

A Convenient and Less Invasive Technique of Labial Minor Salivary Gland Biopsy Using a Minimal Incision With a Needle Tip

Won Yong Lee¹ · Yoon-Seok Choi¹ · Soon-Hyun Ahn² · J. Hun Hah¹

¹*Department of Otorhinolaryngology-Head and Neck Surgery, Seoul National University Hospital and Cancer Research Institute, Seoul National University College of Medicine, Seoul;* ²*Department of Otorhinolaryngology-Head and Neck Surgery, Seoul National University Bundang Hospital, Seoul National University College of Medicine, Seongnam, Korea*

Objectives. This study was to show the technique and to compare the usefulness and complications of biopsy using a minimal incision with a needle tip of the labial minor salivary glands with those of conventional incisional lip biopsy in the diagnosis of Sjögren's syndrome.

Methods. We retrospectively reviewed the medical records of the patients who had the labial minor salivary gland biopsy for the diagnosis of Sjögren's syndrome between January 2005 and December 2008. One hundred forty-three patients were enrolled in this study. The yields of diagnostic salivary tissues and complications of the biopsy using a minimal incision with a needle tip and the conventional incisional lip biopsy were compared.

Results. Out of 143 patients, 56 patients underwent the conventional incisional lip biopsy and 87 patients received the biopsy using a minimal incision with a needle tip. In the biopsy using a minimal incision with a needle tip group, adequate salivary gland tissues were obtained in 85 patients out of 87 patients (97.7%). In the conventional incisional lip biopsy group, adequate specimens were acquired in 44 patients out of 56 patients (78.6%). There was no complication after the biopsy using a minimal incision with a needle tip, whereas there was one patient complained transient numbness of the lip after the conventional incisional lip biopsy.

Conclusion. The less invasive labial minor salivary gland biopsy using a minimal incision with a needle tip was easy to perform and safe and showed the better result than the conventional incisional lip biopsy in terms of the adequate specimen in the diagnosis of Sjögren's syndrome. So it might be a good alternative to the conventional incisional lip biopsy.

Keywords. *Sjogren's syndrome, Lip, Minor salivary glands, Biopsy*

INTRODUCTION

Sjögren's syndrome is a chronic inflammatory autoimmune disease. Its clinical characteristics are dry eyes (keratoconjunctivitis

sicca) and dry mouth (xerostomia) and its histological characteristic is lymphocytic infiltration and destruction of the salivary and lacrimal glands [1]. Labial minor salivary gland biopsy is used as a part of the diagnostic workup for suspected Sjögren's syndrome. The focus score in minor salivary gland biopsy is one of the revised classification criteria for Sjögren's syndrome proposed by the multicenter European study [2]. Among the techniques used to obtain the labial minor salivary gland, the most widely used method is conventional incisional lip biopsy [3]. This technique, however, is time consuming and requiring surgical instruments and assistance to be performed. The biopsy using a minimal incision with a needle tip of the labial minor sali-

• Received January 24, 2013
 Revised June 26, 2013
 Accepted July 5, 2013

• Corresponding author: **J. Hun Hah**
 Department of Otorhinolaryngology-Head and Neck Surgery, Seoul National University Hospital, Seoul National University College of Medicine, 103 Daehak-ro, Jongno-gu, Seoul 110-799, Korea
 Tel: +82-2-2072-0215, Fax: +82-2-745-2387
 E-mail: jhunnah@snu.ac.kr

Copyright © 2014 by Korean Society of Otorhinolaryngology-Head and Neck Surgery.

This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/3.0>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

vary gland is a new technique that can easily be done as an office procedure causing minimal discomfort to the patients.

This study is to compare the usefulness and complications of biopsy using a minimal incision with a needle tip with those of conventional incisional lip biopsy in the diagnosis of Sjögren's syndrome.

MATERIALS AND METHODS

A retrospective chart review of all patients requested for the minor salivary gland biopsy for the diagnosis of Sjögren's syndrome at the tertiary hospitals from January 2005 to December 2008 was performed. One hundred forty-three patients were enrolled and they were 116 females (81.1%) and 27 males (18.9%).

Patients were divided into two groups depending on the biopsy techniques as the biopsy using a minimal incision with a needle tip and the conventional incisional lip biopsy. The existence and numbers of the minor salivary gland obtained and complications of the two techniques were assessed. The adequacy of the specimen is defined as the existence of at least one salivary gland tissue adequate for the diagnosis. This study protocol was approved by Institutional Review Board of Seoul National University Hospital.

