

Department of Orthopaedic Surgery
Northwestern University Feinberg School of Medicine

Laminoplasty is best

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2/15/2017 Park City, UT

Entity	Consulting	Advisory Board	Royalties	Research Grant
Medtronic	X			X
Stryker	X		X	
Pioneer RPT		X		
CeramTec	X		X	
Reliance	X			
Allosource		X		
Globalis		X		
Bioventus		X		
Novasive		X		
Graftys	X			
Minus		X		
LSRS		X		
CSRS		X		
OREF				X

2/15/2017 Disclosures Chicago, IL

Unanswered Questions

– What do we do with asymptomatic stenosis?
– What do we do with asymptomatic myelomalacia?
– What approach do we use?

Goals of Surgical Treatment

- Maintaining long-term spinal cord function
- Improving clinical outcomes
 - Short-term
 - Improve recovery
 - Reduce postoperative pain
 - Long-term
 - Fewer reoperations
 - ****Improve patient satisfaction****
- Minimizing complications



Anterior approach

Advantages

- Remove the offending pathology
- "Pebble" in the shoe
- More complete decompression
- Anterior compression MC
- Ideal in kyphotic spines
- Intraoperative positioning
- Anterior column support
- Removal of a pain generator
- Reduce long-term neck pain



The bad, the ugly

- Rate of complications
 - Anterior > Posterior
 - Graft, instrumentation, surgical site complications
- Fusion disease
 - Increased adjacent segment degeneration with anterior
- ROM
 - Laminoplasty more motion-sparing



Cervical Alignment and Range of Motion After Laminoplasty

Biomechanical Data From More Than 500 Cases With Cervical Spinal Stenosis Myelopathy and a Review of the Literature

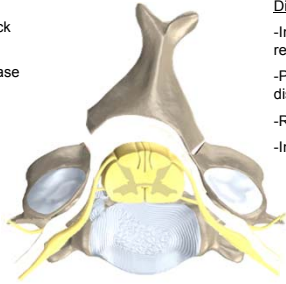
Masaaki Machino, MD, Yoshitaka Nakano, MD, PhD, Tetsuo Hida, MD, Seigo Ito, MD, PhD, Hiroaki Nakashima, MD, Shiroaki Kankawa, MD, Tsugio Hirota, MD, and Fumihiko Kato, MD, PhD

Preserve 88% of motion...

Posterior Approach

Advantages

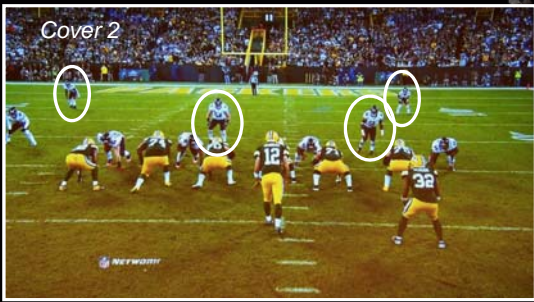
- Avoid anterior neck complications
- Avoid fusion disease
- Bracing



Disadvantages

- Inconsistent axial pain relief
- Posterior muscle disruption
- Recovery time
- Indirect decompression

OD Spinal B&M





An Analysis of Factors Causing Poor Surgical Outcome in Patients With Cervical Myelopathy Due to Ossification of the Posterior Longitudinal Ligament

Anterior Decompression With Spinal Fusion Versus Laminoplasty


Yutaka Masaki, MD, Masashi Yamazaki, MD, PhD, Akihiko Okawa, MD, PhD, Masaki Aramomi, MD, Mitsuhiro Hashimoto, MD, Masao Koda, MD, PhD, Makoto Mochizuki, MD, and Hideshige Moriya, MD, PhD

Journal of Spinal Disorders & Techniques

- 19 anterior fusion vs. 40 laminoplasty
- Anterior > posterior in outcome (JOA scores)
- Elderly pt with laminoplasty with especially poor outcome
- Hypermobility at level of cord compression could be risk factor for poor surgical outcome after laminoplasty

- Epstein et al 1993
- Fessler et al 1998
- Iwasaki et al 2007
- Sakai et al 2011

