Hemoglobin Levels in Patients with Early Onset Scoliosis Treated with Growing Rods

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Dislosures

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Hypothesis

- Early onset scoliosis (EOS) patients have elevated preoperative hemoglobin and hematocrit (H&H) levels

- Distraction-based growing rods will decrease H&H levels postoperatively to normal levels

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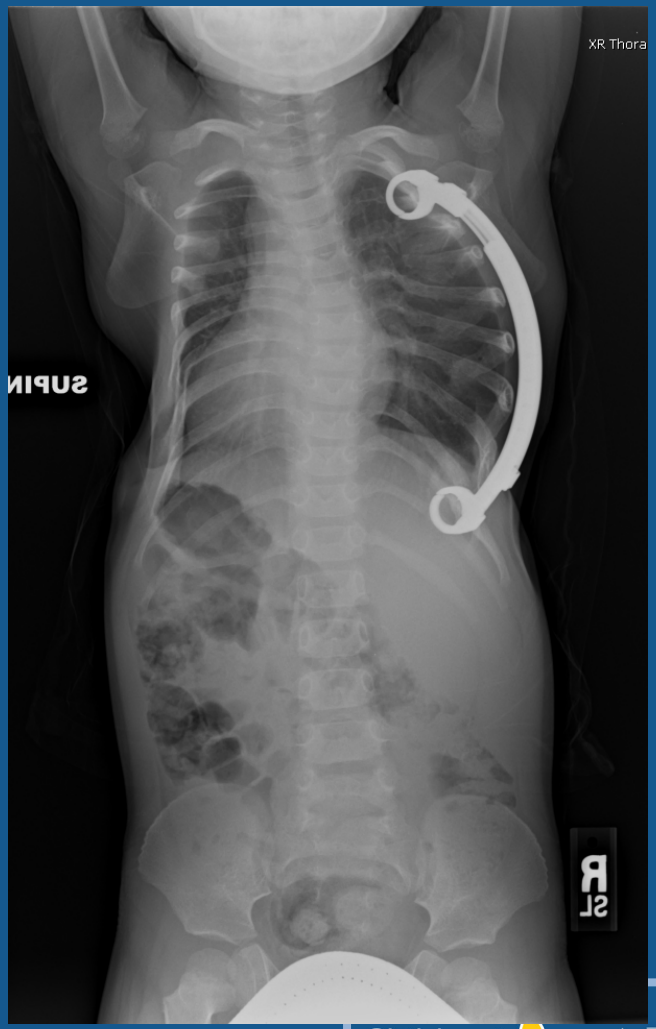
Background

- H&H levels found to be elevated in EOS patients in previous studies
  - Possibly due to body's response to decreased oxygenation
- Patients treated with VEPTR and expansion thoracostomy had mean hemoglobin Z-scores decreased from 0.82 to 0.24 (P = 0.04)



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Methods

- 66 consecutive patients identified retrospectively at 5 institutions.
- All patients had distraction-based growing rods.
- Only patients without confounding respiratory issues or oxygen-dependence included.
- All patients had minimum 2 year follow-up (mean 3.7 years).

