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Cutaneous Manifestations of Toxoplasmosis: a Case Report

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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 colliquative, blood eosinophilia and histological findigs revealing abundant eosinophilic inflitrations.

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 immunodefficiency 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

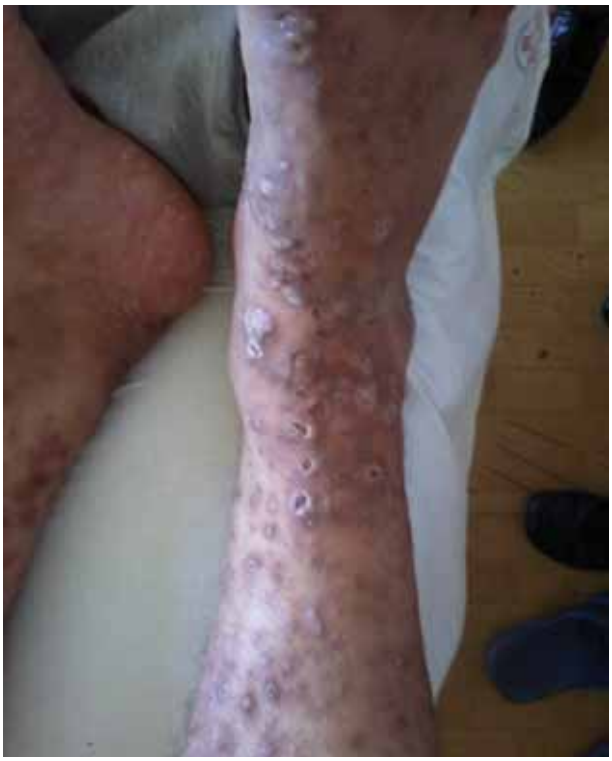

Figure 1. Before the therapy

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 limitis, except for the white cell count which showed leukocytosis with eosinophilia: total white blood count 23.84 x10^9/L, with a differential of: neutrophils 28%, lymphocytes 45.5%, eosinophils 19.2% (4.6 x10^9/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);

