

Clinicopathological Study of Toxoplasma Lymphadenitis in a Girl from Baghdad Province

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Abstract

Background: A wide spectrum of clinical features related to *toxoplasma* infection in human, the enlargement of lymph node are the most frequently observed clinical form of *toxoplasma* in human.

Objective: This study was designated to confirm of *toxoplasma* infection by serological test, hematological tests and histopathological examination of cervical palpable mass in a girl 18 years old.

Patients and Methods: A young woman patient from Baghdad province is described in which the clinical presentation resembled unilateral cervical palpable mass arising from left lateral side of the neck below the ear with three month history of fever, night sweat, weakness, restless and loss of appetite. Blood sample obtained from the patient and white Blood count were performed using blood analyser for haematological test. Also serum was prepared for Serological test. Selective excisional biopsy of the swelling was taken for gross and hisopathological examination, preserved in 10% formalin, fixation and processing was routinely done, and staining with Haematoxylin and Eosin stain.

Results: Hematological and serological results revealed the WBCs were 6.4 co³/ml with mild eosinophilia, while serum sample showed strongly positive for anti Toxo IgM antibodies (63.5) which indicate acute toxoplasmosis. Surgical removal of the swelling appeared as enlarged lymph node consist of oval swelling measuring of 18 × 9 mm. Section showed whitish soft tissue with turbid fluid. Histopathological examination of the lymph node section showed reactive follicular lymphoid hyperplasia with irregular enlargement of germinal centre, other section showed cluster of proliferated epithelioid histiocytes with thickening of trabeculi and ovoid structure in epithelioid histiocytes containing trophozoites appeared within germinal centre and areas of necrosis were observed in other section.

Conclusion: Acute *toxoplasma* lymphadenitis recognized by clinical signs, result of serological test and gross with histopathological examination.

Keywords

Toxoplasma gondii; Cervical lymphadenitis; Acute toxoplasmosis

Abbreviations

IgM - *Toxoplasma gondii* Immunoglobulin M
T. gondii - *Toxoplasma gondii*
WBC - White Blood Cells

Introduction

Toxoplasmosis is a zoonotic parasitic disease caused by protozoon *Toxoplasma gondii*, parasite infected many species of mammals and bird [1]. Infection with Toxoplasmosis is wide spread, people can pick it up quite easily, especially when the cats are around and frequently harbour the parasite. The mode of infection include either infection by oocytes originating in the faeces of feline hosts, or ingestion of tissue cysts invertebrate prey, and by congenital infection [2]. Toxoplasmosis is a disease affecting 500 million people worldwide. The seroprevalence varies from (5-90%) depending on geographical location, age, eating habit, raw meat or unwashed fruit, vegetable and general level hygiene [3]. Dubey [4] found the seroprevalence of toxoplasmosis was estimated to vary from (>2-70%) in south East Asian population [5]. In Baghdad, Juma and Salman [6] found that the infection with *T. Gondii* in women was 19.17%. In Tikrit, Al-Doori [7] showed that the prevalence rate was about 49-95% higher rate of infection was among 25-31 years old in the women and their husbands.

Al-Jebouri et al. [3] mentioned that the seroprevalence of *T. gondii* IgG and IgM among non-pregnant women was higher than pregnant group. In contrast, pregnant women were mostly under risk of catching toxoplasmosis as concluded by Han K et al. [8]. While ADdory [9] mentioned 226 pregnant women had either single or multiple fetal losses and 29.2% of them had toxoplasmosis in Salah-Adden government.

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A wide spectrum of clinical features related to toxoplasma infection in human, the enlargement of lymph node are the most frequently observed clinical form of toxoplasma in human, lymphadenopathy may be associated with fever, fatigue, muscle pain, headache [10]. Person with severally weakened immune system can lead to reactivation of infection which can cause severe symptoms of toxoplasmosis [11]. *Toxoplasmosis* is most severing in certain high risk groups of individual whose immunity is impaired [12]. In immunocompetent people toxoplasmosis may be mild and pass undetected or may cause symptoms such as fever and lymph node enlargement which can be confused with other diseases such as flu or glandular fever [13]. And with mycobacterial infection [14,15].

