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Title: A Lip Fixation Device Facilitates Labial Salivary Gland Biopsy for Sjögren's Disease

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Author Questionnaire

1. We have marked your project as author-provided footage, meaning you film the video yourself and provide JoVE with the footage to edit. JoVE will not send the videographer. Please confirm that this is correct.

✓ Correct

2. Interview statements: Which interview statement filming option is the most appropriate for your group? **Please select one.**



✓ Interview Statements are read by JoVE's voiceover talent.

Current Protocol Length

Number of Steps: 17

Number of Shots: 20

Introduction

NOTE to VO producer: Please generate VO for the interview statements

Authors: Please note that **the questions will not appear on screen.** Please answer in **stand-alone full sentence with sufficient context.**

INTRODUCTION:

~~**REQUIRED:** Summarize the research focus and the main questions it aims to answer.~~

- 1.1. This study uses a new type of lip fixation device to simplify the biopsy for Sjögren's syndrome, thereby enhancing the safety and efficiency of the surgery.

1.1.1. B. roll: 2.2.1

~~**Describe the research gap or limitation in existing methods and how this protocol addresses them.**~~

- 1.2. Traditional methods require assistants. The device used in this protocol stabilizes the mucosa securely, enabling easy solo performance by clinicians.

1.2.1. B. roll: 2.5.1

CONCLUSION:

~~**What does this protocol allow researchers to study or measure?**~~

- 1.3., This protocol consistently yields adequate labial gland tissue, helping researchers accurately evaluate the focus score.

1.3.1. B. roll: 3.5.1

~~**Describe the most important consideration or challenge when performing this protocol.**~~

- 1.4. The critical challenge is positioning the pressure ring perpendicular to the vermilion border to ensure optimal surgical exposure

1.4.1. B. roll: 2.7.1

~~How can future studies build on this work? Describe the questions or research directions that can be investigated next.~~

- 1.5. Future work can optimize the device using 3D printing and facilitate multicenter clinical studies and structured training programs.

1.5.1. B. roll: 3.2.1

Ethics Title Card

This research has been approved by the Medical Ethics Committee of Sun Yat-sen Memorial Hospital

Protocol

2. Patient Preparation and Device Stabilization

Demonstrator: Zhi-Ming Ouyang

2.1. To begin, position the patient supine on the bed [1].

2.1.1. FILE: IMG_6924.MOV 00:00–00:03

2.2. Place a cotton ball in the bucco-alveolar sulcus to absorb saliva and bleeding during the procedure [1].

2.2.1. FILE: IMG_6924.MOV 00:03–00:11

2.3. Perform triple disinfection of the intraoral mucosa, alveolar processes, teeth, perioral skin, and nasal region using Type III povidone–iodine solution [1].

2.3.1. FILE: IMG_6924.MOV 00:24–00:42

2.4. Now, don sterile surgical gloves. Establish a sterile field by applying the sterile, fenestrated surgical drape over the patient's face and Expose only the mouth area [1].

2.4.1. FILE: IMG_6925.MOV 00:00–00:20

2.5. Identify the planned incision site on the lower lip, located either to the left or right of the midline within the transitional zone between the vermillion border and the labial vestibule [1].

2.5.1. FILE: IMG_6926.MP4 01:05–01:20

2.6. Administer local infiltration anesthesia into the region bounded by the mucobuccal fold and the buccal surface of the mandibular first premolar using a 1 milliliter syringe [1-TXT].

2.6.1. FILE: IMG_6926.MP4 01:42–01:52

- 2.7. After 5 minutes, evert the lower lip to fully expose the surgical site. Separate the clamp arms of the fixation device. Orient the major axis of the oval pressure ring perpendicular to the vermillion border [1].

2.7.1. FILE: IMG_6926.MP4 02:15-02:18 and 02:32-02:38

- 2.8. Position the backing plate against the labial skin. Align the oval pressure ring with the intraoral labial mucosa, ensuring that the lip tissue is centered directly over the planned incision site [1].