Procedure technique

All the labial salivary gland specimens were obtained from normal-appearing mucosa in the lower lip between the midline and the commissure. The normal appearance is important because mucosal inflammation could result in inflammatory cell infiltration of submucosal salivary glands. In the biopsy using a minimal incision with a needle tip group, the lower lip was everted by the patient, and local anesthesia was administered with local infiltration of 2% lidocaine with epinephrine (at 1:100,000 dilution). A 5 mm-sized vertical incision was made on the mucosa with a



Fig. 1. A superficial vertical incision was made with a needle tip. Pressure was applied to the sides.

needle tip (21–22 Gauge). The depth of the incision was 2–3 mm. The salivary glands are then released from the surrounding tissue by a sharp dissection using the needle tip. When a gland was taken out, it was grasped with small forceps gently and separated from the bed with the sharp edge of the needle tip. The small incision wound did not need to be reapposed (Fig. 1).

In the conventional incisional lip biopsy group, a 5×10 mm sized elliptical incision was made at the lower lip mucosa around the midline after local anesthesia. The mucosa and the underlying tissues, down to the muscle layer, were taken out with the scalpel or scissors. When the tissues were taken out, the presence of the salivary gland tissues was not evaluated routinely at the time of biopsy. The mucosal wound was sutured with an absorbable suture.

Safety assessment

Complications were investigated immediately after the procedure and postoperative 7 days based on objective signs through the physical examination and subjective symptoms through open-type questions.

Statistical analysis

In the present study, statistical analyses were performed using SPSS ver. 12.0 (SPSS Inc., Chicago, IL, USA). Patients were divided into two groups depending on the biopsy techniques as the biopsy using a minimal incision with a needle tip and the conventional incisional lip biopsy. Success rates were compared using a chi-square test. The numbers of salivary glands obtained were compared using *t*-test. Statistical significance was set at $P < 0.05$.

RESULTS

Out of 143 patients, 56 patients underwent the conventional incisional lip biopsy and 87 patients received the biopsy using a minimal incision with a needle tip. In the biopsy using a minimal incision with a needle tip group, adequate salivary gland samples were obtained from 85 patients out of 87 patients (97.7%). In the conventional incisional lip biopsy group, adequate specimens were acquired from 44 patients out of 56 patients (78.6%). The success rate to obtain adequate biopsy specimens was significantly higher in the biopsy using a minimal inci-

Table 1. Comparison of the diagnostic adequacy between the biopsy using a minimal incision with a needle tip and the conventional incisional lip biopsy

Variable	Needle biopsy (%)	Incisional biopsy (%)
Adequate specimen	85 (97.7)	44 (78.6)
Inadequate specimen	2 (2.3)	12 (21.4)
Total	87 (100)	56 (100)

The difference was statistically significant ($P < 0.001$, by Pearson chi-square test).

sion with a needle tip group than in the conventional incisional lip biopsy group ($P < 0.0001$) (Table 1). In the patients with adequate specimens, the numbers of obtained salivary glands were not different among two groups (needle tip biopsy 1.78 vs. incisional lip biopsy 1.43, $P = 0.111$). There was no complication in the patients after the biopsy using a minimal incision with a needle tip. In the conventional incisional lip group, one patient complained transient numbness of the lip.

DISCUSSION

The biopsy using a minimal incision with a needle tip of the minor salivary gland is a new less invasive technique targeting the gland itself directly. It was easy to perform and safe. In this study, we had a better result with this technique than with the conventional one in term of the adequate specimen in the diagnosis of Sjögren's syndrome.

There is yet no definite or simple diagnostic test for Sjögren's syndrome [4]. According to the European criteria proposed in 1993, diagnosis requires 6 items, which are ocular symptoms, oral symptoms, evidence of keratoconjunctivitis sicca, focal sialadenitis by minor salivary gland involvement, instrumental evidence of salivary gland involvement, and presence of autoantibodies [2]. After that, a new set of classification criteria in a joint effort by the American and European Consensus Group was proposed [5]. The main change is that a positive Ro/La serology and histopathology is compulsory for the diagnosis. A minor salivary gland biopsy with a focus score ≥ 1 is a positive histopathology for the criteria. A focus is defined as an agglomerate of at least 50 mononuclear cells; the focus score is defined by the number of foci in 4 mm² of glandular tissues [6].

The technique for minor salivary gland biopsy was first introduced in 1966 [7,8]. It made an elliptical incision of oral mucous membrane down to the muscle layer [9]. After that, many modifications in a type or length of incision were reported [3,4,10-22]. The minor salivary gland punch biopsy was introduced in 2001 [17]. Although many techniques were introduced as substitutions for the conventional incisional lip biopsy, it is still generally used because of not being too difficult to perform and not making significant problems [3].

