

Submission ID #: 64717

Scriptwriter Name: Debopriya Sadhukhan

Project Page Link: <https://review.jove.com/account/file-uploader?src=19738733>

Title: Full Endoscopic Interlaminar Approach for Paracentral L5-S1 Disc Herniation

Authors and Affiliations:

Duran Sahin, Cafer Ikbal Gulsever, Musa Samet Özata, Irem Yaren Uysal, Aydin Aydoseli, Yavuz Aras

Department of Neurosurgery, Istanbul Faculty of Medicine, Istanbul University

Corresponding Authors:

Duran Sahin duransahn@gmail.com

Email Addresses for All Authors:

Duran Sahin	duransahn@gmail.com
Cafer Ikbal Gulsever	cafer.gulsever@gmail.com
Musa Samet Özata	musasamet@gmail.com
Irem Yaren Uysal	iremyaren11@gmail.com
Aydin Aydoseli	aydinaydoseli@gmail.com
Yavuz Aras	yavuz.aras@istanbul.edu.tr

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: **06/30/2025**

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

Current Protocol Length

Number of Steps: 15

Number of Shots: 41

Introduction

NOTE: The author does not want to have an introduction and just show the procedure

REQUIRED: What is the scope of your research? What questions are you trying to answer?

1.1. ~~**Duran Sahin:** Our research aims to evaluate the full endoscopic interlaminar approach for L5-S1 lumbar disc herniation, focusing on its safety, effectiveness, and minimally-invasive benefits compared to traditional techniques [1].~~

1.1.1. ~~INTERVIEW: Named Talent says the statement above in an interview-style shot, looking slightly off-camera. *Suggested B-roll: 2.2.2.*~~

What are the current experimental challenges?

1.2. ~~**Duran Sahin:** The main challenge is the steep learning curve due to the closed tubular endoscopic environment, requiring precise anatomical orientation and careful manipulation of neural structures [1].~~

1.2.1. ~~INTERVIEW: Named Talent says the statement above in an interview-style shot, looking slightly off-camera. *Suggested B-roll: 3.1.3.*~~

What significant findings have you established in your field?

1.3. ~~**Cafer Ikbal Gulsever:** Our findings demonstrate comparable clinical outcomes to traditional surgery, with significantly reduced pain, shorter operative times, and faster patient mobilization [1].~~

1.3.1. ~~INTERVIEW: Named Talent says the statement above in an interview-style shot, looking slightly off-camera.~~

What research gap are you addressing with your protocol?

1.4. ~~**Cafer Ikbal Gulsever:** We are addressing the need for a standardized, minimally-invasive endoscopic technique specifically designed for paracentral L5-S1 disc herniations [1].~~

1.4.1. ~~INTERVIEW: Named Talent says the statement above in an interview-style shot, looking slightly off-camera. *Suggested B-roll: LAB MEDIA: Figure 2.*~~

What advantage does your protocol offer compared to other techniques?

~~1.5. **Cafer Ikbal Gulsever:** This protocol reduces tissue damage, shortens hospital stay, and provides rapid patient recovery, lowering complications such as dural injury and postoperative instability [1].~~

~~1.5.1. INTERVIEW: Named Talent says the statement above in an interview style shot, looking slightly off camera.~~

Ethics Title Card

This research has been approved by the institutional review board of the Istanbul Faculty of Medicine

Written consent was obtained from the patients before the surgical procedure

Protocol

NOTE: Time codes are added as provided by the authors. The writer has not reviewed the footage.

2. Patient Setup and Interlaminar Access for Lumbar Endoscopic Discectomy

Demonstrator: Aydin Aydoseli

NOTE: The struck-through steps are not provided by the author

- ~~2.1. To begin, place the patient in a prone position with the hip and knee flexed to achieve a wider interlaminar space [1-TXT]. Sterilize the lumbar region with iodine or 10% chlorhexidine [2-TXT] and use sterile sheets to outline the prepared surgical site [3]. Drape the operation field and C-arm with a waterproof surgical drape [4].~~
 - ~~2.1.1. Talent positioning the patient. TXT: Support the thorax and pelvis with pillows~~
 - ~~2.1.2. Talent sterilizing the lumbar region with iodine or chlorhexidine. TXT: Perform the procedure under general anesthesia with an anesthetist~~
 - ~~2.1.3. Talent outlining the prepared surgical site.~~
 - ~~2.1.4. Talent draping the operation field and C-arm with a surgical drape.~~
- ~~2.2. To determine the entry point, obtain an anteroposterior X-ray view [1] and mark the interlaminar space at the L5-S1 (L-five-S-one) level [2]. Using a sterile, surgical skin marker, mark as close to the medial in the craniocaudal middle of the interlaminar window as possible for enough lateral access [3].~~
 - ~~2.2.1. A shot of the anteroposterior X-ray view.~~
 - ~~2.2.2. Talent marking the interlaminar space at the L5-S1 level.~~
 - ~~2.2.3. Talent marking in the craniocaudal middle of the interlaminar window.~~
- ~~2.3. Make a 10 millimeter skin incision as close to the midline as possible with a number 20 (twenty) blade [1] and check that the fascia of the paraspinal muscle has been passed [2]. Insert the dilator through the incision and laterally advance until it reaches the facet joint [3].~~
 - ~~2.3.1. Talent making a skin incision close to the midline.~~
 - ~~2.3.2. A shot showing the fascia of the paraspinal muscle has been passed.~~
 - ~~2.3.3. Talent inserting the dilator through the incision.~~

