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Fine Needle Aspiration is a Reliable Screening Procedure to Detect Toxoplasmosis: Four Case Reports

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Abstract

Lymphadenitis due to toxoplasma infection is not uncommon and should be considered in the diagnosis of unexplained lymphadenopathy at all sites, especially at the cervical region. We report four cases of toxoplasmosis diagnosed by cytologic, histologic and serologic tests. Fine needle aspiration cytologic diagnosis can help the diagnosis of toxoplasma lymphadenitis and eliminate unnecessary hospitalization or surgery.

Key Words : Aspiration biopsy, Fine-needle, Lymphadenitis, Toxoplasma

Introduction

Toxoplasmosis is a well-known zoonosis. According to increase number of persons who live with their pets, rate of the toxoplasmosis is increase. Most cases are asymptomatic, but in the symptomatic cases, cervical lymphadenitis could be present [1]. Fine needle aspiration (FNA) is easily performed first line investigative technique for evaluate the enlarged cervical lymph nodes. Herein, we report four FNA cases of toxoplasmosis which verified by lymph node biopsy.

Case Reports

Case 1:

A 41-year-old man visited to Keimyung University Dong San Hospital with a two week history of gradually increasing palpable mass in his neck. He visited a horse farm one month ago. He did not have any pet including a cat. Physical examination of the cervical area revealed enlarged lymph nodes of the left postauricular area. He underwent FNA, excisional biopsy, and serologic tests.

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Case 2:

A 42-year-old woman visited due to palpable neck mass. The mass developed two weeks ago. It increased gradually. On physical examination, there were non-tender palpable lymph nodes at left level V region. Neck computed tomography (CT) showed multiple enlarged lymph nodes at both level II, left level III, both level VB, right supraclavicular region, right anterior chest wall deep to the pectoralis muscle, and right paratracheal region (Fig. 1A). She did not have any pet. She said that she did not like animals. After FNA cytology, the lymph node was removed. The patient was diagnosed as toxoplasmosis by serologic tests.

Case 3:

A 69-year-old woman visited to the hospital with palpable neck mass for a month. She found the mass incidentally. Tenderness or skin erythematous change was absent. The CT revealed multiple enlarged lymph nodes at both level II and VA area (Fig. 1B). She did not have any specific history. She was diagnosed as toxoplasmsis by cytologic, histologic and serologic tests. After septrin therapy, enlarged lymph nodes were nearly absent.

Case 4:

A 48-year-old man was transferred to present hospital due to incidentally found multiple neck masses. Physical examination revealed enlarged left submandibular lymph nodes. The CT revealed three left submandibular enlarged lymph nodes (Fig. 1C). He did not have any pet. He lived in rural area. His occupation was a cleaning man. The FNA findings were suspected for toxoplasmosis. Without excisional biopsy, he was diagnosed as toxoplasmosis by serologic tests alone.

Cytologic and histologic findings and serologic tests

All patients underwent fine needle aspiration and excisional biopsy. Fine needle aspiration smears showed presence of groups of epithelioid cells (microgranuloma) and presence of monocytoid histiocytes with a polymorphous

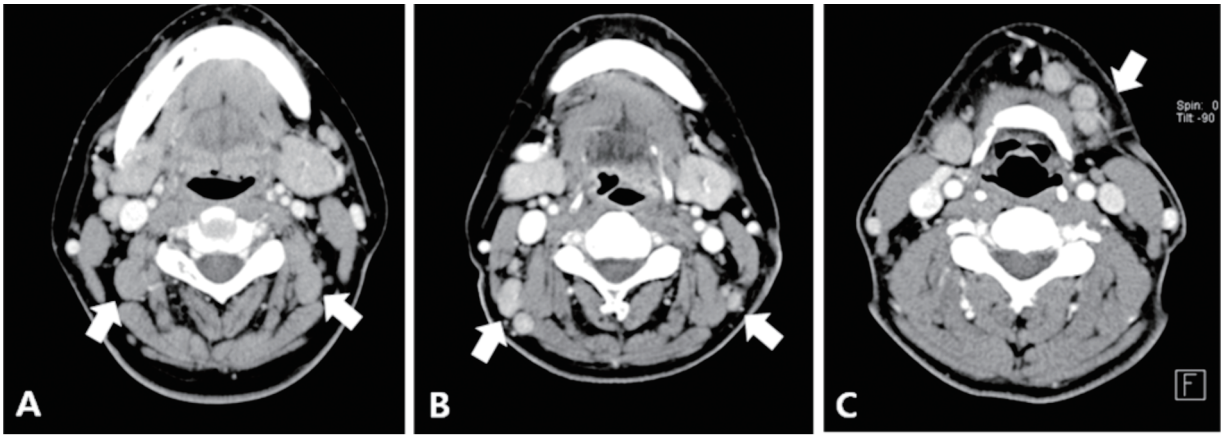

Fig. 1. Neck computed tomography of the toxoplasmosis patients show multiple enlarged lymph nodes (arrows). A: Multiple enlarged lymph nodes are present at both level II region (Case 2). B: The CT revealed round to oval enlarged lymph nodes at both level II area (case 3). C: There are three left submandibular enlarged lymph nodes (Case 4).

