

Malignant Lymphoma with the MRI Findings Mimicking Inflammatory Disease: A Case Report

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Magnetic resonance imaging (MRI) is a more useful diagnostic modality for detecting paranasal tumors compared with computed tomography (CT). We encountered a case of malignant lymphoma of the maxillary sinus. Although CT findings suggested malignancy, MRI findings indicated an inflammatory disease. The patient was a 51-year-old man with a chief complaint of right maxillary toothache. Edema in the right middle meatus and bloody rhinorrhea were observed. CT revealed right maxillary sinus shadow with partial bone loss, suggesting malignancy. However, MRI performed two weeks later showed an internal homogeneous lesion with neither contrast effect, nor invasion outside the maxillary sinus. The patient also had no fever, weight loss, or night sweats. Additionally, no palpable cervical lymphadenopathy was observed. Endoscopic sinus surgery was performed to confirm the diagnosis. Upon opening the maxillary sinus, highly viscous retention and a large amount of yellowish-white debris were observed. Allergic fungal rhinosinusitis was suspected. However, histopathological analysis of the debris established a diagnosis of malignant lymphoma. The debris exhibited pathological findings of necrosis. The patient remained in remission after undergoing radiochemotherapy. Malignant lymphomas of the paranasal sinuses, which have a minimal tendency for invasion but with considerable predominance of necrosis, may be diagnosed as an inflammatory disease, based on MRI findings. In cases in which a thorough physical examination could not rule out malignant lymphomas, an endoscopic biopsy should be immediately considered.

Keywords: malignant lymphoma, paranasal tumor, magnetic resonance imaging, computed tomography, apparent diffusion coefficient

INTRODUCTION

Since malignant lymphomas of the paranasal sinuses exhibit few symptoms during the early stages, imaging studies are beneficial for making diagnosis. Magnetic resonance imaging (MRI), which has a higher density resolution than that of computed tomography (CT), is useful for diagnosing paranasal tumors.

We encountered a case of malignant lymphoma of the maxillary sinus in which CT findings suggested malignancy but MRI findings suggested an inflammatory disease.

CASE REPORTS

A 51-year-old man visited our clinic with a chief complaint of right cheek pain. The right middle meatus was edematous and closed. Moreover, bloody rhinorrhea was observed (Fig. 1). The Papanicolaou classification of nasal cytology was class III (Cytology suggestive of, but not conclusive for, malignancy). CT revealed right maxillary sinus shadow with a partial bony defect, suggesting a malignant disease (Fig. 2a, b). However, MRI performed two weeks later revealed an internally homogeneous lesion without contrast

effect. It exhibited low signal intensity on T1- and T2-weighted imaging without invasion outside the maxillary sinus, consequently suggesting an inflammatory disease (Fig. 2c, d). The patient also had no fever, weight loss, or night sweats. Additionally, no palpable cervical lymphadenopathy was observed. Endoscopic right sinus surgery was performed under local anesthesia to improve the right buccal pain via decompression and confirm the diagnosis. The right maxillary sinus contained a highly viscous mucus reservoir and a large amount of yellowish-white debris. Allergic fungal rhinosinusitis was suspected (Fig. 3a, b). The histopathological diagnosis was diffuse large B-cell lymphoma, based on mucous accumulation and debris from the sinus and its mucosa (Fig. 3c, d). The patient underwent radiochemotherapy, attaining disease remission.

DISCUSSION

We report a case of malignant lymphoma of the paranasal sinuses. Due to its minimally invasive tendency outside the paranasal sinuses and predominance of necrosis, malignant lymphomas may be diagnosed as inflammatory diseases based on clinical and MRI findings.

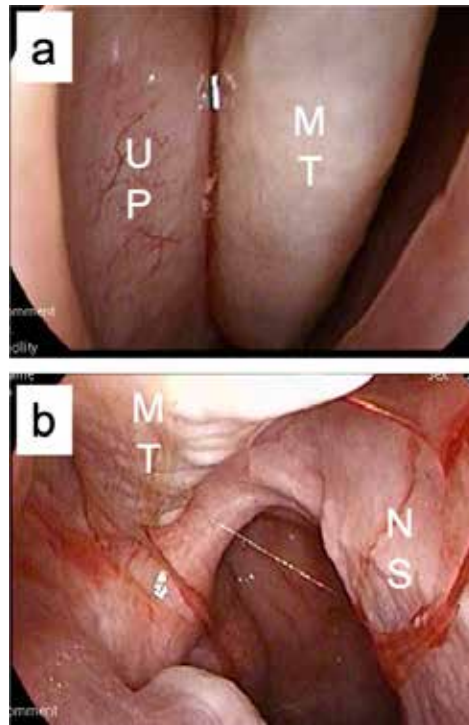


Fig. 1 Initial endoscopic examination reveals edematous obstruction of the right middle meatus, and bloody rhinorrhea.
UP, uncinus process; MT, middle turbinate;
IT, inferior turbinate; NS, nasal septum

