Hyperlordotic Cervical Cages

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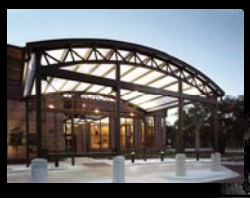
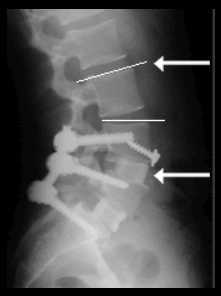
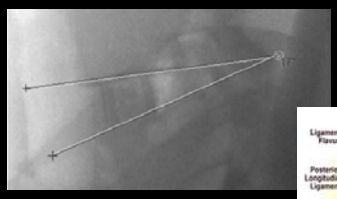


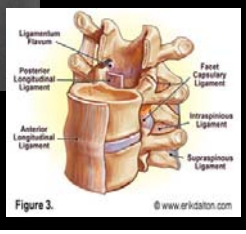
Sagittal Balance

Using Anterior Column



ALL Release

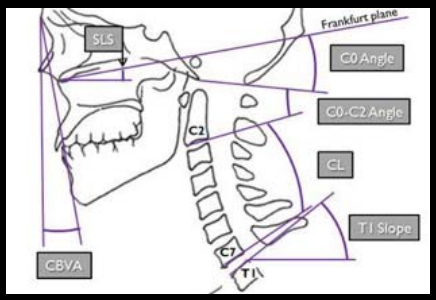




Hyperlordotic Cages

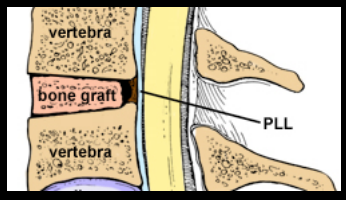
We will get back to Dr Anand

Cervical Balance



Same Principles Apply as Lumbar

Shouldn't we maximize Lordosis



Maximize Lordosis?

But native motion is different

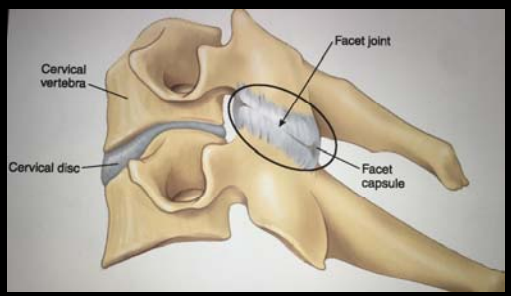
Table 15-1 Normal Cervical Spinal Values in Asymptomatic Adults from the Literature*

Level	Angle (Degrees)	Age Group (yr)	Men (Degree)	Women (Degree)
C0-C1	2.1 ± 5.0	20-25	16 ± 16	15 ± 10
C1-C2	−32.2 ± 7.0	30-35	21 ± 14	16 ± 16
C2-C3	−1.9 ± 5.2	40-45	27 ± 14	23 ± 17
C3-C4	−1.5 ± 5.0	50-55	22 ± 15	25 ± 11
C4-C5	−8.6 ± 4.4	60-65	22 ± 13	29 ± 14
C5-C6	−1.1 ± 5.1			
C6-C7	−4.5 ± 4.3			
C2-C7	−9.6			
Total (C1-C7)	−41.8			

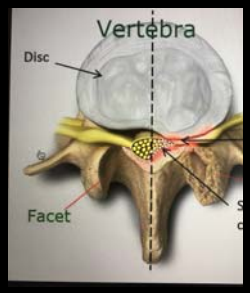
Odontoid marker at C7	15.6 ± 11.2 mm
Odontoid marker at sacrum	13.2 ± 29.5 mm

*Values presented as the means ± SD and the negative sign indicates lordosis in the segmental values.

Anatomy is different

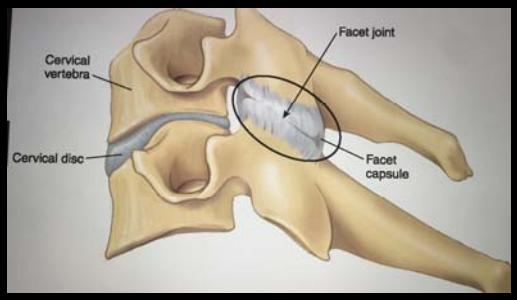


Lumbar facet can override and decrease posterior height



Cervical facets glide

Facets impinge



Keep distracting?

