Pituitary

see Pituitary gland, or hypophysis.

see Pituitary abscess

see Pituitary neuroendocrine tumor

see Pituitary apoplexy

see Pituitary tumor

Imaging

A study aimed to evaluate the efficacy of a combined wavelet and deep-learning reconstruction (DLR) method for under-sampled pituitary MRI.

Methods: This retrospective study included 28 consecutive patients who underwent under-sampled pituitary T2-weighted images (T2 weighted image). Images were reconstructed using either the conventional wavelet denoising method (wavelet method) or the wavelet and DLR methods combined (hybrid DLR method) at five denoising levels. The signal-to-noise ratio (SNR) of the CSF, hypothalamic, and pituitary images and the contrast between structures were compared between the two image types. Noise quality, contrast, sharpness, artifacts, and overall image quality were evaluated by two board-certified radiologists. The quantitative and the qualitative analyses were performed with robust two-way repeated analyses of variance.

Results: Using the hybrid DLR method, the SNR of the CSF progressively increased as denoising levels increased. By contrast, with the wavelet method, the SNR of the CSF, hypothalamus, and pituitary did not increase at higher denoising levels. There was a significant main effect of denoising methods ($p < 0.001$) and denoising levels ($p < 0.001$), and an interaction between denoising methods and denoising levels ($p < 0.001$). For all five qualitative scores, there was a significant main effect of denoising methods ($p < 0.001$) and interaction between denoising methods and denoising levels ($p < 0.001$).

Conclusions: The hybrid DLR method can provide higher image quality for T2 weighted image of the pituitary with compressed sensing (CS) than the wavelet method alone, especially at higher denoising levels [1].

1)
Uetani H, Nakaura T, Kitajima M, Morita K, Haraoka K, Shinojima N, Tateishi M, Inoue T, Sasao A, Mukasa A, Azuma M, Ikeda O, Yamashita Y, Hirai T. Hybrid deep-learning-based denoising method for compressed sensing in pituitary MRI: comparison with the conventional wavelet-based denoising method. Eur Radiol. 2022 Feb 15. doi: 10.1007/s00330-022-08552-6. Epub ahead of print. PMID: 35169896.