- ~~2.4. Obtain a lateral and anteroposterior X-ray view with the C-arm [1] to confirm that the tip of the dilator is at the desired level and facing toward the facet joint of the ipsilateral pathology [2].~~
- ~~2.4.1. Talent obtaining a lateral and anteroposterior X-ray view with the C-arm.~~
- ~~2.4.2. A shot of the tip of the dilator at the desired level and facing toward the facet joint of the ipsilateral pathology.~~
- ~~2.5. Insert the working sleeve by sliding it with the beveled opening toward the midline over the dilator [1] and obtain a lateral X-ray view with the C-arm to confirm that the tip of the working sleeve has reached the end of the dilator [2]. Then, remove the dilator [3].~~
- ~~2.5.1. Talent sliding the working sleeve with the beveled opening toward the midline over the dilator.~~
- ~~2.5.2. A shot of the lateral X-ray view obtained with the C-arm confirming that the tip of the working sleeve has reached the end of the dilator.~~
- ~~2.5.3. Talent removing the dilator~~
- 2.6. Introduce an endoscope with a continuous inflow of saline over the working sleeve until the interface of the ligamentum flavum and muscle [1]. To begin, perform bone resection *via* a high-speed burr to achieve a wider interlaminar space if the interlaminar window is not wide enough to fit the endoscope [1].
- ~~2.6.1. Talent introducing an endoscope with a continuous inflow of saline over the working sleeve.~~
- 2.6.2. Talent performing bone resection *via* a high-speed burr. Author provided timestamp: JOVE64717 Interlaminar disc.mp4 01.47 – 02.02
- 2.7. For the resection of ligamentum flavum, tense it with the long side of the working sleeve [1]. and separate it from the dura for a safer resection, as the dura is more prominent in the midline [2].
- 2.7.1. Talent tensing the ligamentum flavum with the long side of the working sleeve. Author provided timestamp: JOVE64717 Interlaminar disc.mp4 02.05 – 02.08
- ~~2.7.2. Talent separating the ligamentum flavum from the dura.~~
- 2.8. Begin the ligamentum flavum resection from the medial side using a 5.4-millimeter punch [1].

2.8.1. Talent doing the ligamentum flavum resection. **TXT: Control the cutting edge of the punch to prevent a dural tear** Author provided timestamp: JOVE64717 Interlaminar disc.mp4 02.10 – 02.30

2.9. Then, continue the resection laterally until the lateral recess and pedicle are visible to expose the nerve root and its lateral border [1].

2.9.1. Talent continuing the resection laterally until the lateral recess and pedicle are visible. Author provided timestamp: JOVE64717 Interlaminar disc.mp4 02.33 – 02.43

3. Endoscopic Lumbar Discectomy Decompression and Disc Material Removal

Demonstrator: Yavuz Aras

NOTE: The struck-through steps are not provided by the author

3.1. ~~Remove the epidural fat tissue totally using the rongeur [1] for a clear view of the compression [2] and.~~ Mobilize the nerve root medially using the dissector to relieve it from any adhesions [1].

~~3.1.1. Talent removing the epidural fat tissue using the rongeur.~~

~~3.1.2. A shot of the clear view of the compression.~~

3.1.3. Talent mobilizing the nerve root medially using the dissector. Author provided timestamp: JOVE64717 Interlaminar disc.mp4 02.55 – 02.59

3.2. Rotate the long side of the working sleeve clockwise or counterclockwise to medialize the nerve root and expose the pathology [1]. Visualize the anterior epidural space [2]. annular defect [4], disk interval [5], and end plates [6].

3.2.1. Talent rotating the long side of the working sleeve. Author provided timestamp: JOVE64717 Interlaminar disc.mp4 03.00 – 03.05

