Emergency Procedures: Pearls and Pitfalls

Austin T Smith, MD FAAEM FACEP

1

Disclosures

- None relevant to this discussion

2

Acknowledgements

- Outstanding online resources were used for images
- Many of these procedures you will be familiar with

3

Outline

- Reductions
- Sedations
- Wound Repair
- Peritonsillar Abscesses
- Intubation
- Ultrasound without training
- Central Venous Catheters
- Chest tubes

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Emergency Procedures: Pearls and Pitfalls

- Please ask questions as we go

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Case 1

- 46 year old female with fall onto left wrist
- Wrist is deformed, but neurovascularly intact
- Complaining of severe pain

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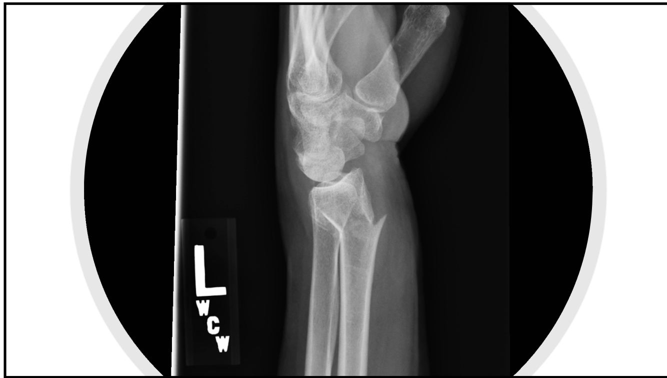

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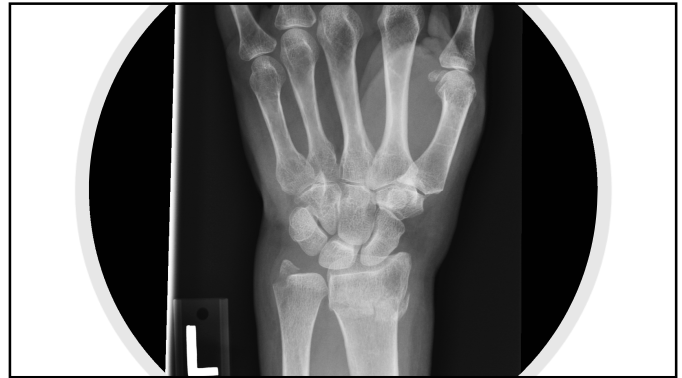

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Case 1

- Analgesia?
  - Oral
  - IV opiate
  - Sedation
  - Nerve block
  - Subdissociative ketamine
  - Hematoma block

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Case 1

- Analgesia?
  - Oral
  - IV opiate
  - Sedation
  - Nerve block
  - Subdissociative ketamine
  - Hematoma block → Oldie, but Goodie!

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Hematoma Block

- Underutilized
- Simple
- Few contraindications
  - Open fracture, young children, gross contamination of site

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Hematoma Block

1. Consent
2. Prep the site
3. Insert the needle into fracture site
4. Aspirate blood
5. Inject

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Hematoma Block

- https://www.youtube.com/watch?v=tjnsdjfwMmY
  - Start at 1:00

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Hematoma Block

- Do they work?

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Tseng *et al. Journal of Orthopaedic Surgery and Research* (2018) 13:62
https://doi.org/10.1186/s13018-018-0772-7

Journal of Orthopaedic Surgery and Research

RESEARCH ARTICLE Open Access

Hematoma block or procedural sedation and analgesia, which is the most effective method of anesthesia in reduction of displaced distal radius fracture?

Ping-Tao Tseng[2], Tsai-Hsueh Leu[1], Yen-Wen Chen[3] and Yu-Pin Chen[1*]

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Hematoma Block

- How much?

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Clinical Research Report

Journal of INTERNATIONAL MEDICAL RESEARCH

Journal of International Medical Research
2018, Vol. 46(11) 4535–4538
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Hematoma block for distal radius fractures – prospective, randomized comparison of two different volumes of lidocaine

Hagay Orbach[1], Nimrod Rozen[1,2], Barak Rinat[1] and Guy Rubin[1,2]

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Hematoma Block

- What if it's hard?

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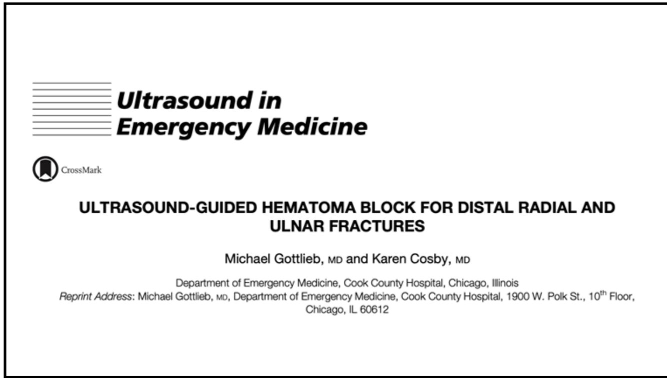
Ultrasound in Emergency Medicine

ULTRASOUND-GUIDED HEMATOMA BLOCK FOR DISTAL RADIAL AND ULNAR FRACTURES

Michael Gottlieb, MD and Karen Cosby, MD

Department of Emergency Medicine, Cook County Hospital, Chicago, Illinois
Reprint Address: Michael Gottlieb, MD, Department of Emergency Medicine, Cook County Hospital, 1900 W. Polk St., 10th Floor, Chicago, IL 60612

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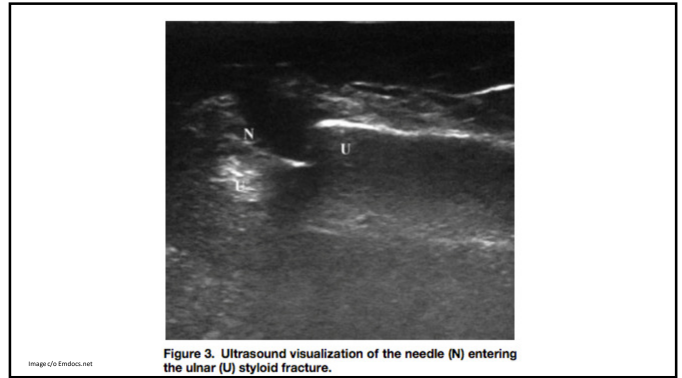

Figure 3. Ultrasound visualization of the needle (N) entering the ulnar (U) styloid fracture.

