Case Report

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Cutaneous Rosai-Dorfman Disease – A Case Report and Review of Literature

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ABSTRACT

Rosai–Dorfman disease (RDD), or Sinus Histiocytosis with Massive Lymphadenopathy (SHML) is a self-limiting, rare benign proliferative disorder of histiocytes in the lymph nodes with occasional extra-nodal involvement of the skin. Isolated Cutaneous Rosai-Dorfman disease(C-RDD) without node involvement is an exceedingly rare occurrence. Despite its unique characteristics, the diagnosis of Cutaneous Rosai Dorfman disease is hampered by its variable clinical presentation, misleading histopathological patterns, and the absence of lymphadenopathy. Herein we present a case report of Cutaneous Rosai-Dorfman disease without any lymph node involvement.

Keywords: *Cutaneous, Rosai-Dorfman Disease, Emperipolesis, S-100*

Introduction

Rosai–Dorfman disease (RDD), or sinus histiocytosis with massive lymphadenopathy (SHML), was first described by Destombes in 1965 but was recognized as a distinctive entity by Rosai and Dorfman in 1969 [1]. It is a self-limiting, rare benign proliferative disorder of histiocytes in the lymph nodes with occasional extra-nodal involvement of the skin, eyes, nasal cavity, paranasal sinuses, salivary gland, pancreas, skeletal system, and central nervous system. Although skin involvement is a frequent extranodal site in this rare disease, pure Cutaneous Rosai-Dorfman (C-RDD) disease without lymph node involvement is an exceedingly rare occurrence and not well documented [2]. It is estimated that the disease is limited to only the skin in 3% of cases [3]. The etiology of RDD is unknown, as are the cases with the purely cutaneous form. In some patients, there have been implications of infectious agents including Epstein-Barr virus, human herpesvirus six, parvovirus B19, herpes simplex virus, *Brucella*, *Klebsiella rhinoscleromatis* and *Nocardia* based on positive serology and temporal association but it seems to be a non-specific reactive response as viral genomes are frequently detected in disorders of lymphoid tissue, [3],[4],[5].

Despite its unique characteristics, the diagnosis of Cutaneous Rosai Dorfman disease is hampered by its variable clinical presentation, misleading histopathological patterns, and the absence of lymphadenopathy. A wide variety of erroneous pathological diagnoses, e.g., granuloma annulare (GA), granulomatous diseases and inflammatory pseudotumor, has been found in the literature, especially in cases showing atypical features [6].

Case Report

A 42- year- old male patient presented to the surgery clinic with complaints of a single slow growing recurrent swelling on the right side of front of neck for 3 months. There were no associated systemic symptoms such as fever, malaise, weight loss or joint pain. He was a diabetic on regular medication.

On examination, the patient was afebrile and there was a single firm swelling measuring 3x3 cm on the right side of front of neck with an overlying brownish red smaller satellite nodule. It was mildly tender and warm on palpation. There was no lymphadenopathy or organomegaly detected clinically. Laboratory investigations showed a normal complete blood count and an erythrocyte sedimentation rate of 16 mm/hr. Serological tests for EBV, CMV, HIV, HBs Ag, HCV and syphilis were all non-reactive. Chest radiograph was normal. An ultrasound examination of the neck showed a soft tissue lesion measuring 2.8x0.7cm in the subcutaneous plane.

The excision biopsy of the swelling was done. Grossly, we received a single skin covered soft tissue mass measuring 5x2.7x1.5 cm. The external surface of the skin showed a tiny brownish red nodule measuring 0.8x 0.5 cm. On cutting along the long axis of skin surface, revealed a well circumscribed pale white to yellowish nodule measuring 2x1.8x1 cm in the dermis.

Microscopic examination showed a circumscribed lesion in the dermis and sub cutis which was composed of pale-staining histiocytes with abundant cytoplasm and vesicular

nuclei with evident nucleoli arranged in sheets, with intervening fibrosis along with vague nodules composed of lymphocytes, plasma cells and histiocytes (Figures 1,2). Emperipolesis was noted in the histiocytes (Figure 3). Special stains including Giemsa stain, Fite Stain, Gram stain and Periodic acid–Schiff were negative. Immunohistochemistry revealed diffuse S-100 protein expression in the histiocytes (Figure 4).