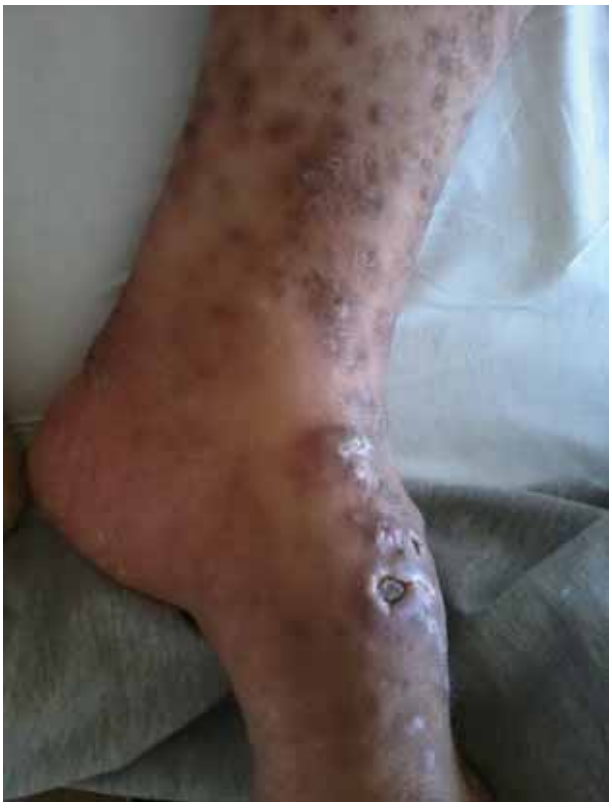

Figure 2. Before the therapy

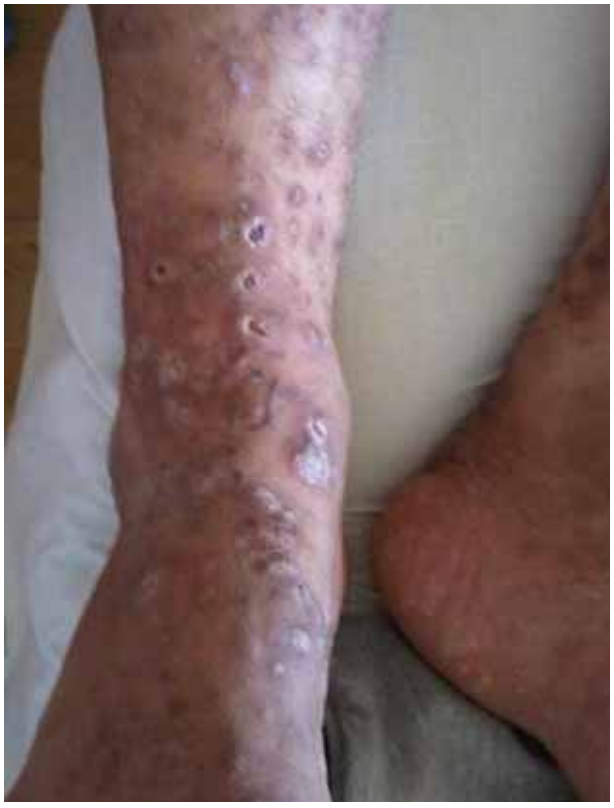

Figure 3. Before the therapy

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 scaring 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,