Image c/o Emdocs.net

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Hematoma Block

- Downsides
  - Does require practice
  - Not always effective enough
  - Requires a somewhat cooperative patient
  - Some fracture patterns/locations make it impossible to do

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Hematoma Block

- Pearls
  - Use ultrasound
  - Use a large needle
  - Don't be too gentle
  - Give it time

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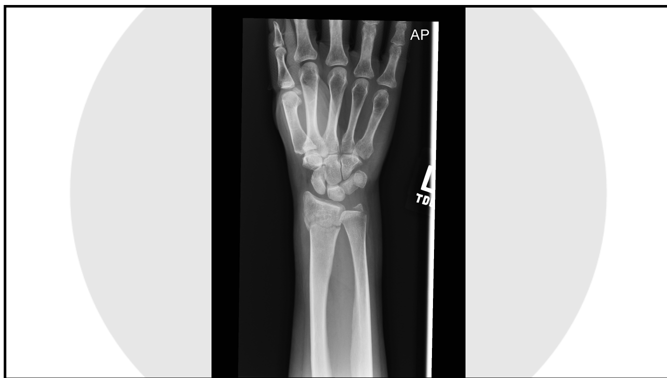

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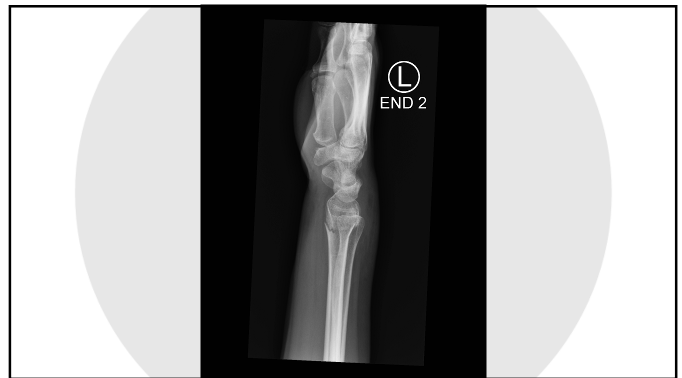

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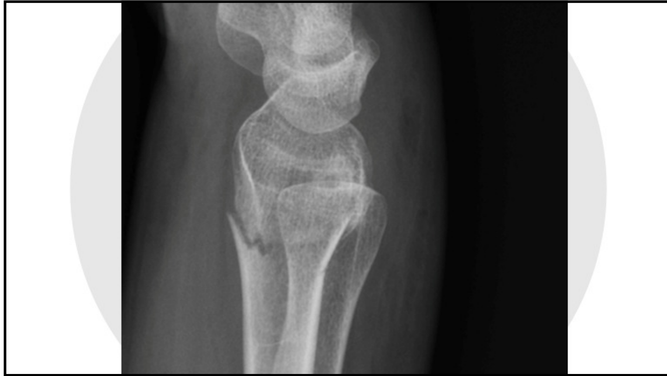

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Hematoma Block

- Pitfalls
  - Not waiting for flash
  - Using a tiny needle
  - Not being patient

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Case 2

- A 27 year old female presents with left arm pain after a mountain bike accident
- An obvious deformity is present, but the upper extremity is neurovascularly intact

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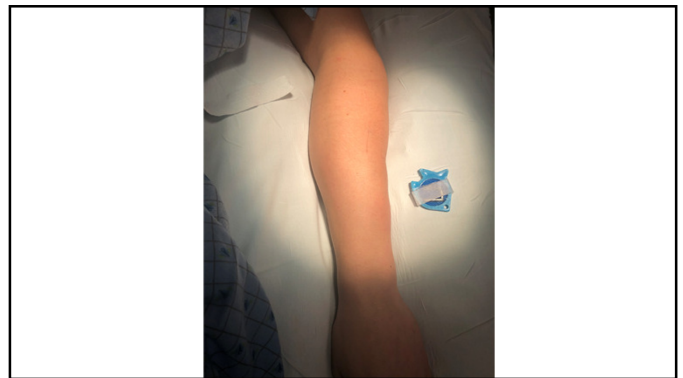

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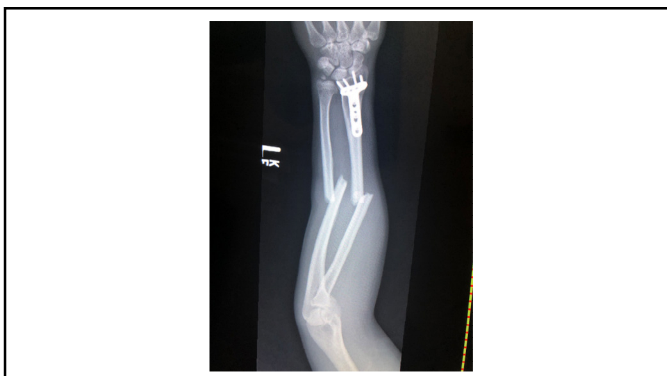

