



## Toxocariasis Mimicking Lymphoma and Presenting as Multiple Lymphadenopathy: A Case Report

전신 림프절 비대로 발현되어 림프종으로 오인된 톡소카라증:  
증례 보고

Yoonmi Choi, MD, Cheol Min Park, MD\*, Jeong Woo Kim, MD, Yang Shin Park, MD,  
Jongmee Lee, MD, Jae Woong Choi, MD, Kyeong Ah Kim, MD, Chang Hee Lee, MD

Department of Radiology, Korea University Guro Hospital, Seoul, Korea

Toxocariasis, a parasitic infection, causes hyper eosinophilia resulting in radiological presentation of eosinophilic infiltrations in the involved organs. In the abdomen, toxocariasis has been reported to manifest as infiltrations in the liver or in the gastrointestinal tract, but it is known to be uncommon to manifest as multiple lymphadenopathy. There have been two case reports of toxocariasis presenting as generalized lymphadenopathy in the chest, neck and inguinal regions. To the best of our knowledge, generalized conglomerated lymphadenopathy occurring mostly in the abdomen from toxocariasis has not been published in the English literature. Herein, we report a rare case of toxocariasis presenting as multiple conglomerated lymphadenopathy mimicking lymphoma on CT.

### Index terms

Toxocariasis  
Eosinophilia  
Lymphadenopathy  
Abdomen  
Computed Tomography, X-Ray

## INTRODUCTION

Toxocariasis is a zoonotic infestation from parasite *Toxocara canis* (*T. canis*) and *cati* (*T. cati*) that manifests in variable parts of human body including the liver, lungs, eyes, heart, and the brain. The specific form of toxocariasis involving the systemic organs such as the liver, lungs and the gastrointestinal tract is named visceral larva migrans (VLM) and it presents clinical symptoms such as abdominal pain, fever, cough and wheezing (1). VLM mainly manifests as infiltrations in the liver (2) or as gastroenteritis (3) and ascites (4) in the abdomen, but rarely as generalized lymphadenopathy (1, 5). There have been rare reports of toxocariasis presented as multiple lymphadenopathies

in the chest (1) or neck areas (5) but not in the abdomen. Therefore, we report a case of toxocariasis presented as multiple conglomerated lymphadenopathy that was initially misinterpreted as lymphoma on abdomen computed tomography (CT).

## CASE REPORT

A 43-year-old female was referred to our hospital for abnormal findings on outside abdomen and pelvis CT scan. The patient had no special past medical or family history and the general physical examination was unremarkable. A thorough history taking of the patient revealed that the patient had a career as a pet groomer at an animal hospital and raised a cat and

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\*Corresponding author: Cheol Min Park, MD

Department of Radiology, Korea University Guro Hospital,  
148, Gurodong-ro, Guro-gu, Seoul 08308, Korea.

Tel. 82-2-2626-1338 Fax. 82-2-863-9282

E-mail: cminpark@korea.ac.kr

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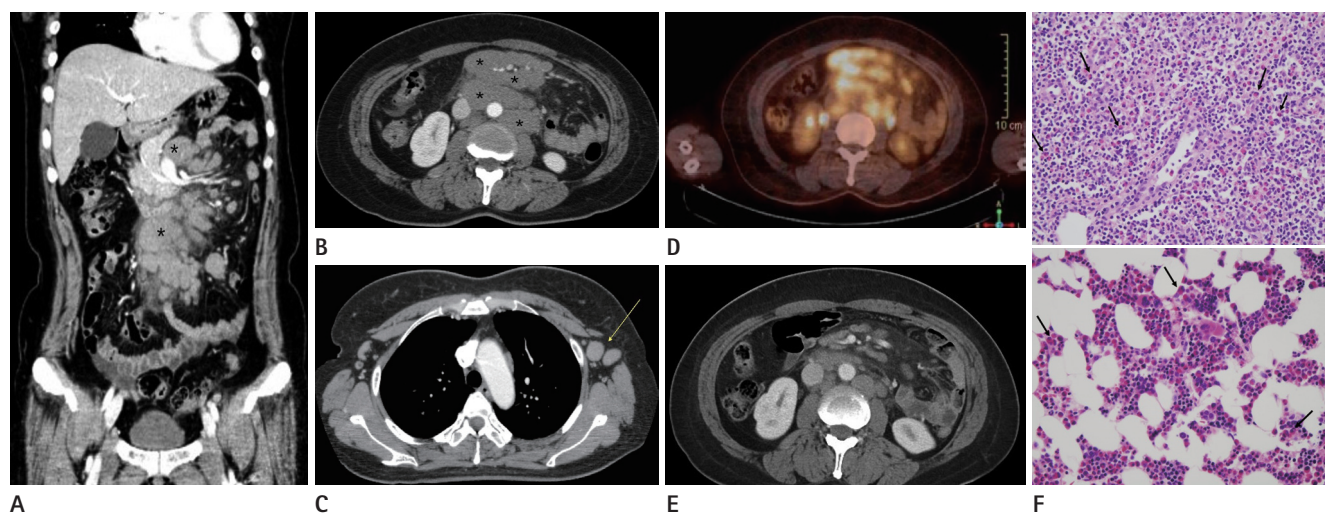
a stray dog at home.

