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Title: Microsurgical Dissection of Fresh Human Mastectomy Specimens for Visualization of Breast Fascial and Ligamentous Support Structures

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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.

3. Proposed interview filming date: Please indicate the proposed date that your group will self-film interviews: **N/A**

When you are ready to submit your video files, please contact our Content Manager, [Utkarsh Khare](#).

Current Protocol Length

Number of Steps: 08

Number of Shots: 10

Interviews

NOTE to VO: Please record 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 your research focus and the main questions it aims to answer.~~

- 1.1. This study uses microsurgical dissection to observe and characterize the fascial and ligamentous structures that form the breast's internal support system.

1.1.1. [2.1.1](#)

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

- 1.2. Traditional dissection methods obscure delicate breast support structures, whereas microsurgical dissection provides clear visualization while preserving their anatomical relationships.

1.2.1. [2.4.1](#)

CONCLUSION:

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

- 1.3. This protocol allows detailed visualization of breast fascial and ligamentous structures and their anatomical relationships.

1.3.1. [4.1.1](#).

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

- 1.4. The key challenge while performing this protocol is to preserve delicate fascial and ligamentous structures.

1.4.1. [5.1.1](#).

Ethics Title Card

This research has been approved by the Institutional Review Board (IRB) at the University of Texas MD Anderson Cancer Center

Protocol

NOTE: Script is drafted using the provided footage

Video editor: Please use title card to include the following:

- Obtain and orient the mastectomy specimen using standardized ink markings
- Section the specimen into approximately 2-cm-thick sagittal slices
- Set the surgical microscope to 5×–10× magnification
- Set the 3-mm Frazier suction tip to 180–200 mmHg and keep tissue hydrated with normal saline
- Orient the slice with the posterior surface facing the dissector and skin facing the assistant
- Identify and examine the superficial fascial system and its surrounding tissue relationships

2. Locating the Superficial Layer of the Superficial Fascia

Demonstrator: Gregory Reece

2.1. Begin by identifying the superficial layer of the superficial fascia, a thin, translucent layer beneath the skin and subcutaneous adipose tissue. It runs parallel to the dermis and is distinct from the surrounding fat tissue [1].

2.1.1. LAB MEDIA: File Name: IMG_1327.MOV: 01:00-01:40 and Figure 4. *(Video editor: Please rotate the footage 90° clockwise to ensure the correct orientation.) Show figure 4B using split screen in the starting for a few seconds.*

2.2. Irrigate with normal saline throughout the procedure to prevent tissue desiccation [1].

2.2.1. LAB MEDIA: IMG_1327.MOV: 04:15 - 04:27

2.3. Adjust the suction evacuation as needed to clear excess fluid and debris from the dissection field, ensuring uninterrupted observation and precise dissection of each ligament [1].

2.3.1 LAB MEDIA: IMG_1327.MOV: 04:28 - 04:55

2.4. Carefully trace the superficial layer of the superficial fascia, observing its attachments to surrounding tissues and ligamentous extensions into the subcutaneous fat [1].

2.4.1. LAB MEDIA: IMG_1327.MOV: 05:00-05:16 *(Video editor: Please rotate the footage 180° to ensure the correct orientation.)*

3. Locating the Deep Layer of the Superficial Fascia

3.1. Identify the deep layer of the superficial fascia as a somewhat translucent fascial layer located immediately superficial to the pectoral fascia and extending transversely across the chest wall. Follow the continuous fascial plane during gentle dissection and observe

it running parallel to the pectoral fascia [2].

3.1.1. LAB MEDIA: IMG_0913.MOV: 00:01 - 00:45 *Video editor: Use figure 5 as an inset*

4. Tracing Cooper's Ligaments

4.1. Cooper's ligaments are identified as smooth, translucent fiber bundles, typically less than one millimeter thick. The posterior Cooper's ligaments appear as multiple distinct fiber bundles with a smooth, translucent appearance [1]. Isolate one ligament and place a white paper strip beneath it as a marker. Apply gentle traction to demonstrate its spatial relationship with the deep layer of the superficial fascia. [2].

4.1.1. LAB MEDIA: IMG_7631.MOV: 00:56 - 01:25

4.1.2. LAB MEDIA: IMG_7632.MOV: 00:50 - 01:04, 08:10 - 8:20

5. Adipose Pockets Dissection

5.1. Using suction, gently remove the adipose tissue on both sides of the target ligament from the cut specimen to expose the edge of the ligament while avoiding direct suction of the ligament or the fascial structures [1].

5.1.1. LAB MEDIA: IMG_0911, MOV: 00:00 - 00:50

5.2. Carefully remove the adipose tissue to expose the ligamentous framework and visualize the anatomical relationships between Cooper's ligaments, the superficial fascial system, and the surrounding adipose tissue [1].

5.2.1. LAB MEDIA: IMG_0911, MOV: 01:11-01:41

Results

6. Results

6.1. After performing microdissections for over a year, it was observed that Cooper's ligaments traversed the superficial layer of the superficial fascia and extended into the dermis [1].