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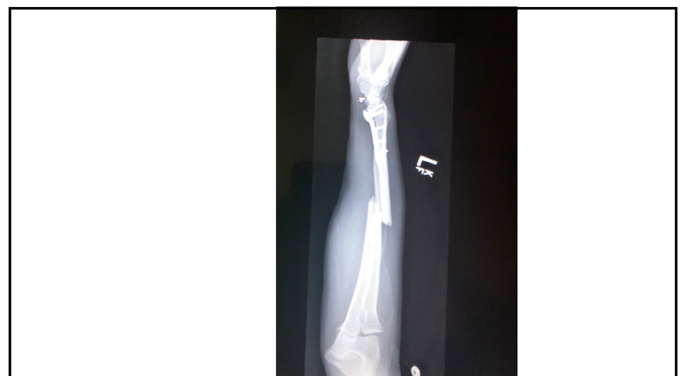

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Fracture Reductions

- Some are easy, some are not

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Fracture Reductions

- Pearls
  - Adequate analgesia/sedation
  - C-arm
  - ”Recreate” the injury

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Adequate Analgesia/Sedation

- Hematoma blocks are great, but limited to specific injuries
- Nerve blocks
- Sedations are a high risk, low reward procedure
  - But often necessary

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Sedation Agents

- Midazolam/Fentanyl
- Etomidate
- Propofol
- Ketamine
- “Ketofol”
  - Pluses: Analgesia, muscle relaxation, use less of both agents, less emesis
  - Minuses: lower dose ketamine can cause agitation

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Reductions

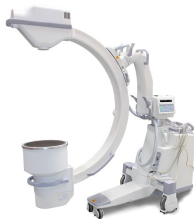

Image c/o IBN Medical

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C arm

- Excellent for watching your reductions in real time
- Helps with final molding of splint
- No need for post reduction films
- Radiology technicians can assist

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C-arm

- A portable x-ray machine is an alternative

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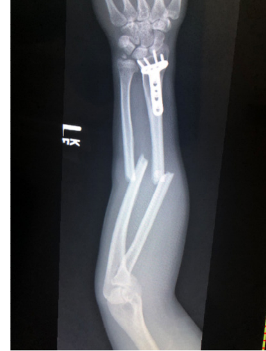

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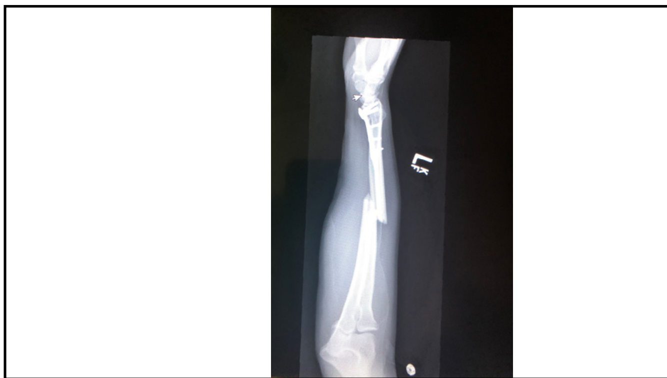

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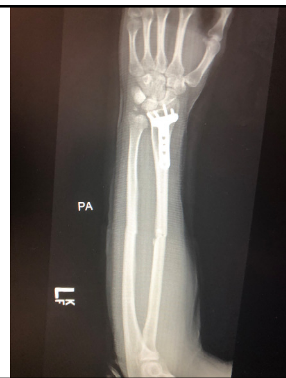

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Fracture Reductions

- Pitfalls
  - Being too gentle
  - Inadequate muscle relaxation

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Case 3

- A 16 year old boy presents with left arm pain after falling on his skateboard
- There is an obvious deformity but the left arm is neurovascular intact

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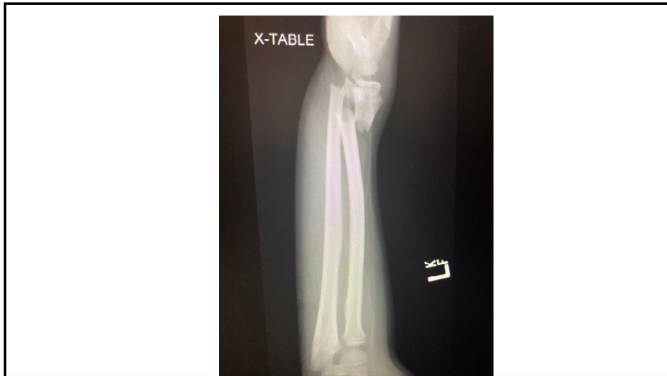

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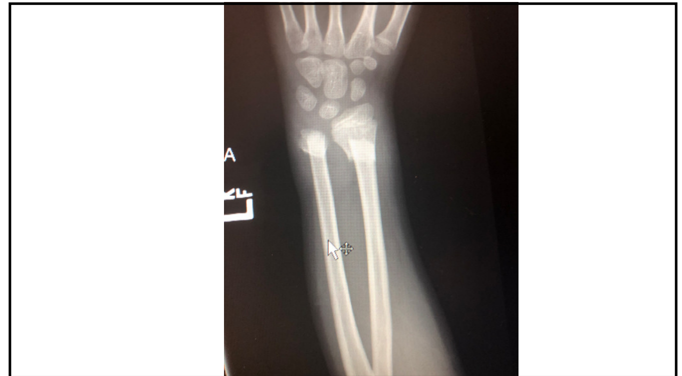

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Splinting

- Plaster vs Orthoglass
  - Plaster is messy, harder to learn, requires practice, but gets GREAT molds
  - Orthoglass is fast, easy, molding is difficult

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Splinting

- Which splint?