We know this happens

As does this

- Wrong technique?

Poor Bone?

OR

OR

- Wrong technique?

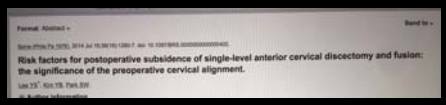
Wrong Technique?

Interbody=correction


Cage subsidence does not, but cervical lordosis improvement does affect the long-term results of anterior cervical fusion with stand-alone cage for degenerative cervical disc disease: a retrospective study.

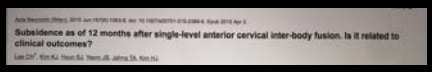
Better Lordosis Correction with interbody
Higher Subsidence rate
Better retained lordosis trended toward better outcome
Attaining fusion was the most important factor

Plates Help


Risk factors for postoperative subsidence of single-level anterior cervical discectomy and fusion: the significance of the preoperative cervical alignment.

Adding a plate helps with subsidence
Trended toward better lordosis
Fusion still most important variable

Conflicting Evidence?


Subsidence as of 12 months after single-level anterior cervical inter-body fusion. Is it related to clinical outcomes?

Subsidence occurred in 46% of patients
Global balance still maintained
Fusion was most important variable to outcome

But back to 2007

J Clin Neurosci. 2008 Sep;15(9):1017-22. doi: 10.1016/j.jocn.2007.05.011. Epub 2008 Jul 23.

Stand-alone interbody cage versus anterior cervical plate for treatment of cervical disc herniation: sequential changes in cage subsidence.

Fujibayashi S[1], Neo M, Nakamura T.

Author information

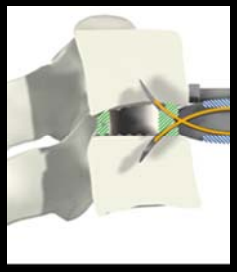
Abstract

Anterior cervical discectomy and fusion with an autogenous iliac bone graft is the gold standard treatment for cervical disc herniation. However, autologous bone grafts obtained from the anterior iliac crest are associated with significant donor-site morbidity and complications. To decrease bone graft-related problems, several types of interbody fusion cage have been developed and are used widely in clinical practice. We compared the clinical and radiological outcomes for two surgical procedures used to treat cervical disc herniation: the stand-alone interbody cage and autologous iliac bone grafting with an anterior plate. The clinical results did not differ between patients treated with the two procedures. The stand-alone cage was less invasive and had less donor-site morbidity. In patients treated with the bone graft and plate, the alignment of the fused segment was maintained in all but one patient, who exhibited nonunion. In contrast, in the cage-treated group, 44% of patients exhibited loss of lordotic alignment of more than 5 degrees and cage subsidence of 3 mm or more. All cage subsidence occurred within 3 months of surgery. Although the stand-alone cage was a less invasive and more effective procedure to treat cervical disc herniation, surgeons should consider the possible drawbacks of the associated subsidence.

Subsidence occurred frequently
Loss of Lordosis was more common in stand alone
Fusion was the only variable that mattered to outcome

So Hyperlordotic cages

Better distraction-Better Lordosis

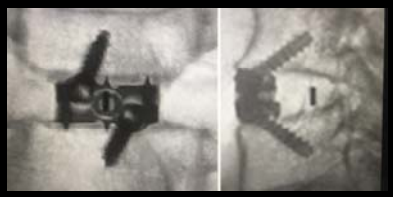


Nobody will talk
Nothing is published

FYI Patients like their scar selfies

My experience

- I performed 10 levels using 12 degree implant
- 8 subsided anteriorly
- The 4 that didn't subside looked like this



Back to Dr Anand

- We have already seen in the Lumbar spine that carpentry and releases matter
- Lordosis doesn't come from the anterior distraction- It comes from anterior distraction AND posterior carpentry/compression
- Is the same true in the C-spine

How I use them now

- To most closely match the patients native alignment in single level acdf
- In conjunction with posterior facet resection when the surgery is for global alignment
- But lets talk about letting the patients find their native alignment- Dr Zigler