Serological surveys indicate that about 80% of all primary infections are asymptomatic, due to the effectiveness of the immune system [16]. The tissue parasitism during the proliferative phase may occur without symptoms. It may lead to a transient illness characterized by lymphadenopathy, fever, fatigue, arthralgia, dermatitis, malaise, headache, and myalgia. Latent toxoplasmosis, i.e., the lifelong presence of cysts and anamnestic concentrations of anti-*T.gondii* antibodies in immunocompetent subjects, is considered asymptomatic and harmless [17].

This report deals with investigated case which was describing (diagnosed) by clinical manifestation, serological, haematological tests and pathological examination.

Patients and Methods

A young woman (18 years old), from Baghdad, was admitted to the surgeon red/crescent hospital with a month history of fever, night sweat, weakness, restless, loss of appetite with one large left cervical palpable mass arising from left lateral side at the neck bellow the left ear, the neck was slightly stiff. There were no similar lesions elsewhere in the body. Imaging the area was performed by ultrasonography (general electric), suggestive of *toxoplasma* infection or extra pulmonary mycobacterium infection. Clinical investigation correlated with serological, surgical removal of the swelling and histopathological examinations are recommended.

Serological test

Blood sample was obtained from the patient and Serum prepared and stored at -20°C till used. Serum sample was tested by Immulite chemiluminescent Immuno assay (system DPC USA), Assay specifically used to determine Anti Toxo IgM antibodies level. Results interpretations were as follow: 0-9 IU/ml test negative, 9-11 indeterminate to be checked. More than 11 IU/ml the test considered positive.

Pathological examination: Immediately after surgical removal of the swelling it was grossly examined and selective excisional biopsy of the swelling was taken and kept in 10% neutral buffer formalin, fixation and processing was routinely done and from the section a slide performed and stained with haematoxylin and eosin [12], the histopathological changes were observed under light microscope.

Results

Clinically

Unilateral cervical palpable mass arising from left lateral side of the neck bellow the ear on palpation the swelling was painful and pedunculated, the neck was slightly stiff. The patient presented with 3 month history of fever, night sweat, weakness, restless and loss of appetite. There was no similar lesion elsewhere in the body.

Haematological test

WBC was $6.4 \times 10^3/\text{ml}$ with mild eosinophilia.

Serological tests

Serum sample show strongly positive for anti Toxo IgM antibodies, the level reached 63.5 which indicate an active toxoplasmosis.

Gross pathological examination

The swelling appeared as oval enlarged lymph node measuring of $18 \times 9 \text{ mm}$ the excisional biopsy was $(2 \times 1.5 \times 1 \text{ cm})$. Section showed

whitish soft tissue with turbid fluid.

Histopathological examination

Lymph node section showed reactive follicular lymphoid hyperplasia associated with infiltration of mononuclear cells in lymphoid parenchyma which characterized by irregular enlargement of germinal centre with variable degree of follicular hyperplasia with evidence of granuloma development and thickening of trabeculi were showed (Figure 1). Also clusters of proliferated epithelioid histiocytes were observed (Figure 2). Avoid structures in the epithelioid histiocytes containing trophozoites within germinal centre and area of necrosis was observed (Figure 3). Other section showed evidence of haemorrhage with apoptosis in lymphoid germinal centre, together with moderate epithelioid infiltration, also reactive follicular hyperplasia of lymphatic tissue was observed mainly in paracortical areas, with dilatation of subcapsular sinuses which contain mononuclear cells (Figure 4).

Discussion

Toxoplasmosis is a generalized infection that may be without symptoms or a mild illness causing lymph node swelling or a syndrome or common presentation mimics to infectious mononucleosis with lymphadenopathy, fatigue and mild fever [2,10,18]. Lymph nodes are not tender do not suppurate are usually discrete and stay enlarged for less than 4-6 weeks. A form of the disease characterized by chronic lymphadenopathy has been described and Lymph nodes enlargement can fluctuate for months [19].

Eighteen young women patient is described with clinical presentation resembled unilateral cervical lymphadenitis these clinical signs accepted with Gregoryjuckkett MD [2], who mentioned that neck is an extremely rare site for toxoplasma infection.

