VPH-PP-06

Alveolar Echinococcosis in fattening pigs – Importance of official meat inspection for diagnosis

R. Igelbrink[1], T. Frey[1], I. Schwabe[2], M. Prot[3], F. Reimus[4], R. Oehme[5], F. Löwenstein[6]

[1] Pig Health Service Baden-Württemberg, Fellbach, Germany
[2] Chemical and Veterinary Analysis Agency Stuttgart, Fellbach, Germany
[3] Veterinary Inspection Office Rastatt, Germany
[4] Tierärzteteam Tiefenbach GmbH, Crailsheim, Germany
[5] State Health Departement of Baden-Württemberg, Stuttgart Germany
[6] State Institution for Swine Breeding of Baden-Württemberg, Seehöfer Straße 50, 97944 Boxberg-Windischbuch, Germany

Introduction

Echinococcosis is a worldwide parasitic zoonosis. Causative agents are Cestoda (Tapeworms) of genus Echinococcus. In Germany, Echinococcus (E.) multilocularis is mainly found as the pathogen causing alveolar Echinococcosis in humans. Final hosts like foxes, domestic dogs and cats are the main risk for infections of humans. Pigs can also become infected as accidental host. In 2022 in a recent case in Southern Germany, up to 100 % of the livers of different slaughter groups from one herd were condemned due to parasitic lesions (milk spots) (Fig. 1) over a six months period. Intensified antiparasitic metaphylaxis with fenbendazole of the fatteners had no effects on the incidence of parasitic lesions during slaughter. Further investigations were carried out at slaughter and on the farm to determine the cause of the liver lesions.

Fig. 1: Liver of swine with typical lesions of *Ascaris suum*. The milk spots are caused by interstitial parasitic inflammation of the liver tissue. In comparison to persistent lesions of tapeworms, the milk spots are only visible for 3 – 6 weeks.

Material and Methods

From two slaughter groups 6 livers were pathological examined. For epidemiological and parasitical examination, fecal-samples were collected from semi-feral domestic cats near the feed mixer and in the corridor of the barn (Fig. 2).

Results

Pathologically oligofocal fibrotic inflammation were observed in the livers (Fig. 3 – 5). Histopathologically, chronic granulomatous hepatitis with massive involvement of eosinophilic granulocytes and central parasitic structures of a helminth could be detected (Fig. 6 – 7). Examination of the liver lesions by PCR revealed evidence of E. multilocularis. In fecal-samples of cats, parasitologically cestode eggs were detected. Genome fragments of E. multilocularis could not be amplified by PCR. Mycobacterium spp., Ascaris suum and other possible pathogens could not be detected by PCR and bacteriological examination.

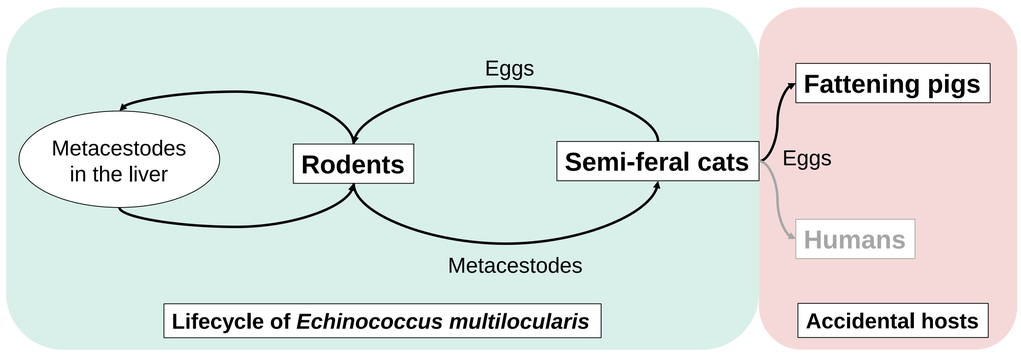

Fig. 2: Case-specific epidemiological entry of *Echinococcus (E.) multilocularis* in the herd. Semi-feral cats become infected with metacestodes through rodents. *E. multilocularis* develops to the adult stage. Eggs are excreted into the environment in feces. Rodents and pigs become infected orally. In rodents (intermediate hosts), the eggs develop into metacestodes in the liver. Pigs and humans are accidental hosts and the lifecycle of *E. mulitlocularis* stops. In the present case, no infections in humans could be observed.

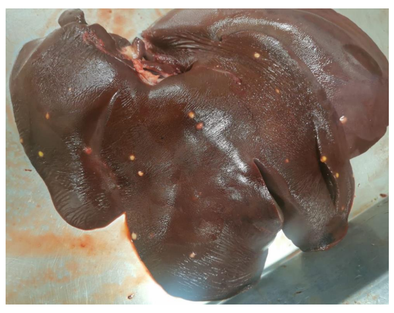

Fig. 3: Liver of a fattening pig with oligofocal fibrotic inflammation.

Fig. 4: Chambered foci of inflammation encapsulated in connective tissue.

Fig. 5: Incised inflammation with cheesy, ivory-coloured contents.

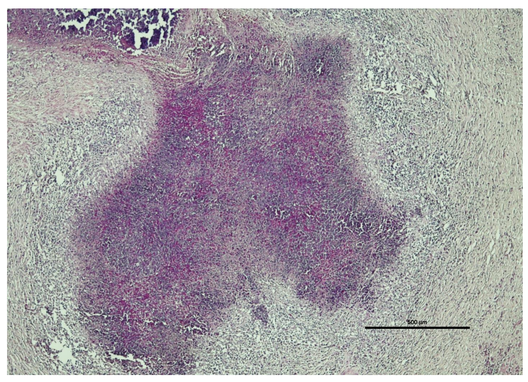

Fig. 6: Chronic active granulomatous inflammation with participation of eosinophilic granulocytes. H & E stain, Scale bar = 500 µm

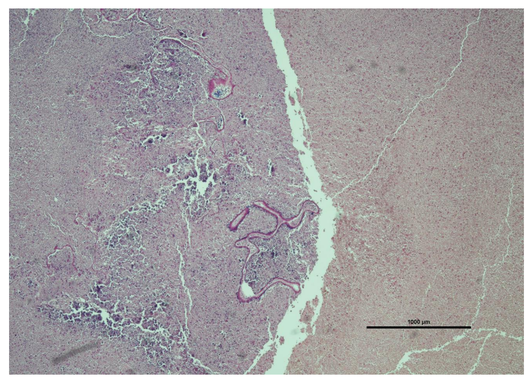

Fig. 7: Fragments of the laminar layer of *Echinococcus multilocularis* hydatids in the central detritus of a granuloma. H & E stain, Scale bar = 1000 µm

Discussion and Conclusion

The present case showed the importance of official meat inspection in diagnosing E. multilocularis infections in pigs. A diagnosis in the herd is not possible due to the absence of clinical symptoms in pigs. Serologically tests are not available. Subsequent epidemiological investigations can identify entry routes into the herd. In the present case, cats were the most likely entry route in the herd. In view of the long incubation period (up to 15 years) of alveolar echinococcosis in humans, early detection is essential. Based on the One Health concept, the detection of liver lesions typical of E. multilocularis during official meat inspection can contribute to human health in risk areas.

References

Igelbrink R, Frey T, Schwabe I, Prot M, Reimus F, Oehme R, Löwenstein F (2023): Alveolar echinococcosis in fattening pigs in a conventional housing system. Tierärztliche Praxis Ausgabe G Grosstiere Nutztiere 51: 391-398. DOI: 10.1055/a-2199-8963