~~3.2.2. The medialized nerve root and the pathology.~~

3.2.3. A shot of the anterior epidural space. Author provided timestamp: JOVE64717 Interlaminar disc.mp4 03.06 – 03.13

~~3.2.4. A shot of the annular defect.~~

~~3.2.5. A shot of the disk interval.~~

~~3.2.6. A shot of the end plates.~~

- 3.3. Then, remove the migrated disc material [1], and loosen the fragments under the annulus through the defect if they are present and visualized [2]. Use the punch to open the posterior longitudinal ligament [3] and the annulus fibrosis if there is a subligamentous protruding material [4].
- 3.3.1. Talent removing the migrated disc material. Author provided timestamp: JOVE64717 Interlaminar disc.mp4 03.15 – 03.35
- ~~3.3.2. Talent loosening the fragments under the annulus through the defect.~~
- ~~3.3.3. Talent opening the posterior longitudinal ligament with the punch.~~
- ~~3.3.4. Talent opening the annulus fibrosis.~~
- 3.4. Use the rongeur to remove the disc material after detecting the annular defect and disc material in both situations [1]. Use the punch to obtain enough space if no annular defect is encountered or the annular defect is too narrow for sufficient removal [2].
- ~~3.4.1. Talent removing the disc material with the rongeur.~~
- ~~3.4.2. Talent using the punch to remove the disc material.~~
- 3.5. Evacuate the disc space until achieving nerve root decompression [1-TXT].
- ~~3.5.1. Talent evacuating the disc space. TXT: Do not perform excessive retraction to prevent neural trauma~~
- 3.6. After the discectomy, coagulate the defect of the annulus by bipolar electrocautery for sealing and hemostasis purposes [1]. Finally, remove the endoscope [2], and working sleeve [3], and close the incision with a single proline suture without drainage [4].
- 3.6.1. Talent coagulating the defect of the annulus by bipolar electrocautery. Author provided timestamp: JOVE64717 Interlaminar disc.mp4 03.40 – 04.00
- 3.6.2. Talent removing the endoscope. Author provided timestamp: JOVE64717 Interlaminar disc.mp4 04.06 – 04.10
- ~~3.6.3. Talent removing the working sleeve.~~
- ~~3.6.4. Talent closing the incision.~~

Results

4. Results

- 4.1. This figure shows the magnetic resonance images or MRI (*M-R-I*) of a patient with a left paracentral disc herniation [1]. The preoperative T2-weighted sagittal and axial MRI scans show left paracentral disc herniation at the L5–S1 (*L-five S-one*) level [2].

4.1.1. LAB MEDIA: Figure 2.

4.1.2. LAB MEDIA: Figure 2A, 2B.

- 4.2. The postoperative T2-weighted MRI scans after full endoscopic interlaminar discectomy show a total removal of the disc material [1].

4.2.1. LAB MEDIA: Figure 2. *Video Editor: Highlight C and D.*

Pronunciation Guide:

1. ligamentum flavum

Pronunciation link: <https://dictionary.cambridge.org/us/pronunciation/english/ligamentum-flavum> [How To Pronounce+15Howjsay+15YouTube+15](#)

IPA: /lɪg.əˌmɛn.təm ˈfleɪ.vəm/

Phonetic spelling: lig-ə-MEN-təm FLAY-vum

2. pedicle

Pronunciation link: <https://dictionary.cambridge.org/us/pronunciation/english/pedicle> [Cambridge DictionaryYouTube](#)

IPA: /ˈped.ɪ.kəl/

Phonetic spelling: PED-ih-kəl

3. nerve root

You might emphasize both words:

nerve /nɜːv/, phonetic: NURV; **root** /ru:t/, phonetic: root

(Standard vocabulary—usually clear to native speakers.)

4. adhesions

Pronunciation link: https://showmeword.com/definition/english_word/adhesion [showmeword.com](#)

IPA: /ədˈhiːzənz/

Phonetic spelling: ad-HEE-zhənz

5. discectomy

Pronunciation link: <https://pronounce.tv/discectomy> [pronounce.tvHow To Pronounce](#)

IPA: /dɪˈsek.tə.mi/

Phonetic spelling: dis-SEK-tə-mee

6. annulus

Pronunciation link: <https://www.pronouncekiwi.com/Discectomy> (context includes annulus) [pronouncekiwi.compronounceonline.com](#)

IPA: /ˈæn.jʊ.ləs/

Phonetic spelling: AN-yoo-ləs

7. epidural

Pronunciation link: <https://dictionary.cambridge.org/us/pronunciation/english/epidural>

[Cambridge Dictionary](#)[Encyclopedia Britannica](#)

IPA: / ˌɛp.ɪˈdjʊ.rəl/ or / ˌɛp.ɪˈdʊr.əl/

Phonetic spelling: ep-ih-DUR-əl

8. decompress

Pronunciation link: <https://dictionary.cambridge.org/pronunciation/english/decompress>

[Cambridge Dictionary](#)[Encyclopedia Britannica](#)

IPA: / ˌdiː.kəmˈpres/

Phonetic spelling: dee-kuhm-PRES

9. medialize

Pronunciation link: <https://www.synonyms.com/pronounce/medialize>

[synonyms.com](#)[en.wiktionary.org](#)

IPA: / ˈmiː.di.əˌlaɪz/

Phonetic spelling: MEE-dee-uh-lyze

10. retractor

Pronunciation link: <https://dictionary.cambridge.org/us/pronunciation/english/retractor>

[Cambridge Dictionary](#)[Howjsay](#)

IPA: /rɪˈtræk.tər/

Phonetic spelling: ri-TRAK-tər