

ANTERIOR VS POSTERIOR APPROACHES TO CERVICAL MYELOPATHY

Jason C Tinley, MD

DFW Center for Spinal Disorders, PLLC

Dallas/Fort Worth, Texas





2/22/2019 Innovasis Symposium - Park City, UT

ANTERIOR VS POSTERIOR – CONSIDERATIONS?

- Location of pathology
- Obesity – anterior and posterior fat depth
- Postop pain
- Strength of fixation - Smoking/nonunion/high demand risks
- EBL
- Postop paraspinous degeneration and function
- Avoidance of fusion – (ADR, laminectomy alone, laminoplasty)
- Comorbidities and tolerance to procedure
- Surgeon comfort level (location of training and familiarity with approaches)

CERVICAL MYELOPATHY CLASSIFICATION

Nurick Classification	
Grade 0	Root symptoms only or normal
Grade 1	Signs of cord compression; normal gait
Grade 2	Gait difficulties but fully employed
Grade 3	Gait difficulties prevent employment, walks unassisted
Grade 4	Unable to walk without assistance
Grade 5	Wheelchair or bedbound
Based on gait and ambulatory function 	
Ranawat Classification	
Class I	Pain, no neurologic deficit
Class II	Subjective weakness, hyperreflexia, dyssthesias
Class IIIA	Objective weakness, long tract signs, ambulatory
Class IIIB	Objective weakness, long tract signs, non-ambulatory
Japanese Orthopaedic Association Classification	
<ul style="list-style-type: none">• A point scoring system (17 total) based on function in the following categories <ul style="list-style-type: none">◦ upper extremity motor function◦ lower extremity motor function◦ sensory function◦ bladder function	

WHAT DETERMINES SUCCESS? DO WE REALLY KNOW?

[Eur Spine J.](#) 2014 Feb;23(2):362-72. doi: 10.1007/s00586-013-3043-7. Epub 2013 Oct 5.

Anterior corpectomy versus posterior laminoplasty for multilevel cervical myelopathy: a systematic review and meta-analysis.

[Liu X¹](#), [Min S](#), [Zhang H](#), [Zhou Z](#), [Wang H](#), [Jin A](#).

- Corpectomy if <3 levels, but complication rates lower with laminoplasty if 3 or more
- (No Level 1 evidence in meta-analysis of 14 studies)

[J Neurosurg Spine.](#) 2012 May;16(5):425-32. doi: 10.3171/2012.1.SPINE11467. Epub 2012 Feb 10.

Perioperative and delayed complications associated with the surgical treatment of cervical spondylotic myelopathy based on 302 patients from the AOSpine North America Cervical Spondylotic Myelopathy Study.

[Fehlings MG¹](#), [Smith JS](#), [Kopjar B](#), [Arnold PM](#), [Yoon ST](#), [Vaccaro AR](#), [Brodke DS](#), [Janssen ME](#), [Chapman JR](#), [Sasso RC](#), [Woodard EJ](#), [Banco RJ](#), [Massicotte EM](#), [Dekutoski MB](#), [Gokaslan ZL](#), [Bono CM](#), [Shaffrey CI](#).

- Prospective, multicenter analysis
- 15.6% complication rate
- Direct correlation with Age, EBL, Operative Time, and Combined A/P procedures
- NO direct correlation with Obesity, Smoking, Front vs Back, or JOA score

Spinal Cord Expansion After Decompression in Cervical Myelopathy: Investigation by Computed Tomography Myelography and Ultrasonography

[Matsuyama, Yukihiro, MD](#); [Kawakami, Noriaki, MD](#); [Mimatsu, Kentaro, MD](#)

[Spine: August 1995 - Volume 20 - Issue 15 - p 1657-1663](#)

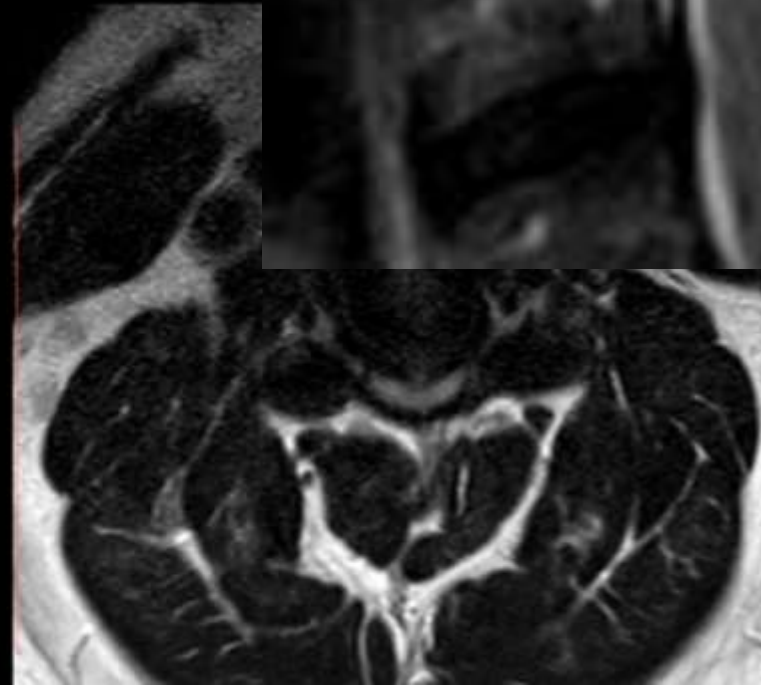
- Japanese study (~1/2 OPLL pts) of 44 pts undergoing posterior decompression
- 68% that had cord expansion postop had good recovery, 32% of those not expanding had good recovery