The patient's white blood cell count was  $3.51 \times 10^3/\mu\text{L}$  with 6.4% neutrophils, 5.3% lymphocytes, and 84.8% eosinophils (normal range: 0–5%). The peripheral blood smear showed eosinophilia of 83%, absolute number of  $2.84 \times 10^9/\text{L}$  (normal absolute number:  $< 0.5 \times 10^9/\text{L}$ ). Lactate dehydrogenase level was 744 IU/L (normal range: 0–480) and serum IgE level was 154 IU/mL (normal range:  $< 100$  IU/mL). Erythrocyte sedimentation rate was 25 mm/hr and C-reactive protein was 3.21 mg/L, both within normal limit. The lab results of electrolytes, liver function, renal function and urine analysis were within normal limit. Since the patient had a career involving multiple contacts with animals, allergy test was carried out measuring IgE levels for possible allergens of animals and pollen. The allergy tests were within normal range. Also, helminthic serologic tests were carried out using enzyme-linked immunosorbent assay (ELISA) kit to detect specific IgG antibodies for specific parasites. *T. canis* specific IgG titer was positive with increased value of 1.364 (cut-off value 1.027) whereas other parasite infections such as *Cysticercus*, *Sparganum*, *Paragonimus westermani*, and *Clonorchis*

*sinensis* were excluded.

Abdominal CT revealed multiple conglomerated enlarged lymph nodes in gastro hepatic, portocaval, aortocaval, para-aortic, mesenteric, and bilateral inguinal areas showing homogenous enhancement (Fig. 1A). The maximal diameter of the conglomerated, enlarged mesenteric lymph nodes was larger than 10 cm in axial view and larger than 15 cm in coronal view. The enlarged lymph nodes showed the 'sandwich sign' by surrounding mesenteric vessels (Fig. 1B). The patient did not accompany organomegaly, bowel wall thickening or ascites. The chest CT scan revealed enlarged bilateral cervical, hilar, mediastinal and axillary lymph nodes with similar features (Fig. 1C). The initial radiologic impression for both the abdomen and chest CT suggested lymphoma.

The patient underwent positron emission tomography (PET)-CT scan with fluorine-18-fluorodeoxyglucose and found multiple hyper metabolic lymph nodes in the neck, axilla and the abdomen (Fig. 1D). The PET-CT report suspected lymphoma involvements in the affected lymph nodes as well, consistent with the abdomen CT report. Furthermore, the patient went



**Fig. 1.** A 43-year-old female with multiple lymph node enlargements detected in abdomen and pelvis CT.

**A.** Coronal image of contrast enhanced CT shows homogenous enhancing conglomerated lymph nodes (asterick) in the abdomen. No abnormal focal lesions are noted in the liver parenchyma.

**B.** Contrast enhanced abdomen and pelvis CT axial view shows multiple conglomerated lymph nodes (asterick) in the abdomen showing sandwich sign around the mesenteric vessels.

**C.** Axial image of initial chest CT shows left axillary lymphadenopathies. This scan also shows enlarged right axillary and bilateral cervical lymph nodes (not shown in this image).

**D.** PET-CT shows high metabolic uptake in multiple abdominal lymph nodes.

**E.** Four months follow-up CT shows marked decreased sizes of lymph nodes.

**F.** Photomicrograph of biopsy specimen from left axillary lymph node and bone marrow shows inflammatory cell infiltrations predominantly composed of eosinophil granulocytes (arrows) (hematoxylin and eosin stain,  $\times 12.5$ ,  $\times 400$ ).

CT = computed tomography, PET = positron emission tomography

through axillary lymph node and bone marrow biopsy, and reactive eosinophilic hyperplasia was pathologically diagnosed (Fig. 1F). Conclusively, the patient was diagnosed as toxocariasis by excluding multiple probable causes for eosinophilia and detecting specific IgG to *T. canis*.

The patient was treated with antihelminthic drugs, praziquantel (600 mg, three times a day- for two days and albendazole (400 mg, twice a day) for two weeks, followed with oral steroids (30 mg, twice a day) for one week. Progressive improvement of eosinophilia was observed from initial count of 84.8% to 6.3% at follow up and the lactate dehydrogenase level was normalized to 378 IU/L. At follow up CT scan taken four months later, the lymph node enlargements had dramatically decreased in size (Fig. 1E).

## DISCUSSION

Toxocariasis is a parasitic zoonosis from roundworm infections of *T. canis* and *T. cati* which live in a dog's small intestine. Human are infected by ingesting ova from contaminated soil or larvae from uncooked meat (cow, pig, lamb, and chickens). The ingested ova or larva invades the small bowel and travels through the portal venous system to reach the liver and spread to the lungs, eyes and the brain (6).

There are two main manifestations of toxocariasis: VLM and ocular larva migrans. VLM is the systemic exhibition showing common clinical features of peripheral eosinophilia, abdominal pain, hepatosplenomegaly, fever, and hypergammaglobulinemia (6, 7).

