Case report: intratesticular tetrathyridiosis in a cat

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SUMMARY

This report provides histological information on the incidental finding of tetrathyridiosis in the testicles of a three-year-old cross-bred cat. The cat was chemically castrated by intratesticular injection of calcium chloride (CaCl₂). Bilateral orchiectomy was performed and no gross lesions were seen in the testicles. Histological evaluation of right testicle revealed tetrathyridiosis with convoluted borders and a thick eosinophilic cuticle. The stroma of the parasitic body was composed of a loose mesenchymal network with widely scattered parenchymal and muscle cells, and numerous clear vesicles (calcereous corpuscles). Thus, the case was evaluated as intratesticular tetrathyridiosis. To our knowledge, this is the first descriptive report of intratesticular tetrathyridiosis in a cat.

Keywords: cat, testicle, tetrathyridiosis

RESUME

Un cas de tetrathyridium intratesticulaire chez un chat

Cet article présente une étude histologique d’un cas tetrathyridium testiculaire chez un chat de 3 ans de découverte fortuite. Le chat a été castré chimiquement avec du chlorure de calcium (CaCl₂). Une orchidectomie bilatérale a été pratiquée et aucune lésion macroscopique n’a pas été observée dans les testicules. L’examen histologique du testicule droit a montré des larves tetrathyridium entourées d’une membrane éosinophile, très contournée. Le stroma du corps parasite était composé d’un réseau difus mésenchymateux avec un parenchyme largement dispersé ainsi que des cellules musculaires et de nombreuses vésicules claires (corpuscules calcifiés) suggérant une infestation intratesticulaire par des larves de type tetrathyridium. A notre connaissance, il s’agit ici de la première description d’un cas de tetrathyridium intratesticulaire chez un chat.

Mots-clés: chat, testicules, tetrathyridium

Introduction

The helminths (Wordle, Mc Leod and Radinovsky 1974, Mesocestoides spp. Valliant 1863) that belong to genus Mesocestoides are small and medium-sized cestodes [2]. Although the life cycle of Mesocestoides is not precisely known oribatid mites that belong to the genus Trichoribates and Sheloribates and coprophagous arthropods are the first intermediate hosts in which the cysticercoids (first stage) take form. Tetrathyridium spp. (Tetrathyridium baillielti, Tetrathyridium elongatum) take form in the second intermediate hosts which are amphibians, reptiles, birds and in some mammals such as rabbits, small rodents, dogs and cats. Their definitive host is dogs, cats, wild carnivores and occasionally humans. Dogs and cats may act as both intermediate and definitive hosts [2, 6, 14, 18].

Tetrathyridia are found in the serous cavities, particularly in the peritoneal and thoracic cavities, liver and lungs [8, 17, 18]. They replicate in the intestines of dogs and may proliferate in the peritoneal cavity by penetrating the gut wall, which may lead to pyogranulomatous peritonitis and thus adhesions [19].

Case History and clinical findings

A parasite was detected incidentally in the histological evaluation of the parenchyma of right testicle of a three-year-old cross-bred cat, weighing 3.5 kg. The testicles of the cat were referred to our laboratory by the Department of Reproduction as being part of an experimental study which is carried on male cats that are chemically castrated by the intratesticular injection of calcium chloride (CaCl₂). Bilateral orchiectomy was performed on the cat. The dimensions of left testicle were 1.1 x 1 x 0.7 cm, whereas those of right testicle were 1.3 x 1 x 0.8 cm. The cut surfaces of both testicles were yellowish in color. Lineal pattern resembling cicatrix tissue was observed in the gross examination of the mediastinum testis. The extirpated testicles were fixed in 10% neutral buffered formalin for 24 hours and embedded in paraffin. Sections cut at 3µm thickness were stained with Haematoxylin and Eosine (H&E) and evaluated under light microscope.

Histological evaluation of right testicle revealed tetrathyridia, which had convoluted borders with a thick eosinophilic cuticle, and a single layer of cells beneath (Figure 1, 2). The stroma of the parasitic body was composed of a loose mesenchymal network with widely scattered...
parenchymal and muscle cells, and numerous clear vesicles (calcerous corpuscles) within and their transversal sections showed suckers in the invaginated ducts (Fig. 2, 3). The radius of the largest larvae was measured as 1.23 x 0.87 mm while that of the smallest one was 1.005 x 0.37 mm. There were numerous lymphocytes, macrophages, foreign body giant cells and a small number of plasma cells, which were surrounded by a fibrous capsule (Fig. 4). The case was evaluated as intratesticular tetrathyridiosis according to the histological findings.

