Management of Implant-Related Infections: VEPTR

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Disclosures

- John T. Smith, MD:
  - Royalties, VEPTR 2
  - Research Support: CWSDRF
  - Consultant, Synthes Spine

Background

- Rib Distraction Techniques (i.e. VEPTR) are widely used for management of:
  - Thoracic Insufficiency Syndrome (TIS)
  - Progressive scoliosis with chest wall constriction
  - Hypoplastic thorax syndromes
- Complications remain problematic
  - Migration
  - Wound slough
  - ***Infection*** **(~15%)**

Why so high?
Risk Factors for Infection

- Repetitive Surgeries
- Co-Morbidities
- Low BMI
- Poor skin
- Bulky implants
- Others

Management of VEPTR Infections

- I&D
- Culture
- Flap coverage of the wound
- IV antibiotics followed by suppression (6 mo?)
- Wound-Vac?
- Derma-matrix?

Is removal of the implant necessary to manage the infection?

Infectious Disease Literature

- Established infection following spinal instrumentation and fusion ***requires*** implant removal
- Infection demands prolonged antibiotic management

Smith et.al. SRS 2009

- Single institution review of infections associated with Rib-based Distraction
- 19 infections in 16 patients
- All managed with I&D, antibiotics and resolved
- *No patient required implant removal*

Spine , November 2010

Research Question:

Can infection associated with Rib Distraction Techniques managed without implant removal be validated at multiple institutions?

Are infections associated with non-fusion technology (Growing Instrumentation) *different* than infections after spinal fusion?

Retrospective chart review:

All VEPTR patients at:

- Children's Hospital of Boston
- Primary Children's Medical Center
- Shriners Hospital For Children-Phila

2002-2009

IRB approved

Diagnosis: Infection Group

- Jeunes Syndrome (1)
- Jarcho-Levine Syndrome (1)
- Congenital Myopathy (2)
- Progressive scoliosis (1)
- Spina Bifida (3)
- Congenital Scoliosis (3)
- Cerebral Palsy (2)
- Poland Syndrome (1)
- OI (1)

- 176 patients treated with Rib Distraction Techniques at 3 participating institutions

- 31 infections in 28 patients
  - Superficial: 19
  - Deep: 12
  - 16% of patients experienced at least one infection
  - 2.3% of patients had instrumentation removed due to infection

Infection Group

- Average age: 6 years
- Average BMI: 16.6 (low)
- Average ANC: 7.32 (low)
- Procedure associated with infection:
  - Initial implant: 12.45%
  - Expansion: 61.17%
  - Exchange: 7.92%
  - Revision: 12.45%

- 22/31 infections were associated with a wound dehiscence

Management

- 24 patients were treated with irrigation, debridement, and closure of the wound.
- 27 patients received IV antibiotics
- Median duration of IV therapy: 37* days
- Median of oral suppressive therapy: 23** days
- 6 patients required more than one debridement to control the infection
- 2 patients *initially* managed with oral antibiotics alone failed.

*2 patients length IV therapy was unknown ** 4 patients length of oral therapy was unknown

6 patients required implant removal to resolve infection

Prevention

- Nutrition
- Soft tissue handling techniques
- Peri-operative antibiotics
- Aggressive management of wound dehisence
- Incisions away from the implant when expanding or exchange
- Flaps

