Cutaneous Manifestations of Toxoplasmosis: a Case Report

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UDC 616.5:616.993

Abstract

Although toxoplasmosis is one of the most widely spread infections in the world, types that involve the skin are extremely rare. However, skin lesions are not specific; moreover, they are quite diverse, which makes the diagnosis of cutaneous toxoplasmosis rather difficult. Thus, differential diagnosis should include a number of other diseases. We present a case of a 43-year-old immunocompetent man with multiple livid erythematous papules and nodules with yellowish discharge that involved the skin of the body and the extremities. By using electro-chemiluminescence immunoassay, immunoglobulin G antibodies to Toxoplasma gondii were detected in the serum, confirming the diagnosis of toxoplasmosis. The treatment with pyrimethamine and trimethoprim-sulfamethoxazole led to complete resolution of skin lesions. In conclusion, although rare in the dermatological practice, cutaneous toxoplasmosis should be considered in all patients presenting with lymphadenopathy, non-specific skin eruptions, especially nodular and colliquiative, blood eosinophilia and histological findings revealing abundant eosinophilic infiltrations.

Key words
Toxoplasmosis; Signs and Symptoms; Skin Manifestations; Pyrimethamine; Trimethoprim-Sulfamethoxazole Combination; Treatment Outcome

Toxoplasmosis is a parasitic disease caused by the protozoan Toxoplasma gondii, a tiny crescent shaped parasite (1). There are 3 genotypes of T. gondii, which cause different clinical manifestations and distribution. The main reservoirs are Toxoplasma cysts found in the cat feces. However, other mammals including humans, can also be infected. The main mechanisms of transmission to humans include consumption of infected undercooked meat or ingestion of ova via contaminated food or water. Other possible mechanisms of transmission are via organ transplantation (2, 3), blood transfusion (4) and transplacental transfer. The parasites form cysts, usually found in the muscles, heart and brain. They also invade the reticuloendothelial system, as well as the endothelium of blood vessels where they form granulomas and later necrosis.

There are three main types of toxoplasmosis in humans:

1. Fetal infection - which may result in severe brain damage, chorioretinitis or stillbirth;

2. Acquired infection - which is asymptomatic in up to 90 % of patients. Cutaneous manifestations are very rare. A small number of patients present with cervical lymphadenopathy and flu-like symptoms. It is estimated that approximately one third of the world population is infected with T. gondii. Ocular disease, is usually due to reactivation of fetal infection (1).

3. Toxoplasmosis in immunocompromised patients - which is often a result of activation of a latent disease and clinical manifestations include papular and nodular eruptions as well as encephalitis. It usually occurs in patients with defects of T-cell–mediated immunity, including patients with hematologic malignancies and transplantations, as well as human immunodeficiency virus (HIV)-infected patients who often develop encephalitis (1).

Case Report

A 43-year-old man complained of skin eruptions which appeared 3 years earlier. He noticed livid spots
and nodules on the skin of the lower extremities with subsequent spreading to the skin of the body and arms, accompanied by moderate itching.

The patient was in good health, afebrile, and physical examination revealed no abnormalities.

Multiple livid erythematous papules with peripheral scaling and livid nodules, some with central depression expressing yellowish discharge, were observed on the skin of the ears, body and upper and lower extremities (Figures 1-3). Postlesional hyperpigmented macules were also present. Two non-tender, soft lymph nodes 1.5 cm in diameter were palpable in the inguinal regions.

Routine laboratory and other relevant tests were within normal limits, except for the white cell count which showed leukocytosis with eosinophilia: total white blood count 23.84 x10⁹/L, with a differential of: neutrophils 28%, lymphocytes 45.5%, eosinophils 19.2% (4.6 x10⁹/L), monocytes 3.4%, basophils 1.5%.

A punch biopsy was performed and histological examination revealed: hyperkeratosis, hypergranulosis, and acanthosis of the epidermis (Figure 4a); in the dermis and upper hypodermis, there was a thick infiltrate, pronounced in the deep dermis (Figure 4b);
deep dermal infiltrate with numerous eosinophils, histiocytes, lymphocytes, plasmocytes and foreign-body giant cells was also observed (Figure 4c); dermal collagen appeared rough and fibrotic (Figure 4d), and a scarring tissue was present as well. However, *T. gondii* zoites were not found.