Correlating the clinical and histopathological data, a diagnosis of Cutaneous Rosai–Dorfman disease was established. Follow-up of the patient till date showed that the disease remained stationary without any clinical, laboratory or radiological progression to the systemic classic form.

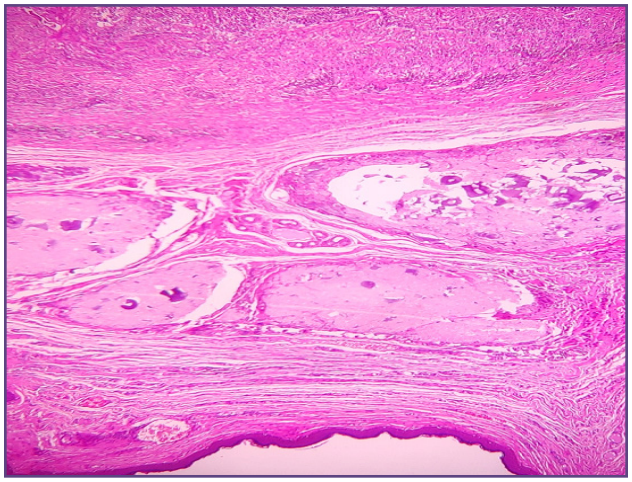

Fig. 1: Skin with an underlying circumscribed lesion in the dermis composed of histiocytes in sheets and vague nodules. (H&E, 4X).

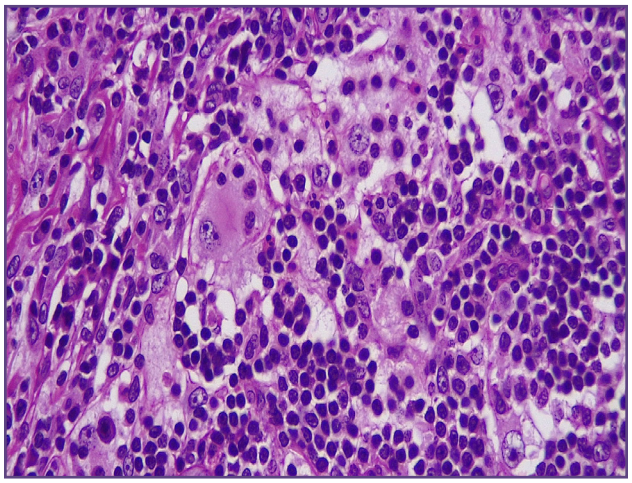

Fig. 3: Histiocytes exhibiting emperipolesis. (H&E, 40X).

Discussion

RDD is a benign, self-limiting non-Langerhans cell histiocytosis of unknown etiology which may be limited to the lymph nodes .However, more than 40% of patients have extra nodal involvement, with the skin being the most frequently affected site .Cutaneous disease without lymphadenopathy is extremely rare and was described for the first time in 1978 [5, 7] .Some authors distinguish purely C -RDD and C-RDD with systemic involvement [8]. Based on the clinical findings, histopathological picture, and other laboratory investigations we could diagnose in our patient, a pure CRDD.

CRDD may manifest as non-specific macules, papules, plaques, or nodules ranging in size and color from yellowish

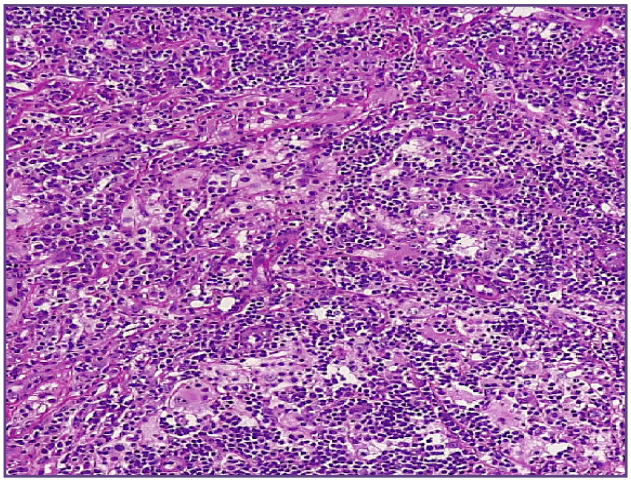

Fig. 2: Lesion composed of sheets of histiocytes with intervening fibrosis. (H&E, 40X).

