Rosai-dorfman disease: A rare presentation of primary ureteral involvement with concurrent sarcoidosis

Connor C. Cocke a, Sarah A. Anderson, Wadad S. Mneimneh, Christopher E. Keel

University of South Alabama, United States

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ABSTRACT
Rosai-Dorfman disease is a rare condition with poorly understood pathogenesis at this time. Although it often involves the lymph nodes, it can present nearly anywhere at extranodal sites. Patients are frequently asymptomatic, but surgical debulking is currently the only method of treatment that has shown benefit for patients requiring intervention. This case report discusses a unique presentation of Rosai-Dorfman disease involving the ureter of a 49-year-old woman with known history of sarcoidosis, discovered incidentally on routine CT scan.

Introduction
Rosai-Dorfman disease (RDD), also known as sinus histiocytosis with massive lymphadenopathy, is a rare condition of still unknown etiology. Multiple hypotheses have been made regarding the pathogenesis of the disease, including exposure to infectious agents or failures of immune regulation. RDD is generally an indolent process typically presenting in young adults with fever and cervical lymphadenopathy. While RDD shows a propensity to involve the lymph nodes (particularly of the head and neck), it can present extranodally at virtually any site throughout the body. While RDD may clinically mimic a lymphomatous process, its histologic findings are typical, characterized by non-Langerhans cell, S100-positive histiocytic proliferation with emperipolesis (lymphohagocytosis). Literature review reveals an extremely diverse extranodal presentation of the disease, and only rare cases presented with urologic manifestations. At this time, surgical debulking appears to be the only effective method of treatment for patients requiring intervention. We present an unusual case of extranodal RDD mimicking ureteral malignancy.

Case presentation
A 49-year-old female with a history of sarcoidosis presented to establish care for a left ureteral mass after undergoing a CT scan for her sarcoidosis that revealed left hydrenephrosis and a ureteral mass. She initially presented in 2013 with splenic and liver lesions and retroperitoneal lymphadenopathy. Biopsies from the liver and spleen lesions at that time reportedly showed non-necrotizing granulomas consistent with sarcoidosis. The patient was treated with steroids at which point the lesions resolved. A more recent follow up CT scan of the abdomen demonstrated left hydrenephrosis and hydrocalycosis, with a 2.4 × 2.8 cm soft tissue mass near the left ureteropelvic junction, suspicious for malignancy [Fig. 1, CT]. Upon presentation, the patient denied hematuria or flank pain, and no palpable lymphadenopathy was present on physical examination. Ureteroscopic biopsy was attempted but no intraluminal tumor was demonstrated. The patient subsequently underwent percutaneous biopsy of the left ureteral mass showing lymphoid tissue without evidence of lymphoma. To further characterize the nature of the mass, and due to the secondary hydrenephrosis, the patient elected to undergo a robot-assisted excision of the left ureteral mass. Microscopically, the lesion consisted of a vaguely nodular lymphohistiocytic proliferation characterized by histiocytes with abundant clear cytoplasm, vesicular nuclei, regular nuclear contours, and inconspicuous nucleoli with admixed abundant lymphoplasmacytic infiltrate [Fig. 2 A]. Some of the histiocytes included intact intracytoplasmic lymphoid elements (emperipolysis) [Fig. 2 B]. By immunohistochemistry, the histiocytes were positive for CD68 [Fig. 2 C] and S100 [Fig. 2 D] and negative for CD1a. These findings were consistent with RDD. No kappa or Lambda light chain restriction or aberrant immunophenotype was seen in the lymphoplasmacytic infiltrate. In addition, occasional well-formed non-necrotizing granulomas were also present at the periphery of the mass.

The patient was discharged the next day without complication. Follow up imaging at three months showed no masses and no signs of hydrenephrosis.
Discussion

Rosai-Dorfman disease is an extremely rare condition affecting adolescents and young adults, with head and neck lymphadenopathy being the most frequent presentation. Forty three percent of cases present with extranodal involvement. RDD diagnosis is challenging due to its clinical similarity in presentation to lymphoma and other lymphoproliferative conditions. The diagnosis of RDD is usually established by histologic examination. RDD is characterized by a non-Langerhans histiocytic proliferation with emperipolesis (lymphophagocytosis). These histiocytes co-express S100 and are negative for CD1a and Langerin by immunohistochemistry. Our case is especially unique for multiple reasons:

1 Atypical age of presentation at 49 years, as compared to the usual younger age range of the disease typically affecting adolescents and younger adults;
2 Unusual urologic manifestation as ureteral mass and secondary hydronephrosis: While the kidney itself is an extremely rare site of RDD, our literature review revealed only three reported cases of RDD with primary ureteral involvement. In addition, the patient was asymptomatic on presentation despite the noted hydronephrosis;
3 Possible association with sarcoidosis: Such association has not been previously reported. While RDD and sarcoidosis could be two separate processes in our patient, the relationship between these two histiocytic disorder at the base of these two disorders may be hypothesized. The original liver and spleen biopsies that established the diagnosis of sarcoidosis were not available for review at our institution. Interestingly, well-formed, non-necrotizing sarcoidal-type granulomas were seen at the periphery of the perireteral mass-forming RDD in our case. These non-necrotizing granulomas could be related to the previous diagnosis of sarcoidosis. Nevertheless, it is possible that the original biopsies were taken at the periphery of more diagnostic areas of RDD.

Conclusion

In conclusion, we present a case of RDD, an extremely rare histiocytic disorder, with atypical features including older age of presentation, unusual clinical manifestation mimicking ureteral malignancy, and possible association with sarcoidosis. RDD remains difficult to diagnose due to the rarity of the condition and the non-specific clinical presentation. RDD should be considered when working up a patient with benign lymphadenopathy, with or without systemic involvement.
References

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