Toxocariasis is diagnosed definitively by visually confirming the larva in infected tissues, but this method has limitations of being insensitive and time-consuming. Therefore the most commonly used indirect diagnostic method for toxocariasis is currently ELISA test for detecting anti-*Toxocara* IgG antibodies (8, 9). After diagnosis, patients are treated with antiparasitic drugs often in combination with corticosteroids to suppress allergic manifestations (10). Our case was diagnosed as toxocariasis with the ELISA method showing increased titers for *Toxocara* specific IgG. Consequently, the patient was treated with antiparasitic drugs in combination with steroids.

Radiologic findings of VLM overlaps with those caused from eosinophilia, showing eosinophilic infiltrations across variable

visceral organs. However, VLM predominantly involves the liver and occasionally involves the gastrointestinal tract or the lungs, as it spreads via the portal system. The affected areas are presented as hepatic eosinophilic infiltrations (2) or eosinophilic gastroenteritis with ascites (3, 4). There have been two case reports on the rare manifestation of toxocariasis as generalized lymphadenopathies (1, 5). Szczepański et al. (5) reported on lymphadenopathies involving the cervical, supraclavicular and inguinal areas with sizes about 0.5–2 cm, but did not offer radiologic images. Bachmeyer et al. (1) reported bilateral hilar and mediastinal lymphadenopathies displayed in the chest radiograph and CT scan with sizes about 2–5 cm in diameter, but the involved lymph nodes were limited to the chest. However, our case showed diffuse conglomerated lymphadenopathies involving multiple areas including the lower neck, bilateral axilla and the abdomen, which were first misinterpreted as lymphoma involvements.

It is important that the radiologists are aware of this rare form of toxocariasis- associated hypereosinophilia. Careful history taking and serologic testing for parasitic infestations are required for accurate diagnosis.

## REFERENCES

1. Bachmeyer C, Lamarque G, Moraiu R, Molina T, Bourée P, Delmer A. Visceral larva migrans mimicking lymphoma. *Chest* 2003;123:1296-1297
2. Laroia ST, Rastogi A, Sarin S. Case series of visceral larva migrans in the liver: CT and MRI findings. *Int J Case Rep Images* 2012;3:7-12
3. Van Laethem JL, Jacobs F, Braude P, Van Gossum A, Deviere J. *Toxocara canis* infection presenting as eosinophilic ascites and gastroenteritis. *Dig Dis Sci* 1994;39:1370-1372
4. Chira O, Badea R, Dumitrascu D, Serban A, Branda H, Hajjar N, et al. Eosinophilic ascites in a patient with toxocara canis infection. a case report. *Rom J Gastroenterol* 2005;14:397-400
5. Szczepański T, Sorita-Jakimczyk D, Janik-Moszant A, Olejnik I. Generalized lymphadenopathy as initial presentation of toxocariasis in a seven-year-old boy. *Pediatr Infect Dis J* 1996;15:717-718
6. Ortega CD, Ogawa NY, Rocha MS, Blasbalg R, Caiado AH,

- Warmbrand G, et al. Hemithic diseases in the abdomen: an epidemiologic and radiologic overview. *Radiographics* 2010; 30:253-267
7. Merdin A, Ogur E, Çiçek Kolak Ç, Avcı Merdin F. A rare cause of hypereosinophilia: a case report. *Turkiye Parazit Derg* 2016;40:114-116
8. Roldan WH, Rubinsky-Elefant G. *Immunodiagnosis of Human Toxocariasis*. In Al-Moslih M, eds. *Serological Diagnosis of Certain Human, Animal and Plant Diseases*, 1st ed. Rijeka: InTech 2012;97-112
9. Fillaux J, Magnaval JF. Laboratory diagnosis of human toxocariasis. *Vet Parasitol* 2013;193:327-336
10. Despommier D. Toxocariasis: clinical aspects, epidemiology, medical ecology, and molecular aspects. *Clin Microbiol Rev* 2003;16:265-272

## 전신 림프절 비대로 발현되어 림프종으로 오인된 톡소카라증: 증례 보고

최윤미 · 박철민\* · 김정우 · 박양신 · 이종미 · 최재웅 · 김경아 · 이창희

톡소카라증은 생간의 섭취 혹은 개의 분변으로 오염된 토양으로부터 인간에게 감염되어 호산구 증가증을 일으키는 기생충 질환으로 뇌, 눈, 폐, 간 등 다양한 장기에 증상을 일으킬 수 있다. 호산구 침윤이 일어난 장기에 따라 간 병변을 유발하거나 장벽 비후 및 복수의 증가로 나타나는 경우가 보고된 바 있으나 전신 림프절의 증대로 나타나는 것은 극히 드물다. 전신 림프절 증대로 나타난 톡소카라증은 현재까지 약 두 개의 증례 보고가 흉부와 경부, 서혜부에서 보고된 바 있다. 하지만 전신 림프절 증대로 인해 림프종으로 오인되었던 톡소카라증은 보고된 바 없어 이러한 드문 형태로 발현된 톡소카라증에 대해 증례 보고를 하고자 한다.

고려대학교 구로병원 영상의학과