Extranodal Rosai-Dorfman Disease Presenting as Incidental Bone Tumor: A Case Report

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Abstract

We report a case of primary extranodal Rosai-Dorfman disease presenting as a painless lesion in the left ilium of a 71-year-old African-American man.

Rosai-Dorfman disease (RDD), or sinus histiocytosis with massive lymphadenopathy, was first described in 1969[1] as a distinct entity involving lymph nodes. Later, the disease was reported to involve multiple organ sites and was described to involve practically all organ systems.[2,3] Osseous involvement as the only manifestation of RDD is rare. Most patients with RDD are young, in the second or third decade of life, with a slight male predominance.[2] We present the case of a 71-year-old African-American man with RDD presenting as a solitary, lytic lesion in the left ilium without nodal or other extranodal involvement. Our case is the oldest patient with bone involvement by RDD reported in the world literature and the first patient with ilium involvement reported in the English-language literature.[4] The authors have obtained the patient's informed written consent for print and electronic publication of the case report.

Case Report

A 71-year-old African-American man presented to the emergency department with a 12-hour history of left lower quadrant abdominal pain. Past medical history was significant for stroke, cardiovascular disease with cardiac stent placement, gastroesophageal reflux disease, hypertension, and diabetes mellitus. Physical examination showed mild to moderate lower abdominal tenderness. Computerized tomography revealed a left proximal ureteral calculus and a 1x5-cm mass centered within the iliac wing with extensions into the iliacus and gluteal muscles (Figure 1). A plain radiograph revealed a 5-cm lytic lesion of the left ilium (Figure 2). The patient then was referred to our institution.

Subsequent physical examination exhibited a nontender palpable mass in the posterior ileum. The patient had a full range of active motion of the hip and knee. There were no abnormal findings on chest radiographs. An incisional biopsy of the iliac mass was performed. Frozen section examination suggested granulation tissue with evidence of acute and chronic inflammation. Tissue was obtained for permanent sections, and cultures and sensitivities. The specimen obtained from the left ilium mass consisted of a 5.5x4.0x1.0-cm aggregate of soft, yellow-tan tissue. Histologic sections revealed large collections of histiocytes admixed with an inflammatory infiltrate composed of neutrophils, plasma cells, and lymphocytes (Figure 3). The histiocytes had either a finely vacuolated, bubbly cytoplasm with distinct cell borders or a light-pink cytoplasm with indistinct cell borders. Nuclei were small, round-oval, centrally located with finely distributed chromatin and small visible nucleoli. No mitotic figures or necrosis were noted.

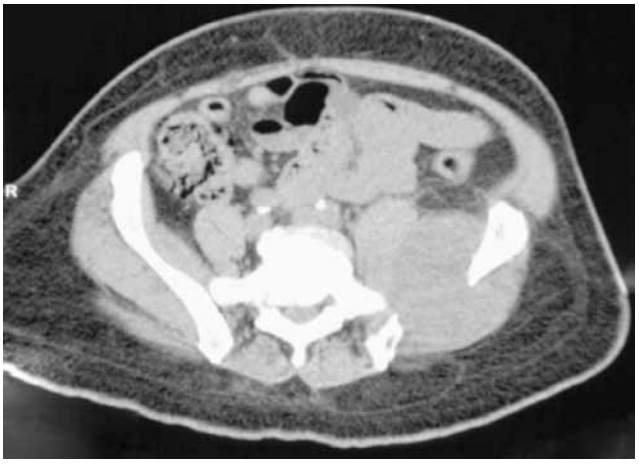

Figure 1. Computerized tomography revealing a mass in the middle of the left iliac wing extending ventrally and dorsally.

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Am J Orthop. 2010;39(11):E123-E125.

