

## The efficacy of ultrasonography-guided biopsy of the submandibular glands in establishing the diagnosis of IgG4-related disease.

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### Background:

Whenever IgG4-related disease (IgG4-RD) is clinically suspected for lung, pancreatic or retroperitoneal lesions, acquisition of the sufficient biopsy specimen is often difficult. Meanwhile, submandibular glands are frequently affected in IgG4-RD. In IgG4-related sialoadenitis of the submandibular glands, ultrasonography (US) has been reported to provide characteristic sonographic appearances which consist of multiple hypoechoic areas arranged in reticular or nodular patterns. When US exhibits some abnormal findings in submandibular glands, the US-guided biopsy is indicated for diagnosing IgG4-RD. We evaluated the accuracy of US-guided biopsy for diagnosing IgG4-RD, in relation with US findings.

### Methods & Materials:

The study population consisted of 28 patients (18 male, 10 female) in whom IgG4-RD was clinically suspected and US yielded abnormal findings. The age of the patients ranged from 37 to 89 (mean; 66). The serum titer of IgG4 ranged from 36 to 1740mg/dl. All the patients underwent either CT or FDG-PET/CT of the whole body, which revealed abnormalities in submandibular glands (n=10), lacrimal glands (n=8), parotid glands (n=7), pancreas (n=9), bile ducts (n=3), kidney (n=6), retroperitoneum (n=4), lung (n=8) and lymph nodes (n=15). The biopsy was performed utilizing high-frequency linear probe and 18-gauge core needle. The US findings including the presence of the gland were evaluated, by at least two experienced radiologists. Then the US findings were compared with final pathologic diagnosis. The complications of the procedure were also inquired.

### Results:

US findings of the submandibular glands were diffusely-decreased echogenicity of the whole glands with reticular hyperechoic lines; reticular pattern (n=15), multiple hypoechoic nodules throughout the glands (n=9), scattered patchy hypoechoic nodules (n=4). The enlargement of the submandibular glands was apparent only in 10 cases with reticular pattern, whereas it was not apparent in the rest of the cases. IgG4-RD was pathologically diagnosed in all but one cases with reticular pattern and four cases with the multiple nodules. All cases with the scattered patchy nodules and three cases of the multiple nodules were diagnosed as non-specific sialoadenitis/reaction. The final diagnosis in the last case with the reticular pattern and two cases with the multiple nodules was T-cell lymphoma and sarcoidosis, respectively. As the complications, two patients experienced hemorrhagic saliva, which was soon resolved.

### Conclusions:

US-guided biopsy of the submandibular glands is a safe and useful procedure for establishing the diagnosis of IgG4-RD. The US patterns of diffuse low-echoic nodules with a reticular high-echoic pattern or multiple nodules are indications of biopsy, regardless of the enlargement of the glands.

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**Comment [1]:** 参加者の殆どが、この略称に馴染みがあると思います。

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**Comment [2]:** 次のsentenceでまたfrequentlyがでてくるため、変更してみました。