Courtesy of John Emans

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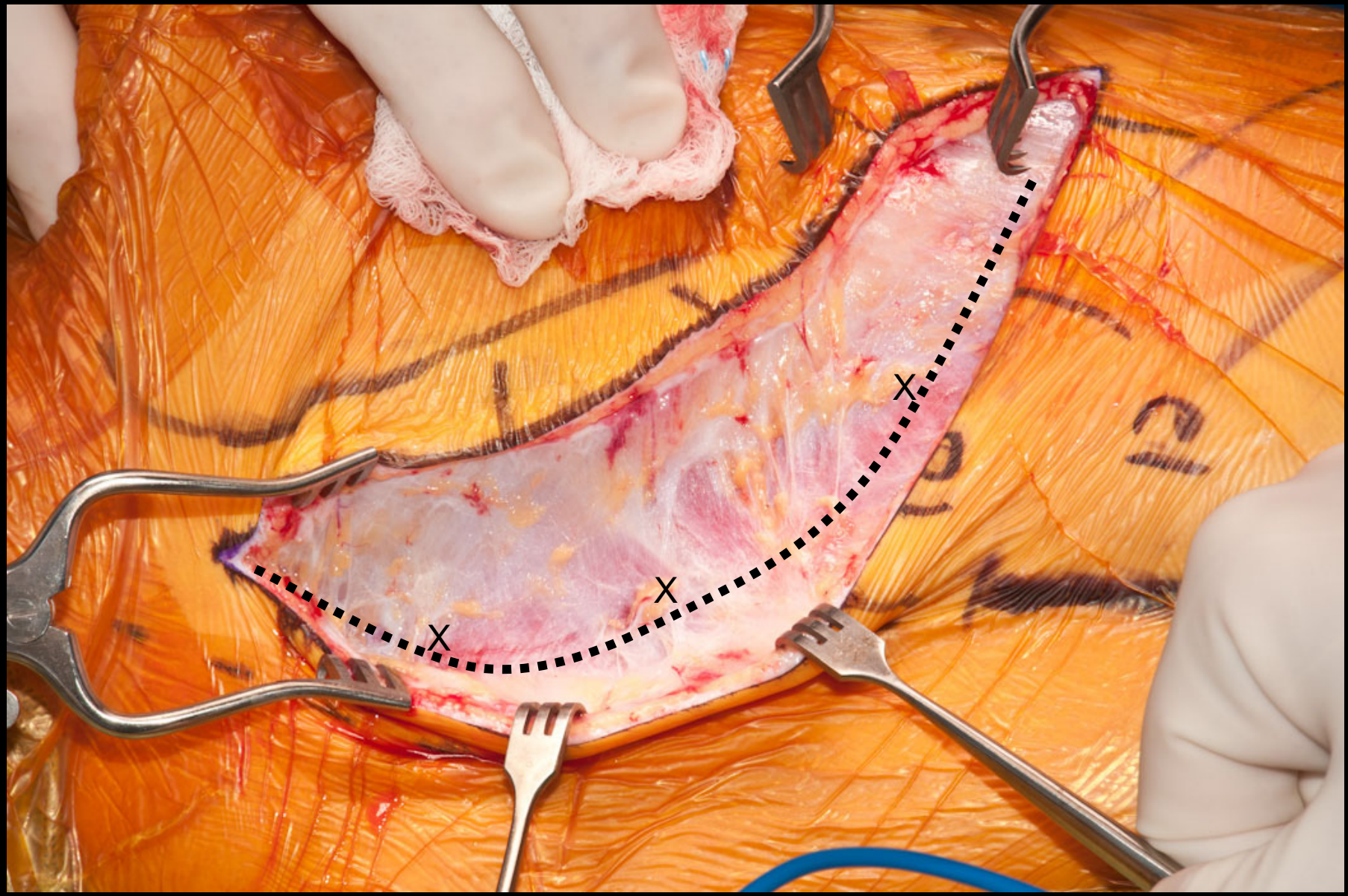

