

Extranodal Rosai-Dorfman disease involving the meninges in a 79-year-old man

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Rosai-Dorfman disease was first described in 1969 as an idiopathic histiocytic proliferative disorder characterized by sinus histiocytosis and massive lymphadenopathy. Cardinal features include massive painless cervical adenopathy, fever and polyclonal hypergammaglobulinemia.^{1,2} Extranodal involvement occurs in 25% to 43% of cases affecting the skin (12%), paranasal sinuses (11%), soft tissue (9%), bone (9%), salivary gland (5%), central nervous system (5%), oral cavity (3%), kidney (2%), lower respiratory tract (2%), larynx (1%), and rarely other locations such as the orbit.²⁻⁶ More than 650 cases of Rosai-Dorfman disease have been reported since 1969.⁷ To our knowledge, there have been 54 cases with central nervous system involvement reported in the literature.⁶⁻¹⁵ Rosai-Dorfman disease occurs most frequently in the first two decades of life.¹⁶ The age of patients with Rosai-Dorfman disease of the CNS ranges between 2 to 78 years and occurs predominantly in males.¹⁴

Case

A 79-year-old man presented to the hospital with recurrent episodes of generalized tonic-clonic seizures, frontal headache and intermittent fever, which was sometimes high grade, from 1 month previously. He had no arthralgia, skin rashes, fatigue, malaise and weight loss during this period. His medical history was significant for hyperthyroidism about 30 years ago which was controlled by medication. He also had a history of rectorrhagia about 25 years ago and colonoscopy and biopsy revealed 2 tubular adenomas. After appropriate intervention, the patient became asymptomatic. Physical examination at the time of admission was unremarkable. There was no Kernig or Brudzinski sign. No lymphadenopathy was palpated and there was no hepatosplenomegaly.

Laboratory tests revealed a white blood cell count of $8 \times 10^3/m$ with normal differentiation, a hemoglobin of 14.5 g/dL, a platelet count of $450 \times 10^3/mL$ and an erythrocyte sedimentation rate (ESR) of 71 mm. C-reactive protein and rheumatoid factor were negative. The Wright and Widal tests were also negative.

Because of the impression of meningitis, a lumbar puncture was performed. Cerebrospinal fluid (CSF) examination showed normal levels of glucose and protein and no red or white blood cells. Chest radiology was negative for pulmonary infiltrates. Enhanced magnetic resonance imaging (MRI) revealed an abnormal extra-axial, dural-based enhancing mass in the left parasagittal region compatible with meningioma or leptomeningeal carcinomatosa (Figure 1). Due to the suspicion of a neoplastic process, a meningeal biopsy was done. Frozen section material showed inflammatory cell infiltration, mainly lymphocytes, which were initially interpreted as inflammatory pseudotumor or lymphoma. Paraffin-embedded sections, however, demonstrated cellular infiltrates composed of mainly histiocytes, plasma cell and lymphocytes in a background of collagen fibers. The typical histiocyte showed indistinct margins with abundant clear to eosinophilic

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cytoplasm with occasional emperipolesis (lymphocytophagocytosis) was characteristic in hematoxylin and eosin stained section (Figures 2, 3). The histiocyte aggregations were immunopositive for the S-100 protein. All of these findings were consistent with extranodal Rosai-Dorfman disease.

The patient was treated with prednisolone using a loading dose of 75 mg/dL, which tapered during 4 months. After this period, the patient became asymptomatic and an MRI of the brain showed no leptomeningeal enhancement.

Discussion

Rosai-Dorfman disease is an uncommon disorder that typically manifests as systemic symptoms, painless cervical lymphadenopathy and fever. The disorder is most commonly seen in children, but the disease affects all age groups. Approximately 90% of patients present with massive bilateral and painless cervical lymphadenopathy. Extranodal sites are involved in approximately 40% of cases. Constitutional symptoms are common but hepatosplenomegaly is rare. Most patients undergo spontaneous remission.^{1,2,9,16} The extranodal form of disease with CNS involvement shows a predilection for males and typically presents during the fourth to fifth decade in contrast to its classic form, which is seen in the first two decades.^{8,17}

To our knowledge, this is the oldest patient with Rosai-Dorfman disease of the CNS that has been reported in the literature. Most of the previous cases of Rosai-Dorfman disease of the CNS were intracranial. Most intracranial lesions have involved the dura, thereby mimicking meningioma both clinically and radiographically.

Intracranial Rosai-Dorfman disease usually involves the meninges,^{8,13,15,18} but mass lesions were also reported,⁸⁻¹² most of which were extra-axial and dura-based although involvement of CNS parenchyma was reported.⁸⁻¹¹ The histologic feature of CNS involvement is similar to those of lymph nodes. Cytologically, the infiltrates are composed of a variable number of histiocytes intermixed with plasma cells and lymphocytes.⁸ Lymphocytosis (emperipolesis) describes the presence of lymphocytes within the histiocytes and is often less apparent in extranodal sites.² Ultra-structurally, the proliferating histiocytes contain lipid vacuoles and varying numbers of lysosomes. The histiocytes have extensive pseudopodia and lack Birbeck's granules, viral particle or other evidence of infection.

In conclusion, extranodal Rosai Dorfman disease of the CNS may mimic the clinical presentation of meningitis, meningeal carcinomatosis or meningioma, but it

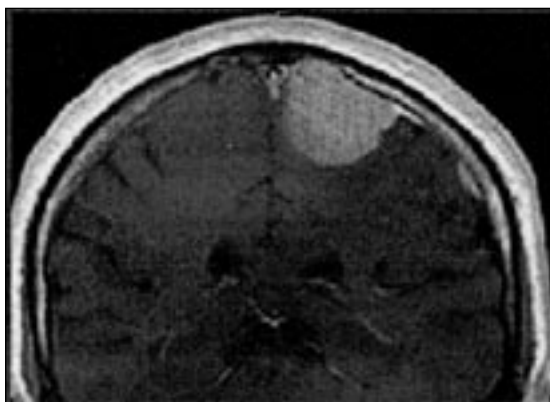


Figure 1. T1 enhanced coronal MRI, showing parasagittal enhancing mass.

