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內文：

Objective. The purpose of this study was to evaluate the diagnostic value of magnetic resonance imaging (MRI), especially dynamic contrast-enhanced magnetic resonance imaging (DCE-MRI), in extranodal non-Hodgkin lymphoma (NHL) of oral and maxillofacial regions.

Study design. Thirteen cases with extranodal NHL were examined using MRI. T1-weighted images (T1WI) and T2-weighted images (T2WI) or short TI inversion recovery (STIR) images were obtained in all cases. Contrast-enhanced images and DCE-MRI were acquired in 10 and 7 cases, respectively. On DCE-MRIs, we analyzed the parameters as follows: contrast index at maximal contrast enhancement (C_{max}), maximum contrast index (CI) gain/C_{max} ratio, and washout ratios (WR300, WR600, and WR900) at 300, 600, and 900 seconds after contrast medium injection.

Results. The signal intensity of all lesions was hypointense to isointense on T1WIs and showed variable contrast enhancement patterns. On T2WIs and STIR images, the signal intensity was isointense to hyperintense in almost all cases. Analysis of DCE-MRI parameters in extranodal NHLs resulted in the identification of 4 types of CI curves according to C_{max} and WR: (1) C_{max} greater than 2.0 and WR900 greater than 40%, (2) C_{max} greater than 2.0 and WR900 less than 40%, (3) C_{max} less than 1.5 and WR900 greater than 40%, and (4) C_{max} less than 1.5 and WR900 greater than 40%.

Conclusions. The signal intensities on MRI were not specific to extranodal NHL and resembled those of other tumor types. When C_{max} was less than 1.5 or WR900 was less than 40%, these parameters contributed to diagnosis in extranodal NHLs.

Malignant lymphomas are divided into non-Hodgkin and Hodgkin groups, and approximately 40% of non-Hodgkin lymphomas (NHLs) arise at extranodal sites outside the lymphoid system.¹ The most common sites of extranodal NHL in the oral region are the palate and maxilla.²⁻⁷ The common clinical symptom is mass formation with or without ulceration, and the radiological sign of lesions involving the jawbone is diffuse bone resorption, similar to those of periodontal inflammation, osteomyelitis, and other malignant tumors.³⁻¹⁰ Some authors have reported the

existence of various magnetic resonance (MR) findings for extranodal NHL of the head and neck region and nonspecific signal characteristics.¹¹⁻¹⁵ It has been reported that the time versus signal intensity curve, which uses the parameters of dynamic contrast-enhanced magnetic resonance imaging (DCEMRI), is useful for diagnosis of some lesions.¹⁶⁻²⁹ Furthermore, using the calculated values from parameters of DCE-MRI, such as the contrast index (CI) curve, might make it possible to investigate the characteristics of lesions and contribute to diagnosis.^{15,30-37} We reported that the CI of malignant lymphomas (including nodal lymphomas in the head and neck region) have characteristic values and maximum CI values that are useful for distinguishing malignant lymphomas from oral squamous cell carcinomas.^{15,35} In the present study, we retrospectively evaluated magnetic resonance imaging (MRI) studies of extranodal NHL of oral and maxillofacial regions. Furthermore, we evaluated the diagnostic value of the parameters of CI curves on DCE-MRI.

MATERIAL AND METHODS

Patients

Twenty-six patients were histopathologically diagnosed with extranodal NHL in our hospital between April 1993 and December 2009. Of these patients, we evaluated the records of 13 who underwent MR examination with or without contrast medium enhancement in this retrospective study.

MRI study protocol

T1WI T2WI (different parameters). Patient images were taken in both the axial and coronal planes.

Evaluation of MR images

The MR images in 13 cases were retrospectively evaluated for tumor size and signal characteristics. Regarding the signal intensity (SI), the signal from the musculature was interpreted as isointense on T1WI, and the signal from the cerebrospinal fluid was interpreted as hyperintense on T2WI and STIR images. In 9 cases with CE-T1WI, we evaluated the degree of contrast medium enhancement as low to high.

Analysis of DCE-MRI parameters

RESULTS

MR findings (size and characteristics of SI)

The MR findings of all cases are summarized in Table I. The mean greatest dimension of the tumor was 34.2mm (range: 18-59 mm). On T1WIs, all cases had homogeneous or nearly homogeneous SIs that were hypointense or isointense (Figures 2, A, and 3, A). On T2WIs (n = 9) and STIR images (n = 4), almost all cases had nearly homogeneous SIs that were isointense or hypointense (Figures 2, B, and 3, B). On the CET1WIs of 10 cases, almost all cases had (nearly) homogeneous SIs, although the degree of enhancement was variable (Figures 2, C, and 3, C).