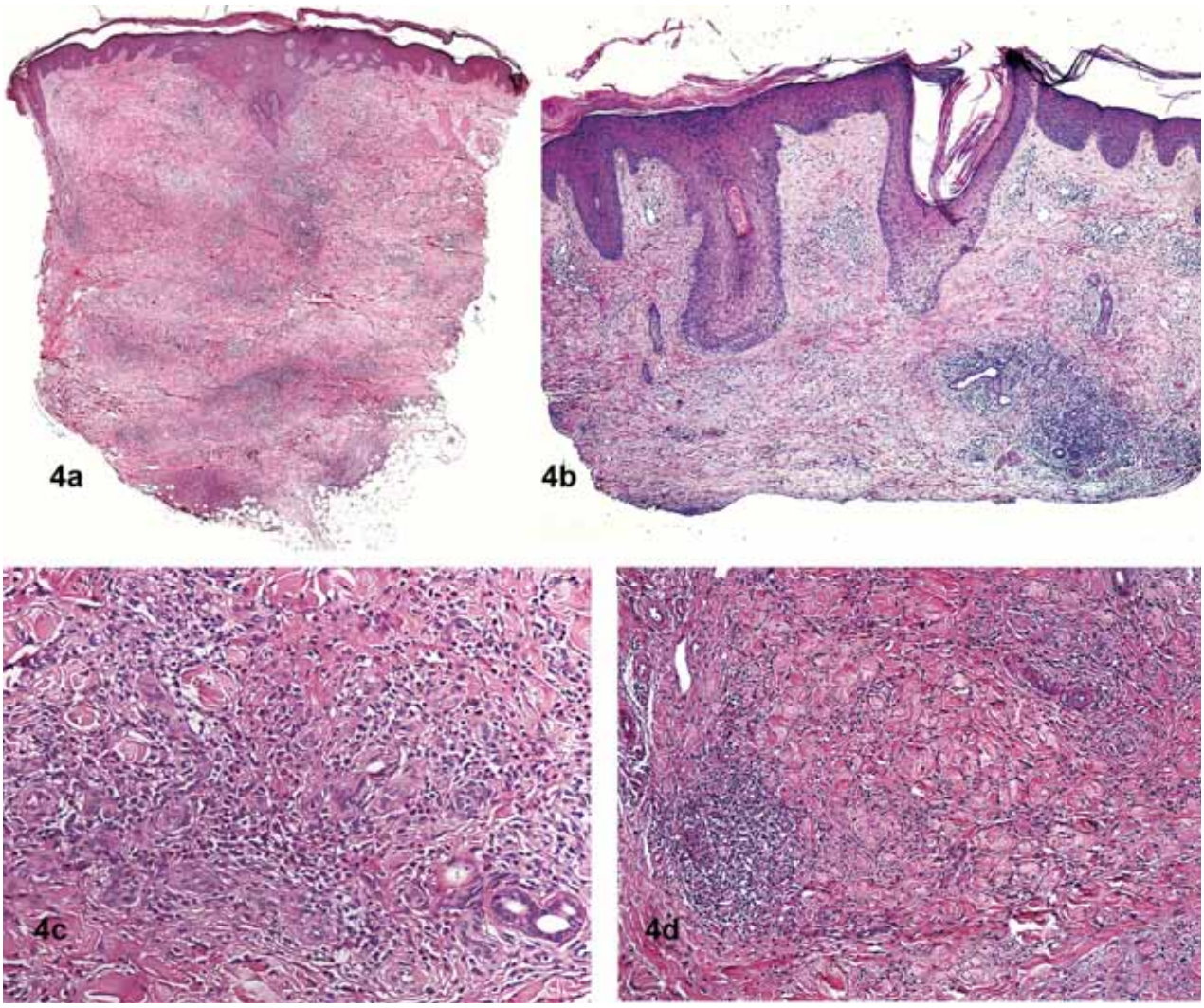

Figure 4a Histopathology of the skin biopsy showed hyperkeratosis, hypergranulosis and acanthosis in the epidermis (HE staining).

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)..

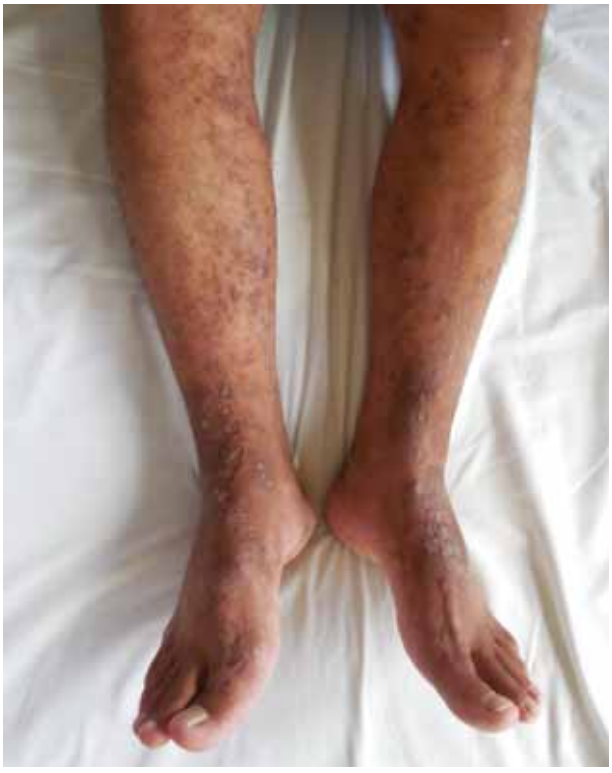

Figure 6. After the therapy

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).

