Two cases of chronic tonsillitis studied by FDG-PET

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We report two cases of chronic tonsillitis studied by FDG-PET. Symmetrical high FDG uptake by the tonsils was observed in both cases. On histopathologic examination of the resected tonsils, follicular hyperplasia was observed with proliferation of lymphocytes in the germinal centers. Increased glucose metabolism in active inflammation involving lymphocyte proliferation was thought to be a cause of high FDG uptake by tonsils in chronic tonsillitis.

Key words: fluorine-18-fluorodeoxyglucose (FDG), positron emission tomography (PET), tonsil, lymphocyte, inflammation

INTRODUCTION

In clinical fluorine-18-fluorodeoxyglucose (FDG) positron emission tomography (PET) studies of the head and neck region, symmetrical high FDG uptake is sometimes observed in the palatine tonsils.1-3 In order to determine the reason for this type of FDG uptake, we performed FDG-PET studies of two patients with chronic tonsillitis who were intended for tonsillectomy, and compared FDG uptake with the histopathologic findings of the tonsils.

CASE REPORTS

Patient 1
A 38-year-old woman complained of dysphagia and sore throat. She had suffered from repeated episodes of tonsillitis two or three times per year since childhood, and was intended for tonsillectomy. On admission, she had dysphagia and sore throat, and her C-reactive protein (CRP) level was 4.5 mg/dl (normal range 0–0.4 mg/dl in our hospital).

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Patient 2
An 18-year-old man complained of fever, dysphagia and sore throat. He had suffered from repeated episodes of tonsillitis several times per year since childhood, and was intended for tonsillectomy. On admission for tonsillectomy, he had no complaint and his CRP level was 0.4 mg/dl.

We obtained informed consent from both patients and FDG-PET studies of the head and neck region were performed. FDG was produced with a NKK-Oxford superconducting cyclotron and NKK synthesis system. A HEADTOME IV SET-1400W-10 (Shimadzu Corp., Japan), which has 4 detector rings providing 7 contiguous slices at 13 mm intervals, was employed for the PET study. Images were obtained from 40 to 55 minutes after intravenous injection of 185 MBq FDG while fasting. In both patients, symmetrical high FDG uptake by the tonsils was observed (Fig. 1a: Patient 1, 1b: Patient 2). Blood sugar levels in the PET studies were 54 mg/dl and 79 mg/dl, respectively. Regions of interest (ROIs: circles 3 pixels in diameter) were placed on the tonsils. The mean standardized uptake values (SUVs; cpm per g tissue/cpm injected per g body weight) of ROIs were measured. SUVs of tonsils were right: 7.4, left: 6.7 (Patient 1) and right: 4.4, left: 4.3 (Patient 2). One week after the FDG-PET studies, they underwent tonsillectomy. On histopathologic examination, follicular hyperplasias were observed in both patients with proliferation of lymphocytes in the germinal centers. The size of the follicles in patient
Symmetrical high FDG uptake was observed in the tonsils in both cases. SUVs of tonsils were right: 7.4, left: 6.7 (Patient 1) and right: 4.4, left: 4.3 (Patient 2).

Follicular hyperplasias were observed in both patients with proliferation of lymphocytes which was found in the germinal centers. The size of the follicles in patient 1 tended to be approximately larger than that in patient 2.

Many neutrophils were found in the peripheral epithelium of the tonsils of patient 1.