2/15/2017




Management of degenerative cervical myelopathy – An update


ANDREI F. JOAQUIM^{1*}, ENRIKO GHIZONI¹, HELDER TEDESCHI¹, WELLINGTON K. HSU², ALPESH A. PATEL³

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- Anterior vs. Posterior approaches
- Similar neurologic recovery rates
- Laminoplasty increased neck pain
- ACDF increased ASD
- Multilevel corpectomy/laminectomy with increased complications
 - Graft, instrumentation, approach-related
- Multilevel corpectomy/laminectomy w fusion have decreased ROM (vs. laminoplasty)



Cervical Myelopathy



- Demographics
 - Age
 - Gender
 - Body Habitus
 - Previous Surgery
- Outcomes
 - Pain relief
 - Function



Search: PubMed Limits Advanced search Help

"laminoplasty" and "surgical technique"

Where should a laminoplasty start? The effect of the proximal level on post-laminoplasty loss of lordosis
Keith W. Michael, MD*, Thomas M. Neustein, BA*, John M. Rhee, MD**

Start LP at C4
C3 & C7 dome
↑ lordosis


Comparative Effectiveness of Open-Door Laminoplasty Versus French-Door Laminoplasty in Cervical Compressive Myelopathy
Hiroaki Nakashima, MD*, Fumihiko Kato, MD†, Yuzutaga Yukawa, MD†, Shiro Inagama, MD*, Keigo Ito, MD†, Masaaki Maruho, MD† and Naoki Ishiguro, MD*

FD > OD in preserving lordosis
ROM ↓ in OD
OD ↑ opening
= improvement
= lordosis
LF ↑ complications, nerve palsies

Laminectomy and fusion vs laminoplasty for multi-level cervical myelopathy: a systematic review and meta-analysis
Kevin Phan^{1,2,3}, Daniel R. Scherman⁴, Joshua Xu¹, Vanessa Leung⁵, Sahab Virk⁶, Ralph J. Makha^{1,2,3}


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Surgical Approach: Anatomic Awareness

- Using all of the information around you
 - Demographics
 - Pathology
 - IMAGING
- Can affect decision-making

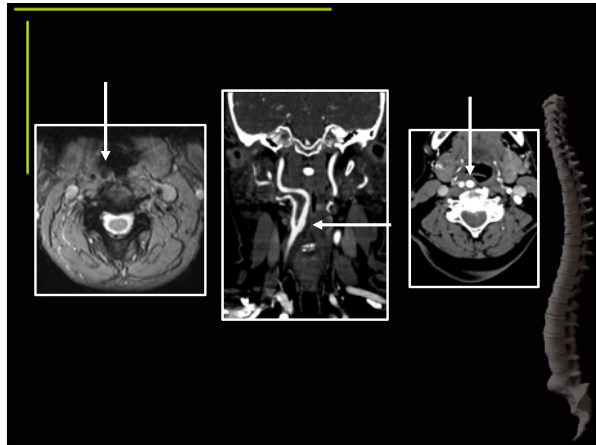


Tortuous Vertebral Artery

- LEFT usually dominant

2.7% incidence of aberrant VA course
Bohlman, Spine, 2000

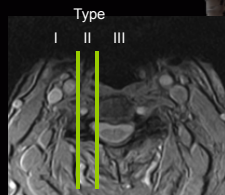




Incidence and Risk Factors of the Retropharyngeal Carotid Artery on Cervical Magnetic Resonance Imaging

Jason Koreckij, MD,* Hasham Alvi, MD,† Robert Gibby, PhD,‡ Eric Pang, BS,† and Wellington K. Hsu, MD§

- Anomalies occur 12% of the time
- More likely to be:
 - Right-sided
 - Cephalad cervical levels
 - Elderly females over 60 years of age
 - Severe spondylosis
 - Kyphotic alignment



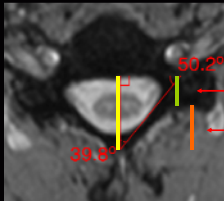
The Triangle Model of Congenital Cervical Stenosis

Tyler J. Jenkins, MD, Harry T. Mai, BS, Robert J. Burgmeier, BS, Jason W. Savage, MD, Alpesh A. Patel, MD, and Wellington K. Hsu, MD