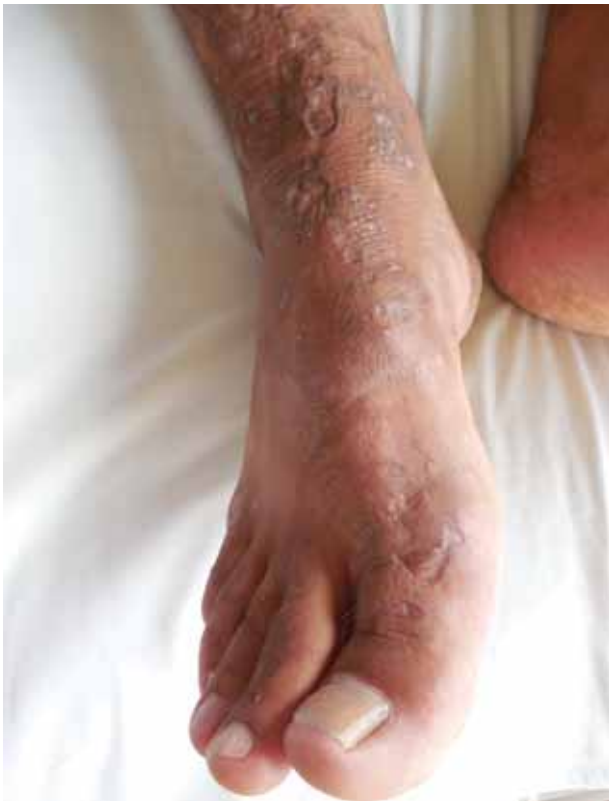

Figure 7. After the therapy

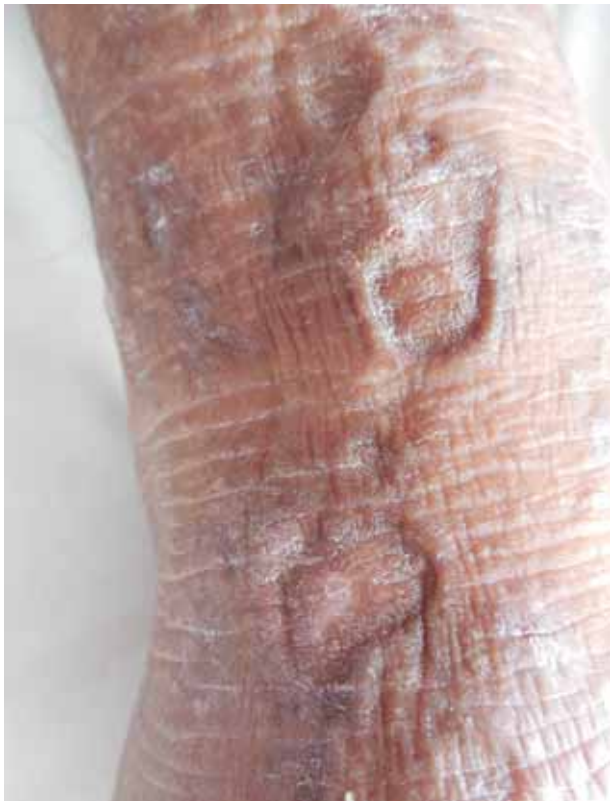

Figure 8. After the therapy

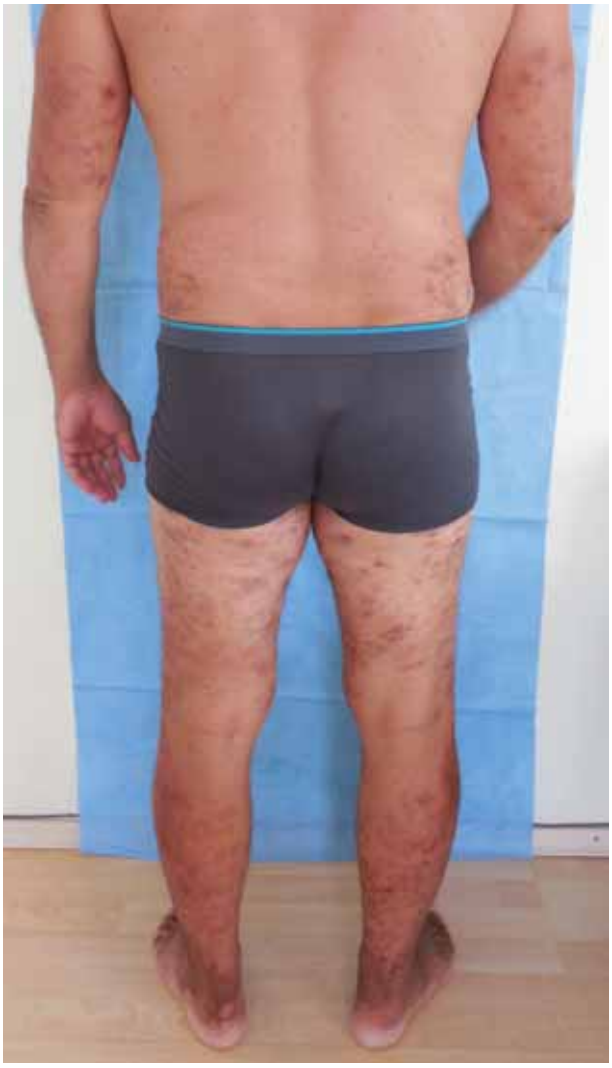

Figure 9. After the therapy

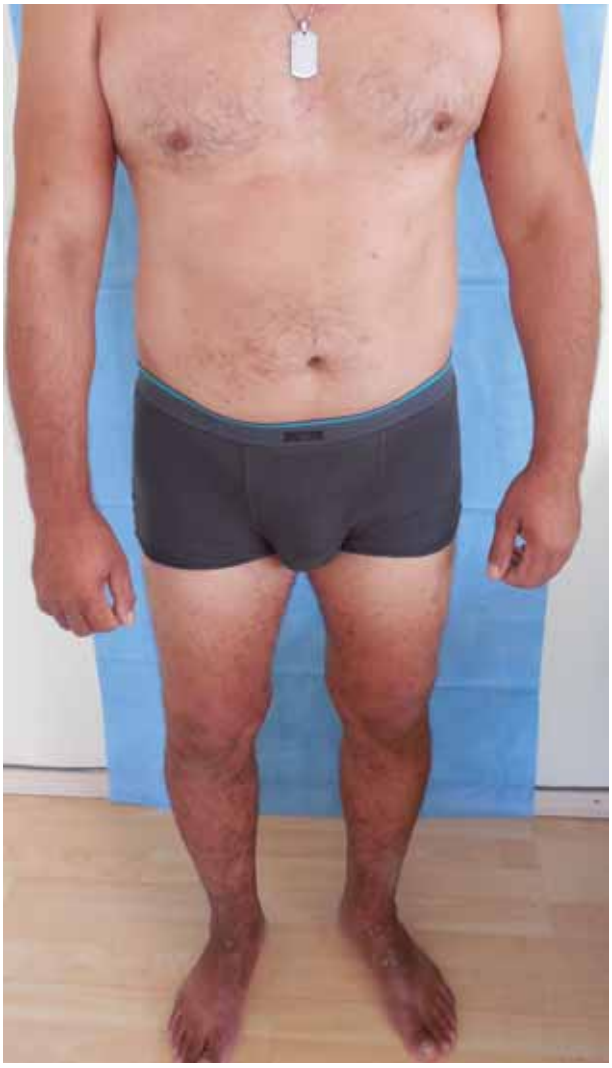

Figure 10. After the therapy

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).

Cutaneous toxoplsmosis 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).

Althouh 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 immuno-competent patients have been described in the

