Isolated Intracranial Rosai-Dorfman Disease: A Case Report of Follow-Up MRI Showing Dynamic Changes of the Lesion

Jie Jiang¹, Dan Han¹, Yuanming Jiang¹, Zhenguang Zhang¹, Fenglin Xue² and Bo He*²

¹Department of Medical Imaging, The First Affiliated Hospital of Kunming Medical University, P.R. China
²Department of Pathology, the First Affiliated Hospital of Kunming Medical University, P.R. China

Abstract

Rosai-dorfman disease (RDD) is a histiocytic proliferative disorder and considered to be extremely rare in the CNS. In this paper, we reported a patient confirmed as isolated intracranial RDD in a 58-year-old woman. MRI imaging without contrast enhancement two years ago found nothing at the onset of the symptoms. Follow-up CT and MRI imaging one year later showed dynamic changes of the lesion from scratch. This report suggests that the symptoms of RDD are earlier than imaging findings. Moreover, we made a systematic literature review on the disease to better understand it.

Keywords: Rosai-Dorfman disease; RDD; Central nervous system

Introduction

RDD, also known as sinus histiocytosis with massive lymphadenopathy, is an uncommon benign histiocytic proliferative disorder of unknown origin with pathognomonic histological and immunohistochemical characteristics [1]. It predominantly affects the lymph nodes but can also be found extranodally in other organs. Primary extranodal sites include the skin, upper respiratory system, orbits, testes, bones, endocrine glands and CNS [2-8]. CNS involvement is unusual and isolated CNS RDD without other body involvement is even more exceptional [8]. We report a case of isolated CNS RDD without other body involvement.

Case Presentation

A 58-year-old Chinese woman with a 2-year history of headache, dizziness, blurred vision and a 3-week history of left facial tics came to our hospital. Neurological examination showed that the patient was with normal mind and without neurological deficit. Systemic lymphadenopathy or cutaneous abnormalities were not identified in physical examination. Cervical and abdomino-pelvic ultrasound and hematological and biochemical studies were normal.

Follow-up CT and MRI images had been performed for two years every several months. At the onset of these symptoms, cerebral MRI without contrast enhancement showed normal (Figures 1a and 1b). After one year, CT and MRI showed a 2 cm lesion in the right-temporal region, apparently adhering to the dural of the convexity and causing a mass effect and peritumor edema. The lesion appeared isodensity on CT and isointense on T1-weighted and T2-weighted images (Figures 2a-2c). Repeated CT and MRI scans in 6 months and about one year showed the lesion gradually increasing, 2.5 cm and 3.5 cm, respectively.

Contrast-enhanced images on MRI showed diffuse enhancement of the lesion with dural tail (Figures 3a-3d). The appearance of the lesion was better defined to be dural-based by the MRI scan, having the same radiological characteristics with the meningiomas. The patient underwent surgery and the removal of the right temporal mass was performed by right occipitotemporal craniotomy. The lesion was loosely attached to the dural; however, the lesion was firm and there was no macroscopic tumor infiltration into the adjacent brain.

Microscopically, the tissue was composed of lymphocytes some plasma cells and histiocytes in a background of fibrosis. The histiocytes were aggregated sheets between the lymphocytes and plasma cells. One of the most important findings was the phenomenon of emperipolesis (Figures 4a and 4b). Immunohistochemistry demonstrated the striking positivity of the histiocytes for S100 and CD68 protein while CD1a was negative.

Discussion

RDD was first described by Rosai and Dorfman in 1969 [3]. In 1965,
Intracranial RRD hasn’t characteristic imaging manifestations and normally presents as a meningioma-like, which is most commonly in extraparenchymal, cerebral convexity and the base of skull [2,8,13]. On computed tomography, the lesion may show a homogeneous, lobulated, hyperattenuating mass and moderate-to-marked peritumour edema. Moreover, there may be associated with bone erosion and appear obvious contrast enhancement. However, calcifications are not seen in the intracranial RRD. On T1-weighted magnetic resonance, the lesion may appear homogeneous, lobulated and isointense to the brain parenchyma, with strong homogeneous enhancement after contrast enhancement. On T2-weighted, the lesion may appear heterogeneous hypo-to-isointense, with intensity similar to adjacent dura. The differential diagnosis of intracranial RRD includes non-specific inflammatory disease of the brain parenchyma and meninges, lymphoproliferative disease, intracranial plasma cell granuloma and Langerhans cell histiocytosis [12-16].

