THE REPORT ON CYSTIC ECHINOCOCCOSIS IN A CAT CAUSED BY ECHINOCOCCUS GRANULOSUS SENSU STRICTO (G1)

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ABSTRACT

In this study, a cystic echinococcosis case was reported in a female stray cat who was brought to Van Metropolitan Municipality Animal Shelter. The genomic DNA from the cysts of Echinococcus granulosus was isolated from the cyst wall in accordance with the kit procedure. 446 bp sized mitochondrial cytochrome c oxidase subunit 1 (cox1) gene region was amplified for the diagnosis of E. granulosus cysts. As a result of the sequence, it was seen that the G1 strain (U50464) and the cox1 gene sequence obtained from Genbank were identical (100%). In this study, the G1 strain of E. granulosus in a stray cat was sequenced and the nucleotide sequences of the isolates were recorded to GenBank (MK926748). In this study, a stray cat with cystic echinococcosis confirmed the G1 strain of E. granulosus by the molecular methods. Furthermore, in this study, cystic Echinococcosis in a stray cat in Van province in Turkey is the first case report.

Keywords: Echinococcus granulosus, Cat, Van

INTRODUCTION

The genus Echinococcus Rudolphi, 1801 is an associate of the family of Taeniidae, an significant group of cestodes that give rise to zoonoses globally. To date, this genus has contained four distinct morphologically species: Echinococcus granulosus, E. multilocularis,

E. oligarthrus and E. vogeli. However, according to the molecular and phylogenetic studies conducted in recent years, these species consist of nine species: E. granulosus sensu stricto, E. canadensis, E. ortleppi, E. equinus and E. felidis (previously all of which contain the type of complex of complexes of E. complexulosus), E oligarthrus, E. vogeli, E. multilocularis and E. shiquicus (NAKAO et al., 2010).

Cystic echinococcosis (CE) is a parasitic infection of various organs and tissues of many mammals, including human, by the larvae of Echinococcus granulosus (hydatid cyst) found in the small intestine of adult parasite dogs and other carnivores.(KASSAİ, 1999). Infection in intermediate hosts occurs as a result of removal of parasitic eggs spreading in the feces of definite hosts (THOMPSON et al., 2006). Cystic echinococcosis has a wide prevalence throughout the world, especially in underdeveloped and developing countries (KASSAİ, 1999; YILDIZ and TUNÇER, 2005).

The disease is also quite common in Turkey; In addition to the danger posed by human and animal health, it also leads to significant economic losses (ALTINTAŞ et al., 2004).

Deoxiribonucleic acid (DNA) based methods used in the classification of species and strains of Echinococcus are independent of host and environment-related factors and are very important methods because they directly study the parasite genome (MCMANUS et al., 2004). Therefore, molecular identification based on mtDNA sequencing is currently the most reliable way to identify Echinococcus species. This study reported a case of cystic echinococcis in a stray cat in the province of Van in Turkey, and with molecular methods it was confirmed to be G1 strain of Echinococcus granulosus s.s.

MATERIALS and METHODS

This study material is composed of cystic echinococcosis cysts seen in a female stray cat, which was brought to the animal shelter of Van Metropolitan Municipality in November, 2018. The pre-operative cat was observed in the abdomen with excessive swelling, difficulty in breathing, high fever and disturbed general condition. (Figure 1).



Figure1: Excessive fatigue in the cat and excessive swelling in the abdomen

No information about the history of the disease could not be reached because of its being a stray cat. Numerous abdominal cysts with a diameter of 5 to 30 mm were detected on ultrasonography. Surgical intervention was decided. After general anesthesia was applied by incision, in the abdominal midline entering the abdominal cavity it was visualized by revealing free cysts. In total, approximately 250 cysts were removed (Figure 2).



Figure 2. Cyst hydatid larvae removed after surgery.

To determine whether removed cysts are fertile or sterile; Cyst fluid was stained with Giemsa staining method to display protoscolex (Figure 3).



Figure 3. Protoscolexes detected by Giemsa staining method

DNA Was Isolated From Cysts By Molecular Methods.