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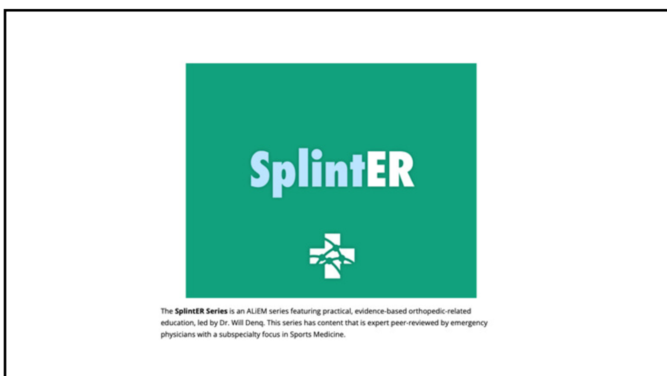

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Splinting

- https://www.aliem.com/splinter-series/

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Splinting

- Molding is underrated

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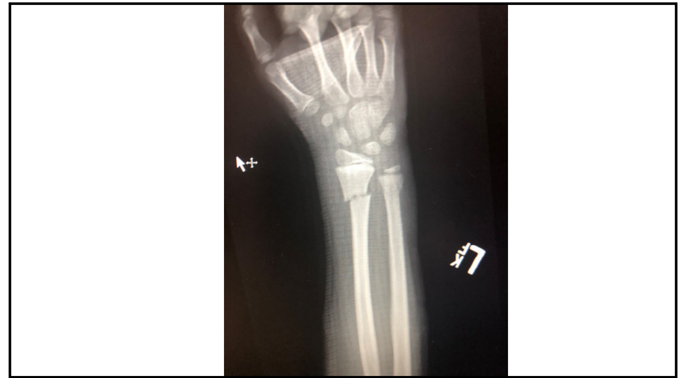

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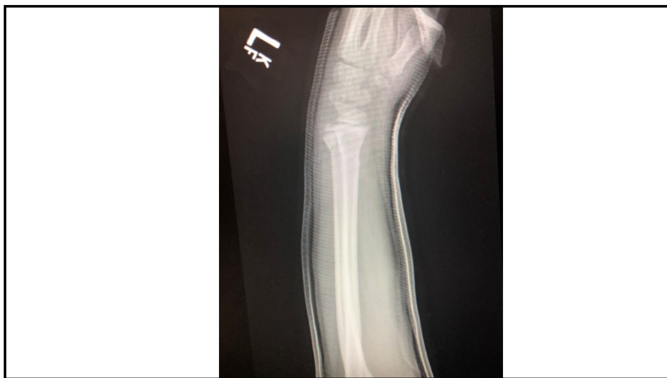

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Splinting

- Pearls
  - Get a good mold
  - Get post reduction images

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Splinting

- Pitfalls
  - Not holding reduction while splinting
  - Splint too tight to too loose

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Case 4

Image c/o Reddit

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Case 4

- A 24 year old male presents with left shoulder pain after he was thrown to the ground by “2 guys” after having “a beer or 2”
- There is an obvious deformity to his right shoulder, but sensation intact over deltoid, and neurovascular intact right shoulder

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Case 4

- Pearls

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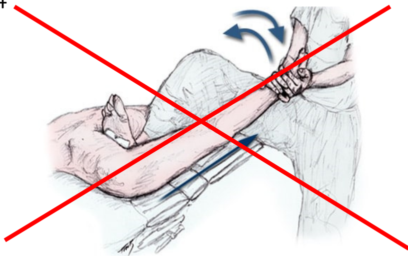
Case 4



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Dislocated Shoulder

- Pearls
  - Leverage, not brute force

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Dislocated Shoulder

- Pearls
  - Leverage, not brute force
  - Patience
  - Treat the reason it won’t reduce

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Cunningham Technique

1. Face patient
2. Place their elbow on your shoulder
3. Massage
4. Have them relax as much as possible

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Cunningham Technique

- https://www.youtube.com/watch?v=MkdCGV_MOCM

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Dislocated Shoulder

- Pitfalls
  - Forcing it is generally not successful and potentially harmful
  - Inadequate analgesia
  - Some patients require sedation

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Case 5

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Case 5

- A 64 year old female presents with left hip pain after a fall skiing
- Her leg leg is held internally rotate and is foreshortened
- Left leg is neurovascular intact

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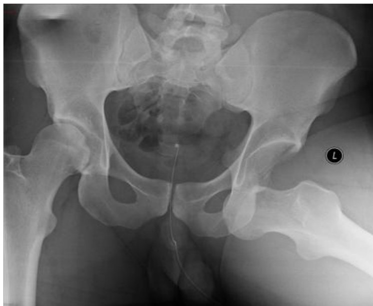

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Anterior Hip Dislocations

- Urgent reduction required to avoid avascular necrosis
- Requires leverage AND force
  - But leverage is more imporant

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Not just for analgesia!

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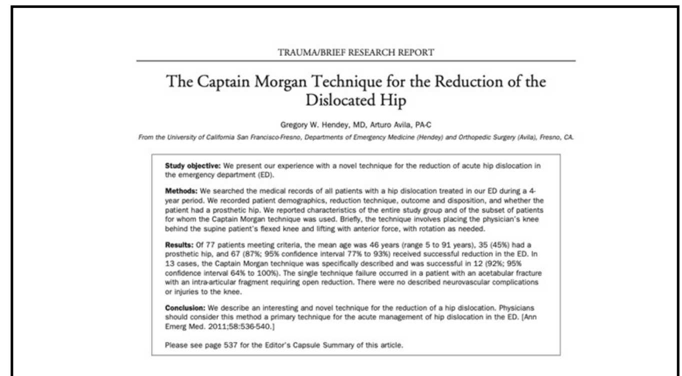

TRAUMA/BRIEF RESEARCH REPORT

The Captain Morgan Technique for the Reduction of the Dislocated Hip

Gregory W. Hendey, MD, Arturo Avila, PA-C

From the University of California San Francisco-Fresno, Departments of Emergency Medicine (Hendey) and Orthopedic Surgery (Avila), Fresno, CA.

Study objective: We present our experience with a novel technique for the reduction of acute hip dislocation in the emergency department (ED).

