Littoral cell angioma of the spleen: Cytological findings and review of the literature

ABSTRACT
Littoral cell angioma (LCA) is a unique lesion of the spleen that arises from the cells lining the venous sinuses of the splenic red pulp and shows the features of combined endothelial and histiocytic differentiation. Several cases of LCA have been reported in the literature; however, the cytological findings have been described for only a few cases. We report the case of an 11-year-old boy with anemia, epigastric abdominal pain, and splenomegaly. The splenic lesions showed anastomosing vascular channels with cyst-like spaces filled by many sloughed endothelial cells, which were positive for CD68 and CD31 and negative for CD34. Scraping cytology revealed isolated and clusters of three-dimensional bland looking, epithelioid foamy tumoral cells with low nuclear cytoplasmic ratio, which mostly contained intracytoplasmic hemosiderin pigment. Although the fine needle aspiration cytology of splenic lesions is uncommon and LCA is a rare splenic lesion, it must be noted in the differential diagnosis of any splenic vascular neoplasm.

Key words: Cytology; littoral cell angioma; spleen

Access this article online

Website: www.jcytol.org

DOI: 10.4103/JOC.JOC_118_15

Mohammad H Anbardar, Perikala V Kumar, Hamed R Forootan
Departments of Pathology and Pediatric Surgery, Shiraz Medical School, Shiraz University of Medical Sciences, Shiraz, Iran

Address for correspondence: Dr. Mohammad H Anbardar, Department of Pathology, Shiraz Medical School, Shiraz University of Medical Sciences, Shiraz, Iran. E-mail: anbardarm@sums.ac.ir

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Anbardar MH, Kumar PV, Forootan HR. Littoral cell angioma of the spleen: Cytological findings and review of the literature. J Cytol 2017;34:121-4.
Introduction

Littoral cell angioma (LCA) is a rare primary vascular tumor of the spleen that arises from the cells lining the venous sinuses of the splenic red pulp (littoral cells), showing the features of combined endothelial and histiocytic differentiation.\[1-8\] LCA is a benign tumor composed of anastomosing vascular channels with papillary projections and cyst-like spaces lined by tall endothelial cells oftentimes showing hemophagocytosis.\[1-3\] Although diagnosis of LCA is confirmed by morphology and immunohistochemistry, fine needle aspiration of tumor can help limit the differential diagnosis before operation.\[3\] To our knowledge, there have been few reports with cytological description of LCA in the literature.\[1-4\] In this study, we discuss a case of LCA with scraping cytological findings and its differential diagnoses.

Case Report

Case history
An 11-year-old boy presenting with anemia, epigastric abdominal pain, and fullness presented to our center. His past medical history was unremarkable. Physical examination revealed an enlarged, firm, and nontender spleen extending approximately 3 cm below the costal margin. Complete blood count values showed anemia (hemoglobin 8.7 mg/dl) and mild thrombocytopenia (76 × 10^9/l). Nonetheless, clotting tests were within the normal limits. Abdominal sonography showed multiple hypoechoiec lesions in the spleen. The patient underwent splenectomy.

Gross and histology
The resected spleen was 20 × 13 × 7 cm in size with a nodular external surface and intact capsule. Moreover, serial cut sections showed multiple ill-defined, irregular-shaped, dark-red spongy lesions measuring 1–4 cm [Figure 1a]. Histologically, the lesions showed ill-defined anastomosing vascular channels with cyst-like spaces filled by many sloughed endothelial cells and red blood cells (RBCs).

There was also a minute focus of papillary projection. The vascular channels and cyst-like spaces were covered by tall cuboidal-to-columnar endothelial cells. These cells showed abundant eosinophilic foamy cytoplasm, low nuclear cytoplasmic ratio without any cytological atypia, extensive hemophagocytosis, and abundant intracytoplasmic hemosiderin pigment. No mitosis or necrosis was detected [Figure 1b].

Immunohistochemical study was performed on the histological sections and revealed positive staining for CD68 and CD31 and negative staining for CD34 in the tumoral cells. According to the histological and immunohistochemical findings, diagnosis of LCA was rendered.