6.1.1. LAB MEDIA: Figure 7A. *Video editor: Highlight the yellow arrows pointing to the pale bands crossing the superficial layer.*

6.2. Cooper's ligaments appeared to extend posteriorly through the deep layer of superficial fascia [1] and continue into the fascia overlying the pectoralis major muscle [2].

6.2.1. LAB MEDIA: Figure 7B. *Video editor: Highlight the yellow arrow and the area it points to*

6.2.2. LAB MEDIA: Figure 7B. *Video editor: Highlight the blue arrow at the lower end of the image*

6.3. Gentle elevation of the superficial layer of superficial fascia provided an additional representative view of its continuity with Cooper's ligament [1].

6.3.1. LAB MEDIA: Figure 8. *Video editor: Highlight the area indicated by the yellow arrows in panels A and B.*

1. Superficial

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

IPA: /ˌsuːpərˈfiʃəl/

Phonetic Spelling: soo·per·FISH·uhl

2. Fascia

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

IPA: /ˈfæʃə/, /ˈfeɪʃə/

Phonetic Spelling: FASH·uh / FAY·shuh

3. Translucent

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

IPA: /trænzˈluːsənt/

Phonetic Spelling: tranz·LOO·suhnt

4. Subcutaneous

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

- IPA: /ˌsʌbkjəˈteɪniəs/
Phonetic Spelling: sub·kyoo·TAY·nee·uhs
5. Adipose
Pronunciation link: <https://www.merriam-webster.com/dictionary/adipose>
IPA: /ˈædᵻˌpouz/
Phonetic Spelling: AD·uh·pohs
 6. Dermis
Pronunciation link: <https://www.merriam-webster.com/dictionary/dermis>
IPA: /ˈdɜːmɪs/
Phonetic Spelling: DUR·mis
 7. Desiccation
Pronunciation link: <https://www.merriam-webster.com/dictionary/desiccation>
IPA: /ˌdesɪˈkeɪʃən/
Phonetic Spelling: dess·ih·KAY·shuhn
 8. Evacuation
Pronunciation link: <https://www.merriam-webster.com/dictionary/evacuation>
IPA: /ɪˌvækjuˈeɪʃən/
Phonetic Spelling: ih·vak·yoo·AY·shuhn
 9. Ligament
Pronunciation link: <https://www.merriam-webster.com/dictionary/ligament>
IPA: /ˈlɪɡəmənt/
Phonetic Spelling: LIG·uh·muhnt
 10. Ligamentous
Pronunciation link: <https://www.merriam-webster.com/dictionary/ligamentous>
IPA: /ˌlɪɡəˈmentəs/
Phonetic Spelling: lig·uh·MEN·tuhs
 11. Fascial
Pronunciation link: <https://www.merriam-webster.com/dictionary/fascial>
IPA: /ˈfæʃəl/, /ˈfeɪʃəl/
Phonetic Spelling: FASH·uhl / FAY·shuhl
 12. Pectoral
Pronunciation link: <https://www.merriam-webster.com/dictionary/pectoral>
IPA: /ˈpektərəl/
Phonetic Spelling: PEK·tuh·ruhl
 13. Transversely
Pronunciation link: <https://www.merriam-webster.com/dictionary/transverse>
IPA: /trænzˈvɜːsli/, /ˈtrænzvɜːsli/
Phonetic Spelling: tranz·VURS·lee / TRANZ·vurs·lee
 14. Cooper's ligaments
Pronunciation link: No confirmed link found
IPA: /ˈkuːpərz ˈlɪɡəmənts/
Phonetic Spelling: KOO·perz LIG·uh·muhnts
 15. Posterior
Pronunciation link: <https://www.merriam-webster.com/dictionary/posterior>

- IPA: /pɑːˈstriər/
Phonetic Spelling: pah·STEER·ee·er
16. Traction
Pronunciation link: <https://www.merriam-webster.com/dictionary/traction>
IPA: /ˈtrækʃən/
Phonetic Spelling: TRAK·shuhn
17. Spatial
Pronunciation link: <https://www.merriam-webster.com/dictionary/spatial>
IPA: /ˈspeɪʃəl/
Phonetic Spelling: SPAY·shuhl
18. Anatomical
Pronunciation link: <https://www.merriam-webster.com/dictionary/anatomical>
IPA: /ˌænəˈtɑːmɪkəl/
Phonetic Spelling: an·uh·TOM·ih·kuhl
19. Traversed
Pronunciation link: <https://www.merriam-webster.com/dictionary/traverse>
IPA: /trəˈvɜːst/
Phonetic Spelling: truh·VURST
20. Posteriorly
Pronunciation link: <https://www.merriam-webster.com/dictionary/posterior>
IPA: /pɑːˈstriərli/
Phonetic Spelling: pah·STEER·ee·er·lee
21. Pectoralis
Pronunciation link: <https://www.merriam-webster.com/dictionary/pectoralis>
IPA: /ˌpektəˈræləs/
Phonetic Spelling: pek·tuh·RAL·uhs
22. Pectoralis major
Pronunciation link: <https://www.merriam-webster.com/dictionary/pectoralis%20major>
IPA: /ˌpektəˈræləs ˈmeɪdʒər/
Phonetic Spelling: pek·tuh·RAL·uhs MAY·jer