

## Usefulness of light and electron microscopy for assessment of pathological changes in human alveococcosis

Chomicz L.<sup>1</sup>, Walski M.<sup>2</sup>, Młocicki D.<sup>1,3</sup>, Świdorski Z.<sup>3</sup>, Fiedor P.<sup>4</sup>

1. Department of Medical Biology, Medical University of Warsaw, Warsaw, Poland
2. Department of Cell Ultrastructure, Medical Research Centre, Polish Academy of Sciences, Warsaw, Poland
3. Institute of Parasitology, Polish Academy of Sciences, Warsaw, Poland
4. Department of General and Transplantation Surgery, Medical University of Warsaw, Warsaw, Poland

[lchomicz@ib.amwaw.edu.pl](mailto:lchomicz@ib.amwaw.edu.pl)

Keywords: microscopy, human liver alveococcosis

The sylvatic cycle of *Echinococcus multilocularis* (with foxes - definitive hosts, and rodents - intermediate hosts) is the predominant source of the infection for humans, that are accidental intermediate hosts (domestic dogs and cats may be involved in the synanthropic cycle). After oral infection with oncospheres, next larvae - metacestodes, usually without protoscolices develop, primarily almost in human liver.

A prolonged asymptomatic incubation period (10 years and more), subsequent chronic course, slow infiltrative growth of this larva result in diagnostic difficulties and poor prognosis: *E. multilocularis* may induce the serious human disease with high fatal rate. Since this infection may be mistakenly diagnosed as a liver cancer, thus, treated inadequately, recognition of alveococcosis should always base on several procedures.

The aim of this study was to analyze several cases of human alveococcosis from Poland (serologically identified, with hepatic lesions visualized by US and CT techniques) in which anti-parasitic chemotherapy and surgical treatment were included, with respect to assess usefulness of microscopy for evaluation of pathological changes in the infected liver.

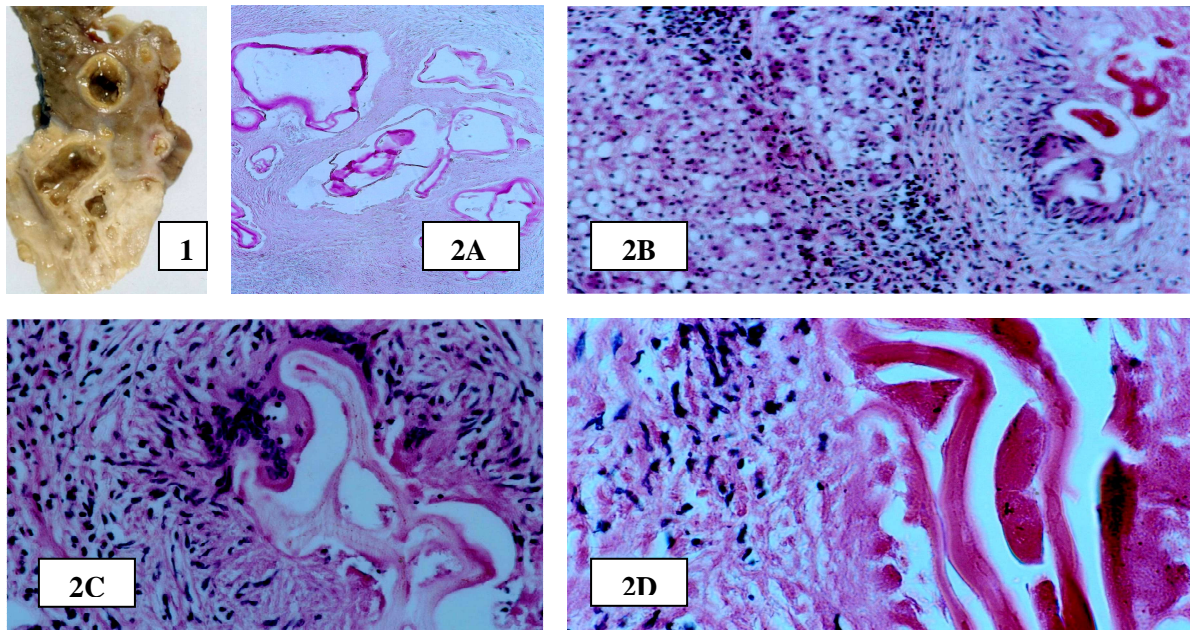
The liver samples that were taken during surgery were examined parasitologically, histopathologically (PAS) and by means of transmission electron microscope (TEM).

Pass-positive fragments of the laminated layer of *E. multilocularis* metacestode were revealed in the liver samples. In some hepatic regions directly adjacent to these larval fragments, signs of echinococcosis with granulomatous inflammations occurred.