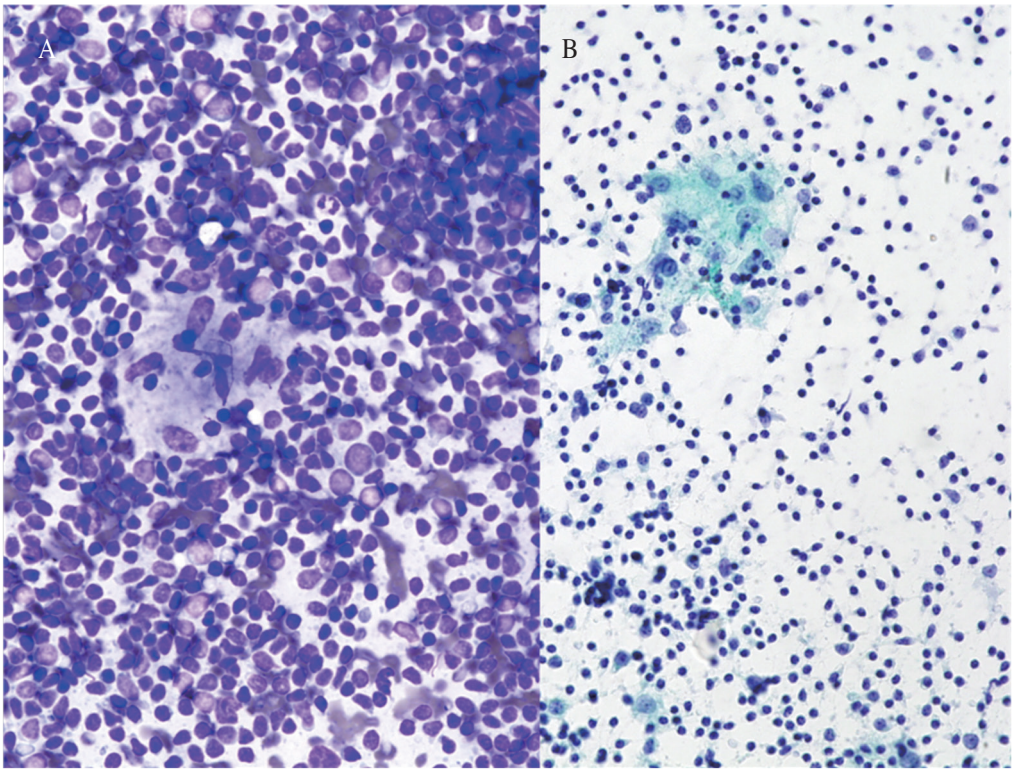

Fig. 2. Fine needle aspiration cytology shows a microgranuloma in a polymorphous lymphoid background. The microgranuloma consists of small aggregates of epithelioid histiocytes with abundant, pale-staining homogenous cytoplasm and oval nuclei. A: Diff-Quick stain. B: Papanicolau stain. × 400.

population of small inactive or large activated lymphocytes (Fig. 2A, 2B). Histologically, the lymph node showed enlarged follicles with prominent germinal center. The follicles exhibited an unusual variation in size and shape. Irregular clusters of 10-15 polygonal epithelioid histiocytes (microgranulomas) were located in the cortical and paracortical zones. The monocytoid B cell proliferation was also found nearby lymphoid follicles and trabecular sinuses (Fig. 3). The bradyzoites of *Toxoplasma gondii* were demonstrated with immunohistochemical stain (Fig. 3, right upper inset). Increased IgG and IgM toxoplasma antibodies were detected by serologic test (Table 1).

Discussion

Toxoplasmosis is a common zoonosis transferred by a cat [2]. The intermediate hosts including human and other mammals are infected througn contaminated food or soli [3].

