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內文：

Introduction :

1. Sjögren syndrome (SS) is an autoimmune disease involving the exocrine glands as main target organs.
2. Criteria for a diagnosis of SS have been controversial. In 1999 by the Research Group for Sjögren Syndrome of the Japanese Society for the Promotion of Science.
3. European Community Study Group diagnostic criteria for Sjögren syndrome consists of 4 items :
   1) Histopathology of biopsy specimens either from the labial salivary glands or the lachrymal glands
   2) Oral examination: (a) sialography or (b) combination of sialometry (chewing gum test or Saxon test) and salivary scintigraphy
   3) Ocular examination: (a) combination of the Schirmer test and the rose bengal test or (b) combination of the Schirmer test and fluolescein staining test
   4) Serologic test of anti–Ro/SS-A antibody or anti–La/SS-B antibody
4. The diagnosis of SS can be made when the patients meet ≧ 2 or more of these 4 items
5. Sialography, a method of choice for exploring the ductal system of the salivary glands, because of its high diagnostic reliability
6. Since the 1990s, computerized tomography, magnetic resonance (MR) imaging, MR sialography, and ultrasonography have also been applied to diagnose SS.
7. Ultrasonography is the most convenient and economic examination and noninvasive.
8. Ultrasonography : a) Criteria for SS have been established by a few researcher
   b) Have not been applied generally and not included among a global diagnostic examination for SS.
   c) Sensitivity of diagnosis of SS ranged from 40% to 100%.
9. The present study investigated the diagnostic reliability and correlation between a diagnosis using sialography, ultrasonography, and histopathology and evaluated the usefulness of ultrasonography as a diagnostic tool for SS.

MATERIALS AND METHODS

1. April 2001~ April 2007, 244 patients visited the Department of Oral and Maxillofacial Surgery and Dental Radiology, Hokkaido University Hospital
2. Patients had undergone examinations for Sjögren syndrome:
   a) **Ocular examinations and serologic tests** at the Division of Rheumatology, Department of Internal Medicine, and the Department of Ophthalmology
   b) **Oral examinations** at the Department of Oral and Maxillofacial Surgery and Dental Radiology
3. 1) 73 patients (4 male and 69 female), aged 13-68 years (mean age 48 years),

underwent 3 oral examinations— sialography, salivary gland biopsy, and ultrasonography

2)Salivary secretion test (chewing gum test or Saxon test) was carried out in some of the patients for diagnostic work-up purpose

3)36 had been diagnosed as SS by ocular examination and serologic test, and the remaining 37 had been diagnosed as non-SS but complained of sicca symptom

4. The diagnosis of SS on sialography and histopathology was made based on the revised Japanese criteria

Table I. Revised Japanese criteria for Sjögren syndrome (1999)

1. Histopathology: positive for at least 1 of (a) or (b):
   (a) Focus score 1 (≥50 periductal lymphoid cell infiltration) or above in a 4-mm^2 minor salivary gland biopsy.
   (b) Focus score 1 (≥50 periductal lymphoid cell infiltration) or above in a 4-mm^2 minor lacrimal gland biopsy.
2. Oral examination: positive for at least 1 of (a) or (b):
   (a) Abnormal findings in sialography, stage 1 or above.
   (b) Decreased salivary secretion (flow rate ≤10 mL/10 min according to chewing gum test or ≤2 g/2 min according to the Saxon test) and decreased salivary function according to salivary scintigraphy.
3. Ocular examination: positive for at least 1 of (a) or (b):
   (a) Schirmer test, ≤5 mm/5 min; and in the rose bengal test, 3 or above according to van Bijsterveld score.
   (b) Schirmer test, ≤5 mm/5 min and positive fluorescein staining test.
4. Serologic examination: positive for at least 1 of (a) or (b):
   (a) Anti-Ro/SS-A antibody.
   (b) Anti-Ro/SS-B antibody.

Diagnostic criteria: Diagnosis of Sjogren syndrome can be made when the patient meets ≥2 of the above 4 criteria.

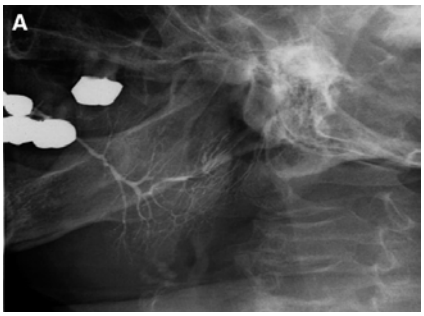
Sialography

1. Cannulation was performed by a 20-gauge catheter into an orifice of the parotid main duct with the help of a fine silver wire
2. Catheter was ligatured to the buccal mucosa under local anesthesia to prevent the catheter falling off and contrast fluids leaking
3. Automatic injector was used to inject 2 mL 76% diatorizoate sodium into the Stensen duct at the rate of 0.0125 mL/s.
4. Serial lateral images were obtained continuously during and after the injection to observe the ductal, acinoparenchymal and functional phases
5. Two dental radiologists (30 and 10 years'experience) evaluated the sialograms and performed the diagnosis based on the classifications of Rubin and Holt