After the detection of intratesticular tetrathyridium in the testicle of the cat, further information was provided from the owner about the history of the patient, revealing that the cat received 5mg/kg I.M praziquantel (Droncit 10 ml vial BAYER®, Turkey) for prophylaxis prior to the experimental study. Nevertheless, fecal samples were collected from the cat and were analyzed twice for the presence of larval stage of the parasite (*Mesocestoides*). Radiography revealed an abdominal hernia. And then laparotomy was performed and no parasite was found in the area of hernia. A tissue sample was collected from the area, as well; however neither parasite (tetrathyridium) nor necrosis was evident either by histology. Liver enzymes, total protein, bilirubin, urea and creatinine levels, all of which were found to be within normal ranges, were evaluated. Hemogram revealed a substantial increase in leukocytes such as 30.5 (×10³/µL of blood) [normal range 5.5-19.5 (×10³/µL)] and thus, an antibiotic was administered to the patient for 10 days (Cefazoline sodium, 125 mg, I.M). The leukocyte count dropped back to 15 (×10³/µL) after the treatment. Besides, urine test results were as follows: Protein (+), pH 7.5 and 3-4 erythrocytes, 2-3 leukocytes and 2-3 kidney epithelial cells were observed per 40 high-power fields (Urine of a healthy cat contains small amounts of protein, a few erythrocytes, leukocytes and kidney epithelial cells and pH level ranges from 5.5 to 7.0).

**Discussion**

Tetrathyridia are larval forms of *Mesocestoides*, which cause necrotic and purulent inflammation in the peritoneal and pleural cavities, lungs and livers of dogs, cats, wild
mammals and reptiles [1, 8, 16, 18, 20]. Nevertheless, they were found in the mammary tissues and even in the pericardium [1, 16]. Following an experimental inoculation in mice, presence of tetrathyridia (Mesocestoides corti) was reported for the first time in the testicle parenchyma by Sprecht and Widmar [15].

They were detected also in the scrotum of dogs with an accompanying peritoneal tetrathyridiosis [4, 21]. Tetrathyridia were detected in the testicular parenchyma of a dog, as well [12]. In domestic animals testicle parasites are mostly seen in the studs and bulls [9]. Larvae of Strongylus edentus and larvae of Setaria labiatopapillosa and also Onchocerca ochengi were mostly observed in the studs and bulls, respectively [9]. Cases of peritoneal tetrathyridiosis have been reported in cats [7, 17]. Yet, no data is available in veterinary literature, regarding an evidence of tetrathyridium or any other parasites in the testicles of cats. To the best of our knowledge, this is the first case report, describing tetrathyridium in the testicle of a cat.

Peritoneal cestodiosis was thought to have resulted from the migration of the parasite from the abdominal cavity to the scrotum via tunica vaginalis and then into the testicular parenchyma from the scrotum [12]. It is well known that mesothelial cells of peritoneum and tunica vaginalis, which lay down the inner surface of the scrotum are in close association since both embryologically originate from the coelomic epithelium [13]. In our case, abdominal radiography, performed following the detection of the tetrathyridium in the testicular parenchyma, revealed hernia. Experimental laparotomy was performed as it was considered that hernia might have occurred due to the inflammation and necrosis caused by the tetrathyridia of Mesocestoides. Biopsy specimen was taken from the abdominal wall, as well. However, histological examination revealed neither tetrathyridia nor inflammation and necrosis.

As peritoneal cestodiasis is seen in dogs and cats, it is of great importance that the differential diagnosis should rule out tetrathyridium of Cysticercus, Strobilocercus, Coenurus spp. and hydatid cyst [5, 7, 10, 11, 17]. In the present case, presence of calcereous corpuscles in the matrix of larvae including the other histological findings were the characteristics of Mesocestoides spp. as previously described. Tetrathyridia generally cause granulomatous inflammation and occasionally multiple cyst formations, particularly in the serosal surfaces and in visceral organs (liver, intestine) and peritoneum of the second intermediate hosts [1, 3, 7, 10, 11]. In a case of tetrathyridiosis in the testicles of a dog, Rodriguez et al. [12] reported that the testicles were remarkably enlarged and there was severe necrosis in the parenchyma. In our case, we detected numerous lymphocytes, macrophages, foreign body giant cells and a small number of plasma cells surrounded by a fibrous capsule. However, the testicles were neither enlarged nor necrotizing.

Tetrathyridia were previously detected in the peritoneum of cats. However, to our knowledge, this is the first case of tetrathyridiosis in the testicular parenchyma of a cat. It is considered that absence of the parasite in the other organs might be associated with the routine antiparasitic chemoprophylaxis. Although we did not find any parasites in the peritoneum following the experimental laparotomy, absence of evidence does not necessarily prove the evidence of absence. Laparotomy is, however, far from being adequate for a thorough examination when compared with necropsy.

In conclusion, this is the first case report of tetrathyridiosis in the testicles of a cat. Peritoneal tetrathyridiosis is frequently seen in cats and in such cases, we believe that, scrotal examination should be made by palpation and also by ultrasonography (USG) considering the fact that cavum vaginale is continuous with the peritoneum.

References

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