Methods: We searched the medical records of all patients with a hip dislocation treated in our ED during a 4-year period. We recorded patient demographics, reduction technique, outcome and disposition, and whether the patient had a prosthetic hip. We reported characteristics of the entire study group and of the subset of patients for whom the Captain Morgan technique was used. Briefly, the technique involves placing the physician's knee behind the supine patient's flexed knee and lifting with anterior force, with rotation as needed.

Results: Of 77 patients meeting criteria, the mean age was 46 years (range 5 to 91 years), 35 (45%) had a prosthetic hip, and 67 (87%; 95% confidence interval 77% to 93%) received successful reduction in the ED. In 13 cases, the Captain Morgan technique was specifically described and was successful in 12 (92%; 95% confidence interval 64% to 100%). The single technique failure occurred in a patient with an acetabular fracture with an intra-articular fragment requiring open reduction. There were no described neurovascular complications or injuries to the knee.

Conclusion: We describe an interesting and novel technique for the reduction of a hip dislocation. Physicians should consider this method a primary technique for the acute management of hip dislocation in the ED. [Ann Emerg Med. 2011;58:536-540.]

Please see page 537 for the Editor's Capsule Summary of this article.

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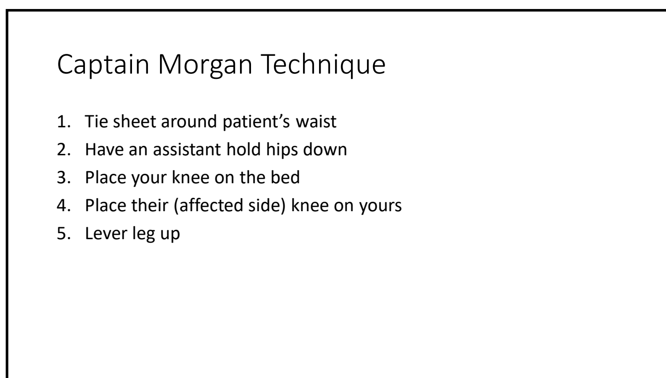

Captain Morgan Technique

1. Tie sheet around patient's waist
2. Have an assistant hold hips down
3. Place your knee on the bed
4. Place their (affected side) knee on yours
5. Lever leg up

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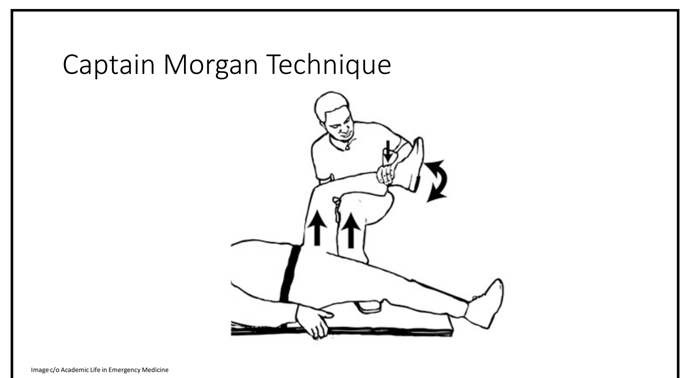

Captain Morgan Technique

Image c/o Academic Life in Emergency Medicine

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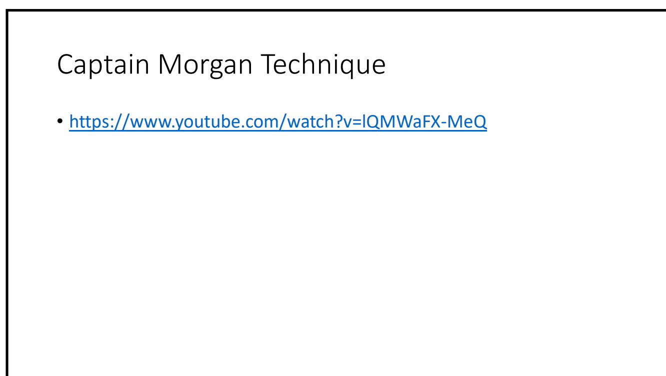

Captain Morgan Technique

- https://www.youtube.com/watch?v=lQMWaFX-MeQ

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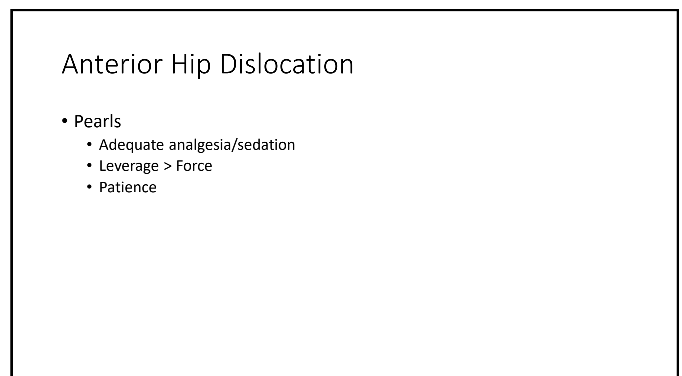

Anterior Hip Dislocation

- Pearls
  - Adequate analgesia/sedation
  - Leverage > Force
  - Patience

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Anterior Hip Dislocation

- Pitfalls
  - Too much force is often a signal that you are doing it wrong
  - Inadequate muscle relaxation

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Case 6

- A 19 year old construction worker falls into sewer drain
- Presents with pain in left leg

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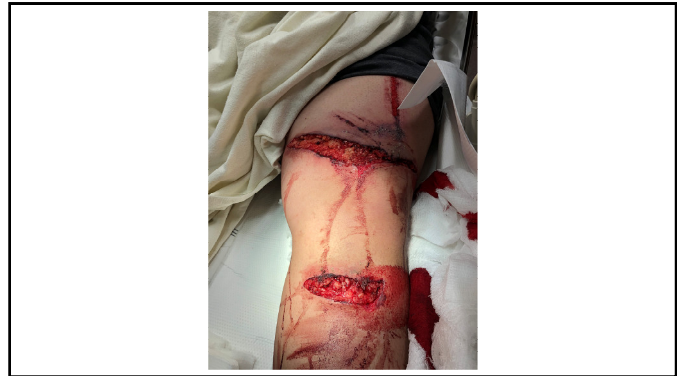