Conclusion

In this case, there had no lymphadenopathy and associated systemic disease except headache, dizziness, blurred vision. At the beginning of these symptoms, CT and MRI examination appear normal. After about one-year, repeated CT and MRI images showed an isolated lesion in the right temporal region, which progressively increased. In the course of two years, we documented imaging data of the entire process of occurrence and development of the lesion. From the case, it suggests that imaging examination may appear normal at the onset of some RRD symptoms. For patients with persistent symptoms, the imaging examinations should be enhanced and undergone repeatedly every several months. Intracranial RRD may appear progressive increase, so an operation should be made as early as possible. Intracranial RRD hasn’t characteristic imaging appearance and it is difficult to differentiate meningioma and another tumor. The secure diagnosis of intracranial RRD is entirely based on histopathology and immunohistochemistry [7,13,17].

References

1. Foucar E, Rosai J, Dorfman R (1990) Sinus histiocytosis with massive lymphadenopathy (Rosai-Dorfman disease). Review of the entity. Semin Diag Pathol 7: 19-73.
2. Adeleye AO, Amir G, Fraifeld S (2010) Diagnosis and management of Rosai-Dorfman disease involving the central nervous system. Neurol Res 32: 572-578.
3. Rosai J, Dorfman RF (1969) Sinus histiocytosis with massive lymphadenopathy: A newly recognized benign clinicopathological entity. Arch Pathol 87: 63-70.
4. Udono H, Fukuyama K, Okamoto H (1999) Rosai-Dorfman disease presenting multiple intracranial lesions with unique findings on magnetic resonance imaging. Case report. J Neurosurg 91: 335-339.
5. Dalia S, Sagatya E, Sokol L (2014) Rosai-Dorfman disease: tumor biology, clinical features, pathology, and treatment. Cancer Control 21: 322-327.
6. Sato A, Sakurada K, Sonoda Y (2003) Rosai-Dorfman disease presenting with multiple intracranial and intraspinal masses: a case report. No Shinkei Geka 31: 1199-1204.
7. Woodcock RJ, Mendell JW, Lipper MH (1999) Sinus histiocytosis (Rosai-Dorfman disease) of the suprasellar region: MR imaging findings: a case report. Radiology 213: 808-810.
8. Wan S, Teng X, Zhan R (2008) Isolated intracranial Rosai-Dorfman disease mimicking suprasellar meningioma: case report with review of the literature. J Int Med Res 36: 1134-9.
9. Gears AR, Ayoubi MA, Achram MC (2004) Rosai-Dorfman disease mimicking neurofibromatosis: Case presentation and review of the literature. Clin Radiol 59: 625-630.
10. Konishi E, Ibayashi N, Yamamoto S (2003) Isolated intracranial Rosai-Dorfman Disease: A Case Report of Follow-Up MRI Showing Dynamic Changes of the Lesion. J Clin Case Rep 8: 1099. doi: 10.4172/2165-7920.10001099
disease (sinus histiocytosis with massive lymphadenopathy). Am J Neuroradiol 24: 515-518.

11. Mosheimer BA, Zandieh S (2017) Bone involvement in Rosai-Dorfman Disease (RDD): A case report and systematic literature review. Curr Rheumatol Rep 19: 29.

12. Kattner KA, Stroink AR, Roth TC (2000) Rosai-Dorfman disease mimicking parasagittal meningioma: Case presentation and review of literature. Surg Neurol 53: 452-457.

13. Mar WA, Yu JH, Knuttinen MG (2017) Rosai-Dorfman disease: Manifestations outside of the head and neck. Am J Roentgenol 208: 721-732.

14. McPherson CM, Brown J, Kim AW (2006) Regression of intracranial Rosai-Dorfman disease following corticosteroid therapy. Case report. J Neurosurg 104: 840-844.

15. Luo Z, Zhang Y, Zhao P (2017) Characteristics of Rosai-Dorfman disease primarily involved in the central nervous system: 3 case reports and review of literature. World Neurosurg 97: 58-63.

16. Elansari R, Elboukhani I, Loufad F (2016) Unusual bilateral eyelid and orbital involvement in Rosai-Dorfman disease (a comprehensive literature review and case report). J Fr Ophtalmol 39: e221-e225.

17. Kozak B, Talbott J, Uzelac A, Rehani B (2015) Rosai-Dorfman disease isolated to the thoracic epidural spine. J Radiol Case Rep 9: 6-16.