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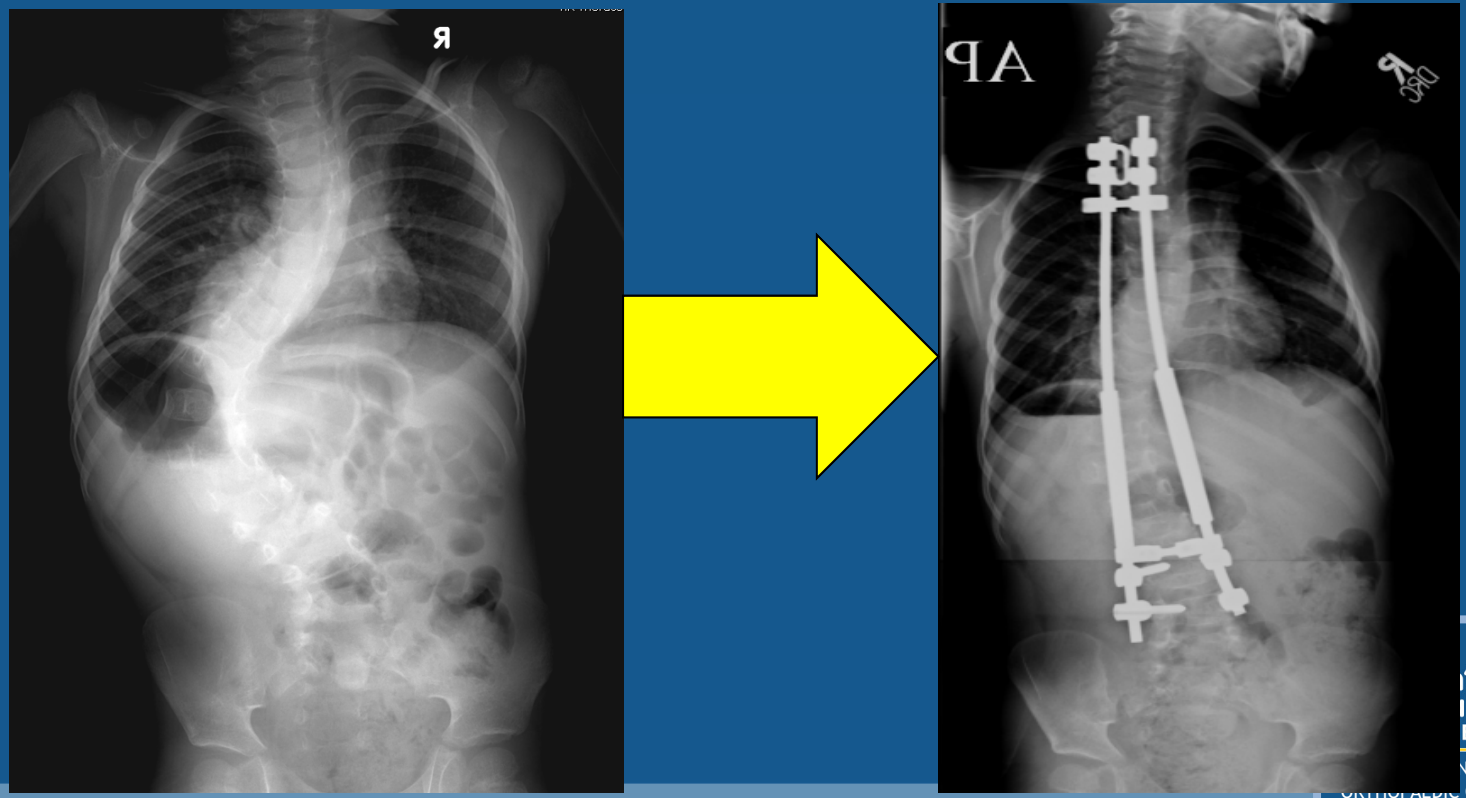
Results

- Preoperative H&H levels were normal (mean Hgb Z-score = 0.19, mean Hct Z-score = 0.34)
- Z-scores remain essentially unchanged at 6, 18, 24, 30, 36, and 48 months after surgery



Results

- Initial decrease at 1 year with H&H levels normalizing by 18 months
  - Remain normal in most patients after this
- In 21 patients with 5-year follow-up, H&H levels were significantly lower at approximately 1 SD below normal at 5 years
  - Patients may represent sicker subset