WHAT DETERMINES SUCCESS? DO WE REALLY KNOW?

- Other studies suggest:
 - Compression Ratio of <0.4 is associated with worse outcome
 - Signal change on T1 or extending 2 levels on T2 associated with worse outcome
 - Duration of symptoms in elderly more relevant than Age < 65

MYELOPATHY CASE 1 – ISOLATED ANTERIOR DISC

- 56 y/o working male, 6'8", 405 lb (shortest of 3 brothers)
- Nonsmoker, nondiabetic
- C3/4 severe central stenosis
- Progressive weakness, numbness in hands, shuffling gait x
- Preop pain 2/10



MYELOPATHY CASE 1 – ISOLATED ANTERIOR DISC

- C3/4 ACDF (Considered ADR but gigantic)
- Full resolution of all symptoms at 3 weeks



3 mos postop



MYELOPATHY CASE 2 – (VERY) MULTILEVEL ANTERIOR PATHOLOGY WITH SEVERE COMORBIDITIES

-
-
-
-
-

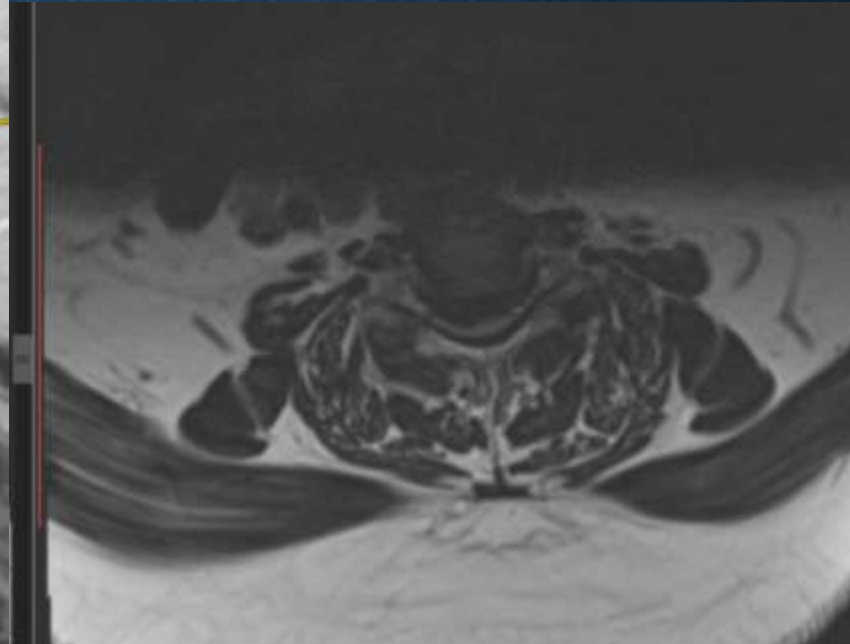


(+ after this visit)

al failure with 5-lb weight gain in 1 week

mbness in upper and lower extremities, walks with
requent falls

tral stenosis (up to 2mm ap diameter)



MYELOPATHY CASE 2 – (VERY) MULTILEVEL ANTERIOR PATHOLOGY WITH SEVERE COMORBIDITIES

- Considerations for treatment?
 - Medical clearance – not an emergent case – (sent her to ER from clinic)
 - High risk of nonunion, infection, heart/lung complications, failure to improve
 - Morbidly Obese Diabetic in ARF
- Surgical Options
 - C3-T2 corpectomy, C2-T3 anterior decompression and fusion
 - Selective anterior decompressions and Posterior lami +/- fusion
 - Posterior only: lami +/- fusion and +/- instrumentation

MYELOPATHY CASE 2 – (VERY) MULTILEVEL ANTERIOR PATHOLOGY WITH SEVERE COMORBIDITIES

- C2-T3 laminectomy and instrumented fusion
- Outcome:
 - Immediate improvement of numbness, pain, strength, and numbness
 - Inpatient rehab x 3 weeks
 - Remained on walker for low back deconditioning
 - 3 months to resolve a C6 radicular paresthesia
 - Overall thrilled with improvement in functional lifestyle
 - Still alive



