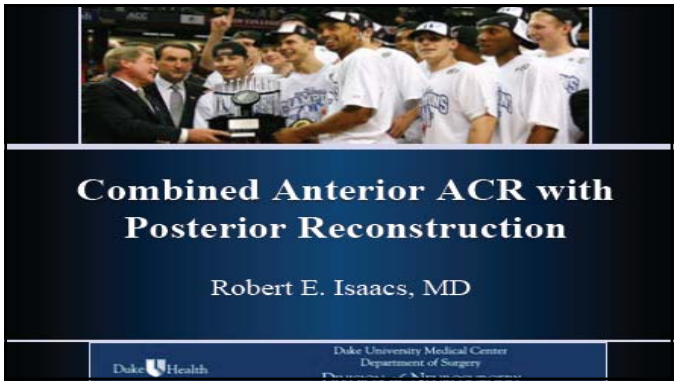


Combined Anterior ACR with Posterior Reconstruction

Robert E. Isaacs, MD

Duke University Medical Center
Department of Surgery

Disclosures

- Consultant
  - Baxano
  - Nuvasive
  - Vertera
- Stock Holder
  - SafeWire
  - VilaSpine
  - SafeRay Spine
  - Vertera
  - Providence
- Scientific Advisory Board
  - Providence
- Travel Reimbursement
  - Vertera
  - ACSR
- Research Support
  - Nuvasive
- Royalties
  - Nuvasive

A Prospective, Nonrandomized, Multicenter Evaluation of Extreme Lateral Interbody Fusion for the Treatment of Adult Degenerative Scoliosis

Perioperative Outcomes and Complications

Robert E. Isaacs, MD,* Jonathan Hyde, MD,† J. Allan Goodrich, MD,‡ William Blake Rodgers, MD,§ and Frank M. Phillips, MD¶

N=107
Average Age: 68.4 yrs (45-87)
72.9% Female
Average BMI: 28.4 (16.1-42.4)
Total 451 levels fused (4.4/ case) / range: 1-9
344 IBF levels (3.2/case) / range: 1-6
– 322 XLIFs / 22 L5-S1

Isaacs, et al, *Spine*, 2010

Spine
Deformity

Adult Degenerative Scoliosis Treated With XLIF

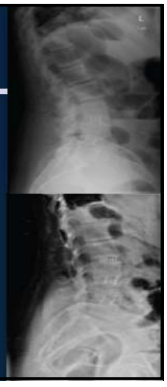
Frank M. Phillips, MD,* Robert E. Isaacs, MD,† William Blake Rodgers, MD,‡ Kaveh Khajavi, MD,§,¶ Antoine G. Tohmeh, MD,‖ Vedat Deviren, MD,** Mark D. Peterson, MD,†† Jonathan Hyde, MD,‡‡ and Mark Kuck, MD*

TABLE 1. Radiographical Results: Coronal Cobb Angles

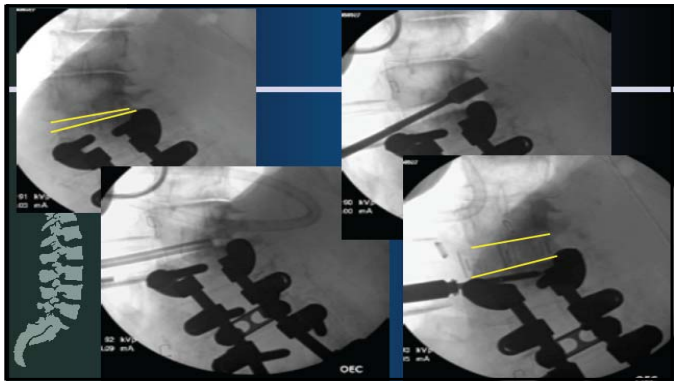
	Preoperation n, Mean (SD)	Postoperation n, Mean (SD)	24 mo n, Mean (SD)	Change Pre- to Postoperation Mean (SD), Percent Change, *P*	Change Postoperation to 24 mo Mean (SD), *P*
Total population	91, 20.9 (10.4)	86, 13.5 (9.2)	68, 15.2 (10.6)	−7.4 (8.2), 35.4%, <0.001	1.6 (5.2), 0.019
Supplemental fixation					
Stand alone	14, 19.4 (5.9)	14, 15.4 (8.6)	13, 18.9 (11.4)	−5.1 (4.0), 26.2%, 0.001	3.9 (4.5), 0.025*
Lateral plate	7, 18.7 (8.0)	6, 10.3 (6.0)	4, 13.7 (9.2)	−8.5 (6.7), 45.4%, 0.027*	3.0 (5.3), 0.431*
Unilateral pedicle screws	27, 15.5 (7.0)	25, 13.2 (7.5)	21, 14.3 (8.6)	−2.3 (5.1), 14.8%, 0.035	1.1 (3.1), 0.178
Bilateral pedicle screws	43, 25.2 (12.0)	43, 13.6 (10.7)	31, 14.6 (11.7)	−11.2 (9.2), 44.4%, <0.001	1.0 (6.1), 0.385