DNA Isolation and PCR

Echinococcus granulosus genomic DNA was isolated from the cyst wall according to the procedure with the QIAmp DNA Mini Kit (QIAGEN). The DNA samples obtained were stored at -20 °C. This study was to determine the diagnosis of E. granulosus cysts 446 bp size mitochondrial cytochrome c oxidase subunit 1 (cox1) gene region amplifying, primers used JB3 (5'TTTTTTGGGCATCCTGAGGTTTAT-3'), JB4. 5 (5'TAAAGAAAGAACATAATGAAAATG-3') which used by (BOWLES et al., 1992; BOWLES and MCMANUS, 1993). PCR products were run on the agarose gel and the images on the gel imaging device (Syngene bio imaging system) were obtained (Figure 4). The data obtained from the sequence analysis of the partial mitochondrial cox1 gene region were compared with the reference sequences found in GenBank (http://www.ncbi.nlm.nih.gov/BLAST/). Direct Sequencing was performed by a private company (Medsantek, İstanbul, Turkey). The resulting sequence was compared with sequences available in GenBank using the online BLAST® tool and revealed 100% homology with E. granulosus s.s. genotype 1 in both genes (e. g. GenBank: AB786664, AB786665).

RESULTS

Post-PCR gel isolates of E. granulosus isolates (1, 2, 3) positive isolates, 1.5% agarose gel, 90 V, 60 min, M: marker; 100bp, Fermentas) (Figure 4).