Figure 2. Case 5: A 58-year-old man. **A**, Axial T1WI shows a mass (*arrow*) with nearly homogeneous isointensity at the right upper gingiva (TR/TE = 660/15). **B**, On T2WI, the lesion (*arrow*) appears with nearly homogeneous isointensity to hyperintensity (TR/TE = 3000/90). **C**, On CE-T1WI, the tumor (*arrow*) shows moderate to high homogeneous enhancement.

Figure 3. Case 8: A 79-year-old woman. **A**, The mass (*arrow*) of the right hard palate

shows homogeneous isointensity on coronal T1WI (TR/TE _ 660/15). **B**, The STIR image shows the lesion (*arrow*) with nearly homogeneous isointensity (TR/TE _ 4500/60). **C**, On CE-T1WI, there is low homogeneous enhancement in the lesion (*arrow*).

DCE-MRI parameters

DISCUSSION

Malignant lymphoma is the second most common malignancy in the head and neck region, although its morbidity rate is not high.³⁸⁻⁴¹ The occurrence rate of extranodal NHL is reported to be approximately 40%, and the most common site in the head and neck region is Waldeyer’s ring.^{1,8,42-48} Only 3.0% to 9.5% of extranodal NHL arises in the oral region, and its most common sites are the palate and maxilla. In the cases of extranodal NHL involving the jawbone, the typical radiological finding is diffuse bone resorption, similar to that of periodontal inflammation and other malignant tumors.³⁻¹⁰ Thus, there is no specific radiological finding for this lesion. Otherwise, when malignant lymphoma arises at the paranasal sinus, computed tomography (CT) images often show specific findings: namely, the tumor permeates the wall without aggressive bony destruction. In NHL of the oral region, such as the jawbone and palate, this finding is not observed as often. Furthermore, in cases arising from soft tissue locally, it is difficult to diagnose NHL by conventional radiographs and CT images.

Generally, the soft tissue contrast resolution of MRI is superior to that of CT; however, MRIs of extranodal lymphoma in the head and neck region have been reported to show variable homogeneity and SI of tumor on both T1WIs and T2WIs. The degree of enhancement on CE-T1WIs has been reported to be even more variable; therefore, characterizing this lesion by MRI is difficult. Our results are consistent with previous articles, including our own. The conflicting results of NHL and SCC can be interpreted 2 ways. Focusing on the present study, the degree of enhancement of extranodal NHLs

might differ by site, unlike oral SCCs. Another interpretation is that the present study might have yielded a lopsided outcome because of the small number of patients. We could not evaluate our cases histopathologically because almost all specimens were taken by biopsy, not total extirpation. Several authors reported that DCE-MRI is useful for discrimination between benign and malignant disease, and the enhancement pattern of DCE-MRI has a relationship with tumor angiogenesis. - We also reported that the DCE-MRI parameters of oral SCC, particularly with the C_Igain/C_Imax ratio, were correlated with the microvessel density (MVD) estimated by CD34. We at least confirmed, however, that the enhancement patterns of diffuse large B-cell lymphoma appeared to be variable. In conclusion, the SIs on MRI are not specific to extranodal NHL and resemble those for other tumors of the oral and maxillofacial regions. Although the DCE-MRI parameters also lack a characteristic pattern, lesions in which C_Imax is less than 1.5 or WR900 is less than 40% can be identified as extranodal NHLs rather than oral SCCs.

題號	題目
1	下列哪一項 non-hodgkin’s lymphoma 的敘述為錯 (A) The second most common malignancy in HIV-infected individuals. (B) This neoplasm occurs in approximately 3% to 5% of those with the

	<p>virus.</p> <p>(C) The treatment usually is not combination chemotherapy, and radiation is reserved for local control of the disease.</p> <p>(D) Typically, NHL in patients with AIDS presents as a high-grade and aggressive disease that frequently is associated with widespread involvement and short survival times.</p>
答案 (C)	出處：Oral and Maxillofacial Pathology(Third Edition)
題號	題目
2	<p>下列哪一項 hodgkin's lymphoma 的敘述為錯</p> <p>(A) Hodgkin's lymphoma almost always begins in the lymph nodes.</p> <p>(B) The most common sites of initial presentation are the abdominal and inguinal lymph nodes.</p> <p>(C) The usual presenting sign is the identification by the patient of a persistently enlarging, nontender, discrete mass or masses in one lymph node region.</p> <p>(D) Ann Arbor system for Classification of Hodgkin's Lymphoma had 4 stages.</p>
答案 (B)	出處：Oral and Maxillofacial Pathology(Third Edition)