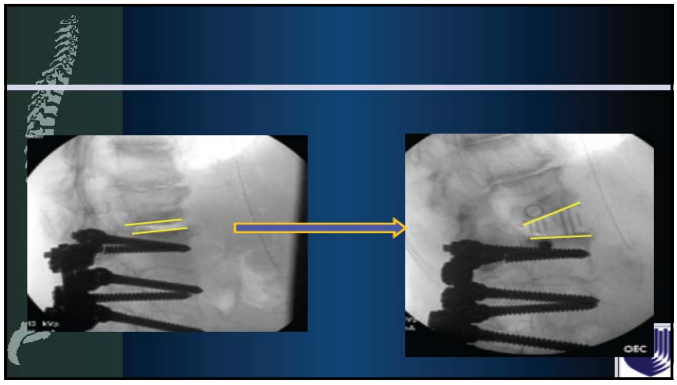
Radiographic Results: Lordosis

- Correction of lordosis was not significantly different between fixation groups (p=0.298)*

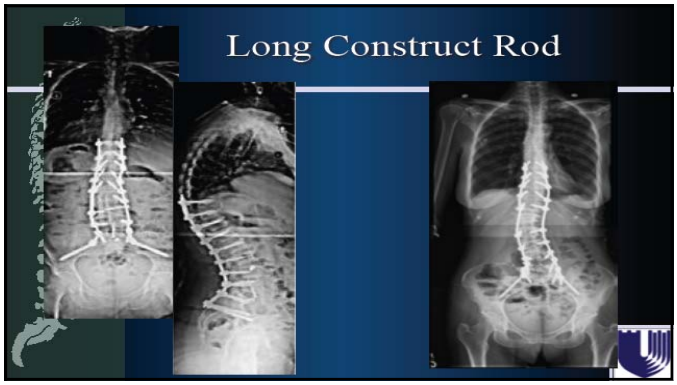


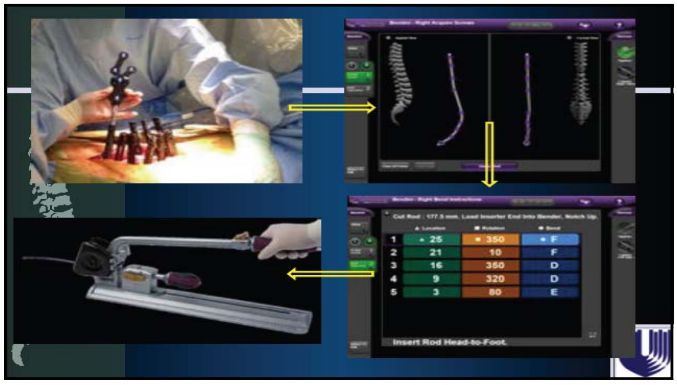

ACR

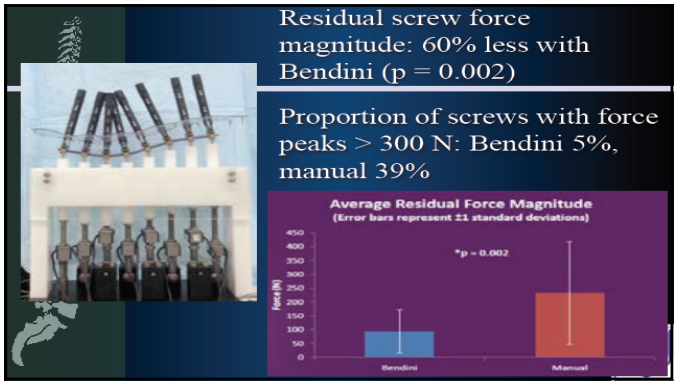

OEC

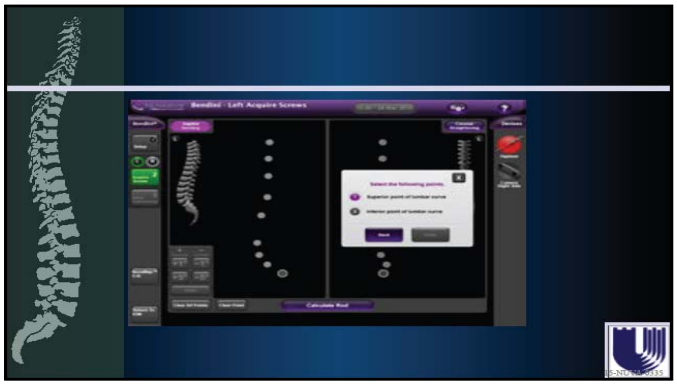

OEC

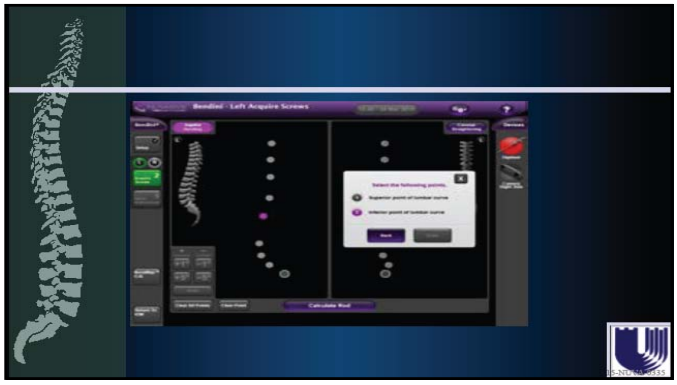

Preop
Postop

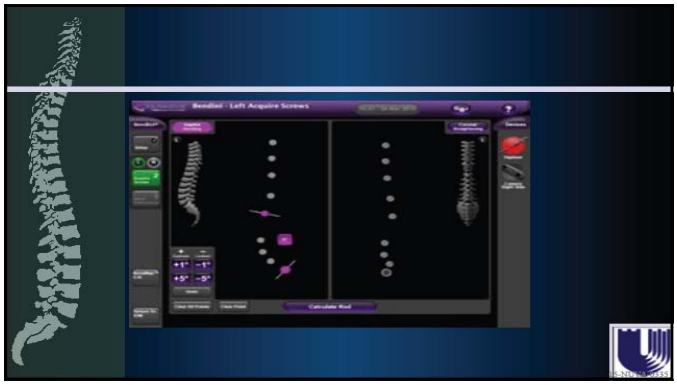