MYELOPATHY CASE 3 – MULTILEVEL ANTERIOR PATHOLOGY WITH SEVERE COMORBIDITIES

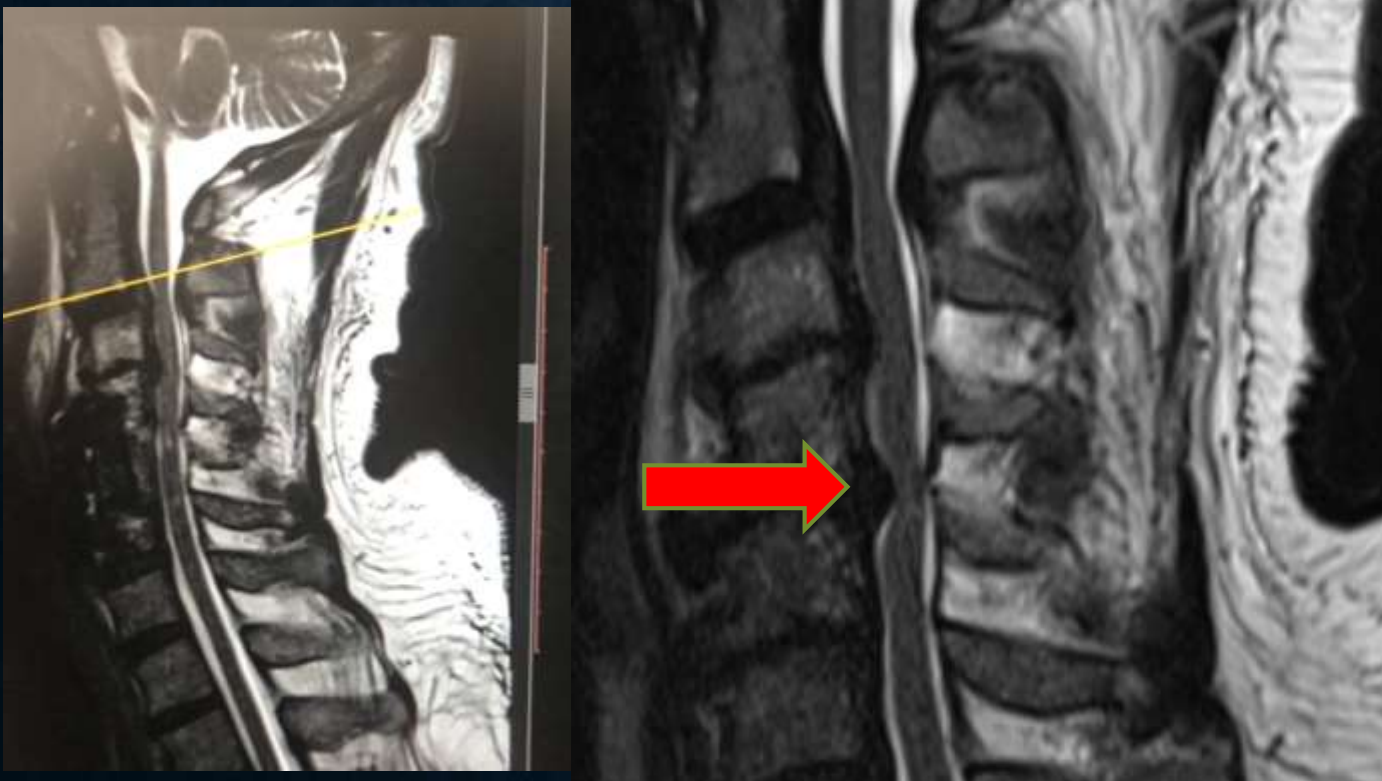
- 68 y/o male with severe CAD s/p CABG
- Non-diabetic, non-smoker
- Profound myelopathy, pain 7/10, focal C6 radiculopathy
- C3/4 moderate-severe and C4/5 severe central stenosis with cord changes, 5/6 bilateral Foraminal stenosis
- Other levels of less severe stenosis
- Options?
 - Acdf's vs corpectomy?
 - Anterior and posterior decomp



MYELOPATHY CASE 3 – MULTILEVEL ANTERIOR PATHOLOGY WITH SEVERE COMORBIDITIES

- C5 Corpectomy in November 2017 – left C3/4 alone due to moderate level
- Outcome – continued symptoms, mild to moderate improvement in any symptoms, definite worsening of myelomalacia under 4/5
- 3 Heart stents placed early January 2018, no more surgery for 1 year
- Requested posterior decompression in late January 2018...

6 weeks post C4 corpectomy **Pre-corpectomy cord changes**



14 months post C4 corpectomy



MYELOPATHY CASE 3 – MULTILEVEL ANTERIOR PATHOLOGY WITH SEVERE COMORBIDITIES

- Options?
 - Nothing – (duh)
 - C2-7 posterior decompression, fusion, and hopeful improvement of lordosis with instrumentation this coming Tuesday

Thanks!!!

(Wish me luck with #3...)