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CT and MR imaging findings of sinonasal angiomatous polyps

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ABSTRACT

Objective: To characterize the CT and MR imaging findings of patients with sinonasal angiomatous polyps (SAPs) and evaluate their respective clinical value in the diagnosis of SAP.
Methods: CT and MR imaging findings of 15 patients with pathologically proven SAP were examined. Assessed image features included location, size, margin, attenuation, and change of the bony walls of the sinonasal cavity on CT, and signal intensity and enhancement pattern on MR.
Results: On CT, the SAP was mostly isoattenuated with patches of slight hyperattenuation. Most lesions caused changes in the adjacent bone, including expansile remodeling ($n=8$), defect or destruction ($n=7$), and hyperostosis ($n=6$). All lesions examined by MR showed heterogeneous isointense signal intensity on T1-weighted images and mixed obvious hyperintense and hypointense signal intensity with linear hypointense septum internally ($n=10$), and hypointense peripheral rim on T2-weighted images ($n=10$). Postcontrast MR images demonstrated areas of heterogeneous and marked enhancement with an unenhanced hypointense rim and septa ($n=7$).
Conclusions: CT and MR imaging have respective advantages in the diagnosis of SAP. Combined application of CT and MR examinations is necessary for patients with suspected SAP.

1. Introduction

Sinonasal angiomatous polyp (SAP) is a rare benign and non-neoplastic lesion. It is primarily composed of extensively hyperplastic and dilated vessels with scanty inflammatory infiltration and abundant extracellular fibrin [1,2]. Although inflammatory sinonasal polyp (SNP) is the most common non-neoplastic sinonasal mass examined pathologically, as a special subtype SAP only accounts for 4–5% of all SNPs [1].

Simple conservative surgical excision of SAP is curative, and postoperative recurrence is rare. Therefore, correct preoperative diagnosis of SAP is important lest patients undergo unnecessary extensive surgery [3]. SAP may show similar imaging features with sinonasal masses, such as other SNP, inverted papilloma, fungus ball, capillary hemangioma, juvenile angiofibroma and some possibly malignant tumors [2,4,5]. To the best of our knowledge, there have been only a few studies describing the imaging features of SAP [1–8]. The purpose of this study was to report the characteristic CT and MR imaging findings of SAP in the sinonasal cavity.

2. Materials and methods

2.1. Patients

The present study was approved by the institutional review board. Between July 2008 and February 2013, a total of 15 patients with pathologically proven SAP were retrospectively reviewed. The patients included five men and 10 women, age range from 12 to 81 years, with a mean age of 42.7 years. CT ($n=13$) and MR ($n=10$) images of these 15 patients were retrospectively reviewed.

Among these 15 cases, two patients had a history of craniofacial trauma 2 days and 2 years previously, respectively. Furthermore, one patient underwent endoscopic sinus surgery to excise a nasal polyp 20 years previously, and there had been massive bleeding from the ipsilateral nasal cavity 5 years previously without apparent cause. The duration of symptoms before diagnosis ranged from 20 days to 20 years (median, 12 months). All 15 patients underwent surgical excision of SAP by endoscopic sinus surgery.

2.2. Imaging techniques

Among the 15 patients, CT scanning was performed in 13 patients and MR imaging in 10 patients. Eight patients underwent