Long Construct Rod

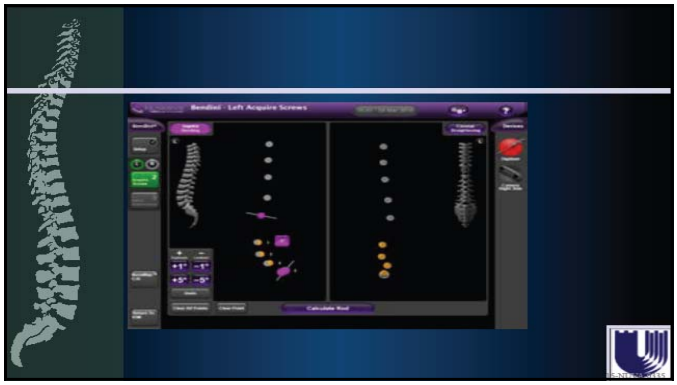

Insert Rod Head-to-Foot.

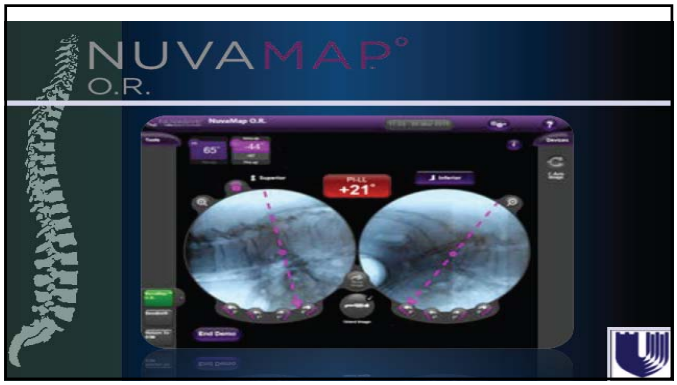

Residual screw force magnitude: 60% less with Bendini (p = 0.002)
Proportion of screws with force peaks > 300 N: Bendini 5%, manual 39%
Average Residual Force Magnitude
(Error bars represent ±1 standard deviations)
*p = 0.002
Force (N)
450
400
350
300
250
200
150
100
50
0
Bendini
Manual



