



Shorter Anesthesia Time and Improved Initial Curve Correction with an Alternative Risser Casting Technique

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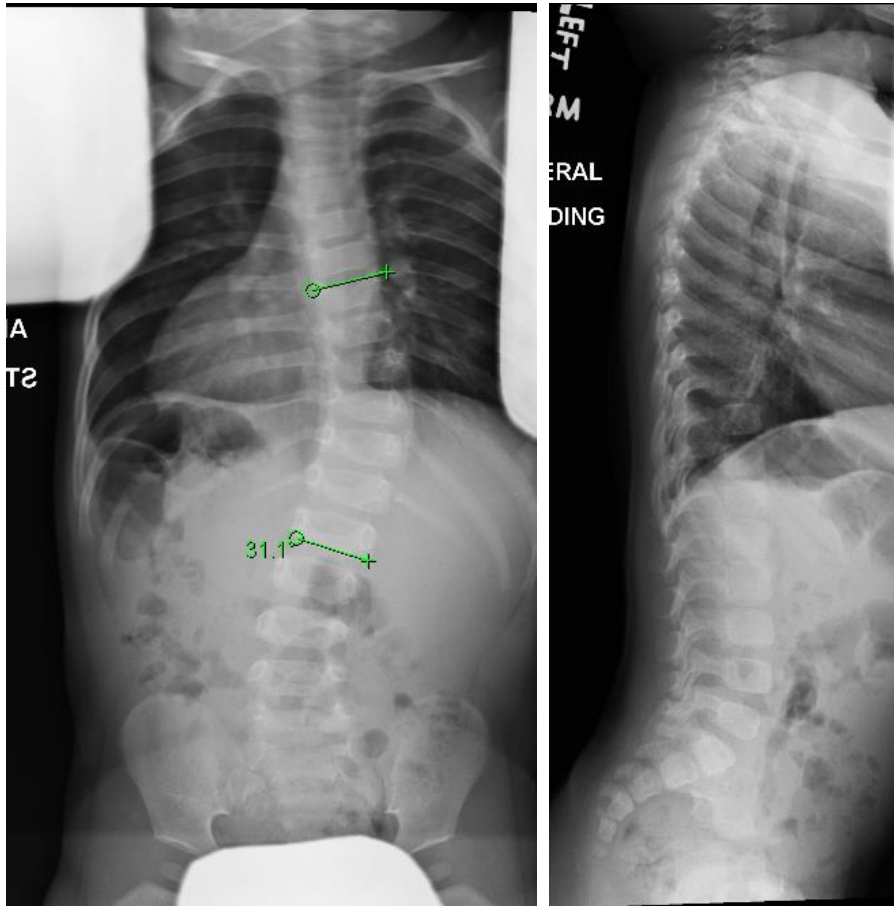