Table II. Sialographic classification of Rubin and Holt (1957)[10]

Classification	*Sialographic findings*
Stage 0 (normal)	No contrast media collection
Stage 1 (punctate)	Contrast media collection ≤1 mm in diameter
Stage 2 (globular)	Contrast media collection 1-2 mm in diameter
Stage 3 (cavitary)	Contrast media collection ≥2 mm in diameter
Stage 4 (destructive)	Complete destruction of the gland parenchyma

6. Stage 1 or higher were diagnosed as positive, but when the peripheral ductal dilation was observed, it was assessed as suspicious (possible)
7. Diagnosis of the radiologists differed, discussion was made and a diagnosis was agreed on **(Normal)** **(Stage 1** Punctate sialectasia, <1mm in size**)**



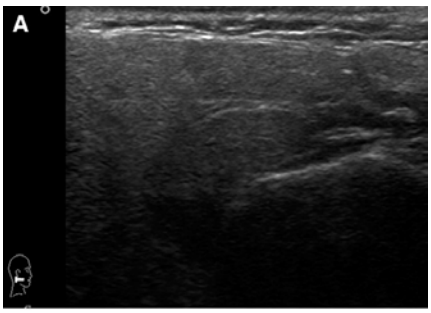
Ultrasonography

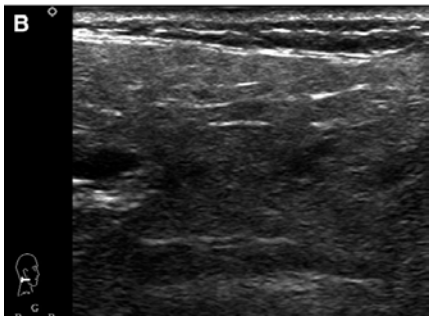
1. Sonographic examinations were performed using HDI 3000
2. Bilateral parotid and submandibular glands were scanned in the axial and coronal planes
3. B-Mode multifoci images were taken with the center frequency of 5-12 MHz
4. Patients were scanned in supine position with their necks extended and heads turned a little toward the opposite side
5. Sonographic evaluations were performed independently by dental radiologists with 25 years' experience who were not informed of the sialographic diagnosis
6. Sonographic diagnosis was performed based on the inhomogeneity of the parenchyma of the glands established by Salaffi
7. Grade 3 or higher were diagnosed as SS, and grade 1-2 were assessed as suspicious (possible)

Table III. Grading of ultrasonography of Salaffi et al. (2000)[9]

Grade	*Findings*
0 (homogeneity)	Normal glands
1 (slight inhomogeneity)	Small hypoechoic spots
2 (mild inhomogeneity)	Multiple scattered hypoechoic areas (<2 mm)
3 (evident inhomogeneity)	Multiple hypoechoic areas (2-6 mm)
4 (gross inhomogeneity)	Multiple hypoechoic areas (>6 mm)

(Normal) **(Grade 3).**





Biopsy

1. Labial salivary gland biopsy was performed under local anesthesia by oral surgeons.
2. A lower lip mucosal incision was made between the midline and the commissure and at least 3 labial gland samples were obtained.
3. The histopathologic findings were graded based on Greenspan classification by experienced oral pathologists.
4. Grade 3 or higher were diagnosed as SS, and grade 2 was assessed as suspicious (possible)

(Grade 4)

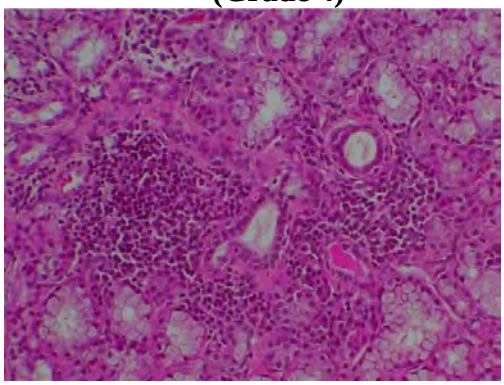


Table IV. Grading of labial salivary gland biopsies of Greenspan et al. (1974)[11]

Grade	*Lymphocytes and plasma cells per 4 mm²*
0	Absent
1	Slight infiltrate
2	Moderate infiltrate or less than one focus* per 4 mm²
3	One focus per 4 mm²
4	More than 1 focus per 4 mm²

*Focus, according to Waterhouse, is an aggregate of ≥50 lymphocytes, histiocytes, and plasma cells (1963).[12]

Statistical analysis

Statistical analyses were performed by the chisquarde test, and a *P* value of <.05 was considered to be statistically significant. We performed all statistical analyses with SPSS Statistic Base 17.0

RESULTS

Table V. Comparison of diagnostic reliability (%) of sialography, ultrasonography, and pathology

	Sensitivity	*Specificity*	*Accuracy*
Sialography	83.3*	94.6*	89.0*
Ultrasonography	77.8	78.4*	78.1*
Pathology	63.9*	91.9	78.1*

*$P < .05$ (chi-squared test).