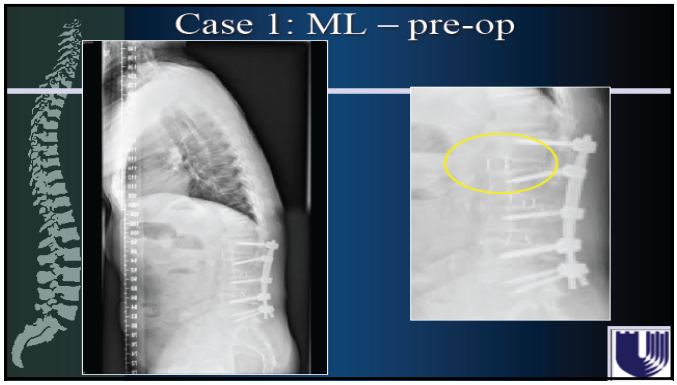


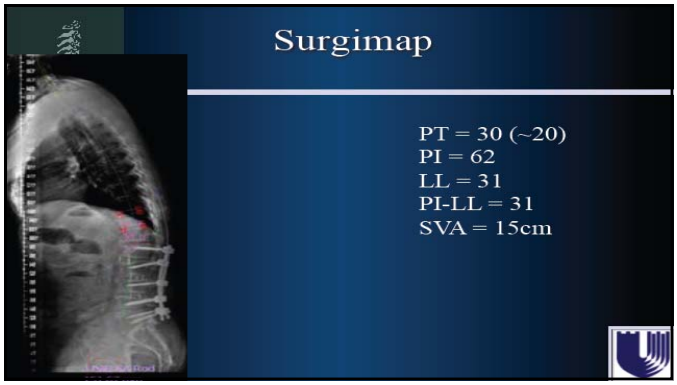


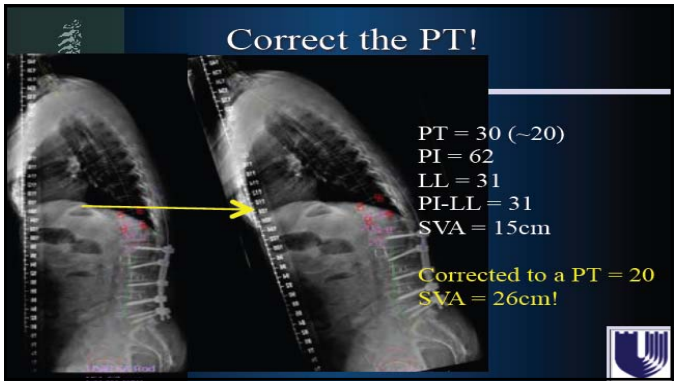


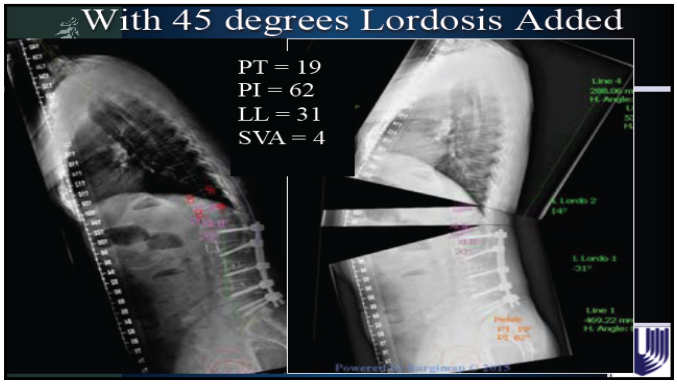

NUVAMAP
O.R.
+21°

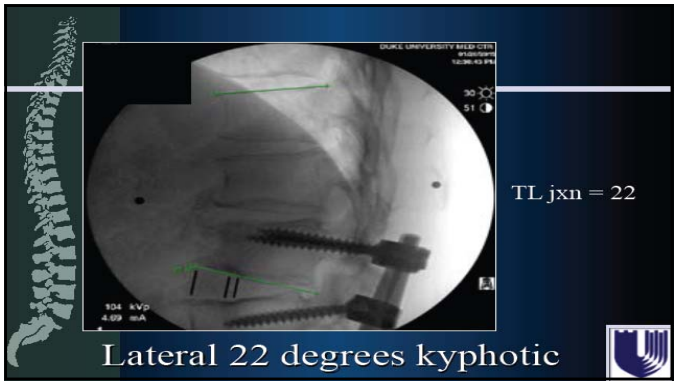

Assess Where You Are
Change It To What You Need

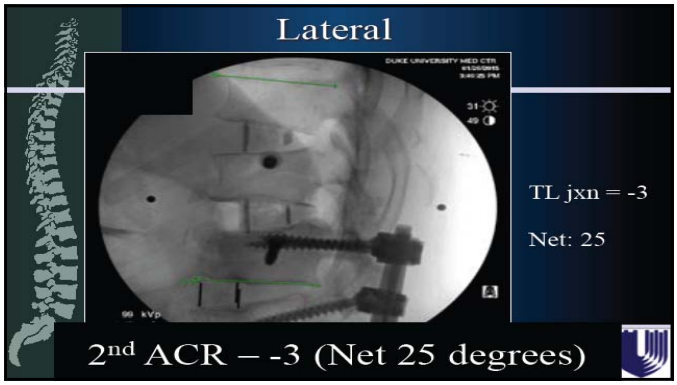

Case 1: ML – pre-op

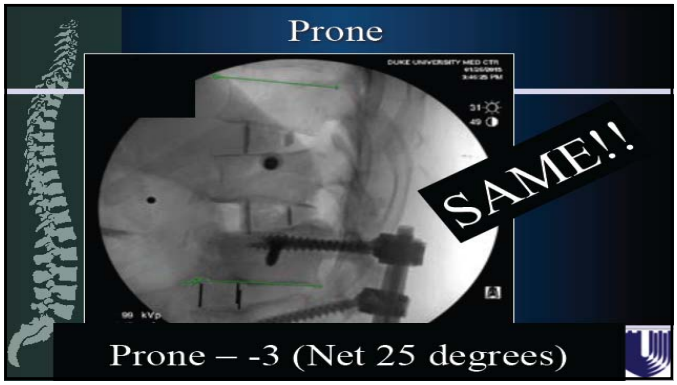

Surgimap
PT = 30 (~20)
PI = 62
LL = 31
PI-LL = 31
SVA = 15cm


Correct the PT!
PT = 30 (~20)
PI = 62
LL = 31
PI-LL = 31
SVA = 15cm
Corrected to a PT = 20
SVA = 26cm!


With 45 degrees Lordosis Added
PT = 19
PI = 62
LL = 31
SVA = 4


TL jxn = 22
Lateral 22 degrees kyphotic


Lateral
TL jxn = -3
Net: 25
2nd ACR – -3 (Net 25 degrees)


Prone
SAME!!