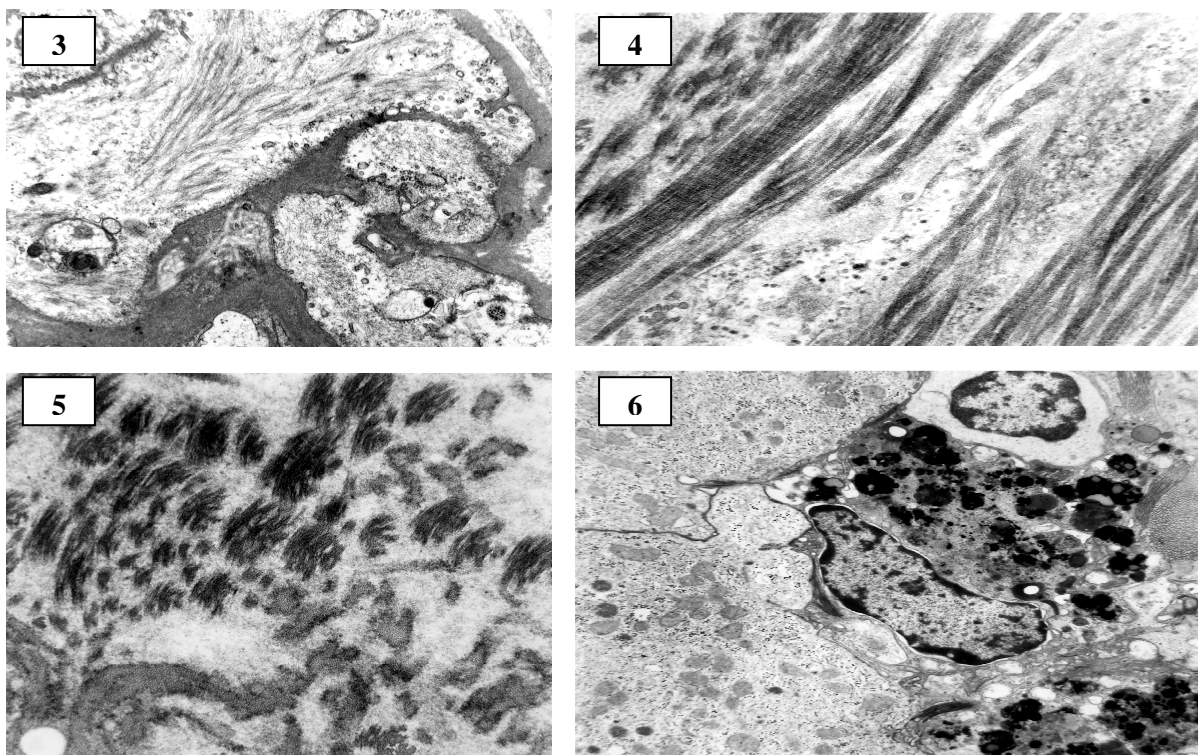
TEM examinations revealed extensive pathological changes in regions adjacent to laminated larval layers. Numerous macrophages with abundance of phagolysosomes and elongated processes were accumulated between hepatocytes. In liver sinusoids, the inflammatory process was expressed in accumulation of Kupffer cells. Evident signs of extensive hepatic fibrosis were visible in the perisinusoidal Disse spaces and within the cytoplasm of hepatocytes. However, collagen fibers with deteriorated structure were also revealed. Simultaneously, some evidences of liver regeneration occurred. The process of regeneration was expressed as frequent cell divisions and occurrence of great number of binucleated hepatocytes.

Our studies indicated, that microscopy techniques are usefulness for verification of diagnose and assessment of pathological changes in the liver infected with *E. multilocularis*.

1. Swiderski Z., Walski M. et al., Proc. Electr. Microsc. ICEM 15 (2002), pp.493-494
2. Chomicz L., Szubert A. et al., Transplant. Proc. 35 (2003), pp.2260-2261



**Figure 1.** Liver sample with parasitic lesions. **Figures 2A - 2D.** Sections throughout infected liver samples - Schiff stained. Note Pass-positive fragments of *E. multilocularis* laminated layers and granulomatous inflammatory reactions (light microscope).



**Figures 3 - 6.** TEM micrographs showing details of pathological changes in regions adjacent to laminated layers of *E. multilocularis* larvae. **Figure 3.** Collagen fibers near liver sinusoids. **Figure 4.** Liver fibrosis - perisinusoidal space; note deformation of collagen fibers. **Figure 5.** Accumulation of deteriorated collagen fibers near the branches of larval laminated layers. **Figure 6.** Macrophage with numerous phagolysosomes near two hepatocytes with altered cytoplasm ultrastructure.