EAST Master Class Series
Live Webinar #4:
Rib Fracture Plating

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Fredric M. Pieracci, MD, MPH, FACS

Generously sponsored by a restricted educational grant
Speakers

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Objectives

- Dr. White:
  - Patient selection
  - Technique

- Dr. Pieracci:
  - Fractures at the margins: difficult anatomy, fracture patterns
  - Post op management
Rib Fracture Stabilization: Patient Selection and Technique

TOM WHITE, MD, FACS

Disclosures

- Paid speaker/consultant:
  - DePuy Synthes
  - KLS Martin
  - Applied Medical Technologies
Indications

- Flail chest
- 3 or more displaced fractures
- Medical management “failure”
- Organ impalement
- “Drive-By” thoracotomy
Contraindications

- Severe TBI
- Unstable spine

Video
EAST Rib Fixation Webinar:
Special Situations and Post Operative
Management

Fredric M. Pieracci, MD, MPH, FACS
Trauma Medical Director
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Associate Professor of Surgery
University of Colorado SOM

Disclosures

• Paid speaker, consultant, and research funding for DePuy Synthes

• Paid speaker and consultant for Zimmer Biomet
Outline

• **Rib Repair at the Margins**
  – Anterior/posterior fractures

• **Post Operative Management**
  – Pleural space
  – Loco-regional analgesia

Anterior Fractures

Challenges

• Exposure

• Proximity to costal cartilage

• Indications for repair
Positioning/Incision(s)

Anterior Fractures
Positioning/Incision(s)

Anterior Fractures

Positioning/Incision(s)

Anterior Fractures
Positioning/Incision(s)

**Anterior Fractures**

- Working underneath the pectoralis flap
- Incisions post op day #2
Working underneath the pectoralis flap

Incisions post op day #2

Rib Fixation to Sternum
Posterior Fractures
Rationale for repair

• Interval displacement
• Bony bridging
Hardware Failure

Mode of Failure of Rib Fixation With Absorbable Plates: A Clinical and Numerical Modeling Study

Silvana F. Marasco, FRACS, Iljja D. Šatalo, PhD, and Anh Y. Bui, PhD
Posterior Fractures
Rationale for repair

• Interval displacement
• Bony bridging

Posterior Fractures
Challenges

• Proximity to transverse process
• Rib angle
• Subscapular location
Posterior Fractures

Challenges

- Proximity to transverse process
- Rib angle
- Subscapular location

Positioning/Incision(s)

Posterior Fractures
Positioning/Incision(s)
*Posterior Fractures*
Positioning/Incision(s)

Posterior Fractures
Postoperative Considerations

Thoracic “Tune Up”

1. Pulmonary toilet
2. Pleural space evaluation/evacuation
3. Logoregional anesthesia
4. Rib repair
The Pleural Space

- Diagnose and treat associated pathology
  - Retained hemothorax
  - Diaphragm injury
- Provide directed loco-regional anesthesia
- Repair rib fractures

Bronchoscopy/Lung Isolation
Surgical stabilization of severe rib fractures decreases incidence of retained hemothorax and empyema


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**KEYWORDS:** Retained hemothorax; Thoracic trauma; Surgical stabilization of rib fractures; Rib fractures; Outcomes

**Abstract**

**BACKGROUND:** Retained hemothorax (RH) is relatively common after chest trauma and can lead to empyema. We hypothesized that patients who have surgical fixation of rib fractures (SSRF) have less RH and empyema than those who have medical management of rib fractures (MMRF).

**METHODS:** Admitted rib fracture patients from January 2009 to June 2013 were identified. A 2:1 propensity score model identified MMRF patients who were similar to SSRF: RH, and empyema and readmissions, were recorded. Variables were compared using Fisher exact test and Wilcoxon rank-sum tests.

**RESULTS:** One hundred thirty-seven SSRF and 234 MMRF were analyzed; 31 (7.5%) had RH requiring 35 interventions; 3 (2.2%) SSRF patients had RH compared with 28 (10.2%) MMRF (P = .003). Four (13.5%) MMRF subjects with RH developed empyema versus zero in the SSRF group (P = .009). 6 (19.3%) RH patients required readmission versus 14 (3.7%) in the non-RH group (P = .002).

**CONCLUSIONS:** Patients with rib fractures who have SSRF have less RH compared with similar MMRF patients. Although not a significant reason to perform SSRF, this clinical benefit should not be overlooked.

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Right diaphragm 6 cm injury

Continuous Intercostal Nerve Blockade for Rib Fractures: Ready for Primetime?

Michael S. Truitt, MD, Jason Murry, MD, Joseph Amos, MD, Manuel Lorenzo, MD, MBA, Alicia Mangram, MD, Ernest Dunn, MD, and Ernest E. Moore, MD
VATS Intercostal Nerve Blocks with Liposomal Bupivacaine

Theoretical Advantages

• Minimize incisions and muscle division
• Eliminate scapular retraction
• Wide exposure to all fracture patterns
• Minimize pulmonary/cardiac injury
• Eliminate discomfort from palpable/subscapular plates

VATS – intra-pleural plates
Thoacoscopic Rib Repair

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Thank You!

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