

Management of Implant Related Infections: Growing Rods

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Surgical Site Infection Epidemiology

- \$4.5 billion are associated with healthcare-related infections¹
- Orthopaedic surgical site infections (SSIs) result in direct costs increased more than three-fold¹
- Recent literature reports spinal deformity correction SSI rates of 3.7-8.5%²⁻⁵



SSI Definitions

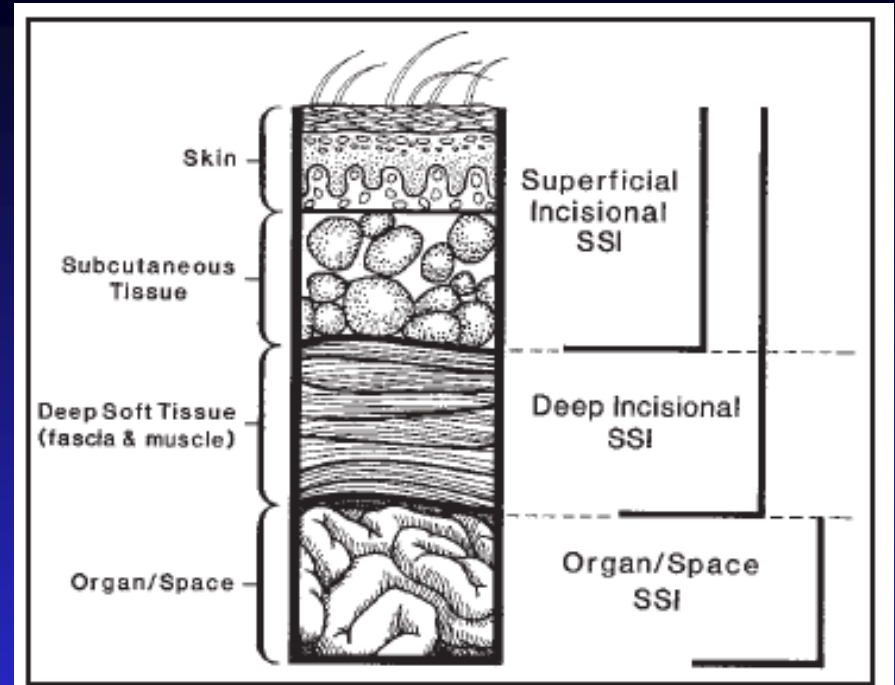
CDC National Healthcare

Safety Network Guidelines:

Superficial SSI (<30 days post-op)

Deep/Implant SSI (<1 year postop)

Organ/Space SSI (<1 year post op)



Added SSI Risk Factors in Distraction Techniques

- **Patient Population**
 - Younger
 - “Sicker”
 - Worse Pulmonary Function
 - More Co-Morbid Conditions
- **Repeated Procedures**
 - Repeated Abx administration
 - Resistance
 - Repeated hardware exposure
 - Increased Opportunity for Site Infection

SSI Rates – CHOP, CHLA, CHONY 5.7%

	Primary Fusion	Revision Fusion	Growing Construct Insertion	Growing Construct Lengthening	Growing Construct Revision
Idiopathic	5/417	2/38	0/9	1/28	5/17
NM	26/198	4/38	3/29	0/82	3/44
Syndromic	5/72	2/26	2/7	3/35	2/19
Congenital	4/66	0/18	2/28	2/71	0/22
Other	3/23	0/7	0/10	2/28	2/15

Complications of Growing-Rod Treatment for Early-Onset Scoliosis

Analysis of One Hundred and Forty Patients

By Shay Bess, MD, Behrooz A. Akbarnia, MD, George H. Thompson, MD, Paul D. Sponseller, MD, Suken A. Shah, MD,
Hazem El Sebaie, FRCS, MD, Oheneba Boachie-Adjei, MD, Lawrence I. Karlin, MD, Sarah Canale, BS,
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Investigation performed at San Diego Center for Spinal Disorders, La Jolla, California

- 140 patients ; 897 growing-rod procedures
- Avg 6yo with average follow up 5 years
- 81/140 (58%) pts had at least one complication
- Wound problems/infection
 - 26% pts with subq rod vs 10% pts with submuscular rod placement

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- Risk of complications occurring during the treatment period decreased by 13% for each year of increased pt age at the initiation of treatment
- Complication risk increased by 24% for each additional surgical procedure performed

Safety and Efficacy of Growing Rod Technique for Pediatric Congenital Spinal Deformities