2.8.1. FILE: IMG_6926.MP4 02:38-02:42 and 02:59 -03:03. *Video editor: there is a glitch in this clip, but authors do not have anything else. They request you to please try to avoid the glitch timestamps as much as possible and provide a smooth finish.*

- 2.9. Now, rotate the screw to apply a uniform compressive force through the oval ring to stabilize the lip during the procedure. Ensure the device is tightened appropriately [1].

2.9.1. FILE: IMG_6926.MP4 03:42-03:55

3. Incision and Isolation of Labial Salivary Glands

- 3.1. Make a linear incision 5 to 7 millimeters in length through the mucosa oriented parallel to the major axis of the oval pressure ring, avoiding damage to the underlying glands or deep muscle fibers [1].

3.1.1. FILE: IMG_6926.MP4 04:56-04:58 and 05:08-05:11

- 3.2. Insert the tips of the tissue forceps vertically into the incision. Gently separate the submucosal connective tissue to tease apart the loose fibrous layers surrounding the glands [1].

3.2.1. FILE: IMG_6926.MP4 05:22-05:30

- 3.3. While grasping the pedicle, apply gentle traction to elevate the gland and perform blunt dissection by separating the pedicle from surrounding tissue with the forceps alone, avoiding sharp dissection [1].

3.3.1. FILE: IMG_6926.MP4 05:36- 05:53

3.3.2. FILE: IMG_6926.MP4 07:15–07:18

3.4. Harvest a minimum of 4 to 6 labial salivary glands to ensure sufficient tissue for histopathological analysis [1].

3.4.1. FILE: IMG_6926.MP4 08:47–08:50 (*Video editor: Don't show the mouth in this clip, just show the extracted pieces on the gauze*)

3.5. Next, loosen the screw knob and carefully remove the fixation device from the lower lip [1].

3.5.1. FILE: IMG_6926.MP4 08:20-08:30

3.6. Apply direct pressure with gauze to achieve hemostasis if bleeding obscures the suture field during wound closure [1].

3.6.1. FILE: IMG_6926.MP4 08:31–08:36

3.7. Anatomically approximate the wound edges and close the incision using a single simple interrupted suture [1].

3.7.1. FILE: IMG_6926.MP4 10:24–10:30 and 10:50-11:00

3.8. Apply gentle digital pressure with a sterile cotton ball to the closed wound for 1 to 2 minutes to ensure final hemostasis [1].

3.8.1. FILE: IMG_6926.MP4 11:46–11:51

Results

4. Results

4.1. A comparative study of device-assisted versus conventional labial salivary gland biopsy was conducted [1]. Procedure time was significantly shorter with the device-assisted technique [2] compared to the conventional technique [3].

4.1.1. LAB MEDIA: Table 1. *Video editor: Highlight the column headings “device assisted” and “conventional”*

4.1.2. LAB MEDIA: Table 1. *Video editor: Highlight the value “8.72 ± 1.88 min” under the device-assisted group*

4.1.3. LAB MEDIA: Table 1. *Video editor: Highlight the value “18.11 ± 2.65 min” under the conventional group*

4.2. Complication rates, including pain, hematoma, and sensory impairment, were not significantly different between the two groups, indicating that the improved efficiency does not compromise safety [1].

