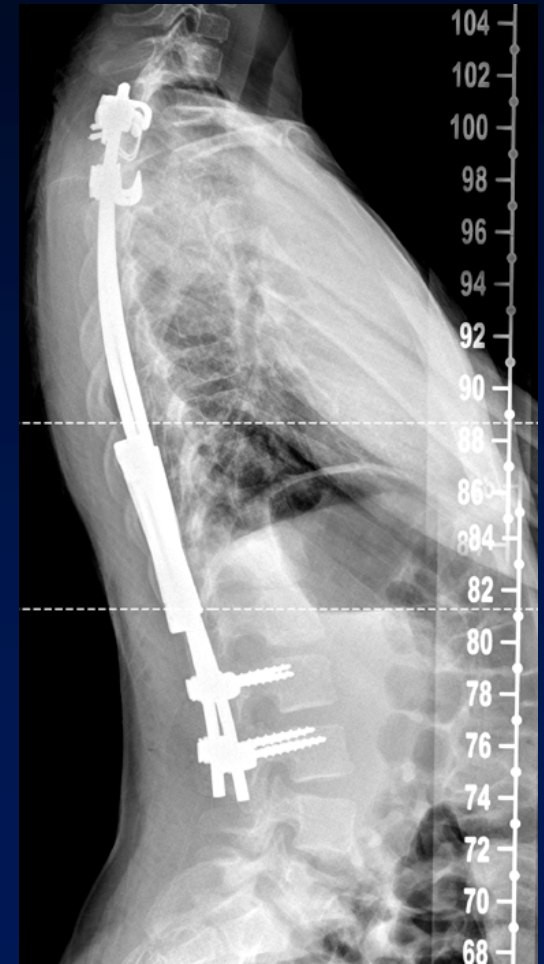


Myth vs. Truth: Screws are Always Superior to Hooks for GR Foundations

ICEOS 2009
Istanbul

Jack Flynn, MD

Associate Chief of Orthopaedic Surgery
Children's Hospital of Philadelphia
Associate Professor of Orthopaedic Surgery
University of Pennsylvania School of Medicine



Anchors for GRs

Introduction

Pedicle screws for growing rod anchors

- Avoids implants in the canal
- Strongest construct
- Useful when laminae or TPs missing



Anchors for GRs

Introduction

Pedicle screws for growing rod anchors

Problems:

- Can plow into nerve root with distraction
- Risk to cord proximally with pullout
- Screw fracture
- Screw can become too short as vertebral body grows

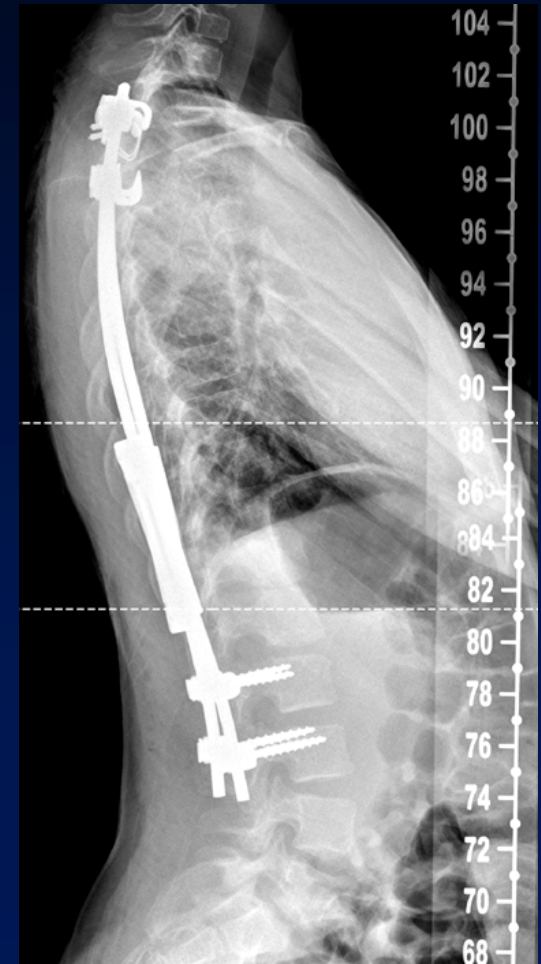


Anchors for GRs

Introduction

Hooks for growing rod anchors

- No risk to anterior structures (esophagus, aorta)
- Saves screw site for final fusion
- Placement without imaging
- Hooks don't break



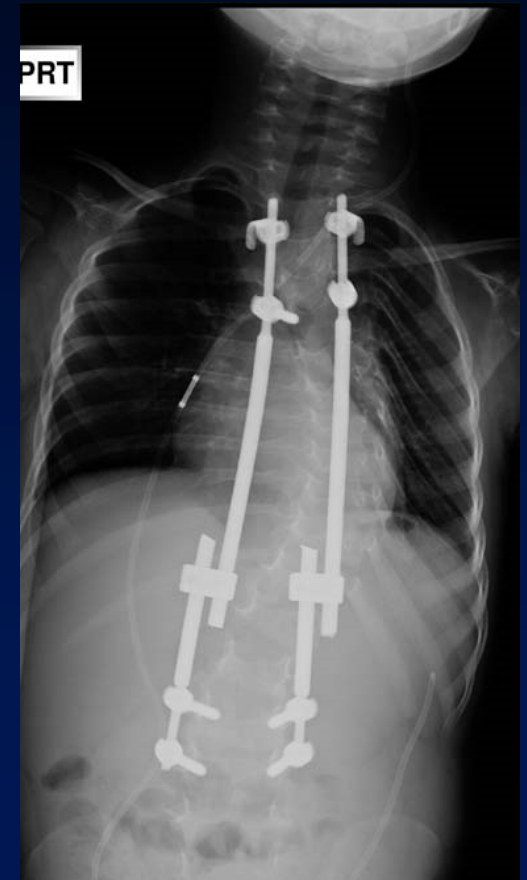
Anchors for GRs

Introduction

Hooks for growing rod anchors

Problems:

