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Title: Anterior Capsular Reconstruction with Human Dermal Allograft for Irreparable Subscapularis Tears

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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. Microscopy: Does your protocol require the use of a dissecting or stereomicroscope for performing a complex dissection, microinjection technique, or something similar? **No.**

3. Software: Does the part of your protocol being filmed include step-by-step descriptions of software usage? **No.**

4. Proposed filming date: To help JoVE process and publish your video in a timely manner, please indicate the proposed date that your group will film here: **04/15/2025**

When you are done shooting the interviews and the first scene (shot 2.1.1), please contact our Content Manager, Utkarsh Khare to submit your video files.

Current Protocol Length

Number of Steps: 07
Number of Shots: 12

Introduction

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

1.1. Rotator cuff tears are degenerative conditions affecting the rotator cuff tendons, which play a key role in shoulder movement. It has been reported that more than half of patients over the age of 60 have rotator cuff-related pathologies. This study introduces the surgical technique and shares clinical outcomes of anterior capsular reconstruction for irreparable subscapularis tears.

1.1.1. *B-roll: 2.1.2*

What are the most recent developments in this field of research?

1.2. A number of innovative techniques, including superior capsular reconstruction and tendon transfers, have recently been introduced to address the surgical techniques on irreparable rotator cuff tears.

1.2.1. *B-roll: 2.4.1*

What are the current challenges in the field?

1.3. While various surgical techniques have been introduced for irreparable posterosuperior tears, there are still relatively few reported options for irreparable subscapularis tears.

1.3.1. *B-roll: 2.5.1*

What advantage does this protocol offer compared to other techniques?

1.4. Tendon transfer techniques for irreparable subscapularis tears do not offer an anatomical reconstruction. Hence, this study aims to present anterior capsular reconstruction, a technique that restores native shoulder stability in an anatomic manner.

1.4.1. *B-roll: 2.6.1*

What research questions will the group focus on in the future?

1.5. Future study aims to reinforce both static and dynamic stability by performing anatomical anterior capsular reconstruction in conjunction with tendon transfer for irreparable subscapularis tear.

1.5.1. *B-roll: 3.1.1*

Ethics Title Card

This research has been approved by the Human Research Ethics Committee at the Myong-ji Hospital

Protocol

2. Anterior Capsular Reconstruction with Human Dermal Allograft

Demonstrator: Yong Girl Rhee

2.1. To begin, position the patient in a beach-chair configuration and use electrosurgical pencils to incise the clavicopectoral fascia and expose the anterior joint capsule **[1-TXT]**.
2.1.1. LAB MEDIA: open ACR.mp4 02:19 – 02:29. **TXT: Administer general anesthesia**

2.2. Use retractors to maintain a clear surgical field and minimize trauma to surrounding structures **[1]**. Then, with a curette, create a bleeding bone surface on the humeral lesser tuberosity to enhance allograft integration **[2]**.
2.2.1. LAB MEDIA: open ACR.mp4 02:57 – 03:40
2.2.2. LAB MEDIA: open ACR.mp4 03:49 – 04:00.

2.3. Insert a Fukuda retractor to improve the visibility of the glenoid **[1]**.
2.3.1. LAB MEDIA: open ACR.mp4 04:15 – 04:22

2.4. Place two suture anchors at the prepared glenoid site for stable graft fixation **[1]** and then place two additional suture anchors into the humeral lesser tuberosity to secure the graft **[2]**.
2.4.1. .LAB MEDIA: open ACR.mp4 05:05 – 05:14, 05:30 – 05:32, 05:34 – 05:38.
2.4.2. LAB MEDIA: open ACR.mp4 06:39 – 07:00.

2.5. Next, thread sutures from the glenoid anchors through the graft **[1]** and secure it to the anterior glenoid with firm knotting **[2]**.
2.5.1. LAB MEDIA: open ACR.mp4 07:11 – 07:37.
2.5.2. LAB MEDIA: open ACR.mp4 08:01 – 08:28.

2.6. Then, use sutures from the humeral lesser tuberosity anchors to pass through the graft **[1]**. Secure the graft to the humeral side using a double-row suture bridge technique **[2]**.
2.6.1. LAB MEDIA: open ACR.mp4 08:57 – 09:10, 09:36 – 09:43.
2.6.2. LAB MEDIA: open ACR.mp4 11:14 – 11:35.

2.7. Finally, close the rotator interval and inferior capsule using adjacent tissue sutures to restore the native soft tissue envelope **[1]**.
2.7.1. LAB MEDIA: open ACR.mp4 12:09 – 12:17, 12:47-13:00.

Results

3. Representative Results

3.1. Significant improvements were observed in clinical outcomes, with the visual analog scale score decreasing from around 6.6 to 1.6 **[1]** and the UCLA shoulder score increasing from around 12.4 to 29 **[2]**.
3.1.1. LAB MEDIA: Table 1. *Video editor: Highlight the "VAS score" row*.
3.1.2. LAB MEDIA: Table 1. *Video editor: Highlight "UCLA score" row*.

