

## VISCERAL LARVA MIGRANS AND TROPICAL PYOMYOSITIS: A CASE REPORT

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### SUMMARY

We report a case of tropical pyomyositis in a boy who presented with a severe febrile illness associated with diffuse erythema, and swelling in many areas of the body which revealed on operation extensive necrotic areas of various muscles that required repeated débridement. The patient gave a history of contact with dogs, and an ELISA test for *Toxocara canis* was positive. He also presented eosinophilia and high serum IgE levels. *Staphylococcus aureus* was the sole bacteria isolated from the muscles affected. We suggest that tropical pyomyositis may be caused by the presence of migrating larvae of this or other parasites in the muscles. The immunologic and structural alterations caused by the larvae, in the presence of concomitant bacteremia, would favour seeding of the bacteria and the development of pyomyositis.

**KEYWORDS:** Tropical pyomyositis; Visceral larva migrans; Staphylococci; Toxocariasis; Hyperimmunoglobulinemia E

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### INTRODUCTION

Tropical pyomyositis (TP) is a pyogenic infection of skeletal muscles caused in 90% of the cases by *Staphylococcus aureus* usually resistant to penicillin and sensitive to other commonly used antibiotics<sup>4, 6, 14</sup>. It is a common disease in the tropics but has also been described in countries with temperate climates<sup>5, 16</sup>.

Visceral larva migrans (VLM), described the first time by Beaver and colleagues in 1952, is a disease caused most commonly by the migration of the larvae of *Toxocara canis* in various organs of the human body<sup>3, 9</sup>.

### CASE REPORT

A 16 years old boy was well until two weeks before admission to hospital when he presented generalized myalgia, diffuse erythema, high spiking fever and lower limb edema. There was a history of intimate contact with dogs and of repeated furunculosis in the family.

At admission he was very ill, febrile, with generalized erythema, edema of the lower limbs, with swelling in the right thigh, right arm, left thigh and buttock. Treatment was started with oxacillin, gentamycin and metronidazol and the affected areas were submitted

to daily débridement removing large amounts of necrotic tissue from the muscles and subcutaneous tissues. His clinical condition deteriorated when he developed respiratory failure due to pneumonia and was transferred to the ICU to be intubated and mechanically ventilated. At this time, a blood examination revealed hemoglobin of 7.7 g/dl, leukocytosis of 28,000 and eosinophilia of 10,000/mm<sup>3</sup>. A stool examination showed viable eggs of *Schistosoma mansoni*. Three blood cultures were negative and the culture of the abscesses showed *Staphylococcus aureus* resistant to penicillin.

He was treated with blood transfusions, total parenteral nutrition, and was eventually discharged from the ICU, and soon after, from the hospital. He was readmitted a few days later due to recurrence of the lesions in some of the previously described areas and was treated with an oral first-generation cephalosporin only, leaving the hospital 9 days afterwards in good condition.

One month later a laboratory makeup showed serum IgE of > 2000 KU/L (normal value: < 140 KU/L), and an ELISA test for visceral larva migrans (VLM) of 1:1042 (positive values: > 1:500). He tested HIV-negative by ELISA and western blot analysis.

Now, after three years of follow up, the patient is doing well using prophylactic benzathine penicillin monthly. He gained weight but was left with extensive scars in the areas affected by pyomyositis.

## DISCUSSION

In spite of being described for the first time in the last century, the underlying cause of tropical pyomyositis is still unknown and various theories have been suggested to explain its etiology<sup>15,16</sup>.

Viral infections<sup>16</sup>, trauma<sup>8</sup>, malnutrition, vitamin deficiency and parasitic diseases<sup>2</sup>, were suggested as possible etiologic factors. O'BRIEN, in 1963<sup>14</sup>, studying 65 patients with tropical pyomyositis found a larva in the pus obtained from the muscle of one of the patients. The author suggested that migrating larvae of worms could be a possible etiologic factor.

Infection with *Toxocara canis* occurs through the ingestion of infective eggs of the parasite in contaminated food, water or through geophagia (pica) in children. Other routes of transmission include ingestion of undercooked meat of rabbits, poultry, cows and pork<sup>17</sup>. In the paratenic host, like man, the larva does not develop or grow but migrates through various body organs such as liver, lungs, brain, kidneys, muscles, and eyes, being capable of surviving for many months, and giving rise to the visceral larva migrans syndrome<sup>13</sup>.

The larva induces a host reaction represented by the granuloma that is rich in neutrophils and eosinophils in the early phase, and in macrophages later on. In a subsequent stage a dense collagenous capsule is formed around a center of epithelioid cells full of lipid material that may contain or not a larva or part of it. At this phase, eosinophils are rarely seen because they have been phagocytosed by the macrophages<sup>10,13</sup>.

Infection with this parasite induces the differentiation of Th0 lymphocytes to Th2 cells that produce IL-4 which switches immunoglobulin production from IgG to IgE and IL-5 that stimulates the production and proliferation of eosinophils. At the same time, these cytokines inhibit the differentiation of Th0 to Th1 cells and so reduce the production of IL-2 and gamma-interferon that induce a more adequate immune response represented by the production of IgG and stimulation of the intracellular killing of pathogens by the macrophages<sup>1,7,11</sup>.

