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T. taeniaeformis Infestation in Laboratory Rat

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Abstract

We report the infection of *Cysticercus fasciolaris* (*C. fasciolaris*), the larval form of *Taenia taeniaeformis* (*T. taeniaeformis*) in one of the rats used in a experiment in lab rats (Wistar rat). Animal showed symptoms like weight loss, lethargy, and a visibly poor coat condition. Gross Pathology revealed a pale and soft cyst in liver which was approximately 1.5 cm in diameter. Inside the cyst revealed a pale white segmented tapeworm (*Taenia taeniaeformis*). Histopathology of liver showed parasitic cyst surrounded by dense granulation tissue compress to the adjacent hepatocytes. Also few placed granulation tissue surrounding the fatty tissue compress the adjacent hepatocytes observed.

Keywords : *Taenia taeniaeformis,* Rat, Tapeworm, Liver cyst,

Taenia taeniaformis is a helminth parasite with cosmopolitan distribution, is found in the intestine of cat and related carnivores. Development of metacestode, *Cysticercus fasciolaris* occurs in the liver of rodents most often in mice and rats. *C. fasciolaris* in laboratory mice and rats by contaminated fees and bedding materials has been reported (Sharma *et al*., 2017). Once the rats have swallowed the eggs, the embryo develops into the earliest larval stage, *Cysticercus fasciolaris*. Hooks are used to poke rats' muscle tissues and dig into the liver via the gut and bloodstream. Later, the larvae will reach the stage of strobilocerci. At this stage, fluid-filled cysts are formed, consisting of a scolex that attaches to the mucosa and connects to the terminal bladder until the larvae grow.

Case History and Observations

A recent observation has brought to light a significant issue concerning worm infestation in a rat in Mass Biotech Chengalpet. A male rat (12 weeks old) in control group in an experiment started showing symptoms such as severe weight loss, lethargy, and a visibly poor coat condition which were noted for more than a week during a regular clinical observation. These clinical signs prompted an in-depth investigation to determine the underlying cause.

Upon euthanasia and necropsy, a cyst (Fig. 1a) was encountered which was white and approximately 1.5 cm in diameter in the left upper lobe of the liver. And inside the cyst, contained pale white, segmented, flat tape worm of approximate length of 15 cm with flat elongated neck (Fig. 1b).

The affected liver and the obtained larva samples were subjected to histopathology. Upon evaluating, the histopathology reveled that, cestodes were noticed in the liver (Fig 2). Upon considering the morphological appearance and histopathology results of the cyst and larvae, it was confirmed as *Taenia taeniaeformis*.

Occurrence of fibrosarcoma is one the complications in this condition. Did you notice any HP changes suggesting fibrosarcoma? Have you done any IHC or any special stain? - No

Cysticercus fasciolaris, the larval form of *Taenia taeniaforrnis*, is also called as *Taenia crassicollis, Hydatigera fasciolaris, Strobilocercus fasciolaris,* and bladder worm (Kohn & Barthold, 1984). Transmission of cysticercus infection to Cat (definite host) is by consuming the infected rodent liver. *T.taeniaeformis* infection is very rare and it is transmitted through food or bedding contaminated with cat fecal material. Rat acts as the intermediate host. Clinically sick rats exhibited pale-yellowish discoloration of the mucous membranes, indicating anaemia. Many have reported cysticercus infection in lab animals. In Onoja *et al*. (2017) and

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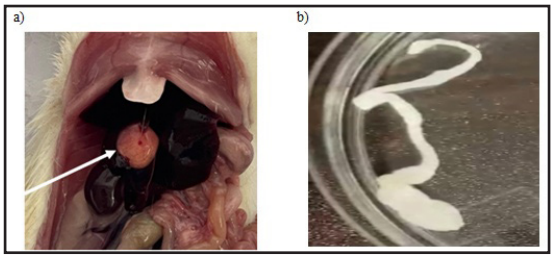

Fig 1a) Cyst (white arrow) present in liver
1b) *Cysticercus fasciolaris* larvae

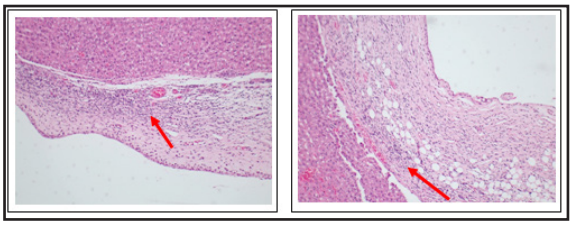

Fig 2. illustrates the necrotic core with inflammatory cells macrophages/ plasma cells] surrounded by thick fibrous tissue/granulation tissue surrounding the cyst.

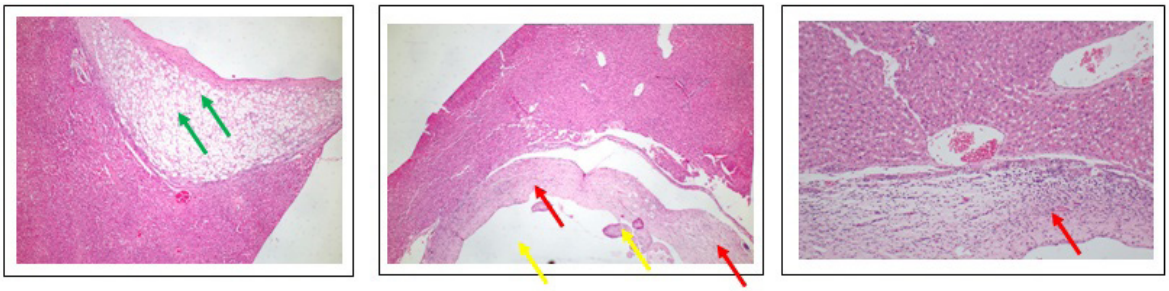

Fig 3. Liver- Multiple foci of granulomatous lesion with centrally located cestodes noticed in centri lobular region of liver. Parasitic cyst [yellow arrow] surrounded by dense granulation tissue compress to the adjacent hepatocytes [Red arrow]. Also few placed granulation tissue surrounding the fatty tissue compress the adjacent hepatocytes [green arrow]. H&E

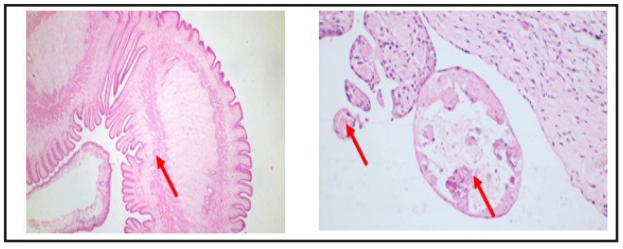

Fig 4. Different stages / cycles of parasites [Cestodes – Taenia] were noticed in the cysts located in the liver.

Moudgil *et al.* (2014) they encountered infiltration of mononuclear cells in rat liver. In Sharma *et al.* (2017) histopathology of liver showed less lesions in the liver except in and around the cyst. As we have also encountered hepatocytes in liver which correlates with the results of Thangapandiyan *et al.*, (2017). Sometimes, this type of abnormal growth will be confused with liver tumor in laboratory animals. Animals infected by *Taenia taeniaeformis*, could be treated effectively by a single dose of praziquantel.

Conclusion

The study at Mass Biotech Chengalpet identified a *Taenia taeniaeformis* infestation in rats, which was characterized by a cystic liver and a tapeworm. Histopathology indicated the presence of *Cysticercus fasciolaris*, which caused significant liver damage. This unusual infection emphasizes the importance of increased biosecurity and regular health checks in preventing and treating parasite infections efficiently.

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