

# **MR perfusion in and around the contrast-enhancement of primary CNS lymphomas**

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**J Neurooncol. 2013 Aug;114(1):127-34. Epub 2013 May 22.**



**Purpose:**

Diffuse cerebral infiltration of primary brain tumors may be missed on conventional MRI. In glioblastomas it may be visible on MR-perfusion images as an elevated rCBV adjacent to the contrast enhancing area (penumbra). We aimed to evaluate whether penumbral rCBV of primary central nervous system lymphomas (PCNSL) is also increased and if PCNSL perfusion has different features than that of glioblastomas.

**Methods:**

We measured dynamic susceptibility contrast MR-perfusion at 3 Tesla in 38 presurgical patients with histopathological diagnosis of PCNSL (n=19) and glioblastoma (n=19). We compared normalized rCBV within and adjacent to the enhancing area and evaluated time-signal intensity curves (TSIC) in all patients. Histopathological comparison of patients representing with different TSIC patterns (with or without shoulder-like increase) was performed.

**Results:**

Relative to the normal tissue, rCBV within and adjacent to the enhancing area was increased ( $p < 0.05$ ) in both glioblastomas and PCNSL. In the penumbra the increase was moderate in both groups, with  $1.4 \pm 0.46$  in PCNSL and  $1.82 \pm 0.82$  in glioblastomas ( $p = 0.07$  between groups). In the enhancing tumor the increase was moderate in PCNSL ( $1.46 \pm 0.62$ ) and marked in glioblastomas ( $4.13 \pm 2.44$ ) ( $p < 0.001$  between groups). A shoulder-like TSIC increase was exclusively found in PCNSL (11/19) and was significantly associated with a less prominent reticulin fibre network compared to the PCNSL without a shoulder-like TSIC increase.