Our patient admitted contact with dogs, a well known risk factor for VLM, and a history of furunculosis that could have been the origin of bacteremia which led to muscle abscesses. An ELISA test for VLM was positive. There was eosinophilia and hyperimmunoglobulinemia E, a common finding in VLM and schistosomiasis<sup>11,12,18</sup>.

Taking all these factors together, we suggest that the presence of larvae of *T. canis* in the skeletal muscles associated with the immunologic and structural alterations that it causes, in the presence of bacteremia, may lead to the formation of muscle abscesses.

In an experimental work undertaken by our group, the development of muscle abscesses in mice infected with *T. canis* larvae and *Staphylococcus aureus* was significantly more frequent ( $p < 0.05$ ) than that found in mice infected with either the bacteria or the larvae alone (unpublished data).

## RESUMO

### Larva migrans visceral e piomiosite tropical: relato de um caso

Os autores relatam o caso de um jovem com piomiosite tropical grave, eosinofilia e hiperimmunoglobulinemia E. O paciente relatou história de contato com um cão e o teste de ELISA para *Toxocara canis* revelou-se positivo. O *Staphylococcus aureus* foi a única bactéria isolada da secreção purulenta obtida dos abscessos musculares. Sugere-se que a piomiosite tropical possa ser iniciada pela presença das larvas desse ou de outros parasitos com tropismo para os músculos. As alterações imunológicas e estruturais nos músculos acometidos pelas larvas e a presença de bacteriemia podem favorecer a instalação da bactéria e o desenvolvimento da piomiosite.

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## REFERENCES

1. ALLEN, J.E. & MAIZELS, R.M. - Th1-Th2: reliable paradigm or dangerous dogma? *Immunol. today*, **18**: 387-392, 1997.
2. ANSALONI, L. - Tropical pyomyositis. *Wld. J. Surg.*, **20**: 613-617, 1996.
3. BEAVER, P.C.; SNYDER, C.H.; CARRERA, G.M.; DENT, J.H. & LAFFERTY, J.W. - Chronic eosinophilia due to visceral larva migrans. Report of three cases. *Pediatrics*, **9**: 7-19, 1952.
4. CHIEDOZI, L.C. - Pyomyositis. Review of 205 cases in 112 patients. *Amer. J. Surg.*, **137**: 255-259, 1979.
5. CHIEFFI, P.P.; UEDA, M.; CAMARGO, E.D. et al. - Visceral larva migrans: a seroepidemiological survey in five municipalities of São Paulo state, Brazil. *Rev. Inst. Med. trop. S. Paulo*, **32**: 204-210, 1990.
6. CHRISTIN, L. & SAROSI, G.A. - Pyomyositis in North America: case report and review. *Clin. infect. Dis.*, **15**: 668-677, 1992.
7. DEL PRETE, G.F.; DE CARLI, M.; MASTROMAURO, C. et al. - Purified protein derivative of *Mycobacterium tuberculosis* and excretory-secretory antigen (s) of *Toxocara canis* expand in vitro human T cells with stable and opposite (type 1 T helper or type 2 T helper) profile of cytokine production. *J. clin. Invest.*, **88**: 346-350, 1991.
8. JAYOUSSI, R.; BIALIK, V.L.; EYAL, N.; SHEHADEH, N. & ETZIONI, A. - Pyomyositis caused by vigorous exercise in a boy. *Acta Paediat.*, **84**: 226-227, 1995.
9. KAYES, S.G. - Human toxocarasis and the visceral larva migrans syndrome. Correlative immunopathology. *Chem. Immunol.*, **66**: 99-124, 1997.
10. KAYES, S.G. & OAKS, J.A. - Development of the granulomatous response in murine toxocarasis. Initial events. *Amer. J. Path.*, **93**: 277-285, 1978.

11. LAMBERTUCCI, J.R. - Hyperimmunoglobulinemia E, parasitic diseases and staphylococcal infection. *Rev. Soc. bras. Med. trop.*, 29: 407-410, 1996.
12. LAMBERTUCCI, J. R.; TEIXEIRA, R.; NAVARRO, M.M.M.; COELHO, P.M.Z. & FERREIRA, M.D. - Liver abscess and schistosomiasis. A new association. *Rev. Soc. bras. Med. trop.*, 23: 239-240, 1990.
13. MARGARETH, H.D.; SMITH, M.D. & BEAVER, P.C. - Persistence and distribution of toxocara larvae in the tissues of children and mice. *Pediatrics*, 12: 491-496, 1953.
14. O'BRIEN, D.D. - Tropical pyomyositis. A manifestation of larva migrans? *J. roy. Army Med. Cps.*, 109: 43-50, 1963.
15. SCRIBA, J. - Beitrag zur aetiologie myositis acute. *Dtsch. Z. Chir.*, 22: 497, 1885.
16. SHEPHERD, J. J. - Tropical myositis: is it an entity and what is its cause? *Lancet*, 1:1240-1242, 1983.
17. STURCHLER, D.; WEISS, P. & GASSNER, B. - Transmission of toxocariasis. *J. infect. Dis.*, 162: 571-572, 1990.
18. TEIXEIRA, R.; FERREIRA, M.D.; COELHO, P.M.Z. et al. - Pyogenic liver abscesses and acute schistosomiasis mansoni: report on 3 cases and experimental study. *Trans. roy. Soc. trop. Med. Hyg.*, 90: 280-283, 1996.

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