3.2. Range of motion improved notably, with forward flexion, abduction, and internal rotation at the side increasing by 28.6, 32.5 and 11.8 degrees, respectively **[1]**, while external rotation at the side decreased **[2]**.
3.2.1. LAB MEDIA: Table 1. *Video editor: Highlight rows "forward flexion, abduction, and internal rotation".*
3.2.2. LAB MEDIA: Table 1. *Video editor: Highlight the row "external rotation".*

3.3. Successful graft healing occurred in 16 out of 18 patients **[1]**.
3.3.1. LAB MEDIA: Table 1. *Video editor: Highlight the row " Graft Healing Rate*".

3.4. Radiological outcomes showed improvements in coracohumeral distance from 3 to 6 millimeters **[1]** and an increase in the acromiohumeral interval from 8.1 to 8.8 millimeters **[2]**.
3.4.1. LAB MEDIA: Table 1. *Video editor: Highlight the row "coracohumeral distance*"
3.4.2. LAB MEDIA: Table 1. *Video editor: Highlight the row "acromiohumeral interval*".

3.5. No complications such as stiffness, infections, or neurovascular injuries were observed **[1]**, but the positive belly press sign remained in 16 out of 18 patients postoperatively **[2]**.
3.5.1. LAB MEDIA: Table 1. *Video editor: Highlight "complications" row*.
3.5.2. LAB MEDIA: Table 1. *Video editor: Highlight the " belly press sign" row.*

Pronunciation Guide

1. Rotator Cuff

Pronunciation link:
https://www.merriam-webster.com/dictionary/rotator%20cuff
IPA: /ˈroʊˌteɪtər ˌkʌf/
Phonetic Spelling: roh-tay-ter kuf

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2. Subscapularis

Pronunciation link:
https://www.merriam-webster.com/medical/subscapularis
IPA: /ˌsʌbˌskæp.jʊˈlɛər.ɪs/
Phonetic Spelling: sub-skap-yuh-lair-iss

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3. Capsular

Pronunciation link:
https://www.merriam-webster.com/dictionary/capsular
IPA: /ˈkæp.sjə.lɚ/
Phonetic Spelling: kap-syuh-lur

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4. Tendon

Pronunciation link:
https://www.merriam-webster.com/dictionary/tendon
IPA: /ˈtɛn.dən/
Phonetic Spelling: ten-duhn

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5. Glenoid

Pronunciation link:
https://www.merriam-webster.com/medical/glenoid
IPA: /ˈglɛnˌɔɪd/
Phonetic Spelling: glen-oyd

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6. Tuberosity

Pronunciation link:
https://www.merriam-webster.com/dictionary/tuberosity
IPA: /ˌtuːbəˈrɑːsəti/
Phonetic Spelling: too-buh-rah-suh-tee

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7. Fukuda

Pronunciation link:
https://www.howtopronounce.com/fukuda
IPA: /fuːˈkuːdə/
Phonetic Spelling: foo-koo-duh

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8. Allograft

Pronunciation link:
https://www.merriam-webster.com/medical/allograft
IPA: /ˈæ.ləˌgræft/
Phonetic Spelling: al-uh-graft

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9. Dermal

Pronunciation link:
https://www.merriam-webster.com/dictionary/dermal
IPA: /ˈdɝː.məl/
Phonetic Spelling: dur-muhl

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10. Electrosurgical

Pronunciation link:
No confirmed link found
IPA: /ɪˌlɛk.troʊˈsɝː.dʒɪ.kəl/
Phonetic Spelling: ih-lek-troh-sur-jih-kuhl

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11. Curette

Pronunciation link:
https://www.merriam-webster.com/dictionary/curette
IPA: /kjuˈrɛt/
Phonetic Spelling: kyoo-ret

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12. Suture

Pronunciation link:
https://www.merriam-webster.com/dictionary/suture
IPA: /ˈsuː.tʃɚ/
Phonetic Spelling: soo-chur

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13. Interval

Pronunciation link:
https://www.merriam-webster.com/dictionary/interval
IPA: /ˈɪn.tɚ.vəl/
Phonetic Spelling: in-ter-vuhl

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14. Acromiohumeral

Pronunciation link:
No confirmed link found
IPA: /əˌkroʊ.mi.oʊˈhjuː.mɚ.əl/
Phonetic Spelling: uh-kroh-mee-oh-hyoo-muh-ruhl

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15. Coracohumeral

Pronunciation link:
No confirmed link found
IPA: /ˌkɔː.rə.koʊˈhjuː.mɚ.əl/
Phonetic Spelling: kohr-uh-koh-hyoo-muh-ruhl

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16. Neurovascular

Pronunciation link:
https://www.howtopronounce.com/neurovascular
IPA: /ˌnʊr.oʊˈvæs.kjə.lɚ/
Phonetic Spelling: nur-oh-vas-kyuh-lur

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17. Belly Press Sign

Pronunciation link (for individual words):

- Belly: https://www.merriam-webster.com/dictionary/belly
- Press: https://www.merriam-webster.com/dictionary/press
- Sign: https://www.merriam-webster.com/dictionary/sign
  IPA: /ˈbɛ.li prɛs saɪn/
  Phonetic Spelling: beh-lee press sine