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Case 6

- Ortho not available

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Wound Repair Considerations

- How to adequately clean large/grossly contaminated wounds
- How to adequately anesthetize large wounds
- How to not spend your entire shift on large wounds

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Wound Irrigation

- “Dilution is the solution to pollution”
- Sterile water vs tap water
  - Probably doesn’t matter, but make sure it’s potable…
    - (Valente et al Ann Emerg Med 2003, Moscati et al Acad Emerg Med 2007, Fernandez et al Coch 2012, Weiss et al BMJ 2013)

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Wound Irrigation

- Pressure vs no pressure
  - Pressure is necessary
  - 8 PSI needed
    - 18g angiocath on a 35mL syringe
    - 19g angiocath on 60cc syringe
    - 400mmHg blood pressure cuff on 1L normal saline

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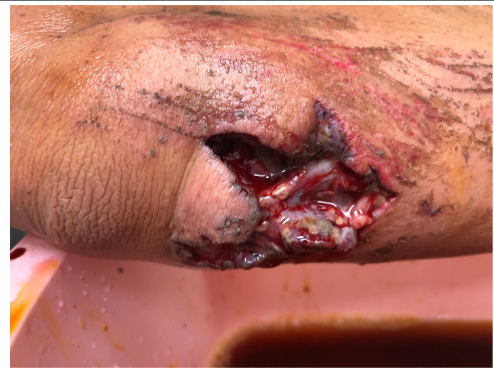

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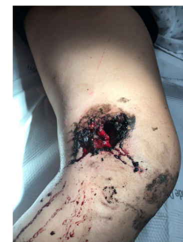

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Wound Irrigation

- Adding an antiseptic?
  - Theoretically harmful, and not beneficial

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Analgesia

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Analgesia

Agent	Max Dose w/o Epi	Max Dose w/ Epi	Duration of Action	Notes
Lidocaine	5 mg/kg	7 mg/kg	30-90 min	1% = 10 mg/ml 2% = 20 mg/ml
Bupivicaine	2.5 mg/kg	3 mg/kg	6-8 hours	0.5% = 5 mg/ml
Mepivicaine	7 mg/kg	8 mg/kg		
Ropivacaine	3 mg/kg			

Image c/o LacerationRepair.com

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Laceration Repair

- Consider staples

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Laceration Repair

- Consider staples
- Running sutures can save TONS of time

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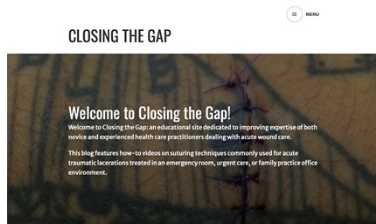
Laceration Repair



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Laceration Repair

- https://lacerationrepair.com

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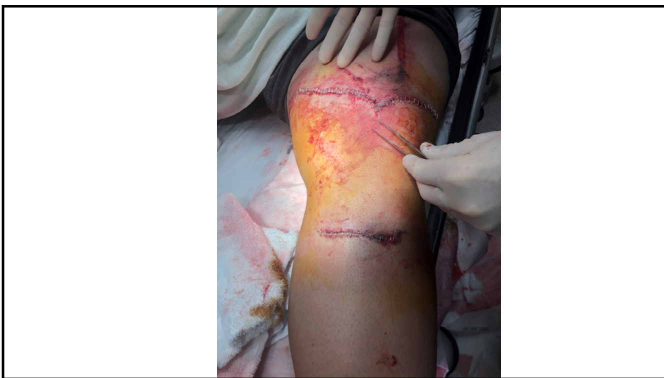

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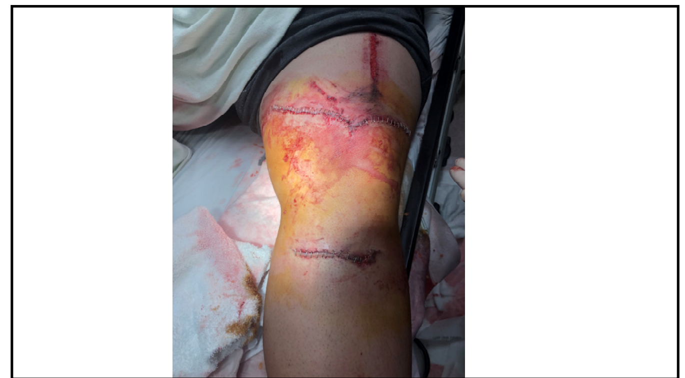

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Laceration Repair

- Pearls
  - Irrigate large wounds yourself
  - Learn running suture techniques if you don't use them
  - Utilize tools at your disposal

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Laceration Repair

- Pitfalls
  - Having someone else irrigate wounds
  - Not paying careful attention to lidocaine use (particularly in pediatrics)
  - Not using deep sutures
  - Missing foreign bodies
  - Missing tendon injuries

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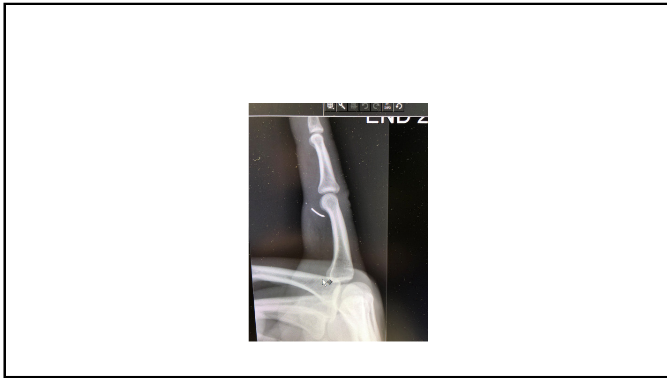