Paediatric toxoplasmosis can be acute or chronic and congenital or postnatally acquired. Toxoplasmosis refers to a symptomatic infection by *Toxoplasma gondii*, a widely distributed protozoan that usually causes an asymptomatic infection in the healthy host [20].

The most common recognize finding is cervical lymphadenopathy, usually painless and sometimes accompanied with low grade of fever [21].

Inflammatory lymphadenopathy is typically self-limited and resolves spontaneously over a period of weeks. Chronic sialadenitis as a result of salivary stones or duct stenosis can result in gland hypertrophy and fibrosis [22]. Chronic inflammation may result in a mass within the submandibular or parotid glands. Treatment is usually conservative unless pain is severe enough to justify surgical excision [23].

Cervical adenitis is probably the most common cause of an inflammatory mass in the neck. This condition is characterized by painful enlargement of normal lymph nodes in response to infection or inflammation [24].

Toxoplasmosis sometimes causes neck masses. This infection generally presents as a single enlarged node in the posterior triangle [25].

Typical and atypical mycobacterial infections are less common infectious causes of neck masses. Mycobacterial infection generally presents as a single enlarged node that is rarely tender or painful. Tuberculous infection generally presents in older patients with a history of tuberculosis exposure and a positive purified protein derivative (PPD) tuberculin skin test [26].

Mycobacterium avian complex is the most frequently isolated species from lymph nodes, followed by *M. Scrofulaceum*, *M. Mallmoense* and *M. Hemophilum* and other spp [12,19]. These spp. can localized lymphadenitis effects children, peak incidence occurs at 1-5 years old generally nontuberculous mycobacteria adenitis is indolent disease [27] while toxoplasmosis the patient in current study suffer from painful swelling.

Serum sample showed strongly positive antitoxo antibodies reach 63.5 which indicate acute toxoplasma infection this result disagree with AL-Jebouri M [3], who mentioned that persons whose immune