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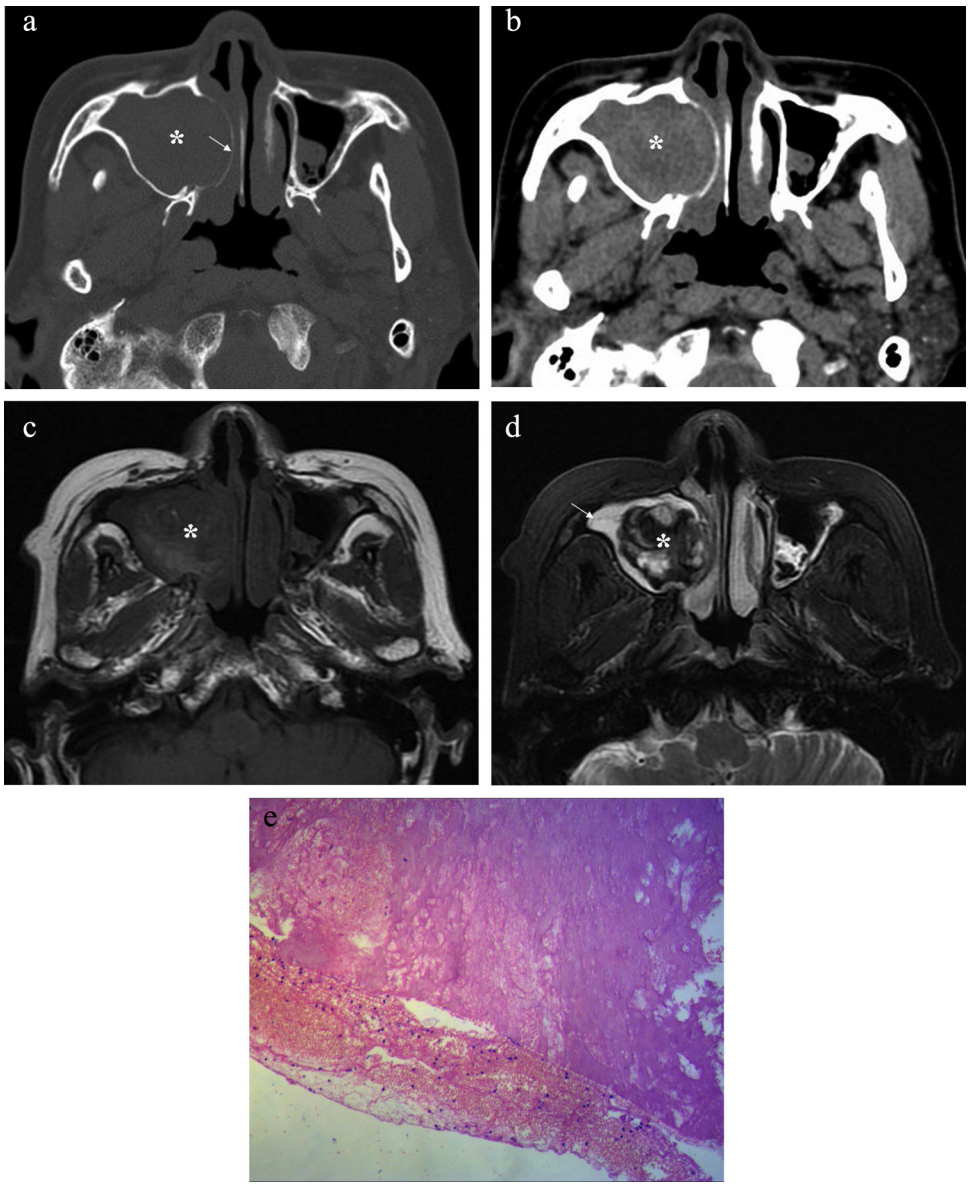

Fig. 1. Axial CT scan with a bone algorithm (a) shows an expansile mass (asterisk) centered in the right maxillary sinus. Expansile remodeling and thinning of the medial wall is observed (arrow). Axial CT scan with a soft tissue algorithm (b) shows a soft tissue mass (asterisk) isoattenuating to the masseter muscle with additional patches of slight hyperattenuation. Axial T1-weighted image (c) depicts heterogeneous isointense signal intensity with additional patches of interspersed hyperintensity and linear shadow of hypointensity on the mass (asterisk). Axial fat-suppressed T2-weighted image (d) demonstrates a well-defined lesion, which is markedly heterogeneous with linear hypointense septum internally and hypointense peripheral rim surrounding the lesion (asterisk). The bright signal intensity (arrow) due to obstructive sinusitis is demonstrated. Photomicrograph (e) shows that the lesion consists mostly of hemorrhage and necrosis, accompanied by extravasated fibrin and inflamed columnar epithelium (H&E, 100).

both CT and MR examinations. Seven patients underwent postcontrast T1-weighted imaging.

CT scans were obtained using a standard CT protocol for the paranasal sinuses. Thirteen patients underwent 2.5-mm-thick axial CT scanning with a bone algorithm and all images were reformatted with a soft tissue algorithm without the use of contrast media. In these patients, direct (n = 10) or reformatted (n = 3) coronal images were also obtained.

MR examinations were performed using a 1.5 T MR scanner (n = 5) (Signa Advantage Horizon; GE Medical Systems, Milwaukee, WI) or a 3.0 T MR scanner (n = 5) (Signa HDx; GE Medical Systems) with an 8-channel head coil. In these patients, precontrast T1-weighted spin-echo images (n = 10) and T2-weighted fast spin-echo images with fat saturation (n = 7) or short TI inversion recovery (n = 3) were obtained, followed by contrast-enhanced, T1-weighted spin-echo images with fat saturation after the intravenous injection of 0.1 mmol/kg of gadolinium dimeglumine in seven patients. Images were obtained in at least two planes with 3 mm section thickness and 1 mm intersection gap.

2.3. Imaging analysis

Two experienced head and neck radiologists retrospectively reviewed all the CT and MR images in consensus. The CT and MR imaging characteristics were analyzed with particular attention to the location, shape (expansile or nonexpansile), size, margin, attenuation on precontrast CT, changes of the bony walls of the sinonasal cavity on bone CT, signal intensity on precontrast MR, and enhancement pattern on contrast-enhanced MR. The attenuation or signal intensity of the lesion was compared with that of the masseter