Disclosures

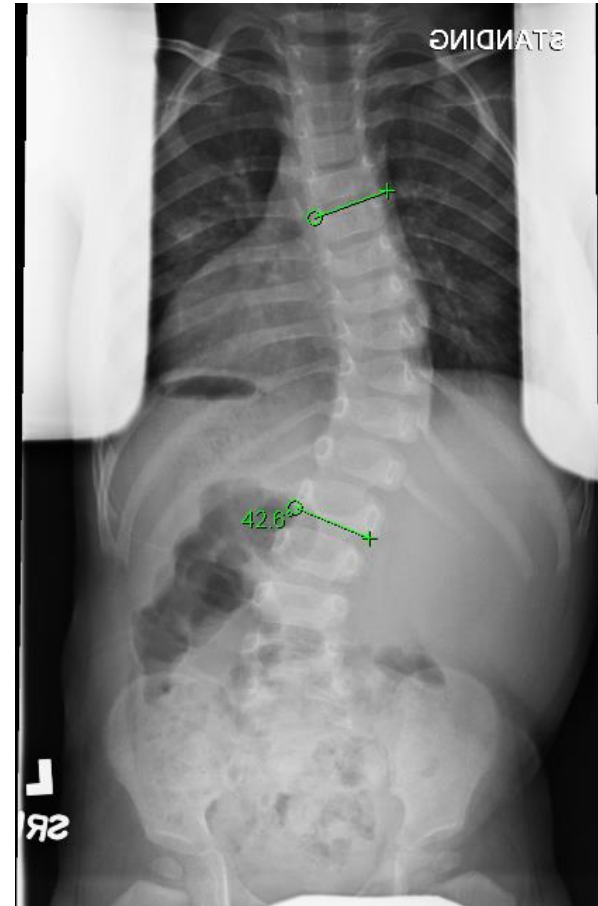
- Robert Lark : Nuvasive, Depuy Synthes



Case Presentation

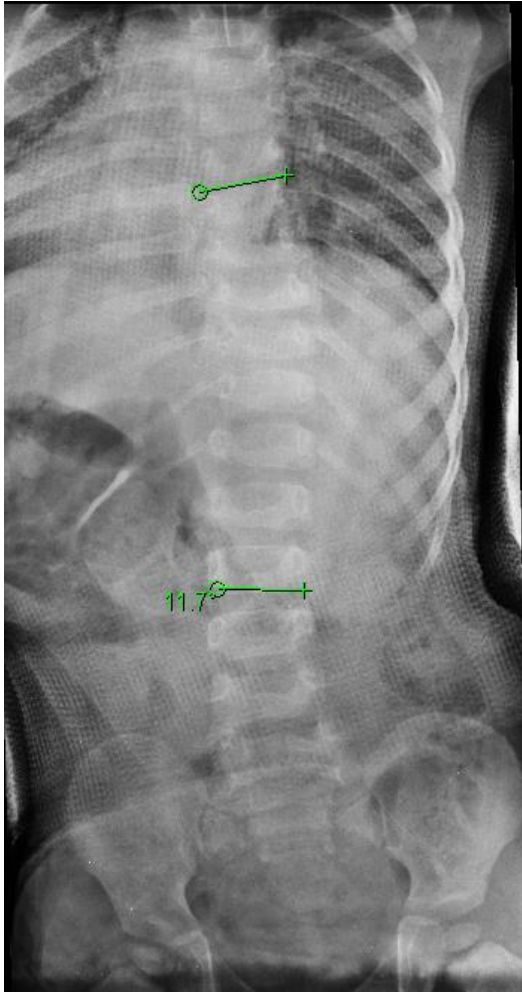


13 months



16 months

Case Presentation – in cast films



17 months

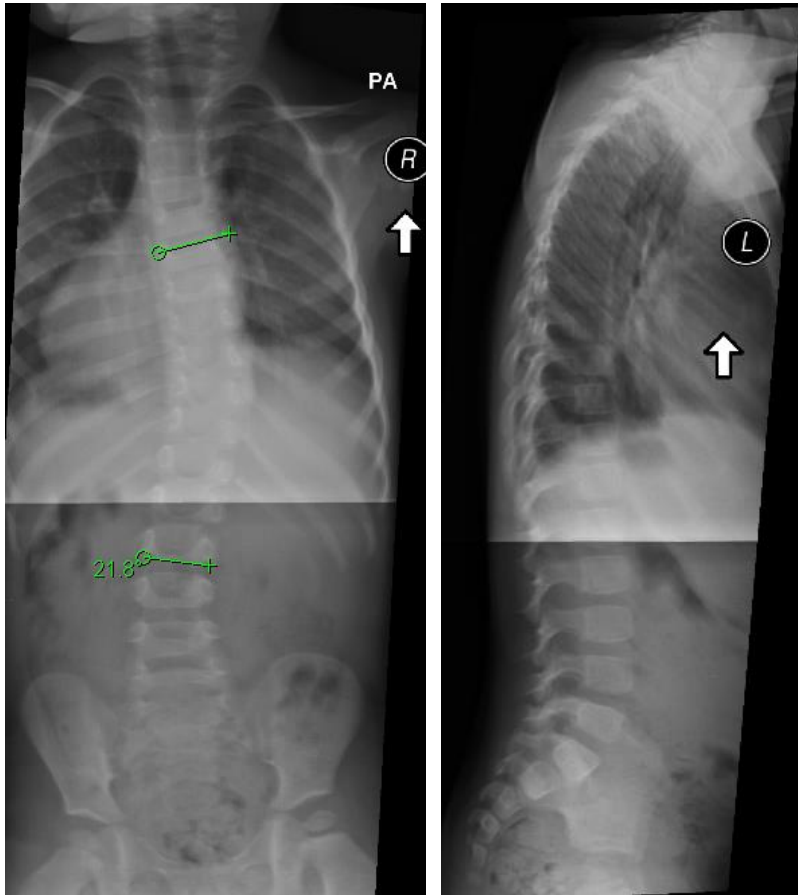


19 months

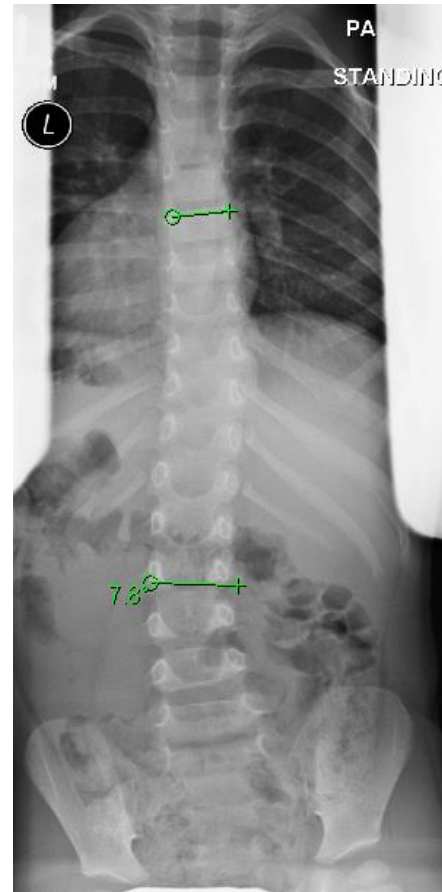


21 months