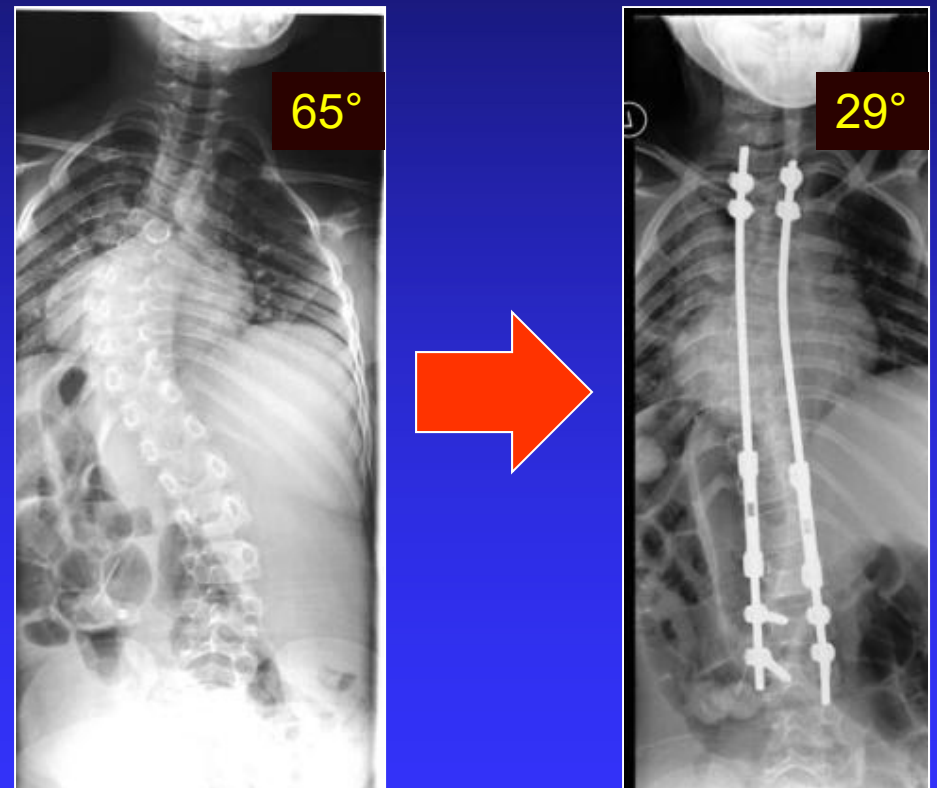
Hazeem B. Elsebai, MD, Muharrem Yazici, MD, George H. Thompson, MD, John B. Emans, MD, David L. Skaggs, MD, Alvin H. Crawford, MD, Lawrence I. Karlin, MD, Richard E. McCarthy, MD, Connie Poe-Kochert, RN, Patricia Kostial, RN, and Behrooz A. Akbarnia

- Complications occurred in 8 pts (42%)
- Of 14 complications, 11 implant related, 2 pulmonary, and 1 postoperative infection

Case Presentation

- 8 year old female with:
 - Diagnosis of Tetralogy of Fallot
 - Subsequent progressive thoracic scoliosis
- Previous Treatment:
 - TLSO

- Current Treatment:
 - Growing Rods



Case Presentation

- Pt presents for post-op visit after 1st lengthening (6mos post-insertion) with:

- Low grade fever
- Some wound dc

...what is the best management plan???



SSI Presentation (increasing severity)

- Pain
- Redness
- Swelling
- Warmth
- Drainage
- Erythema
- Tenderness to palpation
- Edema
- Temperature $>39^{\circ}\text{C}$
- Chills and sweats
- Generalized malaise
- Lethargy
- Hypotension
- Confusion
- Organ failure

SSI treatment decision is both Surgeon **AND Severity dependent...**

SSI treatment options include (but are not limited to):

- Removal of hardware
- Delayed lengthening
 - Until infection clears
- Surgical Debridement
- Outpatient oral Abx
- Inpatient IV abx
- Prolonged Skin/wound care (i.e. skin washes, wound VAC, etc)

VEPTR vs “Growth Rod”

True Nonfusion Construct



Spine-based distraction techniques are more rigid, but require short level fusions of the spine at the attachment locations

Easier to explant VEPTR and sterilize wound

Fusion-Nonfusion-Fusion



Conclusions

- Need to keep future surgeries, risks, plans, etc. in mind when making SSI management decisions
- “Treat through” in most cases without (complete) explantation





Thank You!!!

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