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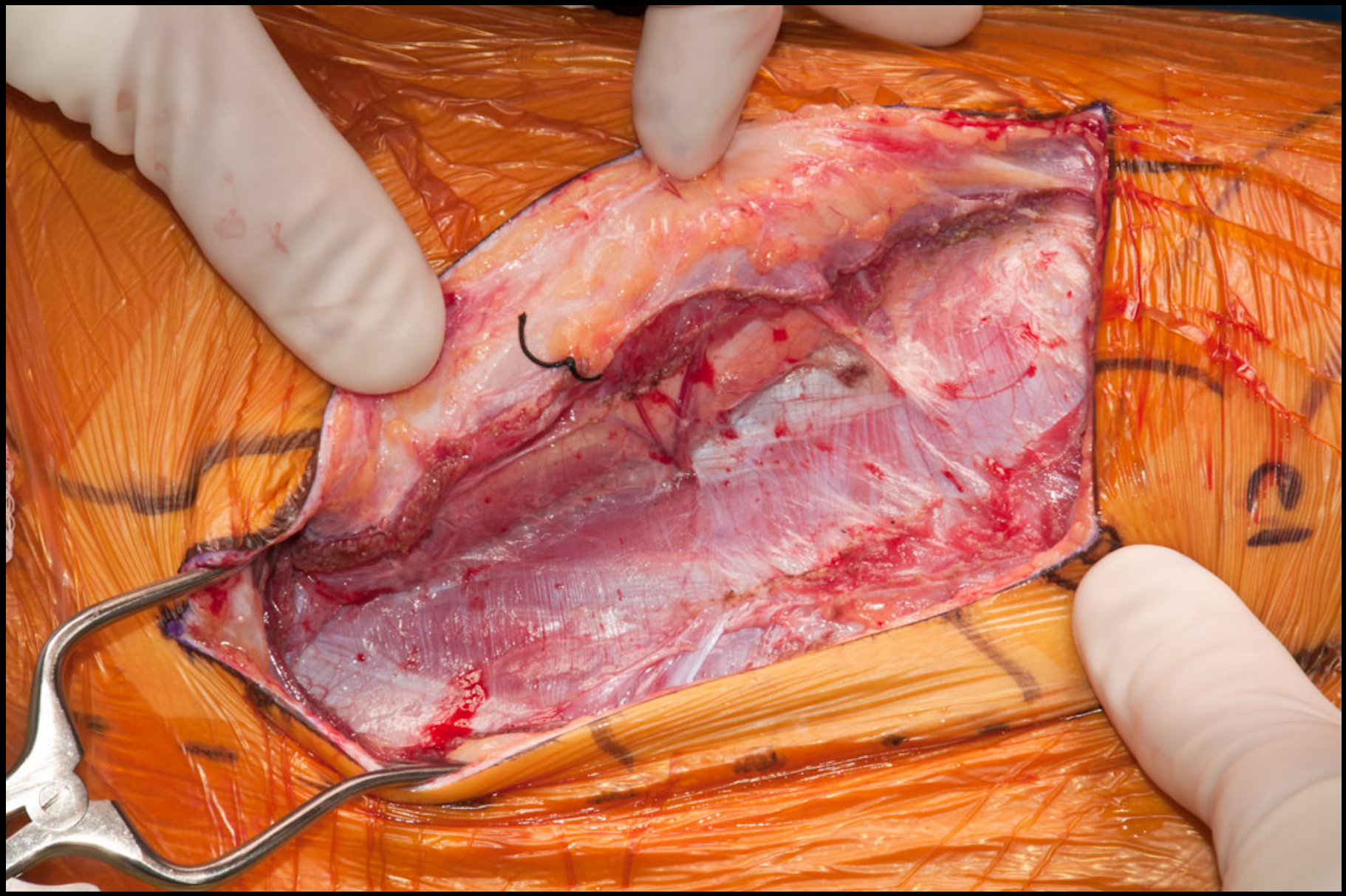
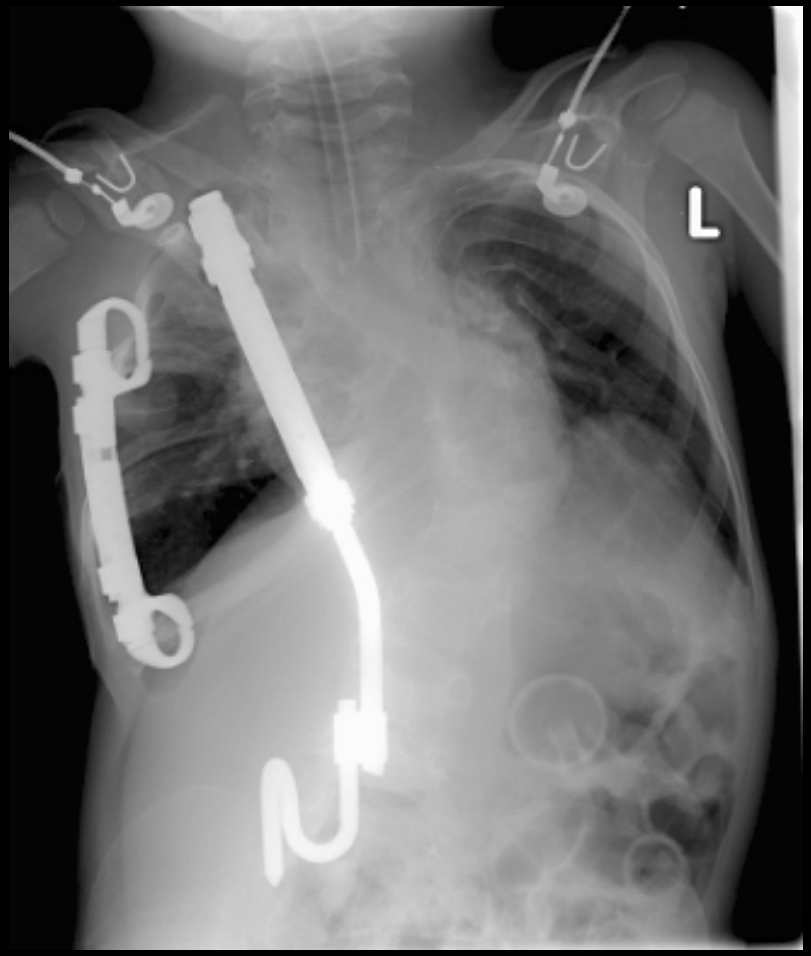


Conclusions

- This population of children are at high risk for infection due to the need for multiple procedures, significant co-morbidities, poor nutrition, etc
- Improved techniques for management of soft tissues and implant coverage may reduce the incidence of infection

Conclusion Cont.

- Most infections associated with rib distraction techniques can be managed *WITHOUT* removal of the devices.
- This differs significantly from the known experience with established infections in spinal fusion patients.
- These data may be useful in educating our infectious disease colleagues for future patients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Thank you!