

Some Connectors in Distraction Based Growing Rods Fail More Than Others

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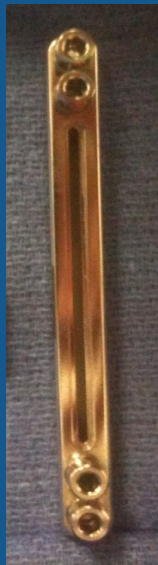
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Disclosures

- Christopher Lee - None
- Karen Myung - None
- David Skaggs - Medtronic (b,d); Stryker (b,d); AO North America (d); Biomet (e)

Hypothesis

- Some connectors fail more than others.

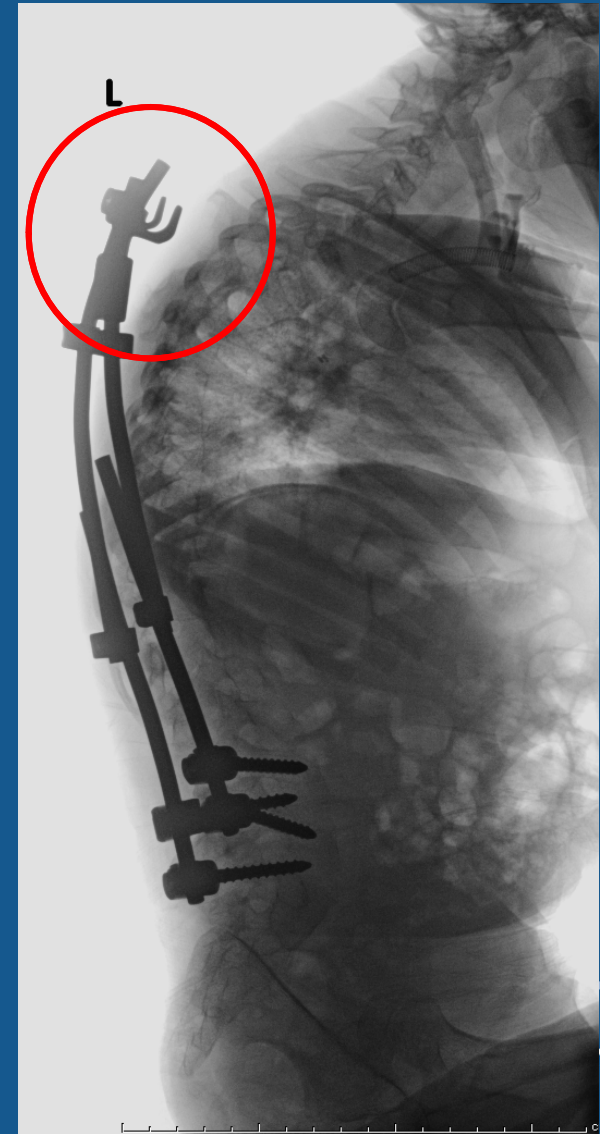


better than



Background

- Distraction-based growing rods have ~2 complications per patient¹
- No study has examined connector failures in growing rod constructs.

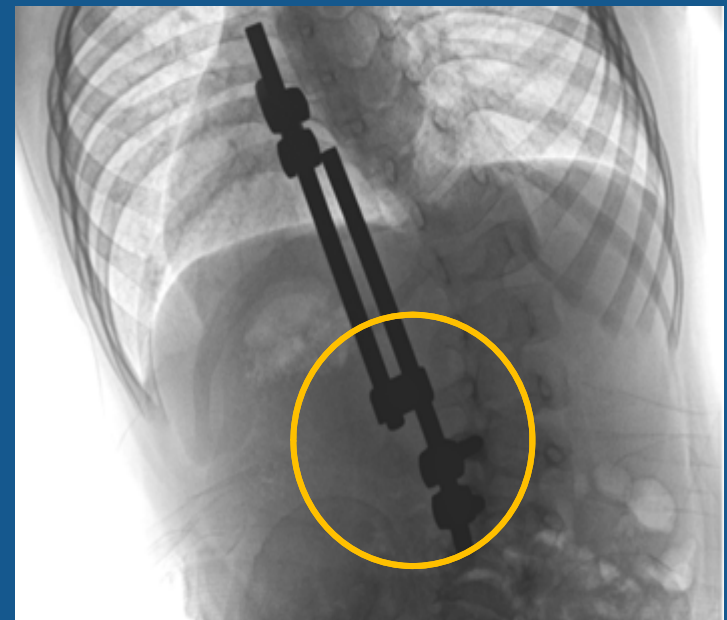


Methods

- 30 consecutive patients identified retrospectively at a single institution.
- All patients had distraction-based growing rods.
- Only connectors subject to distractive forces included.
- All patients had minimum 2 year follow-up (range, 24-83 months).