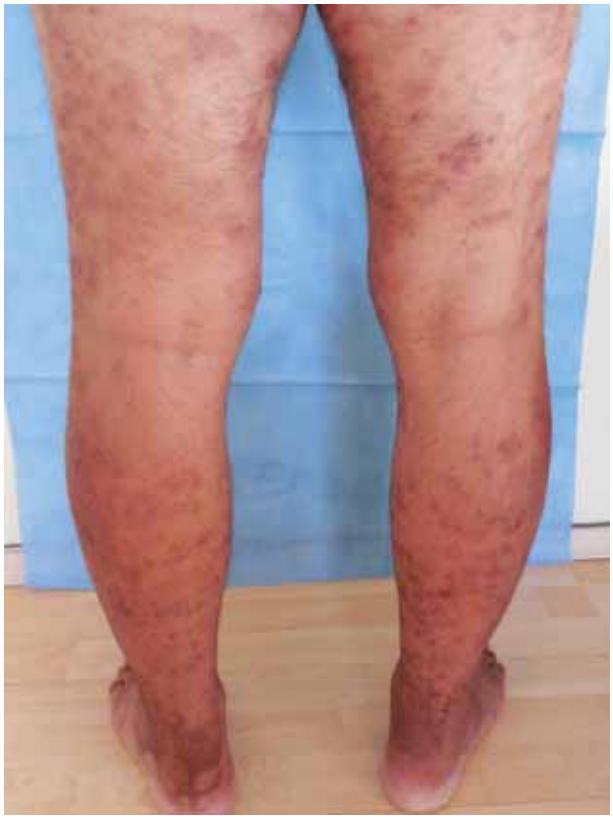

Figure 11. After the therapy

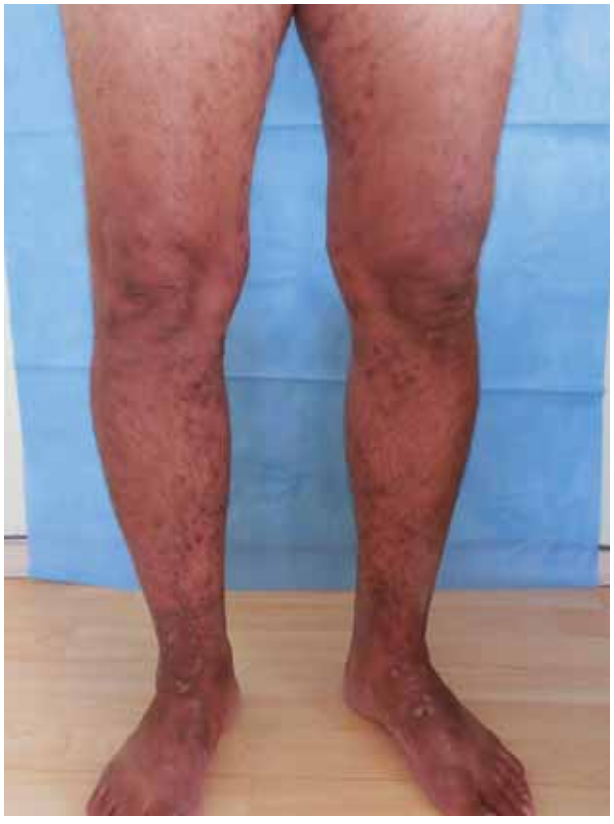

Figure 12. After the therapy

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

1. Vega-López F, Hay RJ. Parasitic worms and protozoa. In: Burns T, Breathnach S, Cox N, Griffiths C, editors. Rook's Textbook of Dermatology. 6th ed. Oxford: Blackwell Publishing Ltd; 2010. pp. 37.1-37.44.
2. Lee SA, Diwan AH, Cohn M, Champlin R, Safdar A. Cutaneous toxoplasmosis: a case of confounding diagnosis. Bone Marrow Transplant 2005;36(5):465-6.

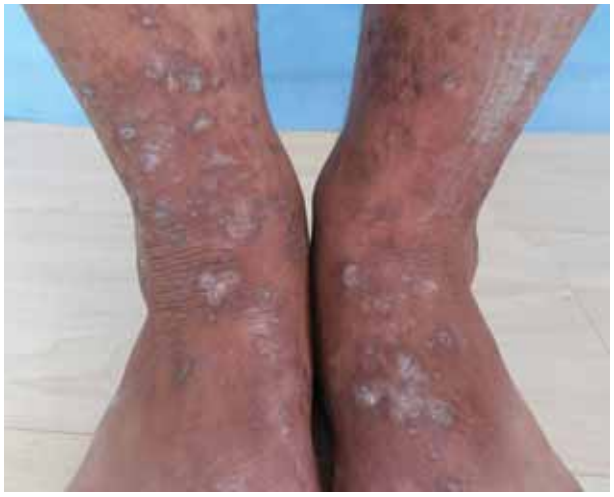

Figure 12. After the therapy

3. Mayes JT, O`Connor BJ, Avery R, Castellani W, Carey W. Transmission of Toxoplasma gondii infection by liver transplantation. Clin Infect Dis 1995;21(3):511-5.
4. Dodd RY. Transmission of parasites by blood transfusion. Vox Sang 1998;74 Suppl 2:161-3.
5. Nicolle C, Manceaux LH. Sur une infection a coyes de Leishman (ou organismes voisins) du gondi. C R Hebdomad Seance Acad Sci 1908;147:763–6.
6. Wolf A, Cowen D, Paige B. Human toxoplasmosis: Occurrence in infants as an encephalomyelitis verification by transmission to animals. Science 1939;89(2306):226-7.
7. Pinkerton H, Henderson RG. Adult toxoplasmosis: a previously unrecognized disease entity simulating the typhus-spotted fever group. JAMA 1941;116(9):807-14.
8. Mawhorter SD, Effron D, Blinkhorn R, Spagnuolo PJ. Cutaneous manifestations of toxoplasmosis. Clin Infect Dis 1992;14(5):1084-8.