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Other Procedural Pearls

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Peritonsillar abscesses

- Pearls

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Peritonsillar abscesses

- Pearls
  - Use ultrasound to find the location of abscess AND big red

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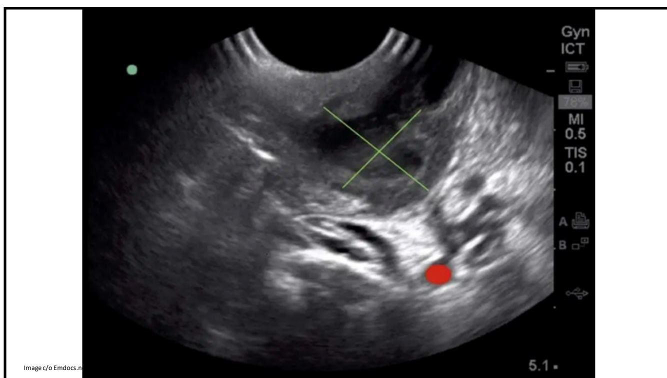

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Peritonsillar abscesses

- Pearls
  - Use ultrasound to find the location of abscess AND big red
  - Use laryngoscope or speculum to visualize and get access

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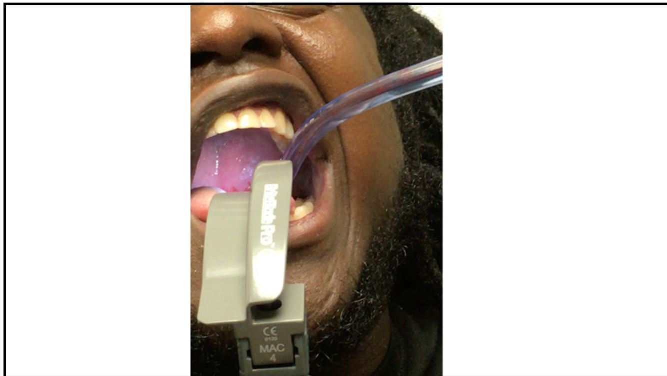

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Peritonsillar abscesses

- Pearls
  - Use ultrasound to find the location of abscess AND big red
  - Use laryngoscope or speculum to visualize and get access
  - Use pediatric bullet tube or spinal needle to remember depth

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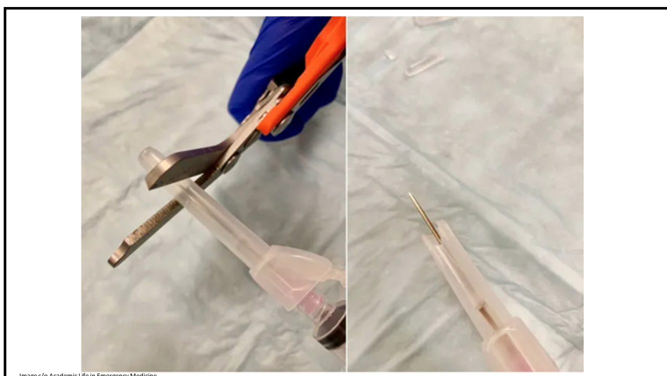

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Image c/o Academic Life in Emergency Medicine

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Peritonsillar abscesses

- Pearls
  - Use ultrasound to find the location of abscess AND big red
  - Use laryngoscope or speculum to visualize and get access
  - Use pediatric bullet tube or spinal needle to remember depth
  - Needle vs. I&D- still unclear, but probably ok to just needle and followup

Cochrane Library — Trusted evidence. Informed decisions. Better health. — Cochrane Database of Systematic Reviews

[Intervention Review]

Needle aspiration versus incision and drainage for the treatment of peritonsillar abscess

Brent A Chang[1], Andrew Thamboo[1], Martin J Burton[2], Chris Diamond[1], Desmond A Nunez[1]

[1]Division of Otolaryngology Head & Neck Surgery, University of British Columbia, Vancouver, Canada. [2]UK Cochrane Centre, Oxford, UK

Contact address: Brent A Chang, Division of Otolaryngology Head & Neck Surgery, University of British Columbia, 2775 Laurel St., 4th Floor Otolaryngology (ENT), Vancouver, BC, V5Z 1M9, Canada. brent.a.chang@gmail.com.

Editorial group: Cochrane ENT Group.
Publication status and date: New, published in Issue 12, 2016.

Citation: Chang BA, Thamboo A, Burton MJ, Diamond C, Nunez DA. Needle aspiration versus incision and drainage for the treatment of peritonsillar abscess. *Cochrane Database of Systematic Reviews* 2016, Issue 12. Art. No.: CD006287. DOI: 10.1002/14651858.CD006287.pub4.

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Chest Tubes

- Pearls
  - Stay above nipple line

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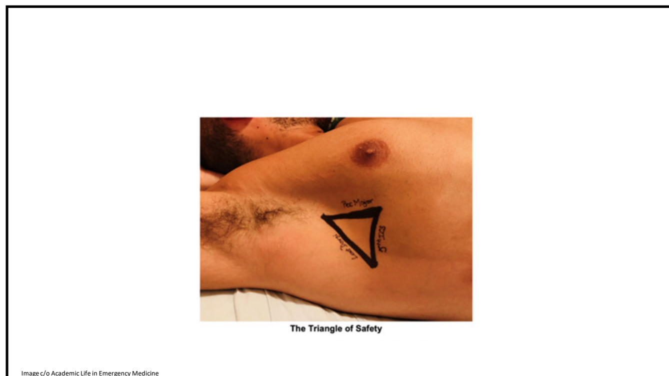
The Triangle of Safety

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Chest Tubes

- Pearls
  - Stay above nipple line
  - Make a large incision (2-3cm minimum)