Acute toxoplasmic lymphadenitis is an important cause of cervical lymphadenopathies. In Korea, 3-5% of healthy adults have positive serologic findings [4,5]. In healthy adult, most cases are asymptomatic or present with a flu-like or infectious mononucleosis-like picture associated with mild fever and myalgia [1]. The most common symptom of toxoplasmosis is a localized lymph node enlargement. The posterior cervical lymph

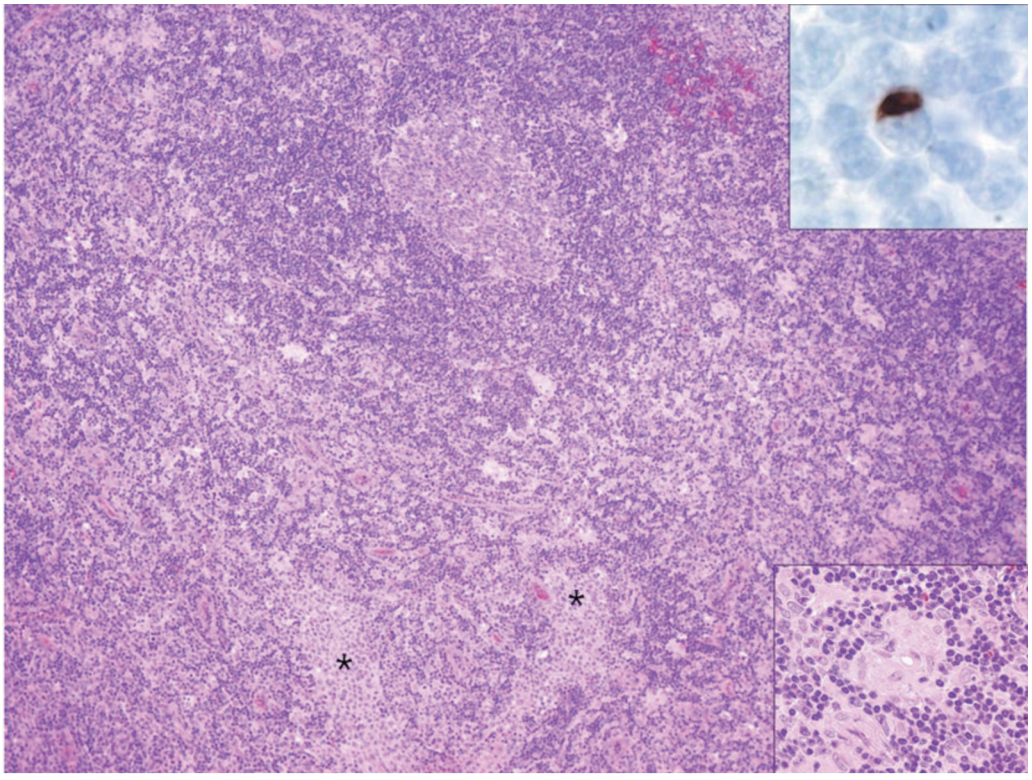

Fig. 3. Lymphoid follicles with reactive germinal center, area of monocytoid cells surrounding blood vessels (asterisk), the germinal center and scattered clusters of epithelioid cells (microgranulomas,) are present (H&E × 40). The microgranuloma consists of 5-10 round to oval epithelioid cells with abundant cytoplasm (right lower inlet, H&E × 400). Immunohistochemical stain for *T. gondii* shows bradyzoit of the toxoplasma in the cytoplasm of a lymphocyte (right upper inlet, × 1,000).

Table 1. Characteristics of the patients who developed palpable cervical lymph nodes

	Age	Sex	Number	Location	IgG (IU/mL)	IgM (S/CO)	Residence	Animal contact
Case 1	41	M	Multiple	Postauricular	126	0.86	Urban	Horse farm
Case 2	43	F	Multiple	Bilateral level II, level VB, right supraclavicular region	205	1.41	Urban	Absent
Case 3	69	F	Multiple	Bilateral level II and VA	>300	0.69	Urban	Absent
Case 4	48	M	Three	Left submandibular	229.8	2.3	Rural	Absent

nodes are the most commonly involved [6].

The involved lymph nodes have intact capsule and show follicular hyperplasia pattern. The lymphoid follicles are markedly enlarged. The germinal center shows prominent tangible body macrophages and penetrated epithelioid cells.

Monomorphic monocytoid B-cell proliferation is noted nearby the enlarged lymphoid follicle. It surrounds blood vessel in interfollicular area. The epithelioid cells are scattered throughout the cortex and paracortex. The epithelioid cells do not make well-formed granuloma [7].