Prone – -3 (Net 25 degrees)

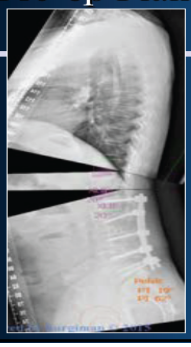
Technique

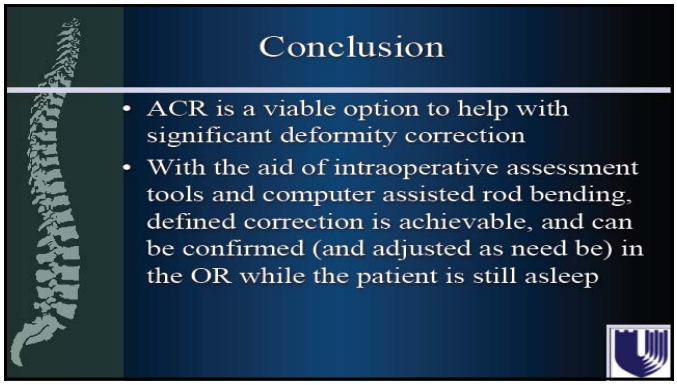
- Temporary Rod
- 2 level Ponce Osteotomy
- Bendini with the addition of 26 degrees of Lordosis
- Placement of Rod on the Opposite side
- Lock down
- Compression
- Remove the Temporary Rod and Bendini the ipsilateral side

After the Posterior Osteotomy

Bendini / Osteotomies – -28 (Net 50 degrees)

Pre-op Plan Post-op




Conclusion
• ACR is a viable option to help with significant deformity correction
• With the aid of intraoperative assessment tools and computer assisted rod bending, defined correction is achievable, and can be confirmed (and adjusted as need be) in the OR while the patient is still asleep