SUMMARY

Background: The aim of this study was to describe the morphological signs of the central nervous system lymphoma (CNSL) in magnetic resonance imaging (MRI). We compared morphological characteristics of primary CNSL (PCNSL) and secondary CNSL (SCNSL) and also of PCNSL and glioblastoma (GBM).

Methods: We included 64 patients with PCNSL (ten of them were immunocompromised), 21 patients with SCNSL and 54 patients with GBM. The diagnosis was confirmed histologically in all patients. We evaluated morphological signs on the first MRI examination. Additionally, in patients with PCNSL, we evaluated the development of the disease on follow-up examination before histological confirmation of the diagnosis, if available.

Results: In most patients with PCNSL (62.5%) the tumor was localized supratentorially and presented as multiple lesions (53.1%) or as a diffuse infiltrative lesion (23.4%). In 87.5% of the patients the lesions reached the brain surface. Infiltration of ependyma was seen in 56.3%, infiltration of meninges in 39.1% and infiltration of cranial nerves in 48.5% of patients. Restriction of diffusion in some part of the tumor was apparent in nearly all patients (97.6%) with PCNSL. After administration of contrast media, marked enhancement was usually seen. In immunocompetent patients, homogenous enhancement was typical (in 64.8%). In immunocompromised patients we found significantly less often homogenous enhancement (only in 40%). In more than a half of the patients, also a non-enhancing portion of the tumor was evident. In the course of time, CNSL can change variably, regression of the lesions is typical after administration of corticosteroids, but regression or migration of the lesion can happen spontaneously, too. Conversely, despite administration of corticosteroids, progression can be seen. The only significant difference between PCNSL and SCNSL was found on DWI; in patients with SCNSL restricted diffusion was seen in only 77.8%. Contrary to PCNSL, GBM mostly appeared as a supratentorially localized solitary infiltrative tumor, mostly non-homogenously enhancing with signs of necrosis.

Conclusion: Despite some typical signs, the appearance of the CNSL can be variable on MRI, can change markedly in the course of the time and can be affected by corticosteroids. We found no significant difference between the morphological appearance of the PCNSL and SCNSL. CNSL and GBM are distinguishable by some characteristic signs on MRI, which can direct the patient to a right diagnosis and to an appropriate treatment.

Key words: lymphoma, glioblastoma, MRI, CNS