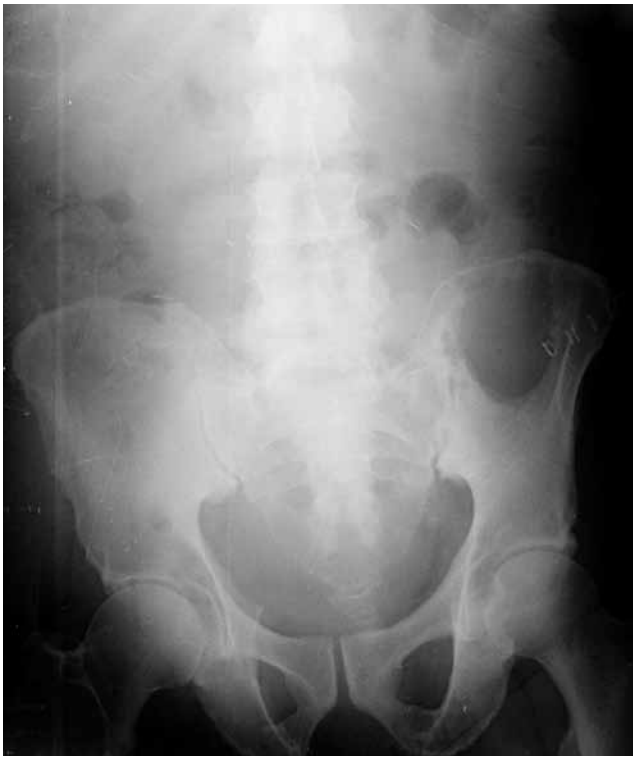

Figure 2. Radiograph revealing a lytic lesion in the left ilium of the patient.

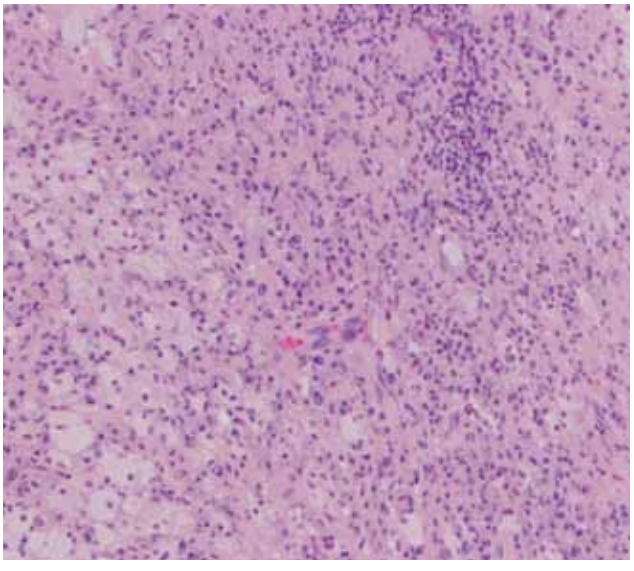

Figure 3. The left ilium mass was composed of a mixed inflammatory infiltrate consisting of lymphocytes, plasma cells, and numerous histiocytes. Occasional neutrophils were seen elsewhere. Some histiocytes had a finely vacuolated, pale cytoplasm with distinct borders, while other histiocytes had a denser, pink, ill-defined cytoplasm (hematoxylin and eosin stain ×200).

Intracellular engulfment of inflammatory cells (neutrophils, lymphocytes, and plasma cells) by these histiocytes was noted (emperipolesis) (Figure 4). Plasma cells with Russell bodies were noted. Immunohistochemical stains showed that these histiocytes were positive for both S-100

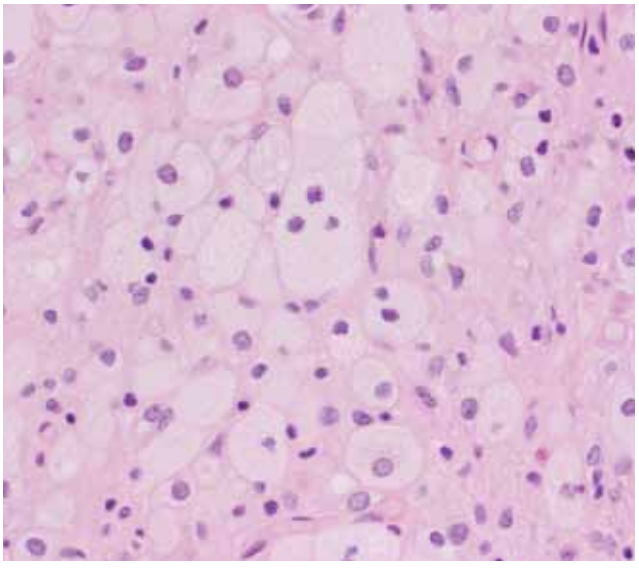

Figure 4. Intracellular engulfment of viable lymphocytes by the foamy histiocytes. This phenomenon of emperipolesis ("wandering in and around") is a characteristic feature of Rosai-Dorfman disease. (hematoxylin and eosin stain ×400).