9. Binazzi M. Profile of cutaneous toxoplasmosis. Int J Dermatol 1986;25(6):357-63.
10. Fong MY, Wong KT, Rohela M, Tan LH, Adeeba K, Lee YY, et al. Unusual manifestation of cutaneous toxoplasmosis in a HIV-positive patient. Trop Biomed 2010;27(3):447-50.
11. Rongioletti F, Delmonte S, Rebora A. Pityriasis lichenoides and acquired toxoplasmosis. Int J Dermatol 1999;38:372-4.
12. Lapetina F. Toxoplasmosis and dermatomyositis: a causal or casual relationship? Pediatr Med Chir 1989;11(2):197-203.
13. Schroter HM, Sarnat HB, Matheson DS, Seland TP. Juvenile dermatomyositis induced by toxoplasmosis. J Child Neurol 1987;2(2):101-4.
14. Topi GC, D`Alessandro L, Catricala C, Zardi O. Dermatomyositis-like syndrome due to toxoplasma. Br J Dermatol 1979;101(5):589-91.
15. Fernandez DF, Wolff AH, Bagley MP. Acute cutaneous toxoplasmosis presenting as erythroderma. Int J Dermatol 1994;33(2):129-30.
16. Midana A, Zina G, Pileri A. Acquired toxoplasmosis in adults with cutaneous papulo-nodular manifestations. Bull Soc Fr Dermatol Syphiligr 1970;77(3):333-4.
17. Leblanc T, Robert MC, Leverger G, Moulonguet-Michau I, Derouin F, Schaison G. Acute disseminated multinodular non-recurrent adiponecrosis. Cutaneous manifestations of recent toxoplasmosis. Arch Fr Pediatr 1989;46(9):679-80.
18. Bossi P, Paris L, Caumes E, Katlama C, Danis M, Bricaire F. Severe acute disseminated toxoplasmosis acquired by an immunocompetent patient in French Guiana. Scand J Infect Dis 2002;34(4):311-4.