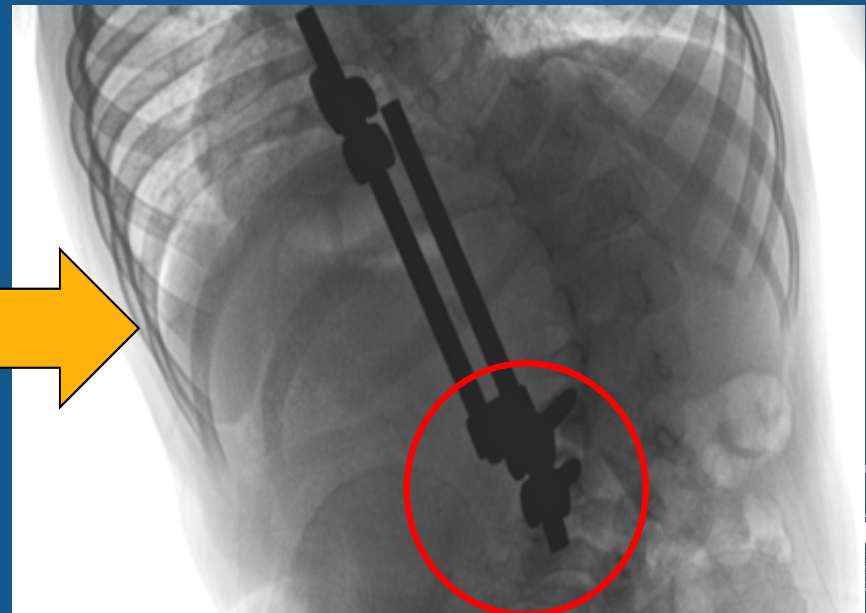
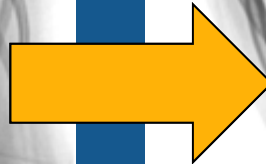
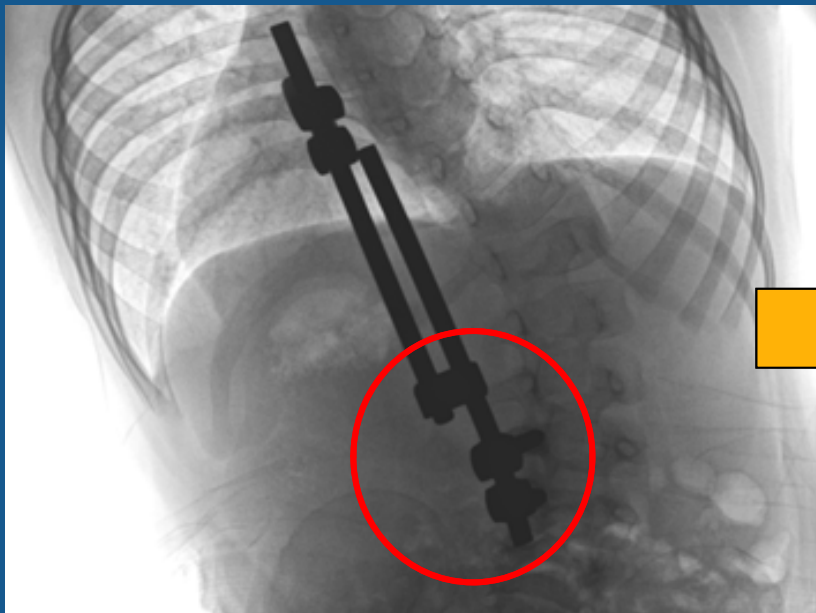
Connector Failures

- Total of 12% failure = 12/98 connectors:
 - All connectors subject to distractive forces.
- Mean time to failure = after 3rd lengthening



Connector Failures

- Dual-rod connectors vs. single-rod connectors:
 - Dual-rod connectors: 32% failure (6/19 constructs)
 - Single-rod connectors: 43% failure (6/14 constructs)
 - *No difference in failure rates ($p=0.38$).*



2 Types of Interface with Rods

Circular Lock
Older design
41% failure rate

V-shape Lock
Previously
patent protected
4% failure rate



3 point fixation

Type of Connector	Failure Rate (n, %)	Connectors
<u>Circular Lock</u> - Medtronic® Wedding Band	7/17, 41%	
<u>V shaped Lock</u> - Medtronic® and Isola®	1/27, 4%	
Stryker®, Open	3/8, 38%	
Longitudinal	1/34, 3%	

28% less T1-S1 Growth with connector failure

- Connector Failure = 6.5 mm/yr
- No failure = 9.0 mm/yr
- ($p > 0.05$) but underpowered
- Seems logical that if distraction is not present, spine growth not driven

Discussion

- Some connectors fail more than others:
 - side-to-side connectors with tapered V-shaped locks failed 10 times less often than those with circular locks.
 - “Wedding Bands” with circular holes fail almost as much as first marriages (41% vs. >50%)
- Age of initial instrumentation may matter:
 - >5 years old: 0 connector failures
 - Greater complications reported in patients treated at younger age^{2,3}

Take Home Lesson:

Use longitudinal connectors or side-to-side connectors with V-locks



V-shape Lock



3 point fixation