Cytology
We scraped the cut surface of the splenic lesion by a clear scalpel to prepare the cytological smears. The smears were immediately fixed on the slides with ethanol and were stained with hematoxylin and eosin stain. They showed high cellularity with isolated and clusters of three-dimensional tumoral cells on a bloody background. The tumoral cells were bland looking, epithelioid foamy cells with low nuclear cytoplasmic ratio, and mostly contained intracytoplasmic hemosiderin pigment. In addition, their nuclei were round and central with fine evenly distributed chromatin and inconspicuous nucleoli. Mitotic figures and necrosis were not present [Figure 2].

Discussion

Vascular neoplasms are the most common primary nonhematopoietic neoplasms of the spleen, including hemangioma, lymphangioma, hamartoma, angiosarcoma, and LCA.\[1-3\] LCA is a unique lesion to the spleen which was first described by Falk et al. in 1991.\[8\] Several cases of LCA have been reported in the literature. This lesion has been detected in a wide age range and occurs in...
both sexes. The clinical manifestations of this condition can include splenomegaly, abdominal pain, anemia, and thrombocytopenia. However, most LCAs are incidentally discovered in splenectomy specimens performed for splenomegaly, as in our case.[1-4] Grossly, the tumor is multiple, nodular, and dark-red with spongy cystic appearance.[1,2,3] Microscopically, it is characterized by anastomosing and cyst-like vascular channels with papillary projections lined by plump endothelial cells.[1-3] The tumor cells demonstrate dual expression of endothelial and histiocytic markers that differentiate it from other vascular tumors.[1,3,5,7] The immune phenotype of LCA has been established to be CD68+ /CD31+/Lysozyme+/vWF+/CD21+/ CD34+/CD8+, which is indicative of dual derivation of the neoplasm.[1,3]

Diagnosis of LCA of the spleen on fine needle aspiration cytology is challenging due to the rare cytological description of these lesions.[1] Cytological findings of LCA were described previously in few reports.[1-4] Among these case reports, one involved bench top aspiration from splenectomy specimen and the others were done preoperatively. However, all indicated that the cellular smears composed of isolated and clusters of tumoral cells with low nuclear cytoplasmic ratio, tall cuboidal to columnar shaped cells, eccentric nuclei, evenly distributed chromatin, and indistinct nucleoli.[1,4] Our case also showed the same cytological findings with prominent intracytoplasmic hemosiderin pigment, which is a feature of hemophagocytic capacity of the littoral cells. Nevertheless, it should be emphasized that hemophagocytosis in not a diagnostic characteristic.[2,3]

Definitive diagnosis of LCA is based on the morphological and immunohistochemical findings that differentiate it from other vascular lesions of the spleen, including splenic hamartoma, hemangioma, lymphangioma, angiosarcoma, and littoral cell angiosarcoma.[2,3] Our discussion on differential diagnosis of LCA is based on both cytological and histological findings because of the lack of sufficient documented reports on the cytological findings of splenic lesions.

Low grade angiosarcoma can mimic LCA and both can display hemophagocytosis and bland looking features. However, cells of angiosarcoma are often in clusters and show hyperchromatic nuclei with shallow longitudinal folds centered in scant cytoplasm.[1,9] In addition, the proliferation index is higher in angiosarcoma and the immunophenotype can be discriminatory (CD68+/− /CD21−/vWF+/CD31+/CD34+/−/CD8+/−/Vimentin+).[1,10]

Fine needle aspiration of hemangioma and lymphangioma can show clusters of spindle cells arranged in a streaming pattern with bloody background. In addition, hemosiderin laden macrophages are rarely seen. Therefore, presence of epithelioid cells with low nuclear cytoplasmic ratio accompanied by intracytoplasmic hemosiderin pigment in LCA can help the differentiation. Moreover, the endothelial cells of hemangiomas are positive for CD34.[1,11]

Splenic hamartoma is a vascular proliferation that is unique to spleen. Up to now, only three case reports have described the fine needle aspiration cytology of this lesion. Among these reports, two showed small and large clusters of bland looking spindle cells in a bloody background, while the other showed atypical cells with misdiagnosis of metastatic carcinoma.[1,12,13] In this study, therefore, splenic hamartoma can be ruled out because of the presence of epithelioid cells and lack of clusters of spindle cells.

According to the presence of epithelioid foamy cells, glycogen storage diseases should be considered in the differential diagnosis. In the glycogen storage diseases, cytoplasmic vacuoles are distinct, uniform, and small without intracytoplasmic pigment.