Kutane manifestacije toksoplazmoze – prikaz slučaja

Sažetak

Uvod. Iako toksoplazmoza predstavlja jednu od najrasprostranjenijih infekcija u svetu, varijante koje zahvataju kožu su ekstremno retke. Manifestacije na koži nemaju spefičan izgled, mogu biti raznolike, što svakako otežava dijagnozu i čini diferencijalnu dijagnozu veoma složenom.

Prikaz slučaja. U ovom radu prikazujemo slučaj četrdesetrogodišnjeg muškarca sa promenama na koži u vidu multiplih papula i nodula iz kojih se spontano i na pritisak cedio žućkast eksudat. Promene su bile diseminovane po trupu i ekstremitetima, najizraženije na dorzumima oba stopala, potkolenicama i natkolenicama; nije bilo promene opšteg stanja niti febrilnosti. Promene su počele da se javljaju tri godine ranije; u početku su bile lokalizovane na donjim ekstremitetima u vidu tamnoljubičastih mrlja i čvorova, da bi se kasnje počele širiti i zahvatati i ostale delove tela.

Relevantne laboratorijske i ostale analize bile su u granicama fizioloških vrednosti, jedino je u krvnoj slici postojala leukocitoza sa eozinofilijom. Patohistološka analiza isečka obolele kože je pokazala hiperkeratozu, hipergranulozu i akantozu u epidermisu; u dermisu, naročito u njegovom dubokom delu kao i u susednim delovima hipodermisa, uočavao se gust infiltrat sačinjen od brojnih eozinofilnih granulocita, limfocita, histiocita, plazma ćelija i džinovskih ćelija tipa oko stranog tela; kolagen je bio fibroziran, ožiljast, vlakna su bila umnožena, grube, neravne zadebljale strukture. Pomoću elektro-hemiluminiscentnog imunoeseja, u serumu je utvrđen značajno povišen nivo imunoglobulina klase G protiv *Toxoplasma Gondii,* na osnovu čega je postavljena dijagnoza toksoplazmoze. Nakon oralnog lečenja sa pirimetaminom i trimetoprim-sulfametoksazolom, došlo je do potpune regresije promena.

Zaključak. Iako je toksoplazmoza veoma retka u svakodnevnoj dermatološkoj praksi, na nju uvek treba misliti kod pacijenata sa limfadenopatijom, nespecifičnim, najčešće nodularno-kolikvativnim promenama na koži, kod kojih se u perifernoj krvi i u kožnim lezijama može dokazati povišen broj eozinofilnih granulocita.

Ključne reči

Toksoplazmoza; Znaci i simptomi; Kožne manifestacije; Pirimetamin; Trimetoprim-sulfometoksazol kombinacija; Ishod terapije

