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Is radiation an effective therapy in echinococcus multilocularis?

Alveolar echinococcosis (AE) is caused by metacestodes of *Echinococcus multilocularis* (EM). In general it is confined to the liver, but metacestodes may also spread to lung and brain. Infections are usually treated with surgery and antihelminthic drugs (benzimidazole derivatives). Due to inaccessible locations, relapse, or medically unfit patients, surgery may be unsuitable. Therefore, alternative local therapies are needed.

In this Journal, Ulger et al. [1] presented a remarkable case of radiation therapy for AE. The authors successfully treated a biopsy proven, localized infection of the sternum. A dose of 25 Gy in 10 daily fractions with concomitant albendazole therapy was administered. Noteworthy, 1 year later pain had disappeared and local disease was stable (presumably in the CT scans). Biopsy was not taken.

To our knowledge, there is only one similar case report describing stereotactic radiosurgery of a brain lesion of EM [2]. As the authors stated, 3 years after treatment the lesion was significantly decreased in size in the MRI scans. Again, no biopsy was taken.

Considering the highly variable course of EM infection, we have to scrutinize whether these impressive results truly reflect a proof of efficacy of radiotherapy in this disease.

In the most comprehensive preclinical study on radiotherapy in EM using an animal model with rodents, no significant damage to EM metacestodes was observed [3]. Even after single doses of 50–100 Gy, or fractionated irradiation with 5 fractions of 10 Gy, no changes of the metacestodes were observed on microscopy. Viability was assessed by protein expression in the vesicle fluid. How-

ever, protein expression was not markedly altered. Moreover, *Echinococcus multilocularis* alkaline phosphatase (EmAP), an intracellular enzyme typically released after treatment with antihelminthic drugs, did not change. Merely distinct morphological and ultrastructural alterations of metacestodes were detected 10 days following treatment. The significance of these findings for EM viability remains to be determined. In fact, preliminary results of re-infection with of irradiated metacestodes did not suggest reduced viability or infectiousness [4]

In the absence of reliable preclinical data, case reports on clinically successful treatments must be viewed with caution. At this stage, we do not agree that “Gamma knife radiosurgery should be considered as an alternative for patients with inoperable cerebral” EM lesions [2]. Alternatively, we encourage that “RT is not well known in this setting. It is the authors’ hope that [...] RT will be borne in mind in cases of resistant and inoperable hydatid disease” [1]. In this regard, more preclinical studies are warranted before ionizing radiation should be used in AE.

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Compliance with ethical guidelines

Conflict of interest. S. Gripp, R. Ernst, and S. Pohle state that there are no conflicts of interest.

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