Full Endoscopic en bloc Flavectomy Technique for Lumbar Spinal Stenosis: A Technical Note

Gian Karlo P. Dadufalza, MD, FPOA, FPSS
Ygna Allyra M. Gamez, MD

Philippine Orthopedic Center, Quezon City

Introduction

- Lumbar spinal stenosis is a common condition in the elderly population and a leading cause of pain and disability.
- In the absence of spinal instability, decompression via a laminectomy is the standard surgical treatment of choice.
- With minimally invasive spine surgery techniques like full endoscopic spine surgery, adequate spinal decompression can be achieved with less collateral damage to the normal anatomical structures(1, 4).

Introduction

- En bloc excision of ligamentum flavum using the biportal technique has been described in literature, however, there are no published studies on en bloc excision using the uniportal technique (2).
- We present our novel technique: full endoscopic uniportal en bloc excision of ligamentum flavum performed in a series of 7 patients.
- To the best of our knowledge, this is the first uniportal method of en bloc ligamentum flavum resection.

Technical Notes (key steps)

- Positioning
- Portal access
- Soft tissue clearing
- Circumferential laminotomy- decompression proper
- Clean up

Circumferential laminotomy

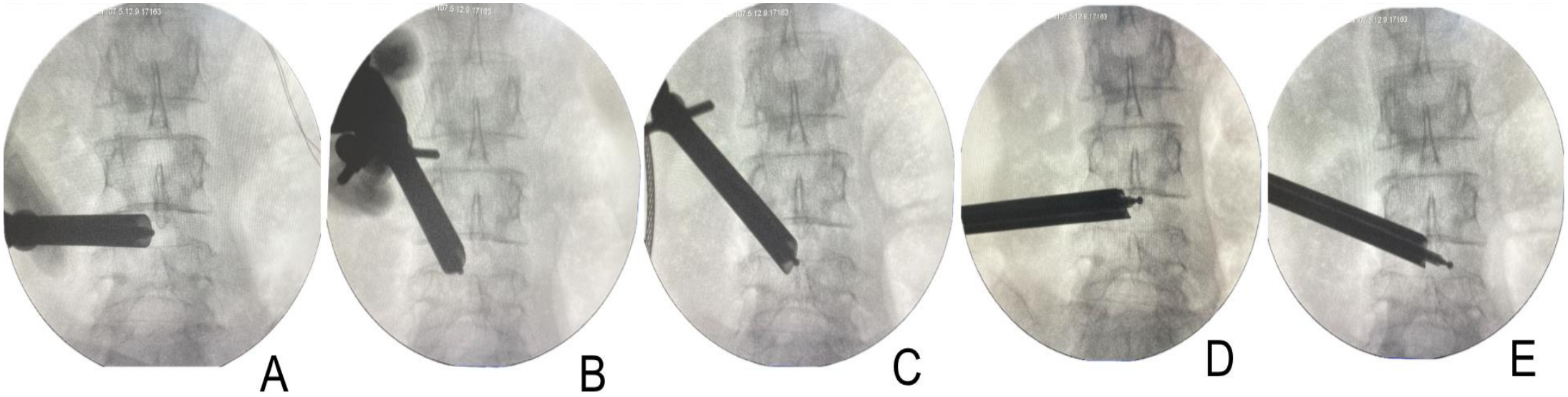

Figure 1

A. Drilling at spinolaminar junction, B . & C. drilling at dorsal SAP to caudal superior lamina, D. drilling of spinous process base and contralateral lamina, E. drilling of contralateral SAP