1. **Sensitivity:** Statistically significant difference between the sialography and histopathology results (P <.05).
2. **Specificity:** Statistically significant difference between sialography and ultrasonography ($P < .05$)
3. **Accuracy:** Statistically significant differences between sialography and both ultrasonography and histopathology ($P < .05$)
4. The incidence of hyposalivation (Saxon or chewing gum test) was 77.8% in SS patients and 54.3% in non-SS patients
5. Sialography-ultrasonography had the highest correlation

Table VI. Correlation between diagnostic tools

	r*
Sialography–ultrasonography	0.58
Sialography–pathology	0.35
Ultrasonography–pathology	0.50

*0.0-0.25: little correlation; 0.25-0.5: slight correlation; 0.5-0.75: good correlation; 0.75-1.0: strong correlation.

6. Complications in 4 patients from the examinations :
   a) 2 patients developed acute sialadenitis due to the sialography procedure
      → overcome with antibiotics
   b) 2 patients complained of persistent pain of the lip due to biopsy
      → pain disappeared in a few weeks and no neuroparalysis remained
   c) No complications related to the ultrasonographic examination were noted.

DISCUSSION

1. Reliability reported in a large institutional analysis by Fujibayashi, The present study was similar to :
   - ✧ Sialography-based diagnosis
     sensitivity, specificity, accuracy = 89.1%, 91.4%, 89.9%
   - ✧ Ultrasonography
     sensitivity, specificity, accuracy = 75.7%, 78.7%, 76.9%
2. Salaffi et al. compared ultrasonography of salivary glands in primary Sjögren syndrome with sialography and scintigraphy → ultrasonography showed the best performance
3. The present study showed comparatively **high false positive** results with the ultrasonographic examination.
   Ultrasonography → include the bilateral parotid and submandibular gland, one of the glands presented a finding of SS criterion →the case was diagnosed as SS
4. Histopathologic examination showed **high false negative** results → biopsy is quantitative, like grade 2, diagnosis may be error, considered to be negative SS.
   ➔ multilevel examination of the biopsy sample is recommended , interposition of 200μm between the evaluated sections, 3 different section levels
   → American-European Consensus Group criteria, sensitivity was not affected, Specificity and accuracy increased 9.8% and 5.9%, increased specificity In biopsies with baseline focus scores of >1 to <2 and >2.
5. Higher correlation between sialography and ultrasonography → investigate the same glands
   Histopathologic examination → investigates minor salivary glands of the lip
6. Approximately 50% of the non-SS patients in the present study reported dry mouth symptoms → effects of aging, medication, systemic conditions, such as DM , and psychologic effects
7. Diagnosis of sialography→ lacks general applicability and requires specific expertise, accuracy depended on the observer, and interobserver agreement
   - ✧ Diagnostic reliability of sialography for SS is better than other diagnostic tools
   - ✧ Costs are low and it has a relatively low degree of invasiveness
   - ✧ Simple and quick procedure.
8. MR images for the standard deviation of the signal intensity is useful in the diagnosis of SS
   - ✧ Noninvasive examination

- ✧ More expensive to conduct than sialography
- ✧ Contraindicated in patients with claustrophobia or cardiac pacemakers.

9. Ultrasonography is not included among the diagnostic criteria for SS

- ✧ Diagnostic reliability is similar to that of histopathology and sialometry combined with scintigraphy
- ✧ Shimizu et al. reported that characteristic sonographic findings -- 1.) multiple hypoechoic areas 2.) multiple hyperechoic lines and/or spots 3.) multiple hypoechoic areas surrounded with hyperechoic lines and/or spots
  → correlated well with the sialographic grade
- ✧ Niemela evaluated ultrasonography of salivary glands in primary Sjögren syndrome
  →MR sialographyt sensitivity (96%), MR imaging (81%) and ultrasonography (78%), specificity of ultrasonography was 94%.

10. Kalk et al. reported that the parotid sodium and chloride concentrations combined with the stimulated submandibular and sublingual gland saliva flow rate was the most accurate test for SS, showing a sensitivity of 85% and a specificity of 96%.
11. Considering the higher correlation to sialography, ultrasonographic examination can be an alternative modality to histopathology and included as a global diagnostic tool for SS

題號	**題目**
1	何種診斷Sjogren syndrome 工具不具侵入性且花費低？ **(A)** Sialography **(B)** MR sialography **(C)** MR image **(D)** Ultrasonography
答案(D)	**出處：** Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2010;109:129-134)
題號	**題目**
2	根據European Community Study Group 診斷 Sjögren syndrome的criteria 有哪些? **(A)** Histopathology of biopsy specimens from the labial salivary glands **(B)** Sialography **(C)** Ultrasonography **(D)** Serologic test of anti–Ro/SS-A antibody or anti–La/SS-B antibody (1) ABCD (2)ABD (3)ABC (4)ACD
答案(2)	**出處：** Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2010;109:129-134)