In this study, we introduced a less invasive biopsy technique with a needle tip. No special equipments but a needle, forceps and gauzes were required for this simple procedure. Complete wound healing can be achieved in 5 days even without the wound closure with sutures. Since this technique is a targeted procedure to the salivary glands, it is helpful to harvest salivary gland tissues selectively without surrounding tissues those are not necessary for the diagnosis. On the contrary, the specimen after the conventional incisional lip biopsy contains surrounding soft tissues those are not necessary for the diagnosis (Fig. 2).

In conclusion, the less invasive labial minor salivary gland biopsy using a minimal incision with a needle tip was easy to perform and safe and showed the better result than the conventional incisional lip biopsy in terms of the adequate specimen in the diagnosis of Sjögren's syndrome. So it might be a good alternative to the conventional incisional lip biopsy.

SUPPLEMENTARY MATERIAL

Accompanying video clip (A technique of labial minor salivary gland biopsy using needle tip) can be found in CEO homepage (<http://e-ceo.org>).

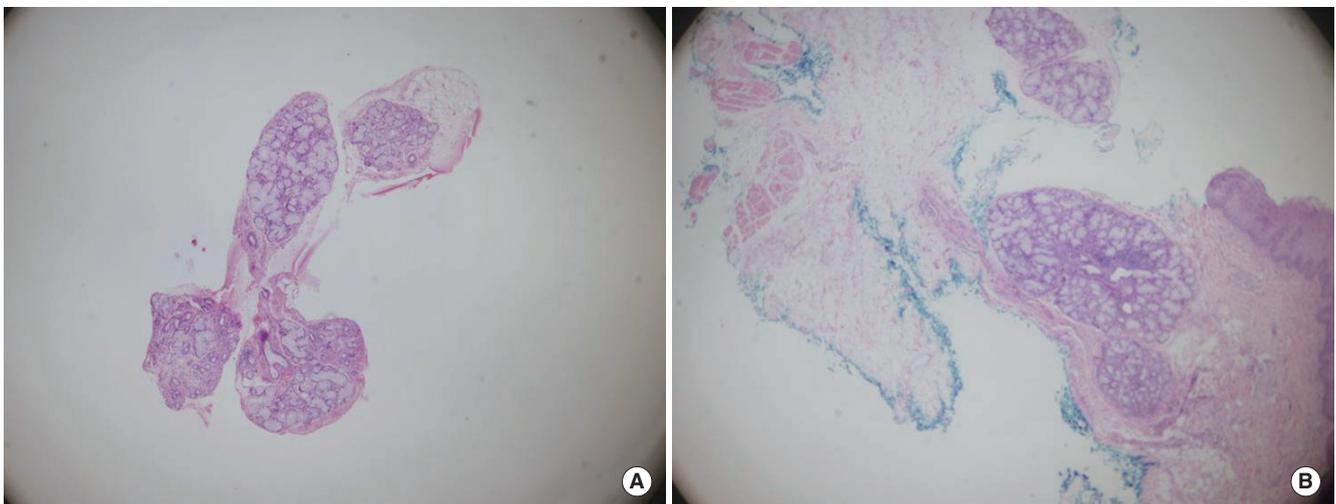


Fig. 2. Microscopic findings of the specimens from the two techniques (H&E, $\times 40$). The specimen (A) from the biopsy using a minimal incision with a needle tip shows highly selective salivary gland tissues. The specimen (B) from the conventional incisional lip biopsy contains not only salivary glands but also epithelium, fatty tissues and muscles.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

ACKNOWLEDGMENTS

This work was supported by the National Research Foundation of Korea (NRF) grant funded by the Korea government (Ministry of Environment, Science and Technology, MEST) (No. 2009-0093737).

