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Letter to the Editor

Reply to "Neurocysticercosis: unwinding the radiological conundrum" by Goddu Govindappa SK *et al.*

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Dear Editor,

I read with interest the excellent article describing the distinct imaging characteristics of parenchymal neurocysticercosis (NCC) lesions by Goddu Govindappa SK *et al.* [1] and appreciate their attempt to propose magnetic resonance imaging (MRI) criteria for distinguishing NCC from tuberculomas. I would like to add certain morphological signs and the additional role of metabolic and physiologic MRI in characterising NCC lesions. These imaging findings can help further in differentiating NCC from tuberculomas. Multiple NCCs in vesicular stage throughout the brain parenchyma is called "Swiss cheese appearance" due to its similar appearance [2]. It is important to note that scolex in the vesicular stage could also be hyperintense on T1-weighted images, and that scolex may be better seen on proton density weighted images also [3]. The presence of a mineralised paramagnetic scolex within a diamagnetic calcified lesion on susceptibility weighted imaging (SWI) is considered pathognomonic of NCC and helps differentiate it from other granulomatous lesions [3]. Magnetic resonance spectroscopy (MRS) adds specificity and helps in confident diagnosis of NCC. NCCs show elevated lactate, amino acids (alanine and threonine), pyruvate, acetate, and choline and decreased levels of *N*-acetylaspartate (NAA) and creatine. Alanine peaks (at 1.3 and 1.4 ppm, inverting at 144 ms), threonine peaks at 1.33 ppm and 3.6 ppm, and pyruvate and succinate at 2.4 ppm are seen in NCCs [3,4]. Contrastingly, tuberculomas show large lipid and choline peaks and decreased levels of NAA and creatine with most tuberculomas showing choline/creatine ratio > 1.2 [4]. Unfortunately, MRS findings of colloidal vesicular stage NCC are indistinguishable from tuberculomas [3]. A prominent singlet at 2.4 ppm consistent with succinate is considered as a putative marker of parasitic cysts. The presence of succinate alone or higher succinate than acetate levels in an intracranial ring lesion helps differentiate NCC from abscess [5]. Higher mean diffusivity, lower fractional anisotropy, and higher apparent diffusion coefficient (ADC) values are seen in NCC compared to tuberculomas on diffusion imaging, due to their lower cellularity, protein content, and viscosity [5]. NCCs also demonstrate lower perfusion and cerebral blood volume (rCBV) than tuberculomas on MR perfusion imaging due to lack of neovascularity [5]. Walls of tuberculomas showed higher mean rCBV values than NCC (3.3 and 1.3, respectively) with the core of the lesions showing lower rCBV values in both lesions (in comparison with normal white matter). A cutoff value of 1.965 for rCBV from the wall of the lesion for tuberculoma showed 90% sensitivity and 100% specificity [6]. Thus, all the above findings could further help in differentiating NCCs from tuberculomas.

Disclosures

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4. Conflicts of interest: None.

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