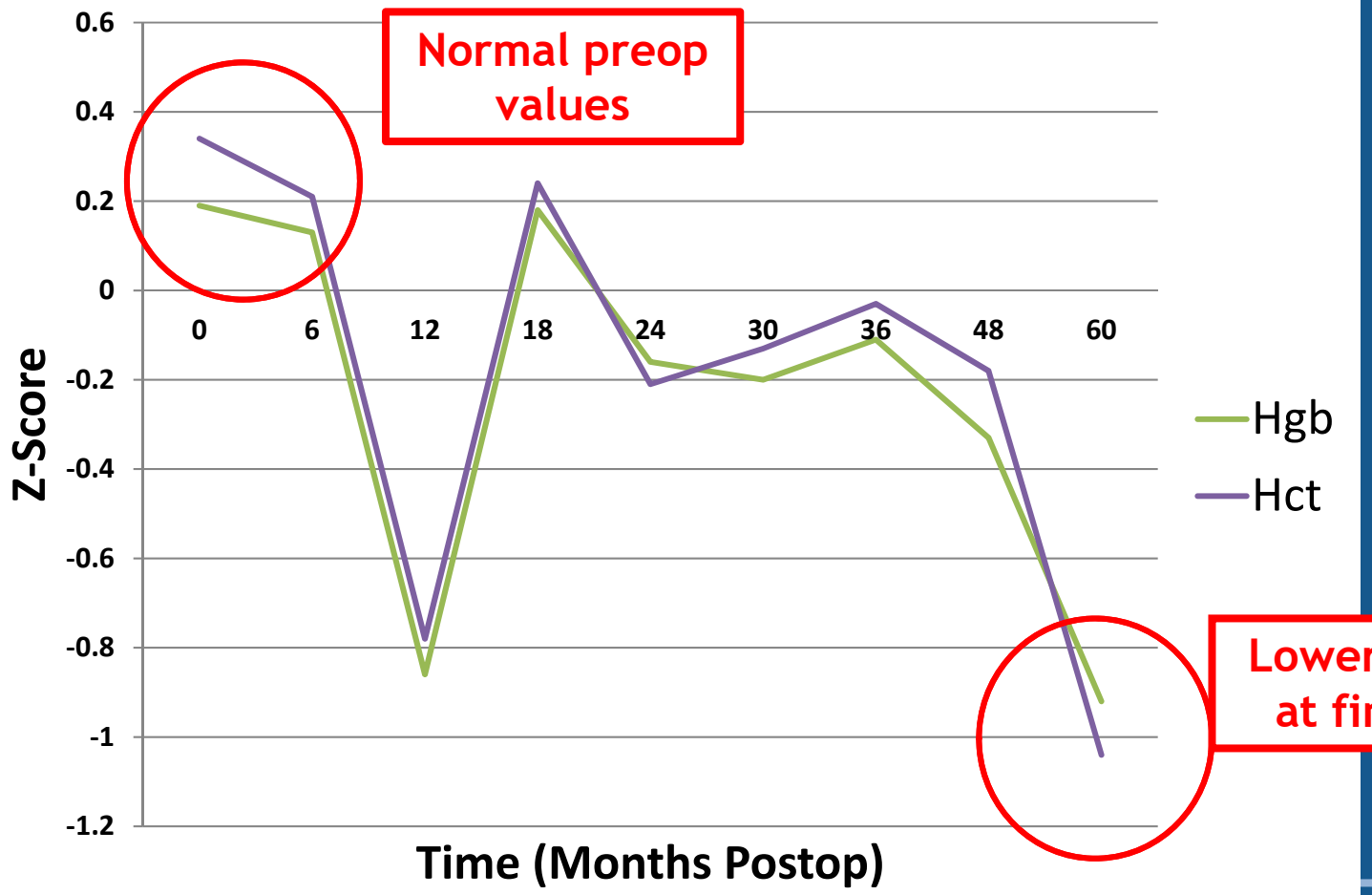
Hgb/Hct Up To 2 years

	Preop	6 mos postop	12 mos postop	18 mos postop	24 mos postop
Hgb	0.19 ± 1.77	0.13 ± 1.93 (p=0.87)	-0.86 ± 2.43 ***(p=0.02)***	0.18 ± 1.96 (p=0.48)	-0.16 ± 1.51 (p=0.36)
Hct	0.34 ± 1.55	0.21 ± 1.99 (p=0.74)	-0.78 ± 2.25 ***(p=0.01)***	0.24 ± 2.10 (p=0.52)	-0.21 ± 1.62 (p=0.10)

Hgb/Hct Up To 5 years

	30 mos postop	36 mos postop	48 mos postop	60 mos postop
Hgb	-0.20 ± 2.21 (p=0.40)	-0.11 ± 1.21 (p=0.17)	-0.33 ± 1.34 (p=0.18)	-0.92 ± 1.45 ***(p=0.01)***
Hct	-0.13 ± 1.88 (p=0.25)	-0.03 ± 1.47 (p=0.29)	-0.18 ± 1.80 (p=0.18)	-1.04 ± 1.72 ***(p≤0.001)***

Hgb/Hct Z-Scores



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Discussion

- Previous reports have indicated that EOS patients may have elevated H&H levels
  - In this study of children with EOS undergoing distraction-based growing rods, no evidence of preoperative hypoxemia

- Subset of patients with 5-year follow-up had consistently low H&H from 12-60 mos postoperatively

Take Home Lesson:

EOS patients may not have elevated H&H levels preoperatively

mean Hgb Z-score = 0.19, mean Hct Z-score = 0.34

… Distraction-based growing rods may cause lower H&H levels long term…

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