FUNCTIONAL IMAGING OF THE SALIVARY GLAND: DIAGNOSTIC VALUE FOR DETECTING SALIVARY GLAND TUMORS. P. Nakanishi, T. Kasuga, T. Yamasaki, K. Yano and H. Hirano. Department of Radiology, Department of Oral Surgery and Technological Service of Radiology, Shinshu University School of Medicine, Matsumoto.

This study was designed to evaluate regional function of the salivary gland in washout phase. Functional image was produced by computerized image subtraction technique. It was as follows: The data were collected on MT in 30 sec. frame from 0 to 40 min. after Tc-99m pertechnetate i.v. administration. At 30nd min. lemon juice was administered. An image acquired 2nd min. after stimulation was subtracted from an image acquired just before stimulation. The remaining activity of the salivary gland and this subtraction reflects the function of washout phase. This technique has been applied to 13 cases with histologically confirmed salivary gland tumors and evaluated comparing with conventional scintigram. In conventional image, 5 of 13 tumors were imaged as normal or hot areas without clear delineation of tumor and normal gland. But in functional image, all of these tumors were visualized as cold areas.


It is well known that many kinds of tumor occur in the salivary gland. Therefore, it is very useful to differentiate non-invasively malignant tumor from benign one. In this present study, salivary gland scintigraphy using Ga-67 citrate (Ga-67) and Tc-99m pertechnetate (Tc) have been performed on 13 patient in whom diagnosis is confirmed by the pathological examination. Tc scintigraphy were combined with excretory function test by lemon. Strong accumulation of Ga-67 was found in all of 3 patients with malignant tumor, and 20 of 8 patients with benign tumor. Increased accumulation of Tc was shown in 2 patients with Warthin tumor and 1 patient with multiple myeloma. Combined study of excretory function of salivary gland shows as below: (1) Malignant tumor accumulated strongly Ga-67 whether normal excretory function or not. (2) Two cases of benign tumors with strong accumulation of Tc were shown to be disturbed on the excretory function. It might be partially due to retention of Ga-67 in the salivary gland that Ga-67 was strongly accumulated in these two benign cases. Our study demonstrated that it was possible to differentiate malignant salivary tumor from benign one by scintigraphy using both Ga-67 and Tc and associated with excretory function test.


Ga-67 citrate scintigraphy has been shown to be useful in the evaluation of the effectiveness of the treatment, and in the early detection of the local recurrence and metastases on post-irradiated patients with head and neck malignant tumor. Bekerman et al. has described the increased concentration of Ga-67 citrate within salivary gland following radiation therapy, which results in the false-positives on scintigramp and may be confused with cervical lymph-node or recurrence activity. The decision that the increased uptake of Ga-67 citrate is salivary gland is only due to clinical course. Therefore, none of the sites considered to be salivary gland may be due to tumors.

Then, we used 115mTcO4- salivary gland scintigraphy to evaluate the false-positive as well as clinical findings. Furthermore, we studied on the relation between the Ga-67 uptake and absorbed dose in the salivary glands.