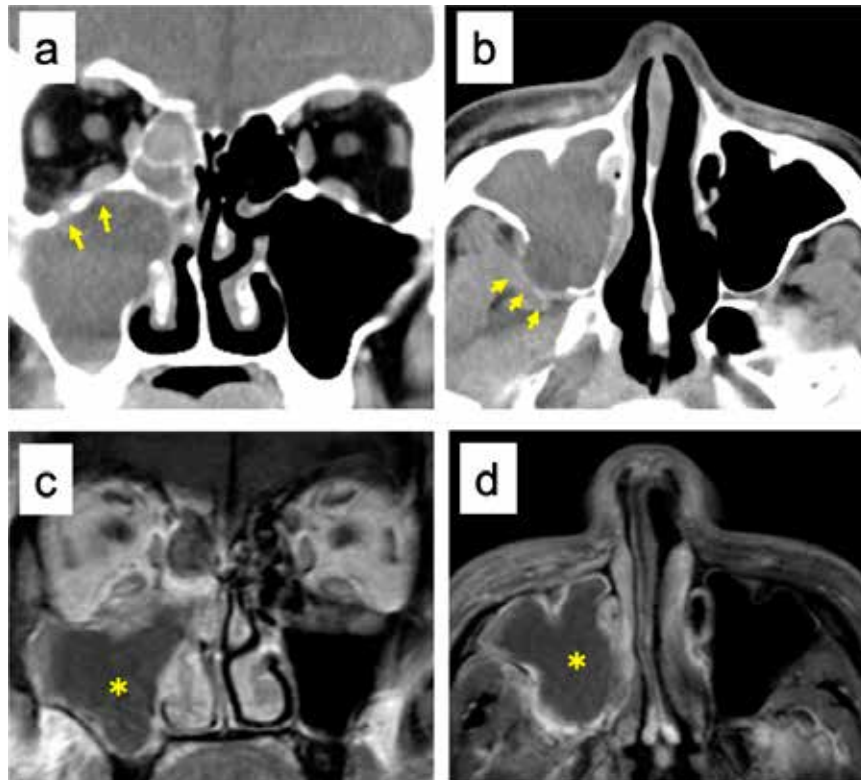


Fig. 2 Initial computed tomography reveals a right maxillary sinus shadow with moth-eaten pattern of bone destruction (a, b; yellow arrows).
Gadolinium-enhanced, T1-weighted magnetic resonance imaging reveals an internally homogeneous low lesion without contrast effect and no invasion outside the maxillary sinus, predominantly indicative of an inflammatory disease (c, d; *).

