## Sphenoid sinus mucosal thickening

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In pituitary apoplexy etiology, there are reports on the appearance of sphenoid sinus mucosal thickening (SSMT)  $^{1)}$   $^{2)}$ .

SSMT is otherwise uncommon with an incidence of up to 7% in asymptomatic individuals. The etiology of SSMT in pituitary apoplexy is unclear and may reflect inflammatory and/or infective changes <sup>4)</sup>.

The mechanism of thickening of the para sellar dura mater and sphenoid sinus mucosa have been considered to be caused by congestion of dural blood flow because of increased cavernous and circular sinus pressure due to a sudden increase in intrasellar pressure.

A study revealed that age, tumor size, and thickened sphenoid sinus mucosa were strongly related to the occurrence of internal carotid artery stenosis in pituitary apoplexy. Among these factors, age had the potential of being an independent predictor of the condition <sup>5)</sup>.

Two magnetic resonance imaging (MRI) signs of pituitary apoplexy are the "pituitary ring sign" and "sphenoid sinus mucosal thickening". The occurrence of both these MRI signs together in patients with ischaemic pituitary apoplexy was investigated. A literature review searching the terms "pituitary ring sign" and "sphenoid sinus mucosal thickening" in the context of pituitary apoplexy from 1990 until the present was performed. To be included in the study, each case had to have ischaemic pituitary apoplexy defined as the acute expansion of a pituitary neuroendocrine tumor or, less commonly, in a non-adenomatous gland, from infarction without hemorrhage or very little hemorrhage and a T1-weighted MRI of the brain with contrast that displayed both "sphenoid sinus mucosal thickening" and a "pituitary ring sign" either on an actual study (the author's cases) or in a figure in an article from the literature that could be reviewed and clearly illustrate these two signs. Twelve cases of ischaemic pituitary apoplexy were found, all with MRI images that showed both of these signs. Ten cases from the literature (3 of which were published by this author) plus an additional 2 recently evaluated in our hospital, totaled the 12 cases. Thus, 5 of the total 12 cases were evaluated by this author. Of these 12 patients, both headache and visual loss were present in 5 patients, headache alone was indicated in 5 patients (10 of the 12 presented with headache), and no initial symptoms identified in 2 patients (incidentally found Non-Functioning Pituitary Neuroendocrine Tumors on MRI). These findings indicate that each sign ("pituitary ring sign" and "sphenoid sinus mucosal thickening") may exist alone with or without pituitary apoplexy, yet both signs together in

the appropriate clinical context is a strong predictor of pituitary apoplexy <sup>6)</sup>.

Arita et al. treated two patients with pituitary apoplexy in whom magnetic resonance (MR) images were obtained before and after the episode. Two days after the apoplectic episodes, MR imaging demonstrated marked thickening of the mucosa of the sphenoid sinus that was absent in the previous studies. The relevance of this change in the sphenoid sinus was investigated. Retrospective evaluations were performed using MR images obtained in 14 consecutive patients with classic pituitary apoplexy characterized by acute onset of severe headache. The mucosa of the sphenoid sinus had thickened predominantly in the compartment just beneath the sella turcica, in nine of 11 patients, as ascertained on MR images obtained within 7 days after the onset of apoplectic symptoms. This condition improved spontaneously in all four patients who did not undergo transsphenoidal surgery. The sphenoid sinus mucosa appeared to be normal on MR images obtained from three patients at the chronic stage (> 3 months after onset). The incidence of sphenoid sinus mucosal thickening during the acute stage was significantly higher in the patients with apoplexy than that in the 100 patients without apoplexy. A histological study conducted in four patients who underwent transsphenoidal surgery during the early stage showed that the subepithelial layer of the sphenoid sinus mucous membrane was obviously swollen. The sphenoid sinus mucosa thickens during the acute stage of pituitary apoplexy. This thickening neither indicates infectious sinusitis nor rules out the choice of the transsphenoidal route for surgery  $^{7}$ .

## References

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