Rosso et al. described littoral cell angiosarcoma as a malignant vascular tumor of the spleen with features of both histiocytic and endothelial differentiation. Solid tumor nests, cytological atypia, mitotic activity, and lack of CD68 staining were the main differential findings compared to LCA.[1,14]

Conclusion

Although the fine needle aspiration cytology of splenic lesions is uncommon and LCA is a rare splenic lesion, it must be noted in the differential diagnosis of any splenic vascular neoplasm. In this study, we described the scraping cytological findings of this rare tumor with its differential diagnoses.

Acknowledgements

The authors would like to thank Ms. A. Keivanshekouh at the Research Improvement Center of Shiraz University of Medical Sciences for improving the use of English in the manuscript.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.
References

1. Ramdall RB, Alasio TM, Cai G, Yang GC. Primary vascular neoplasms unique to the spleen: Littoral cell angioma and splenic hamartoma diagnosis by fine-needle aspiration biopsy. Diagn Cytopathol 2007;35:137-42.

2. Heese J, Bocklage T. Specimen fine-needle aspiration cytology of littoral cell angioma with histologic and immunohistochemical confirmation. Diagn Cytopathol 2000;22:39-44.

3. Nagarajan P, Cai G, Padda MS, Selbst M, Kowalski D, Proctor DD, et al. Littoral cell angioma of the spleen diagnosed by endoscopic ultrasound-guided fine-needle aspiration biopsy. Diagn Cytopathol 2011;39:318-22.

4. Priego P, Rodríguez Velasco G, Griffith PS, Fresneda V. Littoral cell angioma of the spleen. Clin Transl Oncol 2008;10:61-3.

5. Harmon RL, Cerruto CA, Scheckner A. Littoral cell angioma: A case report and review. Curr Surg 2006;63:345-50.

6. Suvajdžić N, Cemerikić-Martinović V, Saranović D, Petrović M, Popović M, Artiko V, et al. Littoral-cell angioma as a rare cause of splenomegaly. Clin Lab Haematol 2006;28:317-20.

7. Hu ZQ, A YJ, Sun QM, Li W, Li L. The splenic Littoral cell angioma in China: A case report and review. World J Surg Oncol 2011;9:168.

8. Falk S, Stutte HJ, Frizzera G. Littoral cell angioma. A novel splenic vascular lesion demonstrating histiocytic differentiation. Am J Surg Pathol 1991;15:1023-33.

9. Abele JS, Miller T. Cytology of well-differentiated and poorly differentiated hemangiosarcoma in fine needle aspirates. Acta Cytol 1982;26:341-8.

10. Arber DA, Strickler JG, Chen YY, Weiss LM. Splenic vascular tumors: A histologic, immunophenotypic, and virologic study. Am J Surg Pathol 1997;21:827-35.

11. Layfield LJ, Mooney EE, Dodd LG. Not by blood alone: Diagnosis of hemangiomas by fine-needle aspiration. Diagn Cytopathol 1998;19:250-4.

12. Kumar PV. Splenic hamartoma: A diagnostic problem on fine needle aspiration cytology. Acta Cytol 1995;39:391-5.

13. Lee SH. Fine-needle aspiration cytology of splenic hamartoma. Diagn Cytopathol 2003;28:82-5.

14. Rosso R, Pauli M, Gianelli U, Boveri E, Stella G, Magrini U. Littoral cell angiosarcoma of the spleen. Case report with immunohistochemical and ultrastructural analysis. Am J Surg Pathol 1995;19:1203-8.

New features on the journal’s website

Optimized content for mobile and hand-held devices
HTML pages have been optimized of mobile and other hand-held devices (such as iPad, Kindle, iPod) for faster browsing speed.
Click on [Mobile Full text] from Table of Contents page.
This is simple HTML version for faster download on mobiles (if viewed on desktop, it will be automatically redirected to full HTML version)

E-Pub for hand-held devices
EPUB is an open e-book standard recommended by The International Digital Publishing Forum which is designed for refloable content i.e. the text display can be optimized for a particular display device.
Click on [EPub] from Table of Contents page.
There are various e-Pub readers such as for Windows: Digital Editions, OS X: Calibre/Bookworm, iPhone/iPod Touch/iPad: Stanza, and Linux: Calibre/Bookworm.

E-Book for desktop
One can also see the entire issue as printed here in a ‘flip book’ version on desktops.
Links are available from Current Issue as well as Archives pages.
Click on ♥ View as eBook