REFERENCES

- Jonsson R, Haga HJ, Gordon TP. Current concepts on diagnosis, autoantibodies and therapy in Sjögren's syndrome. *Scand J Rheumatol*. 2000 Jan;29(6):341-8.
- Vitali C, Bombardieri S, Moutsopoulos HM, Balestrieri G, Bencivelli W, Bernstein RM, et al. Preliminary criteria for the classification of Sjögren's syndrome: results of a prospective concerted action supported by the European Community. *Arthritis Rheum*. 1993 Mar;36(3):340-7.
- Daniels TE. Labial salivary gland biopsy in Sjögren's syndrome: assessment as a diagnostic criterion in 362 suspected cases. *Arthritis Rheum*. 1984 Feb;27(2):147-56.
- Pijpe J, Kalk WW, van der Wal JE, Vissink A, Kluijn PM, Roodenburg JL, et al. Parotid gland biopsy compared with labial biopsy in the diagnosis of patients with primary Sjögren's syndrome. *Rheumatology (Oxford)*. 2007 Feb;46(2):335-41.
- Vitali C, Bombardieri S, Jonsson R, Moutsopoulos HM, Alexander EL, Carsons SE, et al. Classification criteria for Sjögren's syndrome: a revised version of the European criteria proposed by the American-European Consensus Group. *Ann Rheum Dis*. 2002 Jun;61(6):554-8.
- Vitali C, Bombardieri S, Moutsopoulos HM, Coll J, Gerli R, Hatron PY, et al. Assessment of the European classification criteria for Sjögren's syndrome in a series of clinically defined cases: results of a prospective multicentre study. The European Study Group on Diagnostic Criteria for Sjögren's Syndrome. *Ann Rheum Dis*. 1996 Feb;55(2):116-21.
- Calman HI, Reifman S. Sjögren's syndrome: report of a case. *Oral Surg Oral Med Oral Pathol*. 1966 Feb;21(2):158-62.
- Cifarelli PS, Bennett MJ, Zaino EC. Sjögren's syndrome: a case report with an additional diagnostic aid. *Arch Intern Med*. 1966 Mar;117(3):429-31.
- Chisholm DM, Mason DK. Labial salivary gland biopsy in Sjögren's disease. *J Clin Pathol*. 1968 Sep;21(5):656-60.
- Berquin K, Mahy P, Weynand B, Reychler H. Accessory or sublingual salivary gland biopsy to assess systemic disease: a comparative retrospective study. *Eur Arch Otorhinolaryngol*. 2006 Mar;263(3):233-6.
- Liquidato BM, Soler Rde C, Bussoloti Filho I. Evaluation of the concordance of sialometry and salivary glands scintigraphy in dry mouth patients. *Braz J Otorhinolaryngol*. 2006 Jan-Feb;72(1):116-9.
- Teppo H, Revonta M. A follow-up study of minimally invasive lip biopsy in the diagnosis of Sjögren's syndrome. *Clin Rheumatol*. 2007 Jul;26(7):1099-103.
- Delgado WA, Mosqueda A. A highly sensitive method for diagnosis of secondary amyloidosis by labial salivary gland biopsy. *J Oral Pathol Med*. 1989 May;18(5):310-4.
- Greenspan JS, Daniels TE, Talal N, Sylvester RA. The histopathology of Sjögren's syndrome in labial salivary gland biopsies. *Oral Surg Oral Med Oral Pathol*. 1974 Feb;37(2):217-29.
- Friedman H, Kilmar V, Galletta VP, Cossermelli W. Lip biopsy in connective tissue diseases: a review and study of seventy cases. *Oral Surg Oral Med Oral Pathol*. 1979 Mar;47(3):256-62.
- Smith SR, Shneider BL, Magid M, Martin G, Rothschild M. Minor salivary gland biopsy in neonatal hemochromatosis. *Arch Otolaryngol Head Neck Surg*. 2004 Jun;130(6):760-3.
- Guevara-Gutierrez E, Tlacuilo-Parra A, Minjares-Padilla LM. Minor salivary gland punch biopsy for evaluation of Sjögren's syndrome. *J Clin Rheumatol*. 2001 Dec;7(6):401-2.
- Gorson KC, Ropper AH. Positive salivary gland biopsy, Sjögren syndrome, and neuropathy: clinical implications. *Muscle Nerve*. 2003 Nov;28(5):553-60.
- Fox PC. Simplified biopsy technique for labial minor salivary glands. *Plast Reconstr Surg*. 1985 Apr;75(4):592-3.
- Peloro TM, Ramsey ML, Marks VJ. Surgical pearl: "X" marks the spot for the salivary gland biopsy. *J Am Acad Dermatol*. 2001 Jul;45(1):122-3.
- Seoane J, Varela-Centelles PI, Diz-Dios P, Romero M. Use of chalcitonin forceps to ease biopsy of minor salivary glands. *Laryngoscope*. 2000 Mar;110(3 Pt 1):486-7.
- Mahlstedt K, Ussmuller J, Donath K. Value of minor salivary gland biopsy in diagnosing Sjögren's syndrome. *J Otolaryngol*. 2002 Oct;31(5):299-303.