaneous Rosai-Dorfman disease. *Malaysian J Pathol.* 2007;29(1):49-52.
9. Middel P, Hemmerlein B, Fayyazi A, Kaboth U, Radzun HJ. Sinus histiocytosis with massive lymphadenopathy: Evidence for its relationship to macrophages and for a cytokine-related disorder. *Histopathology.* 1999;35(6):525-33.
10. Landim FM, Rios HdO, Costa CO, Feitosa RGF, Filho FDR, Costa AAA. Cutaneous Rosai-Dorfman disease. *An Bras Dermatol.* 2009;84(3):1-5.
11. Salim A, Williamson M, Barker F, Hughes J. Steroid responsive cutaneous Rosai-Dorfman disease associated with uveitis and hypothyroidism. *Clin Exp Dermatol.* 2002;27(4):277-9.
12. Kong Y, Kong J, Shi D, Lu H, Zhu X, Wang J. Cutaneous Rosai-Dorfman disease a clinical and histopathologic study of 25 cases in China. *Am J Surg Pathol.* 2007;31:341-50.
13. Lu C-I, Kuo T-t, Wong W-R, Hong H-S. Clinical and histopathologic spectrum of cutaneous Rosai-Dorfman disease in Taiwan. *J Am Acad Dermatol.* 2004;51(6):931-9.
14. Scheel MM, Rady PL, Tyring SK, Pandya AG. Sinus histiocytosis with massive lymphadenopathy: Presentation as giant granuloma annulare and detection of human herpesvirus 6. *J Am Acad Dermatol.* 1997;37(4):643-6.
15. Annesi G, Giannetti A. Purely cutaneous Rosai-Dorfman disease. *Br J Dermatol.* 1996;134(4):749-53.
16. Lai FM-M, Lam WY, Chin CW, Ng WL. Cutaneous Rosai-Dorfman disease presenting as a suspicious breast mass. *J Cutan Pathol.* 1994;21(4):377-82.