Circumferential laminotomy

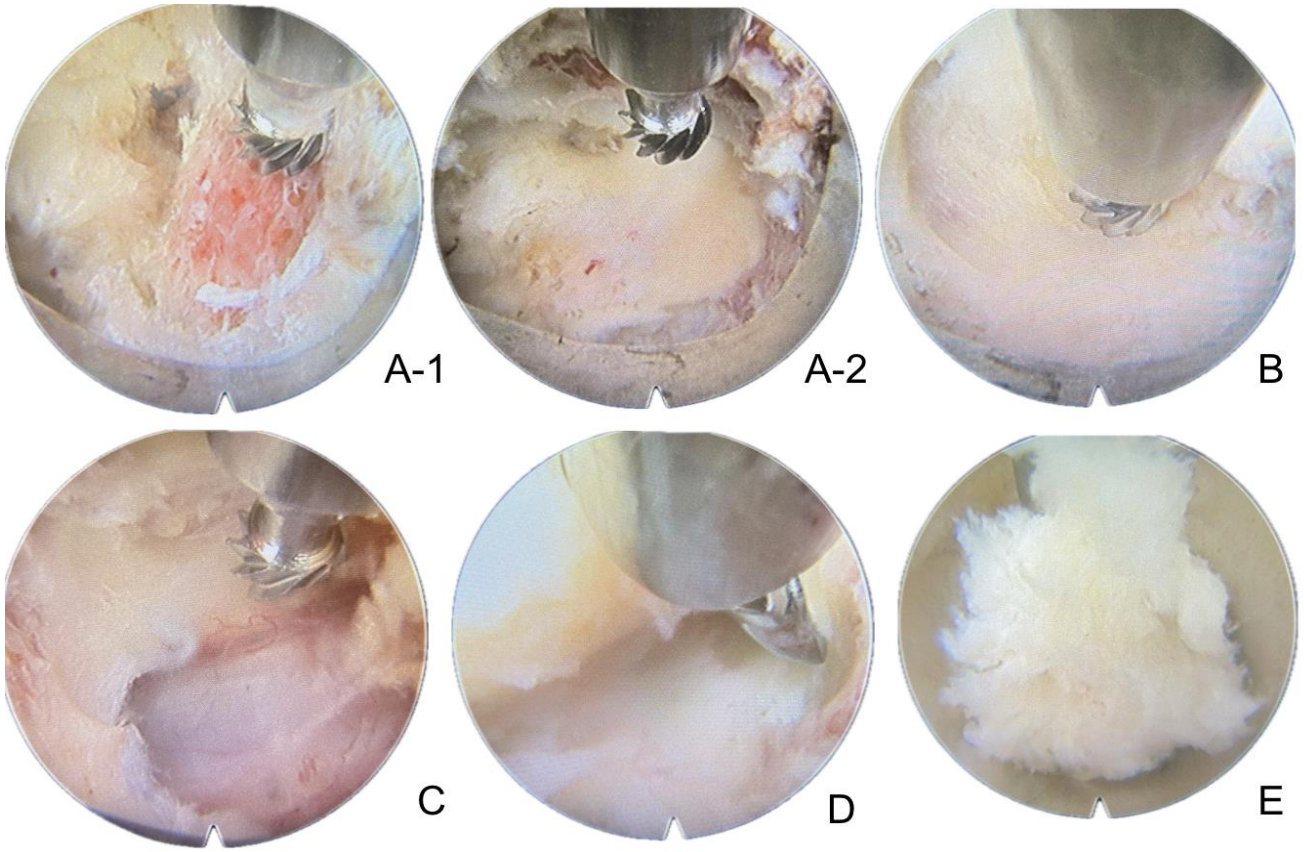

Figure 2

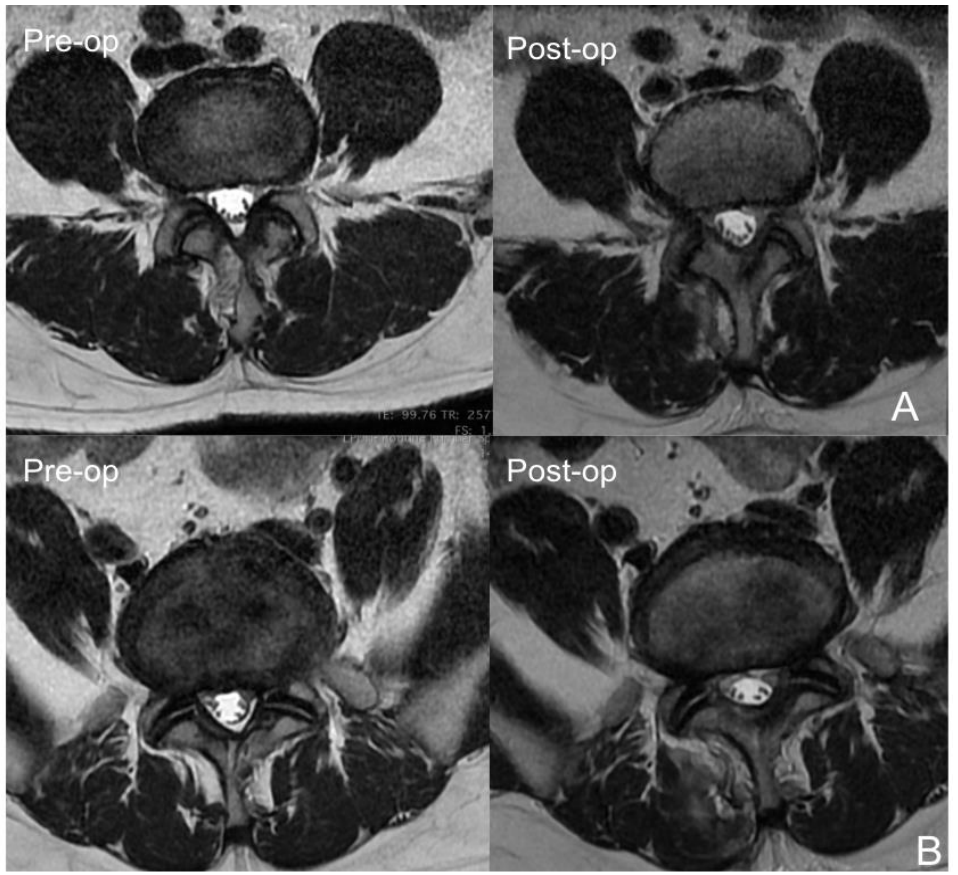

Figure 4

A-1 Drilling at spinolaminar junction, A-2 drilling of spinous process base, B. drilling of SAP and caudal lamina, C. drilling of contralateral SAP, D. detaching LF from ventral lamina using articulating curette, E. en bloc flavectomy