- Plow through laminae requiring revision
- Hook sites may be absent or very weak



Anchors for GRs

Study results

Maher, Akbarnia et al Spine 2008

- 8 porcine spines
- Hook-hook, hook-screw, screw-screw → with crosslink
- Screw-screw without crosslink
- Biomechanical pullout test
- Screws had better pullout strength
- Crosslink did not significantly enhance strength

Anchors for GRs

Distal anchors

- Most are using 4 pedicle screws for the distal anchor
 - Risk of pull out is generally low
 - Risk of plowing also low
 - Theoretically root is at risk
 - Rare with 2 level fixation



Anchors for GRs

Proximal anchors

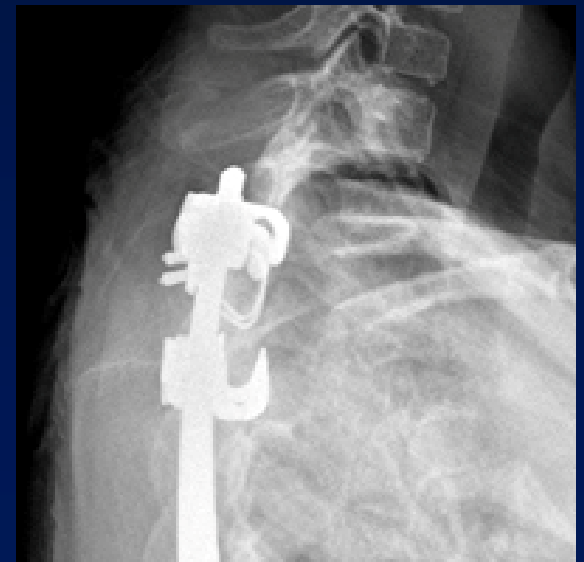
- 4-6 screws
 - Risk of catastrophic pull-out
 - AP distance is small in toddlers.
Can be out anterior
 - 3 level proximal thoracic fusion
(trying to avoid proximal thoracic spine fusions)
- Hook screw combinations



Anchors for GRs

Proximal anchors

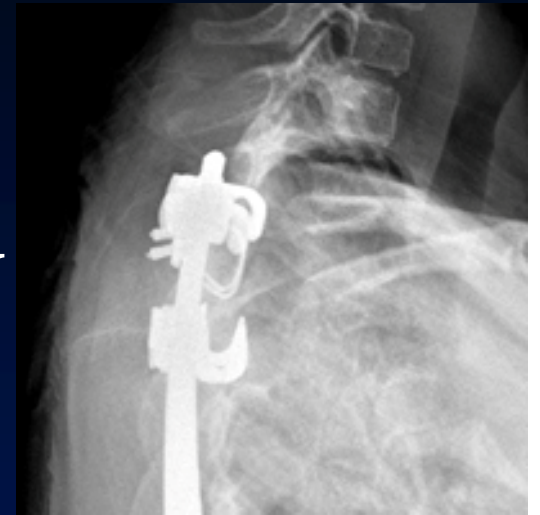
- 4 hooks
 - Supralaminar (canal volume)
 - Transverse process (weaker)
- 4 hooks with sublaminar cable augmentation
 - Authors preferred method
 - Best risk benefit profile



Myth vs. Truth: Screws are Always Superior to Hooks for GR Foundations

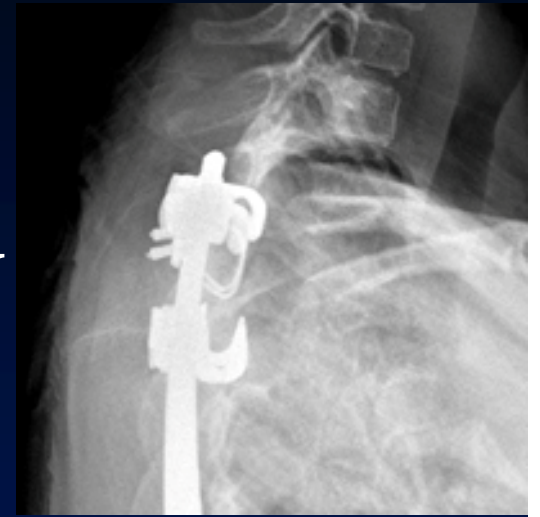
Myth vs. Truth: Screws are Always Superior to Hooks for GR Foundations

- Myth proximally



Myth vs. Truth: Screws are Always Superior to Hooks for GR Foundations

- Myth proximally
- Truth distally



Thank you