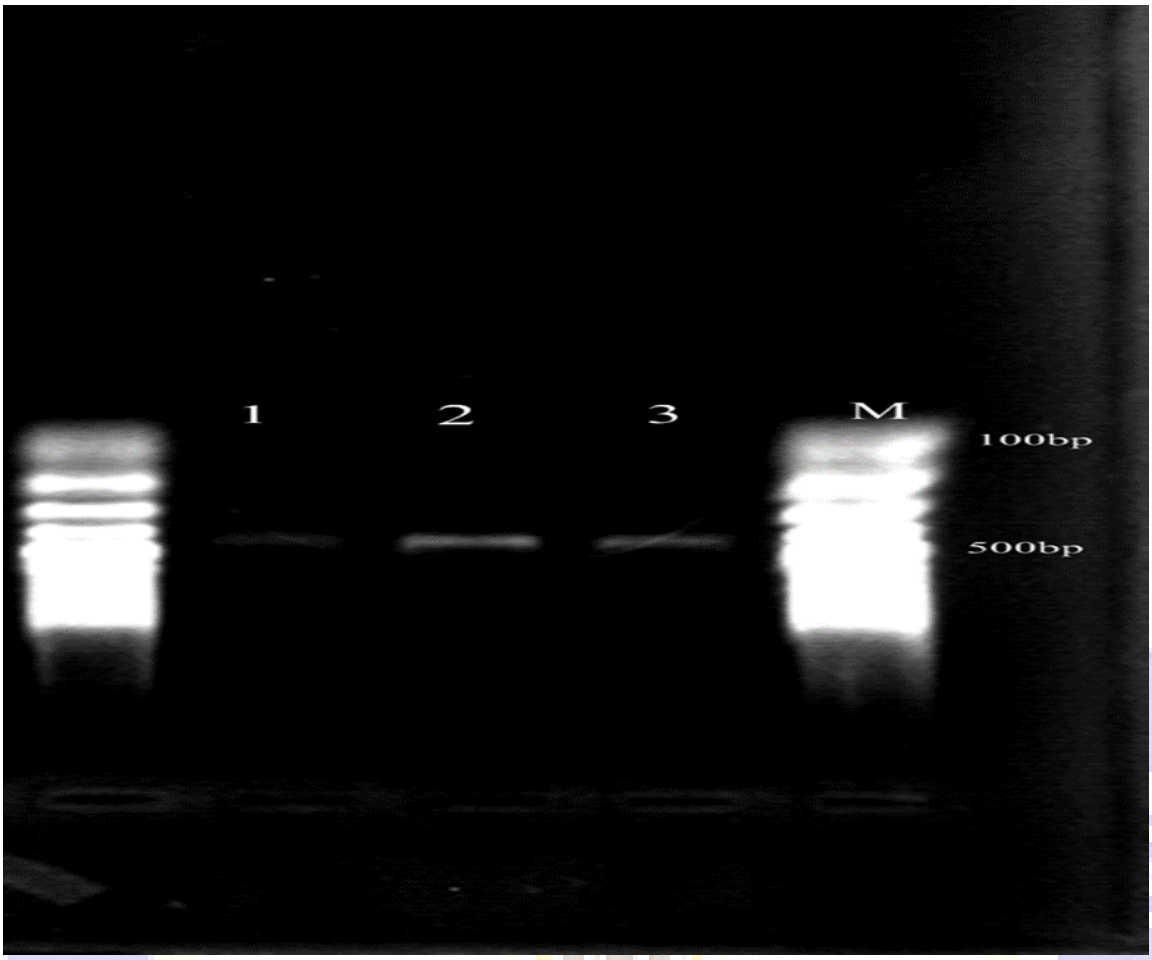


Figure 4. Post-PCR gel isolates of E. granulosus isolates (1, 2, 3) positive isolates, 1.5% agarose gel, 90 V, 60 min, M: marker; 100bp, Fermentas)

The purified amplicons were sequenced using the Applied Biosystems 377 DNA Sequencer. Genetics Analysis version 6.0 (MEGA) was sequenced with the references specified in Figure 5 using the ClustalW algorithm in the program. Using the Neighbor-Joining method, a phylogenetic tree was created with a bootstrap test (100 repetitions) (Figure 5).

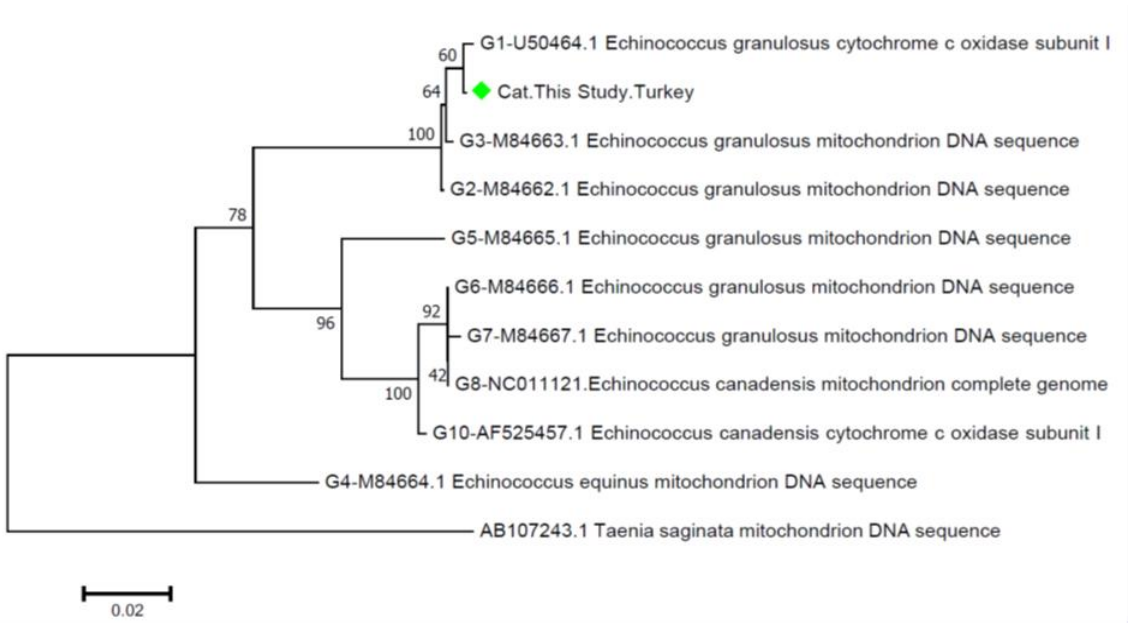


Figure 5. The phylogenetic relationship of the isolate obtained from GenBank with G1, G2, G3, G4, G5, G6, G7, G8, G10 strains obtained from GenBank. Teania saginata was selected as the outer group of sagittal.