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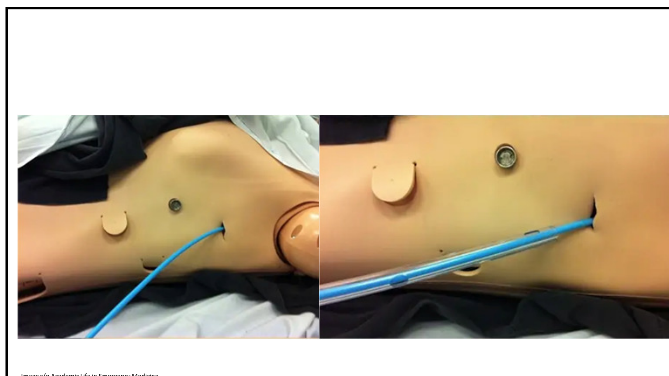

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Chest Tubes

- Pearls
  - Stay above nipple line
  - Make a large incision (2-3 cm minimum)
  - Don't forget to clamp the distal end of tube!

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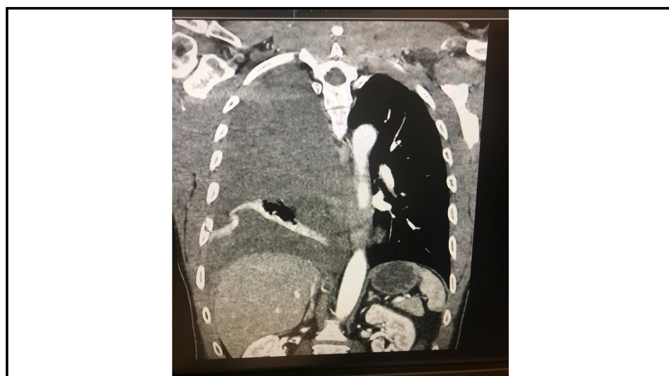

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Chest tube

- Pitfalls
  - Inadequate analgesia
    - Don't forget to save a squirt for pleura
  - Tube doesn't enter pleural space

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Ultrasound

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Ultrasound

- Pearls
  - Excellent for procedural guidance
    - Abscesses, joint injections/aspirations, hematoma blocks, IV catheter placement, arterial line placement

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Ultrasound

- Pearls
  - Excellent for procedural guidance
    - Abscesses, joint injections/aspirations, hematoma blocks,
  - An outstanding tool for MSK diagnoses and procedures
  - Many scans need minimal training

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Ultrasound

- Pitfalls
  - Using it to “rule out”
  - Using without training
  - Repetition is key
    - But supervised repetition is often necessary

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Central Lines

- Pearls
  - Use the included angiocatheter

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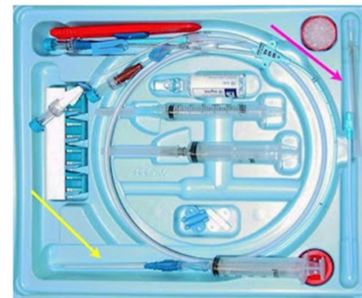

Image c/o Academic Life in Emergency Medicine

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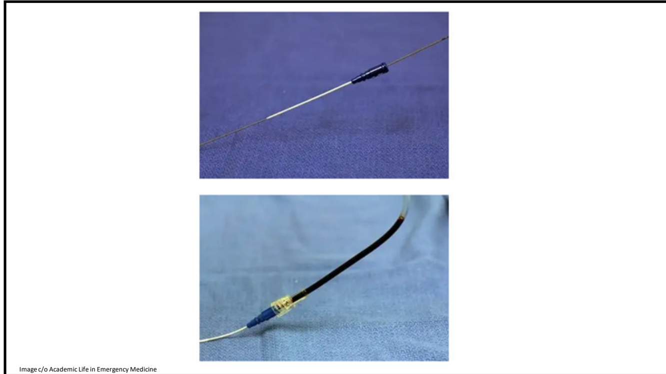

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Central Lines

- Pearls
  - Use the included angiocatheter
  - Use femoral lines!
    - Still higher risk of infection, but can be switched out if needed and often they are safer in a crashing patient

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The risk of catheter-related bloodstream infection with femoral venous catheters as compared to subclavian and internal jugular venous catheters

A systematic review of the literature and meta-analysis*

Marik, Paul E. MD, FCCM; Flemmer, Mark MD; Harrison, Wendy PhD

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Critical Care Medicine: August 2012 - Volume 40 - Issue 8 - p 2479-2485
doi: 10.1097/CCM.0b013e318255d9bc

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The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Intravascular Complications of Central Venous Catheterization by Insertion Site

Jean-Jacques Parienti, M.D., Ph.D., Nicolas Mongardon, M.D., Bruno Mégarbane, M.D., Ph.D., Jean-Paul Mira, M.D., Ph.D., Pierre Kalfon, M.D., Ph.D., Antoine Gros, M.D., Sophie Marqué, M.D., Marie Thuong, M.D., Véronique Pottier, M.D., Michel Ramakers, M.D., Benoît Savary, M.D., Amélie Seguin, M.D., Xavier Valette, M.D., Nicolas Terzi, M.D., Ph.D., Bertrand Sauneuf, M.D., Vincent Cattoir, Pharm.D., Ph.D., Leonard A. Mermel, D.O., and Damien du Cheyron, M.D., Ph.D., for the 3SITES Study Group*

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Central Lines

- Pitfalls
  - Pushing the wire against resistance
  - Losing the orientation of ultrasound probe
  - Not ordering post procedural X-ray for IJ and subclavian lines

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- Central Lines
  - Pearls: Femoral lines are great!, use the plastic catheter, suture in well
  - Pitfalls: placing catheter even with wire resistance, flipping the ultrasound

126

Peritonsillar Abscesses

- Pitfalls
  - Hitting big red
  - Going for inferior pole first

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- Peritonsillar abscesses
  - Pearls: not all need drainage, go for the inferior pole first!, use ultrasound
  - Pitfalls:

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