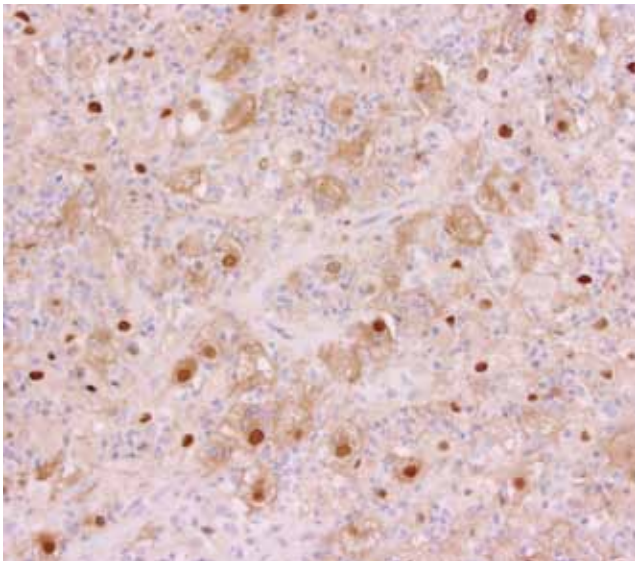

Figure 5. Histiocytes are positive for S-100 protein (immunohistochemical stain ×400).

protein and CD68, and negative for pan-cytokeratin AE1/AE3 (Figure 5). Special stains (Ziehl-Neelsen, Gomori methenamine silver, and Gram) were negative for microorganisms. Periodic acid Schiff (PAS) with and without diastase revealed only few scattered, small, intracytoplasmic granules. No foreign particles were seen under polarized light. Routine bacterial and mycobacterial cultures were negative. Based on these findings, a diagnosis of extranodal Rosai-Dorfman disease was made.

Follow-Up

Further scans and radiographs of the patient revealed no other lesion and no lymph node involvement. Given

the patient's age and the fact that the lesion was causing no pain or illness, no treatment was pursued. Nineteen months after the lesion was initially found, the patient is clinically well with no evidence of disease.

Discussion

In 1990, Foucar and colleagues[2] synthesized the results of a database collecting patients exhibiting the histologic and clinical signs of RDD. Of the 423 RDD patients in the database, 179 patients (42.3%) had extranodal involvement. Only 33 of these patients (7.8%) had osseous involvement, and only 9 of those patients (2%) had osseous involvement without lymphadenopathy; this group included both primary solitary osseous involvement as well as synchronous bone and extranodal site involvement. In their literature review of isolated bone lesions of RDD, Sundaram and colleagues[5] summarized the findings in 15 patients with solitary bone lesions and 3 patients with multiple bone lesions as the sole manifestation of RDD that were documented in the world literature until 2004. Four additional cases have been reported since then; 2 cases with multiple bone lesions[6,7] and 2 cases with solitary bone lesions.[8,9]

Radiographically, the bone lesions in RDD are typically small, medullary, lytic lesions with sharply or poorly defined borders. They also can be large, mixed lytic and sclerotic,[10] with cortical involvement and periosteal reaction,[3,11] or destructive with soft-tissue extension.[2] Differential diagnosis in children includes Langerhans cell histiocytosis (eosinophilic granuloma), multifocal osteomyelitis, and metastatic neuroblastoma,[3] while in adults, the metastatic malignancy[2,10] is the most important entity to be considered in the differential.

Treatment of RDD consists of close observation unless clinical signs are present. In a study by Pulsoni and colleagues,[12] they found that 32 of 40 cases of RDD that were not treated with surgery, radiation therapy, or chemotherapy resulted in complete remission. Of the 8 patients observed who did not obtain complete remission, 1 patient had partial remission, 5 patients had persistent disease, and 1 died of amyloidosis with renal failure. In cases in which treatment becomes necessary because of clinical signs or symptoms, surgical debulking has the best outcomes, with 8/9 patients obtaining complete remission. Radiation therapy alone on 9 patients resulted in 3 complete remissions, 3 patients with persistent disease, and 3 patient deaths due to widespread nodal and extranodal disease involvement. Chemotherapy largely is ineffective, with only 2/12 patients having any response to vinca alkaloids, anthracyclines, or alkylating agents.

The patient that we are reporting was discovered to have a large ilium lesion during the work-up for abdominal pain. The radiologic studies revealed a lytic lesion with ill-defined borders, no periosteal reaction, and cortical destruction. The differential diagnosis, in light of the patient's age, was metastatic disease. During the intraoperative consultation, the differential diagnosis expanded to include osteomyelitis or other inflammatory conditions. Only after reviewing the histology and appropriate immunohistochemical stains, the diagnosis of RDD was made.

Although the etiology of RDD remains unknown, the leading hypothesis is that it is of infectious origin. The lytic lesions seen in bone support the infectious origin, as does the appearance of the tissue intraoperatively; however, cultures and serologic studies had been negative. It has been suggested that RDD may be linked to infection with Parvovirus after 4 samples—2 from nodal patients and 2 from extranodal patients—were shown to be highly reactive with an antibody to Parvovirus B19 capsid proteins.[13]

We present this case to raise awareness of the disease and to include it in the differential diagnosis even in elderly patients presenting with lytic lesions.

Authors' Disclosure Statement

The authors report no actual or potential conflict of interest in relation to this article.

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