Cytomorphology of Sinus Histiocytosis with Massive Lymphadenopathy (Rosai-Dorfman Disease): A Report of Two Cases

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Case Report

Abstract: Rosai–Dorfman disease (RDD), a rare, benign, self-limiting histiocytic proliferative disorder, can be encountered in both nodal and extranodal locations, and fine needle aspiration (FNA), a simple, accurate and economic tool, has been widely used for the diagnosis of superficial and deep-seated lesions. Familiarity with the cytomorphologic features of RDD is important as prognosis and treatment are quite different from other benign or malignant diseases for which it may clinically masquerade. We report two cases of Rosai–Dorfman disease, one with typical and other with an unusual cytomorphological feature. Pathologist should be aware of the variations in the cytomorphological features of RDD so that a correct diagnosis is not missed on FNAC. We concluded that FNAC is a useful and reliable tool for the diagnosis of sinus histiocytosis with massive lymphadenopathy (Rosai-Dorfman disease) and biopsy can be avoided in these patients, thereby reducing patient inconvenience and health care cost.

Keywords: rosai dorfman disease,sinus histiocytosis.

Introduction

Rosai–Dorfman disease (RDD), a rare, benign, self-limiting histiocytic proliferative disorder, can be encountered in both nodal and extranodal locations, and fine needle aspiration (FNA), a simple, accurate and economic tool, has been widely used for the diagnosis of superficial and deep-seated lesions. Familiarity with the cytomorphologic features of RDD is important as prognosis and treatment are quite different from other benign or malignant diseases for which it may clinically masquerade. We report two cases of Rosai–Dorfman disease, one with typical and other with an unusual cytomorphology.

Case Reports

Case 1 was 31 year old male, presented with multiple bilateral soft to firm non-tender, cervical and submandibular lymphadenopathy of six months duration. To begin with he had fever of short duration followed by neck swellings on the left side. There was no history of pain, respiratory tract infections or any symptoms related to ear, nose or throat. There was no family history of tuberculosis. Clinical examination showed multiple, enlarged, bilateral, cervical and submandibular lymph nodes ranging in size 4x3 cms to 2x2 cms. They were non-tender, discrete firm and mobile.

Cytological Examination: FNA of the cervical lymph nodes on the left side was performed from multiple sites and a blood mixed aspirate was obtained. Smears were stained with giemsa stain. On microscopic examination, smears revealed presence of diffusely distributed histiocytes throughout the smears. These cells had abundant pale cytoplasm with single to multilobated or multiple nuclei but no nuclear atypia or nuclear grooving. The nuclei showed fine chromatin and inconspicuous to prominent nucleoli. The cytoplasm of these histiocytes exhibited numerous intact plasma cells and lymphocytes (emperipolesis). In some histiocytes the phagocytosed cells were so numerous that they obscured the nucleus. The background had mature lymphocytes, plasma cells, eosinophills and tingible body macrophages (figure 1a and1b). Based on this characteristic cytomorphology, a diagnosis of Rosai- Dorfman Disease was made. The patient was put on steroids (oral prednisolone 0.4 mg/kg per day for 6 months), with improvement.

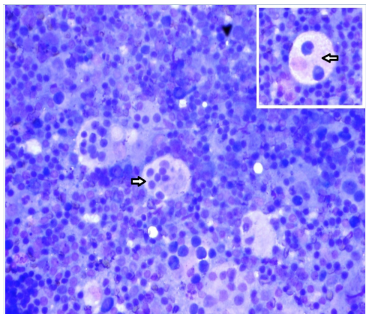

Figure 1(a): *Smear revealed numerous histiocytes, multi nucleated giant cells with extensive emperipolesis (arrow) in the background of mixed inflammatory cells (Giemsa stain; 200X).*

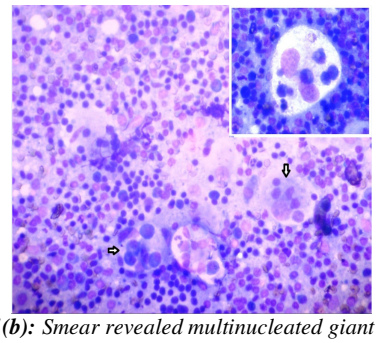

Figure 1(b): *Smear revealed multinucleated giant cells in a lymphohistiocytic background, along with neutrophils, good number of plasma cells and rare eosinophils. Emperipolesis of numerous plasma cells and lymphocytes (arrow). Ingested cells were well preserved; no mitosis or necrosis was observed (Giemsa stain; 400X).*

Case 2 was a 37 year old male, presented with fever, multiple unilateral, firm, tender, matted, cervical lymphadenopathy of 3 months duration, ranging in size 3x2 cms to 4x3 cms. The patient was on anti-tuberculosis treatment, as he was diagnosed as a case of tuberculous lymphadenitis at another centre. Investigations showed Hb- 10.2 gm/dl, total leucocyte count - 16,000/cmm with neutrophilia and erythrocyte sedimentation rate 45 mm at the end of one hour by Westergrens method.

