

# Intracranial germ cell tumor magnetic resonance imaging

General imaging features include

T1: isointense to grey matter

T2: isointense to grey matter

T1 C+ vivid contrast enhancement

germinomas tend to be homogeneous

**DWI**: restriction is common especially for germinomas due to high cellularity

**ADC** values are higher than found in [pineoblastoma](#)

**SWI**: hemorrhage is common in non-germinomatous germ cell tumors <sup>1)</sup>

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The role of T2\*-based MR imaging in intracranial germ cell tumors (GCTs) has not been fully elucidated. The aim of a study was to evaluate the susceptibility-weighted imaging (SWI) or T2\* gradient echo (GRE) features of germinomas and [nongerminomatous germ cell tumors](#) (NGGCTs) in midline and off-midline locations.

Morana et al. retrospectively evaluated all consecutive pediatric patients referred to our institution between 2005 and 2016, for newly diagnosed, treatment-naïve intracranial GCT, who underwent MRI, including T2\*-based MR imaging (T2\* GRE sequences or SWI). Standard pre- and post-contrast T1- and T2-weighted imaging characteristics along with T2\*-based MR imaging features of all lesions were evaluated. Diagnosis was performed in accordance with the SIOP CNS GCT protocol criteria.

Twenty-four subjects met the inclusion criteria (17 males and 7 females). There were 17 patients with germinomas, including 5 basal ganglia primaries, and 7 patients with secreting NGGCT. All off-midline germinomas presented with SWI or GRE [Hypointensity](#); among midline GCT, all NGGCTs showed SWI or GRE [Hypointensity](#) whereas all but one pure germinoma were isointense or hyperintense to normal parenchyma. A significant difference emerged on T2\*-based MR imaging among midline germinomas, NGGCTs, and off-midline germinomas ( $p < 0.001$ ).

Assessment of the SWI or GRE characteristics of intracranial GCT may potentially assist in differentiating pure germinomas from NGGCT and in the characterization of basal ganglia involvement. T2\*-based MR imaging is recommended in case of suspected intracranial GCT <sup>2)</sup>.

<sup>1)</sup>

Borja MJ, Plaza MJ, Altman N, Saigal G. Conventional and advanced MRI features of pediatric intracranial tumors: supratentorial tumors. *AJR Am J Roentgenol*. 2013 May;200(5):W483-503. doi: 10.2214/AJR.12.9724. Review. PubMed PMID: 23617516.

<sup>2)</sup>

Morana G, Alves CA, Tortora D, Finlay JL, Severino M, Nozza P, Ravegnani M, Pavanello M, Milanaccio C, Maghnie M, Rossi A, Garrè ML. T2\*-based MR imaging (gradient echo or susceptibility-weighted

imaging) in midline and off-midline intracranial germ cell tumors: a pilot study. *Neuroradiology*. 2017 Nov 11. doi: 10.1007/s00234-017-1947-3. [Epub ahead of print] PubMed PMID: 29128947.

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