The evolutionary distance between isolates was determined using Maximum Composite Likelihood. Phylogenetic analysis of the sequences obtained in our study with the references between G1-G10 as described previously was done using the Neighbor-Joining method.

Cox1 sequences obtained from the isolates, Genotype 1- U50464.1 (OKAMOTO et al., 1995), Genotype 2 M84662.1 (BOWLES et al., 1992), Genotype 3-M84663.1 (BOWLES et al., 1992), Genotype 4 -M84664.1 (BOWLES et al., 1992), Genotype 5 veM84665.1 (BOWLES et al., 1992), Genotype 6-M84666.1 (BOWLES et al., 1992), Genotype 7- M84667.1 (BOWLES et al., 1992), Genotype 8-NC011121 (NAKAO et al., 2007), Genotype 10-AF 525457.1 (LAVİKAİNEN et al., 2003) as a result of comparison with the phylogenetic tree is given in Figure 5. As a result of the sequence, it was seen that the G1 strain (U50464) (Okamoto et al., 1995) and the cox1 gene sequence obtained from Genbank were identical (100%).

DISCUSSION:

Echinococcus is a helminth of tapeworm. Echinococcus granulosus which is the last host dogs and wolves, and E. alveolaris (E. multilocularis, E. sibiricensis) which are the last mansion especially fox are determined to be two distinct species (ÇETİN et al., 1985; MERDİVENCİ and AYDINLIOGLU, 1982).

Incidentally, Echinococcus eggs, abnormal hosts can also produce infection, one of these abnormal intermediate hosts are cats (ECKERT and DEPLAZES, 2004). Cystic echinococcosis is an uncommon disease in cats, but the fact should be taken into account that self-grooming cats can infect themselves as a result of ingestion of Echinococcus eggs (VON DER AHE, 1967).

There are several reports of cystic echinococcosis (CE) in cats caused by the larval form of Echinococcus granulosus. Some of these studies are reviews describing eight cystic echinococcosis cases in cats (ABULADZE, 1964; MCDONALD and CAMPBELL, 1963), one domestic cat in Germany (VON DER AHE, 1967), one stray cat in Turkey (BURGU et

al., 2004), a domestic cat in Saint Petersburg, Russia (KONYAEV et al., 2012), a domestic cat in Rocha city, Uruguay (ARMUA-FERNANDEZ et al., 2014) and a domestic cat in Italy (BONELLİ et al., 2018).

In this study, it was reported for the first time in a stray cat in Van where a case of cystic echinococcus caused by Echinococcus granulosus s.s. (genotype 1). The species was confirmed by morphological and molecular studies. According to the results of this study, cats for E. granulosus show that besides the random hosts, protoscolexes can also develop in cats as intermediate hosts. However, although immunocompromised cats were able to develop accidental infection, immunological status was not investigated in this study. In addition, cat immunodeficiency and cat leukemia viruses should be considered in advanced cases.

REFERENCES

ABULADZE, K.I. (1964): Essentials of cestodology, Vol. IV. Taeniata of animals and man and disease caused by them. 530 pp. Moscow, Nauka (in Russian).

ALTINTAŞ, N., R. TINAR, A. ÇOKER (2004): Echinococcosis. Hydatidology Association, Publication No: 1, İzmir.

ARMUA-FERNANDEZ, MT., O.F. CASTRO, A. CRAMPET, et al. (2014): First case of peritoneal cystic echinococcosis in a domestic cat caused by Echinococcus granulosus sensu stricto (genotype1) associated to feline immunodeficiency virus infection. Parasitology International, 63, 300-302.

BONELLİ, P., G. MASU, S. DEİ GİUDİCİ, et al. (2018): Cystic echinococcosis in a domestic cat (Felis catus) in Italy. Parasite 25:25.

BOWLES, J., D. BLAİR, DP. MCMANUS (1992): Genetic variants within the genus Echinococcus identified by mitochondrial DNA sequencing. Mol Biochem Parasitol 54:165–173.

