Nasal Cavity Lesions Associated with the Infundibular Widening on CT: Differentiation with MR FSE T2 Weighted Images

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Introduction
There are several nasal cavity lesions that show total opacification of maxillary sinus and nasal cavity masses associated with infundibular widening on CT. Some lesions are arisen from the maxillary sinus and extended into the nasal cavity, others are arisen from the nasal cavity and extended into the maxillary sinus associated with inflammatory disease by obstructed sinus. Theses lesions all look similar on CT even if the contrast enhanced scan can be helpful for differential diagnosis. Nevertheless, there are limitations of evaluation of these lesions on contrast enhanced CT scan because of its lower soft-tissue resolution and metal artifact from tooth amalgam. In this respect, the purpose of this study is to evaluate MR imaging findings for differential diagnosis of these nasal cavity lesions, which are associated with infundibular widening on CT.

Materials and Methods
We have retrospectively evaluated MR imaging findings of 55 cases of pathologically proved nasal cavity lesions which show total opacification of maxillary sinus and nasal opacification associated with infundibular widening on CT. These are 18 cases of prolapsed antral mucosa (PAM), 10 cases of the antrochoanal polyp (ACP), 10 cases of inverted papillomas (IP), 9 cases of aspergillosis, and 8 cases of nasal polyps with ipsilateral maxillary sinusitis. Cases of nasal polyps are only included when they arise near the infundibulum and show infundibular widening. MR imaging is done in all cases. MR imaging was performed on a 1.5-T Sigma MR scanner with head coil. Sagittal localizer (600/5/1 [TR/TE/excitation]), axial fast spin echo (FSE) T2 weighted images (T2WI) (3500/102/2), coronal T1 (600/12/2) and fast spin echo T2 weighted images, and Gd- DTPA enhanced axial and coronal images are obtained. We have analyzed MR imaging findings by focusing on the signal intensities of FSE T2 weighted images.

Results
CT Findings of these nasal cavity lesions are very similar. All case of these lesions show soft tissue masses which are filled in the entire maxillary sinus and nasal cavity masses associated with the erosion of the uncinate process and widened infundibulum. On MR imaging, these lesions can be distinguished as evaluating their signal intensities on FSE T2WI and patterns of Gd-enhancement. PAM shows the central mixed signal intensity with peripheral rim of hyperintensity. The ACP shows homogeneous bright signal intensity on FSE T2 WI. On Gd-enhanced T1WI, cases of PAM reveal thick peripheral rim enhancement along the sinus wall and nasal component. Cases of ACP show thinner peripheral rim enhancement along the polyg. Inverted papilloma show intermediate signal intensity blended with high signal intensity on FSE T2WI. All the cases of aspergillosis show central dark signal foci on FSE T2WI. The nasal polyps show stration of intermediate and high signal intensity confined to the nasal cavity associated with ipsilateral maxillary sinusitis. The polyps can be clearly separated from the sinus inflammatory disease on FSE T2 weighted image. (Fig 1-5).

Discussion
The PAM is a manifestation of the long-standing maxillary sinusitis. When the inflamed and swollen sinus mucosa becomes redundant and prolapsed into the nasal cavity through a widened sinus ostium, it can mimic the findings of the ACP on CT. In the cases of PAM, the central inhomogeneous mixed signal intensity on FSE T2 weighted image is correlated to different protein content of purulent material. The rim of hyperintensity on FSE T2WI reflects the inflamed mucosa. Pathologically, the antrochoanal polyp is liable to pseudocyst degeneration and contains a large amount of serous fluid. This explains that they are homogeneous bright signal intensity on FSE T2WI. There is no signature pattern of MR signal intensity characteristics suggestive of specific diagnosis of inverted papilloma. However, they show inhomogeneous intermediate signal intensity mixed with high signal intensity, suggesting tumors conditions rather than inflammatory condition on FSE T2WI. In fungal infection, very low signal intensity on FSE T2WI is due to the presence of ferromagnetic elements within fungal concretion. In the cases of nasal polyp, high signal striations represent either mucoid secretion within the background matrix or inflamed mucosa of the polyp.

In conclusion, MR imaging can help distinguish the nasal cavity lesions which show infundibular widening and cannot be differentiated on CT by means of evaluation of their signal intensity on FSE T2 weighted image.

References
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