Cytological Examination: FNA of the cervical lymph nodes was performed from multiple sites and a purulent aspirate was obtained. Smears were stained with Giemsa and Ziehl Neelsen stain. On microscopic examination, smears revealed presence of diffusely distributed histiocytes throughout the smears. The cytoplasm of these histiocytes exhibited (emperipolesis) numerous intact neutrophils, few eosinophils and occasional apoptosis of ingested cell nuclei (figure 2a&b). The background had numerous mature neutrophils, lymphocytes and tingible body macrophages. Stain for acid fast bacilli were negative. Based on this characteristic cytomorphology, a diagnosis of Rosai- Dorfman Disease with marked granulocytic emperipolesis was made. Patient was put on oral steroids (commencing at high dose- 2mg/kg), one year after diagnosis the patient is clinically well, with no residual lymphadenopathy.

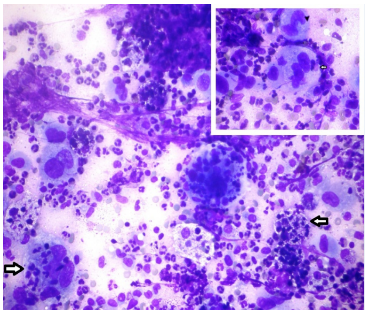

Figure 2(a): *Smear revealed multinucleated giant cells in a background of mixed inflammatory cells; predominately neutrophils, few lymphocytes & rare eosinophils. Emperipolesis of numerous neutrophils (arrow) (inset); (Giemsa stain; 400X).*

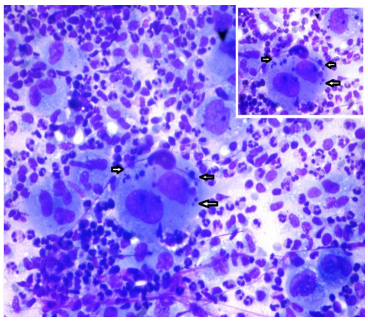

FIGURE 2(b): *Smear revealed multinucleated giant cells, histiocytes in a background of mixed inflammatory cells (predominately neutrophils); nuclei of ingested cells showing apoptosis (arrow); (Giemsa stain; 400X).*

Discussion

RDD is a rare non-malignant proliferative disorder first described by Rosai and Dorfman in 1969. [1] Most patients with RDD have a complete and spontaneous remission. Some may experience recurrent or persistent but stable lymphadenopathy. In rare cases, the disease follows an aggressive course and may be fatal and involvement of kidney, lower respiratory tract, or liver has been found to be a poor prognostic sign. [2] Occasionally, RDD may be associated with autoimmune disorders and hematopoietic malignancies. [3] The etiology of RDD is unknown though it has been speculated that an occult chronic infection or an aberrant exaggerated immune response to an infectious agent or an antigen causes the initial histiocytic proliferation.[4] The cytological features of SHML usually reveal numerous large histiocytes with abundant, pale cytoplasm and phagocytosed lymphocytes and rarely granulocytes (emperipolesis), which is seen in one of our case, this is of great diagnostic significance. The internalized WBC are usually located within cytoplasmic vacuoles. [5] Apoptosis of neutrophils resulting after emperipolesis in cutaneous Rosai–Dorfman disease is a rare and new feature [6] and is seen in one of our case.

As a diagnostic entity it is significant in that it has the readily recognizable, although not specific, cytomorphologic feature of emperipolesis on FNA. This finding should also bring to mind a wide differential diagnosis including lymphoma, malignancy, hemophagocytic syndrome, infection, Langerhans histiocytosis and various other reactive processes. Lymph node specimens are most helpful diagnostically and should be sampled, in addition to extranodal sites, when possible.

Conclusion

FNA represents an efficient, minimally invasive, cost-effective and reliable, though not infallible, technique for the diagnosis of RDD and biopsy can be avoided in these patients, thereby reducing patient inconvenience and health care cost. However, awareness of the entity along with its cytological variations and consideration of it as a diagnosis in histiocytic and lymphocytic pathologies is of utmost importance if one is to be successful in the diagnosis of RDD by FNA.

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