BOWLES, J., DP. MCMANUS (1993): NADH dehydrogenase 1 gene sequences compared for species and strains of the genus Echinococcus. Int J Parasitol; 23: 969–72.

BURGU, A., SA. VURAL, O. SARİMEHMETOGLU (2004): Cystic echinococcosis in a stray cat. Veterinary Records, 155, 711-712.

ÇETİN, TE., Ö. ANG, K. TÖRECİ (1985): Medical parasitology. Istanbul: Istanbul Medical Faculty Department of Microbiology Publications.

ECKERT, J., P. DEPLAZES (2004): Epidemiological, and clinical aspects of echinococcosis, a zoonosis of increasing concern Clinical Microbiology Reviews, 17, 107-135).

KASSAİ, T. (1999): Veterinary Helminthology.Butterworth-Heinemann, Linarce House,Jordon Hill, Oxford, pp. 45-48.)

KONYAEV, SV., T. YANAGİDA, MV. IVANOV, et al. (2012): The first report on cystic echinococcosis in a cat caused by Echinococcus granulosus sensu stricto (G1). J Helminthol, 86, 391-394.

LAVİKAİNEN, A., LEHTİNEN M, MERİ T, et al. (2003): Molecular genetic characterization of the Fennoscandian cervid strain, a new genotypic group (G10) of Echinococcus granulosus. Parasitology 127:207–215.

MCDONALD, FE., CAMPBELL AR (1963): A case of cystic hydatids in the cat. New Zealand Veterinary Journal, 11, 131-132.

MCMANUS, DP., TH LE, D BLAİR (2004): Genomics of parasitic flatworms. Int J Parasitol;34(2):153-8.

MERDİVENCİ, A., K AYDINLIOĞLU (1982): editör. Hidatidoz (hidatik kist hastalığı). ‹İstanbul: ‹İstanbul Üniversitesi Cerrahpaşa Tıp Fakültesi Yayınları.

NAKAO, M., D MCMANUS, P SCHANTZ, et al. (2007): A molecular phylogeny of the genus Echinococcus inferred from complete mitochondrial genomes. Parasitology 134:713–722.

NAKAO, M., T YANAGİDA, M OKAMOTO et al. (2010): State-of-the-art Echinococcus and Taenia: phylogenetic taxonomy of human-pathogenic tapeworms and its application to molecular diagnosis. Infection, Genetics and Evolution 10, 444–452.

OKAMOTO, M., Y BESSHO, M KAMİYA, et al. (1995): Phylogenetic relationships within Taenia taeniaeformis variants and other taeniid cestodes inferred from the nucleotide sequence of the cytochromec oxidase subunit I gene. Parasitol Res 81:451–458.

THOMPSON, RC., CM KAPEL, RP HOBBS, P DEPLAZES (2006): Comparative development of Echinococcus multilocularis in its definitive hosts. Parasitology 132, 709–716.

VON DER AHE, C. (1967): Studies on larval echinococcosis in the domestic cat. Zeitschrift für Tropenmedizin und Parasitologie, 18, 369-375.

YILDIZ, K., Ç TUNÇER (2005): Prevalence of Hydatid Cysts in Cattle in the Province of Kırıkkale. T Journal of Parasitol, 29: 247-250.

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ACCEPTANCE LETTER/ KABUL YAZISI

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On behalf of organizing committee, we are delighted to inform you that your abstracts /work entitled (see below) has been accepted for oral presentation in the *29th OF OCTOBER SYMPOSIUM ON SCIENTIFIC RESEARCHES - 4*to be held on October 29-30, 2022at Adana, Turkey.	29-30 Ekim 2022tarihindeAdana'da düzenlenecek olan *4. ULUSLARARASI 29 EKİM BİLİMSEL ARAŞTIRMALAR SEMPOZYUMU*'na göndermiş olduğunuz bildiri/özet (aşağıda belirtilmiş konu başlıklı) bilim kurulumuzca sözlü sunum olarak uygun görülmüştür.

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