Due to the finding of a dense eosinophilic infiltrate and an increased number of eosinophils in the blood, the patient was examined by a hematologist and bone marrow examination was performed. The bone marrow was normocellular with a myeloid to erythroid ratio of 3:1; granulocytes of all stages maturation were seen; the blast cell count was under 5%; the eosinophil count was 5%; the megakaryocyte count was slightly increased. According to the hematologist, there were no abnormalities suggesting a lymphoproliferative process.

Taking into account the patient's complaints, the appearance of lesions and laboratory test results,

*Figure 4a* Histopathology of the skin biopsy showed hyperkeratosis, hypergranulosis and acanthosis in the epidermis (HE staining).

*Figure 4b*. Histopathology of the skin biopsy revealed a thick infiltrate in the dermis as well as in the upper hypodermis, mostly pronounced in the deep dermis (HE staining).

*Figure 4c*. Histopathology of the skin biopsy showed a deep dermal infiltrate with numerous eosinophils, histiocytes, lymphocytes, plasmocytes and foreign-body giant cells (HE staining).

*Figure 4d*. Histopathology of the skin biopsy revealed a rough and fibrotic dermal collagen and scaring tissue. (HE staining).
a parasitic disease was suspected. No intestinal parasites were detected. Serologic testing for *Echinococcus granulosus* antibodies was negative. However, by using ECLIA (electro-chemiluminescence immunoassay), immunoglobulin G (IgG) antibodies to *Toxoplasma gondii* were detected in the serum with an elevated titer of 598 IU/ml (normally < 1 IU/L). HIV testing was negative. After consulting a parasitologist, treatment with Daraprim® tbl (pyrimethamine) 2 x 25 mg/d and Biseptol® (trimethoprim-sulfamethoxazole) 2 x 960 mg/d p.o. were initiated in three courses of 5 days with 14-days intervals between them. The eruptions resolved completely leaving scars and postinflammatory hyperpigmented macules (Figures 5-12). One month later, the titer of antibodies decreased significantly to 1:80.

**Discussion**

Although toxoplasmosis is a common infection, affecting about 1/3 of the world population, it is asymptomatic in most cases. *T. gondii* was first observed by Nicolle and Manceaux in 1908 in a North African rodent, *Ctenodactylus gondii* (5). In 1939, it was identified as the cause of severe congenital syndrome by Wolf, Cowan, and Paige (6).
Cutaneous toxoplasmosis is usually found in patients with a compromised immune system, such as transplanted patients or patients having acquired immunodeficiency syndrome (AIDS). Cutaneous lesions are rarely observed in immunocompetent patients. In 2002, Bossi described acute disseminated toxoplasmosis in 3 patients with normal immune system with maculo-papular rash and systemic symptoms (18).

Although demonstration of the organism in biopsy of lymph node, liver or spleen, bone marrow, or in cerebrospinal and ventricular fluid confirms toxoplasmosis, the diagnosis is usually based on clinical evidence, and confirmed serologically (1).

Up to now, only few cases of disseminated cutaneous nodular toxoplasmosis in immunocompetent patients have been described in the literature. Pinkerton and Henderson were the first to describe cases of cutaneous toxoplasmosis in 1941 (7). Cutaneous manifestations are rare, but quite diverse, ranging from macular (8), papular (8), urticarial, hemorrhagic eruptions (9) to formation of nodules (10) and bullae. Lesions resembling pityriasis lichenoides (11) and dermatomyositis (12, 13, 14) have been described. Fernandez et al. have reported a case of erythrodermia in cutaneous toxoplasmosis (15).

Several cases with cutaneous nodular lesions in toxoplasmosis infection have been described by Midana A, et al. (16) in 1970 for the first time. In 1989, Leblanc T, et al. reported multinodular non suppurative panniculitis in a 3 year-old boy (17). A case of cutaneous toxoplasmosis characterized by nodular lesions in a HIV-positive patient has been reported recently (Fong et al., 2010) (10).
literature. We report a case of nodular cutaneous toxoplasmosis in a young patient without concomitant diseases. The diagnosis was confirmed serologically. The patient was treated with sulphonamides and pyrimethamine (Daraprim) which as it has been reported act synergistically and are effective (1).

**Conclusion**

Although rare in the dermatological practice, cutaneous toxoplasmosis should be considered in all patients presenting with lymphadenopathy, non-specific skin eruptions, especially nodular and colliquative, blood eosinophilia and histological findings of abundant eosinophilic infiltrations.

**Abbreviations**

- HIV - human immunodeficiency virus
- CRP - C-reactive protein
- ECLIA - electro-chemiluminescence immunoassay
- IgG - immunoglobulin G
- AIDS - acquired immunodeficiency syndrome

**References**