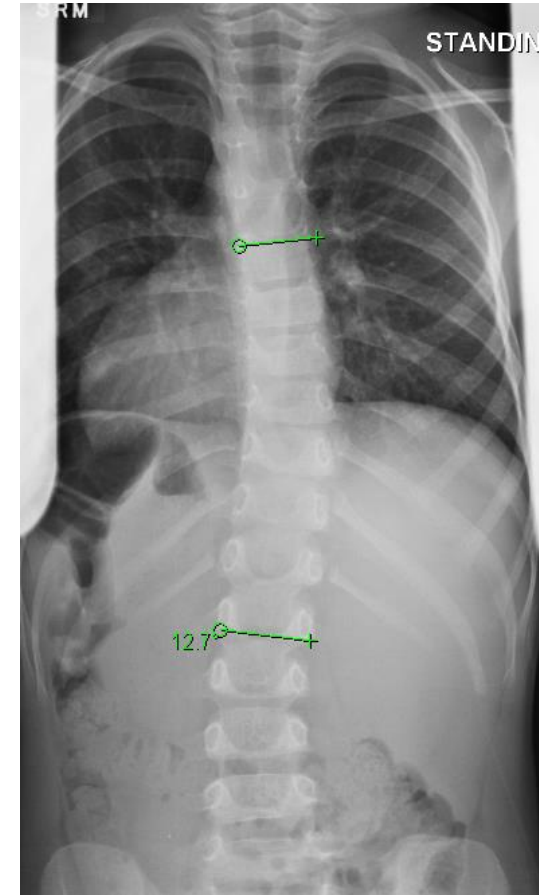
Case Presentation



2+1 years

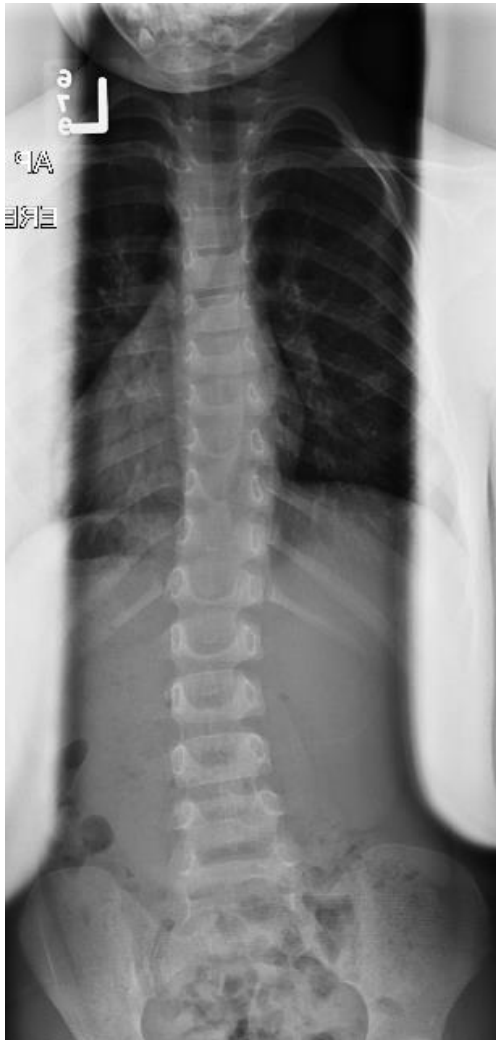


2+7 years

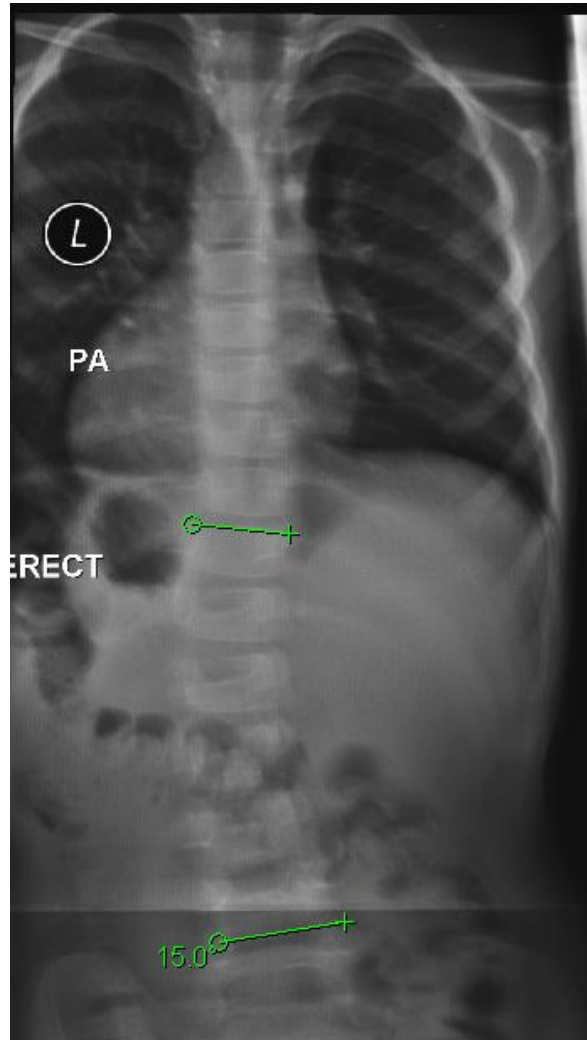


3+1 years

Case Presentation



3+6 years



4+0 years



4+6 years



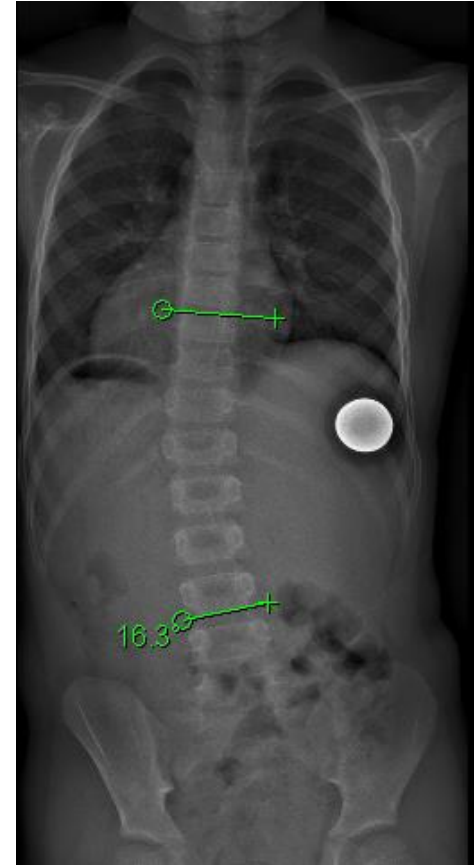
Case Presentation



5 years



6 years



7 years





Background

- EDF casting works for **(IS)**^{1,2}
- Improved results when **GA and NMB agents** are used³
- Multiple casts → **Multiple Anesthetics**
- Children < 3 y.o. may experience **potential neurocognitive sequelae**^{4,5,6}



FDA review results in new warnings about using general anesthetics and sedation drugs in young children and pregnant women