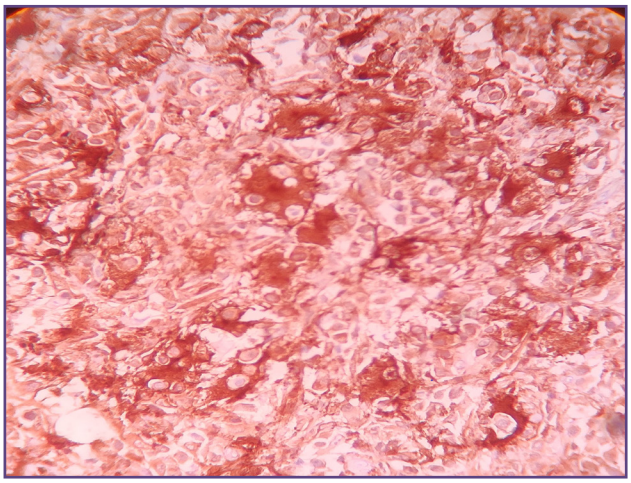

Fig. 4: Immunohistochemistry showing diffuse S-100 expression in the histiocytes.

– red to reddish – brown [8]. Lesions mimicking acne, vasculitis or panniculitis have also been reported [5]. While the disease has a capricious topographic distribution, facial skin appears to be the most affected. Of reported cases, the average age is around 45 years and women appear to be more affected than men (2:1), and most cases have been seen among Caucasians and Asians [7]. But our case was a middle-aged man who presented with a neck swelling.

Laboratory tests and radiograph results were unremarkable in RDD. Noguchi et al reported that patients of RDD might show slight elevation of CRP and ESR [9]. However, such results were not observed in our case. Laboratory parameters may show nonspecific increase in RDD, which was reported by a previous literature [9].

The diagnosis of C-RDD is confirmed by pathological examination. Specimens are obtained by open surgical biopsy or fine needle aspiration. In general, histopathological inspection markedly shows a large number of mixed cell population, including mature plasma cells and lymphocytes. The most typical cells are histiocytes of accentuated phagocytic appearance, which in turn demonstrate emperipolesis of lymphocytes, although sometimes plasma cells, erythrocytes and neutrophils are also affected. However, mitosis and necrosis are rare. The most useful immunohistochemical markers of histiocytes in RDD include a positive S-100 protein and CD68, and negative CD1a [10-12]. Our case showed similar histopathologic appearance and a positive S-100 protein immunohistochemistry.

Doubtlessly, numerous uncharacteristic cutaneous presentations and nonspecific laboratory findings makes the diagnosis of CRDD challenging. Other histiocytosis, granulomatous infectious diseases, sarcoidosis, lymphomas, and soft tissue tumours are the most common differential diagnosis to be considered. Immunohistochemical examination, however, present reproducible features and help in distinguishing the various differential diagnosis [3,5].

This disease is considered self-limiting due to spontaneous resolution and usually does not require aggressive intervention, unless bothersome to the patient or if it leads to significant functional or physical impairment, such as compression of a vital organ. Yet, there are a few patients reporting refractory or persistent disease [3].

The recommended management of RDD is close observation, as its course is usually self-limited. Should management be warranted, such as in cases of lesions causing physical compression or in cases with internal organ involvement, surgical excision is considered the most effective treatment. Although corticosteroids, thalidomide, radiotherapy, and alkylating agents have anecdotally been used, their effectiveness have not been proven. The optimal management is yet to be elucidated, and well-designed studies are warranted to draw definitive conclusions [7].

Conclusion

Cutaneous RDD is an extremely rare benign soft tissue disorder. Herein we report a case of isolated CRDD in a middle-aged man with a history of Diabetes Mellitus. We would like to highlight the importance of consideration of rare entities in the differential diagnosis of non-specific skin lesions which can pose a diagnostic dilemma.

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Competing Interests

None

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