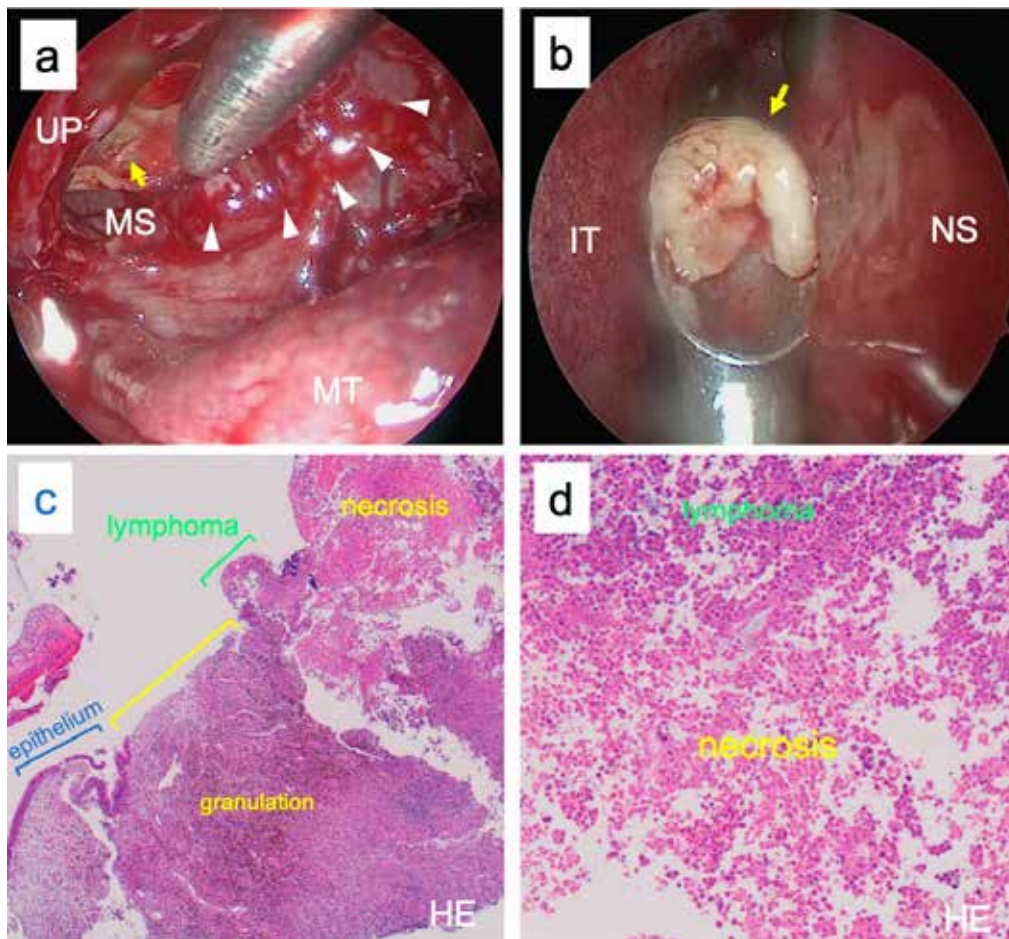


Fig. 3 a, b: Intraoperative findings

A large amount of yellowish-white debris is found in the right maxillary sinus (ab: yellow arrow), and part of the maxillary sinus mucosa exhibits pathological edema (a: white triangle).

c: Photomicrograph of the biopsy specimen of the maxillary sinus mucosa (a: white triangle, hematoxylin and eosin, $\times 2$)

Most tissue exhibits granulomatous changes and necrosis, with some atypically large lymphocytes.

d: Photomicrograph of the biopsy specimen of mucous accumulation and debris collected from the maxillary sinus (ab: yellow arrow, hematoxylin and eosin, $\times 10$)

The tissue is predominantly necrotic. Some of it contains large transformed lymphoid cells with vesicular nuclei and prominent nucleoli, suggestive of diffuse large B-cell lymphoma. MS, maxillary sinus; IT, inferior turbinate; NS, nasal septum; HE, hematoxylin and eosin.

MRI is beneficial for diagnosing nasal sinus tumors due to its higher-density resolution compared with that of CT [1, 2]. Moreover, imaging tests are useful for diagnosing early-stage malignant lymphomas of the paranasal sinuses that exhibit few symptoms. The CT features of malignant lymphoma include a geographic or moth-eaten pattern of bone destruction with permeative bone processes [3]. On MRI, malignant lymphoma exhibits internal homogeneity, low- to iso-intensity on T1-weighted imaging, iso- to high-intensity on T2-weighted imaging, and faint contrast [2, 4]. Additionally, low apparent diffusion coefficient (ADC) values on diffusion-weighted imaging are characteristic features of malignant lymphoma [3, 5]. In this case, CT revealed a moth-eaten pattern of bone destruction. Therefore, malignancy was suspected. However, MRI exhibited nonspecific findings of malignant lymphoma. Furthermore, the lesion was confined to the maxillary sinus without mass formation or contrast effect. Therefore, the patient was diagnosed with an inflammatory disease. A radiologist specializing in

head and neck regional imaging reinterpreted the MRI scans retrospectively but did not suspect neoplastic lesions. The lesion had a high ADC value ($1.4 \times 10^{-3} \text{ mm}^2/\text{s}$). The mucous reservoirs and debris collected intraoperatively from the maxillary sinus exhibited necrotic features on histopathology (Fig. 3c, d). Malignant lymphoma is typically characterized by diffuse tissue necrosis [6]. Since the maxillary sinus lesion was predominantly necrotic, the MRI findings were interpreted as manifestations of an inflammatory disease. Malignant lymphomas of the paranasal sinuses have minimal tendency for invasion outside the sinuses but show predominant necrosis. Therefore malignant lymphomas of the paranasal sinuses might be diagnosed as inflammatory diseases based on clinical and MRI findings.

MRI is generally useful for diagnosing malignant lymphomas of the paranasal sinuses. However, in cases of severe necrosis, utilizing MRI may result in diagnosing these lymphomas as inflammatory diseases. Therefore, the imaging results should be interpreted

carefully. An endoscopic biopsy should be considered during the early stages in cases where a malignant lymphoma cannot be definitively ruled out.

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DATA AVAILABILITY

Primary data about the patient were obtained from the electronic medical records of the Tokai University School of Medicine. Cited manuscripts were found on PubMed.

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None.

ETHICAL STATEMENT

The present study was approved by the Institutional Review Board for Clinical Research of the Tokai University School of Medicine (21R-269). The study was carried out in accordance with the Code of Ethics of the World Medical Association (Helsinki

Declaration). The institutional review board takes responsibility for the anonymization of the patient and the informed consent has been waived.

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