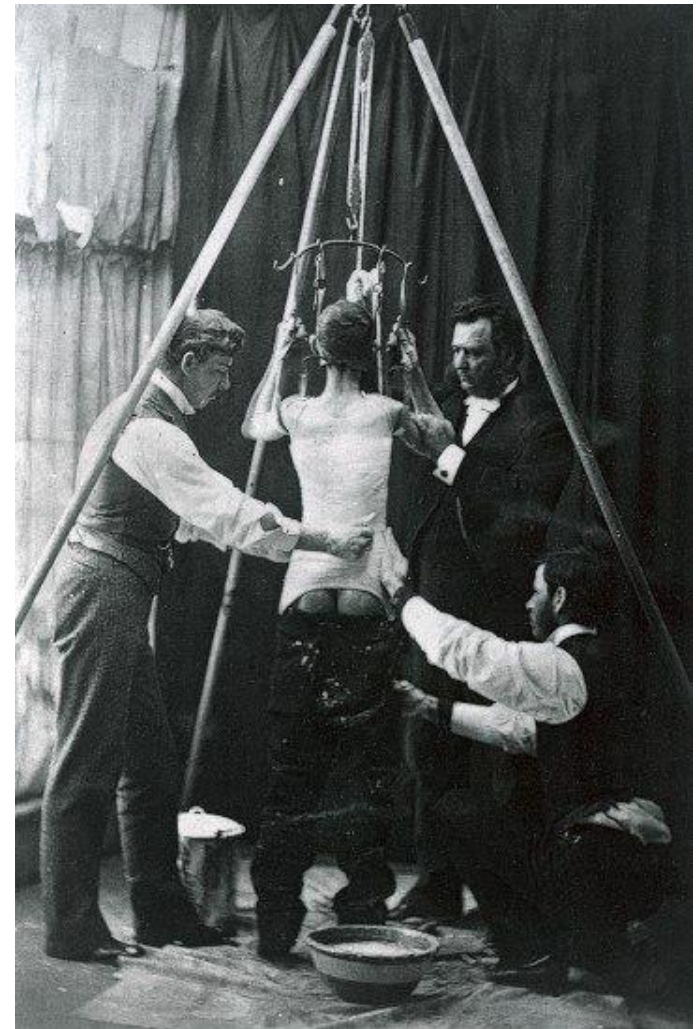
Safety Announcement





Hypothesis

- Utilizing a cantilever bending technique for cast application will reduce anesthetic time with equal or improved curve correction compared to traditional techniques





Methods

- Retrospective review
 - Our institution's patient database was queried to identify IS patients who underwent at least one EDF casting event (2009-2018)
- Patient cohort parameters
 - Idiopathic, neuromuscular, and congenital scoliosis patients were included
 - At least one EDF casting event, treated by one of two senior authors (RDF, RKL)
- Exclusion criteria
 - Anesthesia times not correctly documented in EMR
 - No radiographs or poor quality radiographs making measurements difficult at any time point
- Study groups
 - Classic Mehta casting technique
 - Cantilever bending (CB) technique
- Outcome measures
 - Anesthesia time
 - Recorded induction time to extubation time
 - Percentage of curve correction
 - At initial casting event
 - At final or most recent casting event
- Statistical Analysis
 - Unpaired t-tests comparing the means of each group
 - Mac Wizard Software (E Miller, Chicago, IL)



Casting Technique





Results

	CB Casting	Mehta Casting	p-value
Number of patients	14	9	
Total anesthesia events	54	25	
Age @ 1st Cast	2.6 ± 1.5	3.0 ± 2.2	0.498
Number of casts / patient	3.9 ± 2.6	2.4 ± 1.3	0.548
Initial Cobb angle	53.9 ± 15.9	47.8 ± 10.3	0.566
Total time in cast (yrs)	0.63 ± 0.52	0.31 ± 0.21	0.302
Anesthesia time (min) / cast	28.2 ± 10.9	55.6 ± 18.1	<0.001
% correction in 1st cast	60.1 ± 17.0	38.9 ± 11.2	0.004
% correction out of final cast	17.7 ± 7.6	14.6 ± 13.6	0.671



Limitations

- Small patient cohort with limited follow-up
 - Unable to determine superiority of one method
 - Difficult to to determine total anesthesia exposure through entire treatment course
- Each casting technique was performed by different surgeons
 - Treatment decision-making differs between surgeons
- CB Cast likely only effective for single curve patterns



Conclusions

- Significantly decreased anesthesia time when using the CB technique **by nearly 30 minutes / case**
 - With multiple casting events for each patient, there is the potential for substantial reduction in cumulative anesthesia exposure
- Improved initial curve correction has been identified as a positive predictor for treatment success⁷
 - CB casting **had improved % curve correction** when compared to Mehta casting
- Further studies with longer follow-up is needed to determine the efficacy of this technique and the neurocognitive effects of anesthesia exposure
- With serial casting being integral in the treatment for EOS, especially patients <3 years old, efforts to reduce radiation and **anesthesia exposure** will be critical to minimizing complications and unwanted side effects



References

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