En bloc Flavectomy

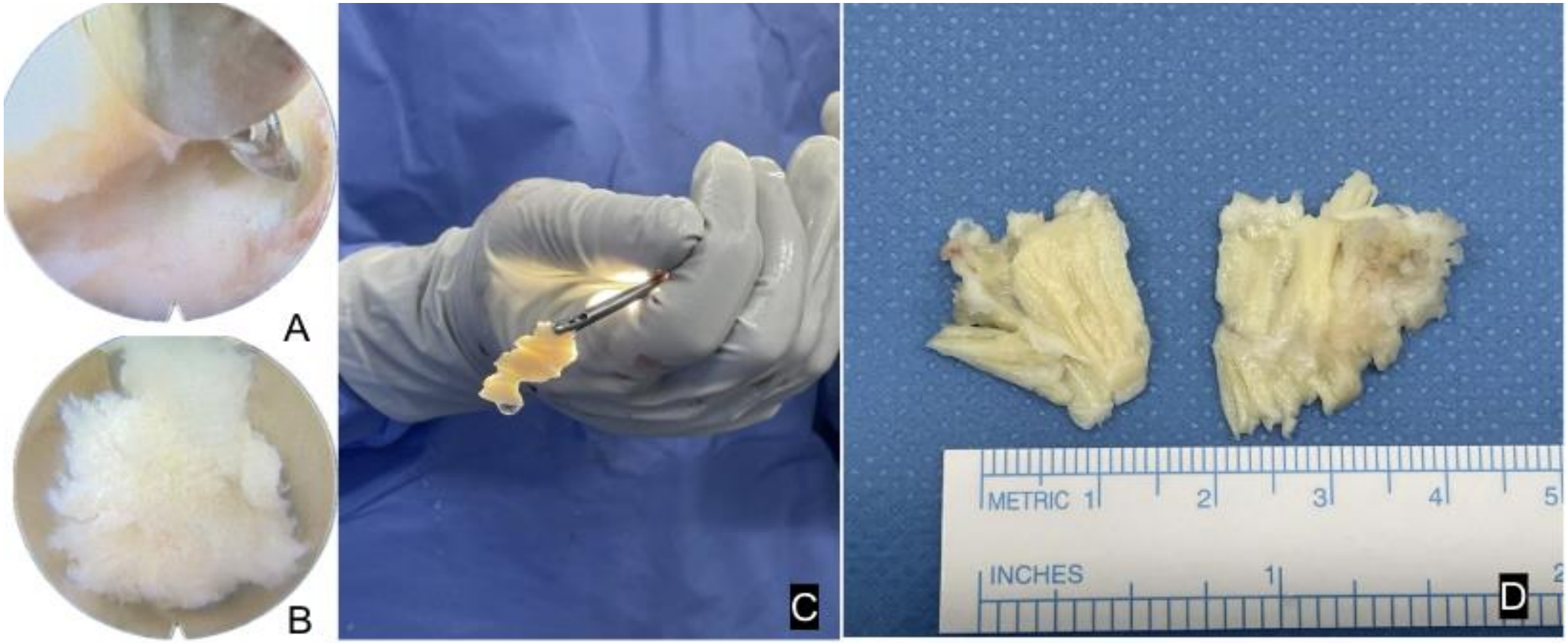

Figure 3

A. detaching LF from ventral lamina using articulating curette, B.& C en bloc flavectomy, D. en bloc LF right and left halves -“ butterfly” shape

Discussion

- The principles of endoscopic decompression are similar to the microtubular ULBD technique wherein the spinal canal is approached from one side and crosses over contralaterally to complete the decompression.
- We present our technique which is similar to the “Butterfly method” of Park and Oh, albeit our method utilizes a single portal through the working channel endoscope.
- The main advantage of our method is the use of a single portal. Theoretically, this provides a less invasive approach compared to a bi-portal technique because we limit the soft tissue collateral damage.
- The benefits on en bloc flavectomy was emphasized by Park and Oh which are decreased risk of dural tears, less bleeding and better endoscopic visualization and lesser irrigation pressure related complications because the LF is left as a protective barrier and it is removed towards the end of the decompression (3).
- Compared to bi-portal technique, our method is more technically challenging because of instrument movement limitations in uniportal surgery due to the co-axial nature of the working channel spine endoscope.

Conclusion

- Full endoscopic en bloc LF excision technique is a safe, effective and reproducible method for treatment of lumbar spinal stenosis.
- The single portal access allows for minimal soft tissue collateral damage. This technique may be more tedious compared to bi-portal en bloc LF excision method.
- There is no standard method of resecting the LF and we recommend that each surgeon should develop his own technique based on his surgical experience and skill level.

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