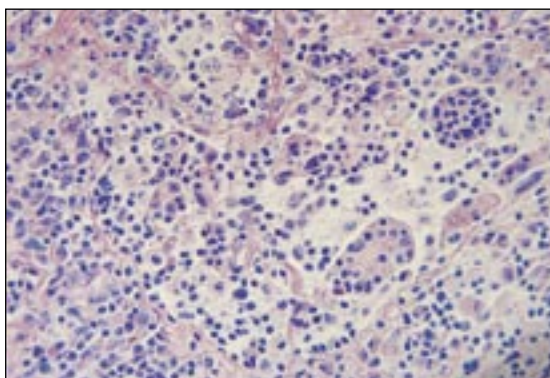


Figure 2. Lymphocytaphagocytosis by the histiocytes (H&E/x400)

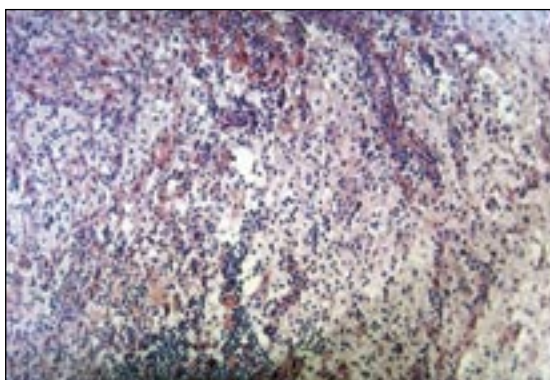


Figure 3. Cellular infiltrate, composed of mainly lymphocytes and many histiocytes (H&E/x250)

has a benign course with a very good response to corticosteroid therapy and complete clinico-radiographic remission.

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References

- Rosai J, Dorfman RF: Sinus histiocytosis with massive lymphadenopathy. A newly recognized benign clinicopathologic entity. *Arch Pathol.* 1969; 87: 63-70
- Foucar E, Rosai J, Dorfman R: Sinus histiocytosis with massive lymphadenopathy (Rosai-Dorfman disease): review of the entity. *Semin Diagn Pathol.* 1990; 7: 19-73
- Kim M, Provias J, Berstein M: Rosai-Dorfman disease mimicking multiple meningioma: case report. *Neurosurgery.* 1995; 36: 1185-7
- Shaver EG, Rebsamen SL, Yachnis AT, et al: Isolated extranodal intracranial sinus histiocytosis in a 5 year old boy: case report. *J Neurosurg.* 1993; 79: 769-73
- Foucar E, Rosai J, Dorfman RF, Brynes RK: The neurologic manifestation of sinus histiocytosis with massive lymphadenopathy. *Neurology.* 1982; 32: 365-72
- Chang YC, Tsai MH, Chen CL, et al: Nasal Rosai-Dorfman disease with intracranial involvement: A case report. *Am J Otolaryngol.* 2003; 24(3): 183-6
- Wu M, Anderson AE, Kahn LB: A report of intracranial Rosai-Dorfman disease with literature review. *Ann Diagn Pathol.* 2001; 5(2): 96-102
- Andriko JA, Morrison A, Colegial CH, et al: Rosai - Dorfman disease isolated to the central nervous system: report of 11 cases. *Mod Pathol.* 2001; 14(3): 172-8
- Konishi E, Ibayashi N, Yamamoto S, Scheithaver BW: Isolated intracranial Rosai-Dorfman disease (sinus histiocytosis with massive lymphadenopathy). *AJNR Am J Neuroradiol.* 2003; 24(3): 515-8
- Juric G, Jakic - Razumovic J, Rotim K, Zarkovic K: Extranodal sinus histiocytosis (Rosai-Dorfman disease) of the brain parenchyma. *Acta Neurochir.* 2003; 145(2): 145-9
- Hadjipanayis CG, Bejjani G, Wiley C: Intracranial Rosai - Dorfman disease treated with microsurgical resection and stereotactic radiosurgery. Case report. *J Neurosurg.* 2003; 98(1): 165-8
- Wrzolek MA, Zagzag D: May 2002: 38-year-old man and 69 year-old woman with dural based masses. *Brian Pathol.* 2002; 12(4): 517-8
- Franco-paredes C, Martin K: Extranodal Rosai-Dorfman disease involving the meninges. *South Med J.* 2002; 95(9): 1101-2
- Petzold A, Thom M, Powell M, Plant GT: Relapsing intracranial Rosai-Dorfman disease. *J Neurol Neurosurg Psychiatry.* 2001 oct; 71(4): 538-41
- Kitai R, Llena J, Hirano A, et al: Meningeal Rosai-Dorfman disease: report of three cases and literature review. *Brain Tumor Pathol.* 2001; 18(1): 49-54
- Silverberg SG, Delellis RA, Frable WJ: Surgical pathology and cytopathology. Churchill Livingstone Inc. New York 1997
- Sita G, Guffanti A, Colombi M, et al: Rosai-Dorfman syndrome with extranodal localizations and response to glucocorticoids: A case report. *Haematologica.* 1996; 81: 165-7
- Song SK, Schwartz IS, Strauchen JA, et al: Meningeal nodules with features of extranodal sinus histiocytosis with massive lymphadenopathy. *Am J Surg Pathol.* 1989; 13: 406-12