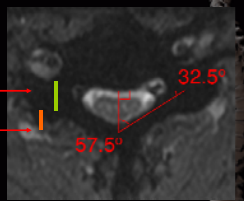
- MRI database of 1000 patients
- CCS defined as
 - Age < 50 yo
 - mid-sagittal canal diameter < 10 mm
 - Multiple levels from C3-C7
 - Measured at pedicle level
- 68 patients met inclusion criteria (CCS)
 - 14 age-matched controls
- CCS patients with smaller lateral mass, flatter angles causing stenosis
- Posterior elements are driving force for congenital stenosis



Normal

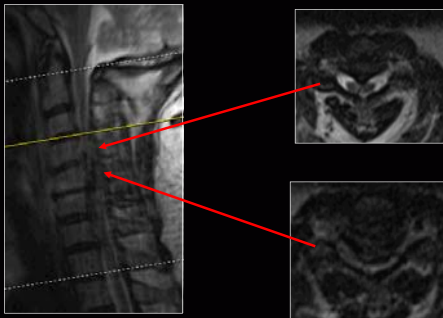


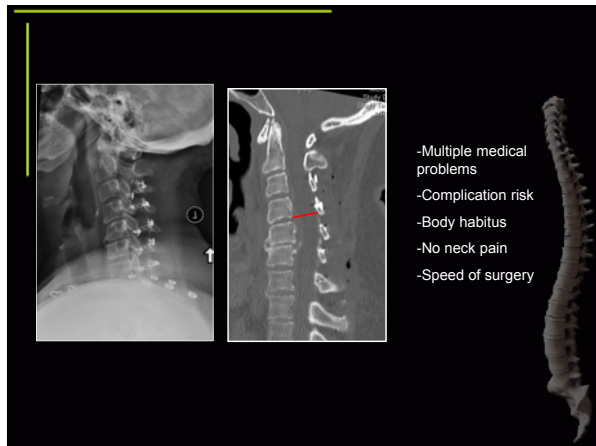
Congenital Stenosis

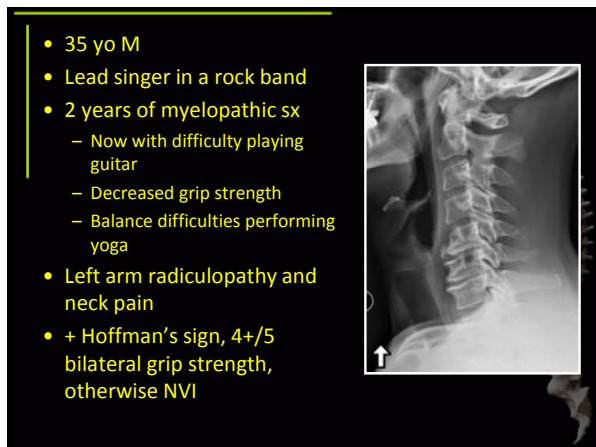


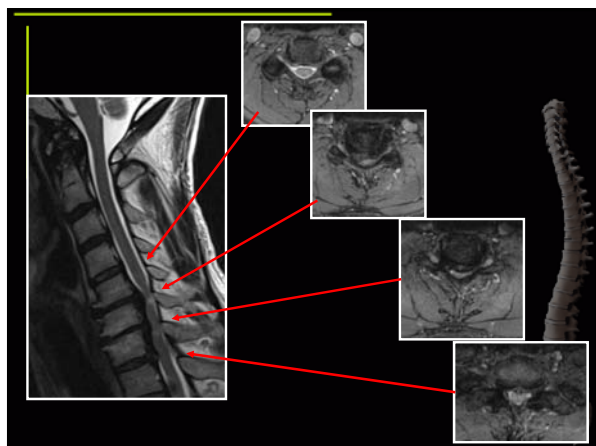
Triangle Model – Posterior-based anomaly
Surgical treatment should be posteriorly based

55 yo F, 450#, 6 mo h/o inability to ambulate, no bowel/bladder, MMP













Laminoplasty is best

- Myelopathic patients deserve individualized treatment plans
- Subset of myelopathy patient population that this procedure is ideal for
 - Little neck pain
 - Lordosis
 - Multilevel pathology
 - Congenital stenosis
 - Need for retained ROM
 - Multiple comorbidities



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