4.2.1. LAB MEDIA: Table 1. *Video editor: Highlight the rows pain, hematoma and sensory impairment showing values for both groups*

1. Supine

Pronunciation link: <https://www.merriam-webster.com/dictionary/supine>

IPA: /'suːpaɪn/

Phonetic Spelling: soo·pyne

2. Bucco-alveolar

Pronunciation link: No confirmed link found

IPA: /ˌbʌk.oʊ æl'viː.ə.lə/

Phonetic Spelling: buhk·oh al·vee·uh·ler

3. Sulcus

Pronunciation link: <https://www.merriam-webster.com/dictionary/sulcus>

IPA: /'sʌl.kəs/

Phonetic Spelling: suhl·kuhs

4. Intraoral

Pronunciation link: <https://www.merriam-webster.com/dictionary/intraoral>

IPA: /ˌɪn.trəˈɔːr.əl/

Phonetic Spelling: in·truh·or·uhl

5. Povidone

Pronunciation link: <https://www.merriam-webster.com/medical/povidone>

IPA: /ˈpɑː.vəˌdoʊn/

Phonetic Spelling: pah·vuh·dohn

6. Fenestrated

Pronunciation link: <https://www.merriam-webster.com/dictionary/fenestrated>

IPA: /ˈfen.əˌstreɪ.tɪd/

Phonetic Spelling: fen·uh·stray·tid

7. Vermilion

Pronunciation link: <https://www.merriam-webster.com/dictionary/vermilion>

IPA: /vərˈmɪl.jən/

Phonetic Spelling: ver·mil·yuhn

8. Vestibule

Pronunciation link: <https://www.merriam-webster.com/dictionary/vestibule>

IPA: /ˈves.təˌbjʊːl/

Phonetic Spelling: ves·tuh·byool

9. Infiltration

Pronunciation link: <https://www.merriam-webster.com/dictionary/infiltration>

IPA: /ˌɪn.flɪˈtreɪ.jən/

Phonetic Spelling: in·fil·tray·shuhn

10. Mandibular

Pronunciation link: <https://www.merriam-webster.com/dictionary/mandibular>

IPA: /mə'n'dɪb.jə.lə/

Phonetic Spelling: man·dib·yuh·ler

11. Premolar

Pronunciation link: <https://www.merriam-webster.com/dictionary/premolar>

IPA: /pri:'moʊ.lə/

Phonetic Spelling: pree·moh·ler

12. Perpendicular

Pronunciation link: <https://www.merriam-webster.com/dictionary/perpendicular>

IPA: /ˌpɜː.pən'dɪk.jə.lə/

Phonetic Spelling: per·puhn·dik·yuh·ler

13. Compressive

Pronunciation link: <https://www.merriam-webster.com/dictionary/compressive>

IPA: /kəm'pres.ɪv/

Phonetic Spelling: kuhm·pres·iv

14. Submucosal

Pronunciation link: <https://www.merriam-webster.com/dictionary/submucosal>

IPA: /ˌsʌb.mjʊ:'koʊ.səl/

Phonetic Spelling: sub·myoo·koh·suhl

15. Fibrous

Pronunciation link: <https://www.merriam-webster.com/dictionary/fibrous>

IPA: /'faɪ.brəs/

Phonetic Spelling: fy·bruhs

16. Pedicle

Pronunciation link: <https://www.merriam-webster.com/dictionary/pedicle>

IPA: /'ped.ɪ.kəl/

Phonetic Spelling: ped·ih·kuhl

17. Histopathological

Pronunciation link: <https://www.merriam-webster.com/dictionary/histopathological>

IPA: /ˌhɪs.təʊ.pæθ.əˈlɑː.dʒɪ.kəl/

Phonetic Spelling: his·toh·path·uh·loj·ih·kuhl

18. Hemostasis

Pronunciation link: <https://www.merriam-webster.com/dictionary/hemostasis>

IPA: /ˌhiː.məʊˈsteɪ.sɪs/

Phonetic Spelling: hee·moh·stay·suhs

19. Anatomically

Pronunciation link: <https://www.merriam-webster.com/dictionary/anatomically>

IPA: /ˌæn.əˈtɑː.mɪ.kli/

Phonetic Spelling: an·uh·tom·ih·klee

20. Hematoma

Pronunciation link: <https://www.merriam-webster.com/dictionary/hematoma>

IPA: /ˌhiː.məˈtoʊ.mə/

Phonetic Spelling: hee·muh·toh·muh