Several reports describe the cytologic features of toxoplasmic lymphadenitis. In some of them the authors highlight the presence of microgranulomas as the main cytologic feature. Viguer *et al*. [8] reviewed 11 cytologic specimens of toxoplasmosis. They considered epithelioid microgranulomas as main diagnostic features. The microgranulomas consist of small clusters (usually of <10-15 cells) of monomorphous, polygonal, epithelioid to oval cells with moderated to abundant, homogenous eosinophilic cytoplasm and oval, eccentric nuclei. A few lymphocytes can be mixed with the epithelioid cells. Usually monocytoid B-cell hyperplasia is not detected in the smears.

Because of presence of microgranulomas, it can be described as granulomatous inflammation. Cytologic differential diagnosis of toxoplasmosis includes tuberculosis, sarcoidosis, malignant lymphomas, and other infectious diseases. In tuberculosis, definite granulomas and multinucleated giant cells are present. Frequently necrotic background is associated. The results of PCR for *Mycobacterium tuberculosis* and AFB stain are positive. In sarcoidosis, the granulomas are small and thightly organized. In contrast to sarcoidosis, the histiocytes in toxoplasmosis are more diffuse, and the granulomas are less well circumscribed, not as organized and lack multinucleated giant cells [9]. Multinucleated giant cells can be noted. Hodgkin lymphoma associated with polygonal epithlioid cell is characterized by typical Hodgkin cells or Reed-Sternberg cells and polymorphous background containing eosinophils. Lennert lymphoma shows scattered epithelioid cells in aspiration cytology. However, reactive background with tangible macrophages is not found. The lymph nodes in cat-scratch disease and brucellosis generally do not have diffuse histiocytosis and often display prominent focal necrosis that is not seen in toxoplasmosis [9].

FNAC is highly cost effective and accurate as a first line investigative technique with differential diagnoses including reactive hyperplasia/ inflammatory conditions, granulomatous disorders and malignancy, stratifying cases requiring further investigations, surgical intervention or clinical follow-up [10].

Toxoplasmosis may occur lymphadenitis in the general population. Although histologic findings are consistent with toxoplasmosis, a tentative histologic diagnosis of toxoplasmosis must be confrmed by serologic tests. The cytologic diagnosis of toxoplasmosis can be also easily confirmed with serologic studies. A combination of FNA features with positive serological test gives the diagnosis of toxoplasmosis and thus avoids unnecessary surgical excision.

Conflict of Interest

The authors report no conflict of interest in this work.

References

1. McCabe RE, Brooks RG, Dorfman RF, Remington JS. Clinical spectrum in 107 cases of toxoplasmic lymphadenopathy. *Rev Infect Dis* 1987;**9**:754-74.
2. Remington JS, Jacobs L, Kaufman HE. Toxoplasmosis in the Adult. *N Engl J Med* 1960;**262**:180-6.
3. Krick JA, Remington JS. Toxoplasmosis in the adult-an overview. *N Engl J Med* 1978;**298**:550-3.

4. Yang H-J, Jin K-N, Park Y-K, Hong S-C, Bae J-M, Lee S-H, *et al*. Seroprevalence of toxoplasmosis in the residents of Cheju island, Korea. *Korean J Parasitol* 2000;**38**:91-3.
5. Lee Y-H, Noh H-J, Hwang O-S, Lee S-K, Shin D-W. Seroepidemiological study of *Toxoplasma gondii* infection in the rural area Okcheon-gun, Korea. *Korean J Parasitol* 2000;**38**:251-6.
6. Gray GF, Jr., Kimball AC, Kean BH. The posterior cervical lymph node in toxoplasmosis. *Am J Pathol* 1972;**69**:349-58.
7. Ioachim HL, Medeiros LJ, Ioachim HL. *Ioachim's Lymph Node Pathology*. 4th ed. Philadelphia: Wolters Kluwer/Lippincott Williams & Wilkins; 2009.
8. Viguer JM, Jimenez-Heffernan JA, Lopez-Ferrer P, Gonzalez-Peramato P, Vicandi B. Fine needle aspiration of toxoplasmic (Piringer-Kuchinka) lymphadenitis: a cytohistologic correlation study. *Acta Cytol* 2005;**49**:139-43.
9. Suh YJ, Kim W, Park W-B, Chun CS. Cervical lymphadenitis caused by *Toxoplasma gondii*. *J Korean Surg Soc* 2002;**62**:271-3.
10. Koo V, Lioe TF, Spence RA. Fine needle aspiration cytology (FNAC) in the diagnosis of granulomatous lymphadenitis. *Ulster Med J* 2006;**75**:59-64.