

Magnetic resonance imaging for pituitary neuroendocrine tumor diagnosis

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[Magnetic resonance imaging](#) is the most useful [imaging technique](#) in the [pituitary neuroendocrine tumor diagnosis](#). The popular [Magnetic resonance imaging sequences](#) are [spin-echo](#) (SE) non-contrast T1-weighted [sagittal](#) and [coronal plane](#) sections, [fast spin echo T2 weighted image](#) in [coronal plane](#) sections, and contrast-enhanced T1-weighted coronal plane sections. For simple [screening examinations](#), only non-contrast MRI is performed and contrast-enhanced MRI may not be performed. [Axial](#) T2-weighted or [fluid-attenuated inversion recovery](#) imaging of the whole brain is also recommended to exclude [incidental](#) or concurrent brain lesions.

MRI of the pituitary gland requires some ingenuity because of its small size, its proximity to bone and sinusoidal air, and the proximity of the internal carotid artery. To obtain images with high spatial resolution, slice thickness should be ≤ 3 mm, and the fine matrix (256×256 or more) setting with a small field of view (≤ 20 cm) should be used ¹⁾

The basic requirements and elements should be covered by magnetic resonance imaging ²⁾

Kurosaki reported the clinical experience with MRI for pituitary neuroendocrine tumors (PitNETs) with reference to histopathological findings through a review of the literature. A previous study indicated that the three dimensional-spoiled gradient echo (3D-SPGR) sequence is suitable for evaluating sellar lesions on a postcontrast T1 weighted image (T1WI). This image demonstrates a defined relationship between the tumor and its surroundings, such as the normal pituitary gland, cavernous sinus, and optic pathway. This 3D-SPGR sequence is also suitable for detecting microtumors in corticotroph PitNETs. In somatotroph PitNETs, the signal intensity on T2WI is important to differentiate densely granulated tumors from sparsely granulated somatotroph tumors. In lactotroph PitNETs, distinct hypointense areas in the early phase on T2WI, possibly due to diffuse hemorrhage, indicate pronounced regression of invasive [macroprolactinomas](#) during [cabergoline](#) therapy ³⁾

Because the WHO classification made an important and significant change in the fundamental concept of the disease, the imaging diagnosis (magnetic resonance imaging, computed tomography, and positron emission tomography) of PitNET/pituitary adenoma in detail, considering these revisions as per the latest version of the WHO classification ⁴⁾

It is commonly used in the evaluation of [pituitary neuroendocrine tumors](#) (PAs). However, it has difficulty to locate the lesions sometimes, especially [microadenomas](#) and/or postoperative recurrent tumors. On the MRI they can present various enhancement patterns and other imaging features. About 18% of macroadenomas contain cystic components, and about 20% show foci of hemorrhage, which are usually clinically asymptomatic and diagnosed incidentally in MR imaging.

Results did not show usefulness of the [Diffusion-weighted magnetic resonance imaging](#) and [T1-weighted images](#) for assessing the [consistency](#) of [pituitary macroadenomas](#), nor as a [predictor](#) of the degree of surgical [resection](#) ⁵⁾

[Pituitary microadenoma Magnetic resonance imaging](#)

[Pituitary macroadenoma Magnetic resonance imaging](#)

1)

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