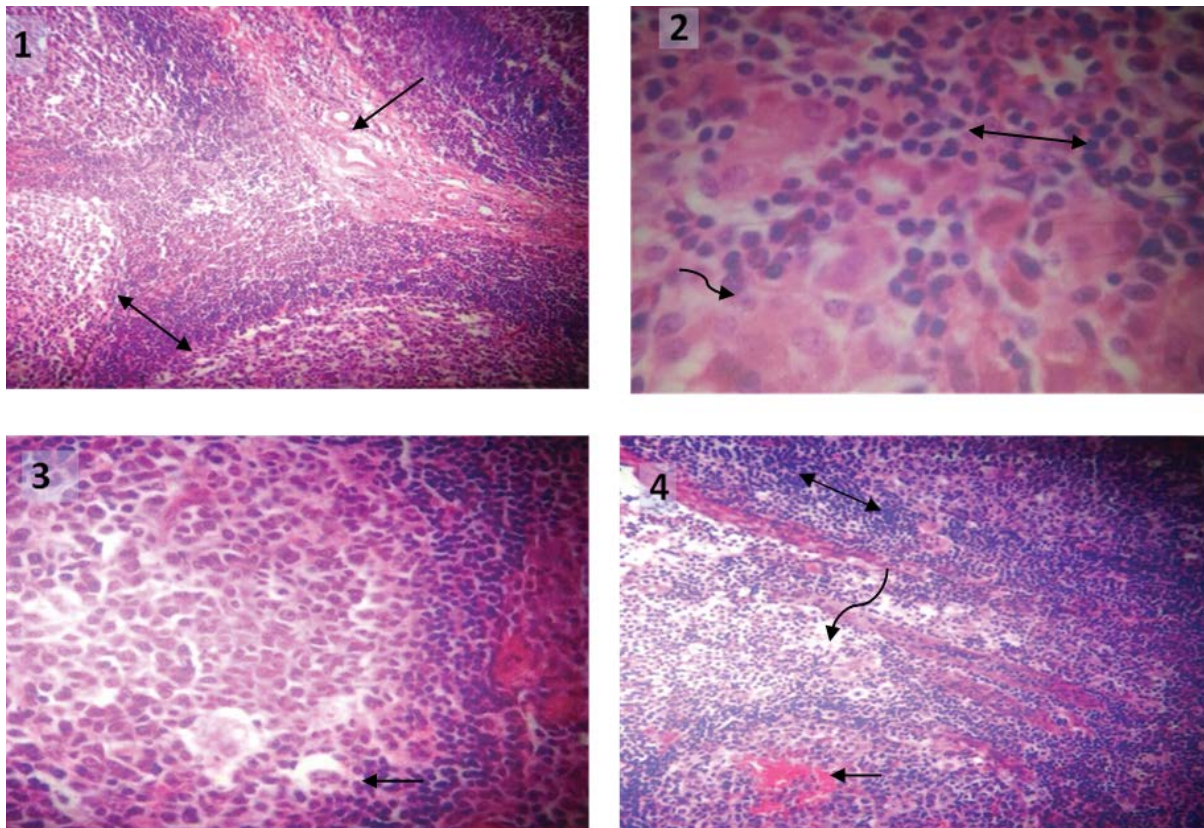


Figure 1: Histopathology section in the lymph node showing: irregular enlargement of germinal centre of lymphoid follicles (↘) and thickening of trabeculi (↖) (H&Ex10)

Figure 2: Clusters of proliferated epithelioid histiocytes (↖) with area of necrosis (↘) (H&Ex40)

Figure 3: Ovoid structures in epithelioid histiocytes containing trophozoites (←) (H&Ex40)

Figure 4: Hemorrhage (←) with apoptosis (↘), follicular hyperplasia in paracortical areas (↖) (H&E x10)

systems are intact. Acute toxoplasmosis is usually asymptomatic and self-limit condition can go unrecognized in 80-90% of adults and children with acquired infection [28].

In the current study, the mode of infection of the girl is unknown, may be congenitally acquired in utero during the second or third trimester of fetal development usually from a symptom less mother or acquired post natal by ingestion tissue cysts in undercooked or uncooked meat or by food or water contaminated with oocysts from infected cat feces [29,30]. Toxoplasmosis in human beings in Iraq has been linked to drinking unfiltered water [10].

Toxoplasma gondii infection changing with age, education, crowding, sanitary habits, socioeconomic, ethnic consideration [31]. Also the climatic factors are very important, therefore, oocyst survive in moist, warm soil than dry, hot or arid regions [32,33].

In our opinion the association between level of IgM and the level development of swelling is an indication for acute case, we concluded that a recent infection may occur since IgM appear during the first days of infection and persist for 3 weeks then decline and disappear within four month post infection.

The IgM antibodies appear sooner after infection than the IgG antibodies and disappear faster than IgG antibodies after recovery [34]. In most cases, *T. gondii*-specific IgM antibodies are detected initially in patients with recently acquired primary infection, but these titers become negative within a few months, however, in some patients, positive *T. gondii*-specific IgM titers can still be observed during the chronic phase of infection [35].

Lesions or tissues necrosis may be found in many organs of the body during acute toxoplasmosis, whereas the chronic infection lesion occurs more often in muscles of eyes and brain than in

visceral tissues [36]. During acute infection the tachyzoites invade every kind of host cell except non nucleated (red blood cells). The host cell invasion is a major step in its biological cycle and pathogenesis [37].

The salient feature of toxoplasmosis in the present case was the elevated *toxoplasma* IgM antibody titre accompanied with clinical symptoms and histopathological study which revealed presence of *Toxoplasma gondii*, (Demonstration of tachyzoites) in lymph node tissue section, which indicated an acute acquired toxoplasmosis infection.

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Author's contribution

Ass. Prof. Dr. Athmar. K. Alazawi performed supervisor search and writing rough copy of the research while, Ass. Prof. Dr. Waffa. A. Ahmed: responsible for rapporteur of the research plan and bring of the samples and histopathological slides examination and Ass. Lecturer Shaimaa A. Majeed writing research and arranged.

Conflict of Interest

The authors declare no conflict of interest concerning this work.

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