Polytrauma Case Review:
Mutli-Disciplinary Management of Life-Threatening Injuries

Ski & Mountain Trauma Conference

Sun Valley, ID

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Disclosures

- None

Objectives

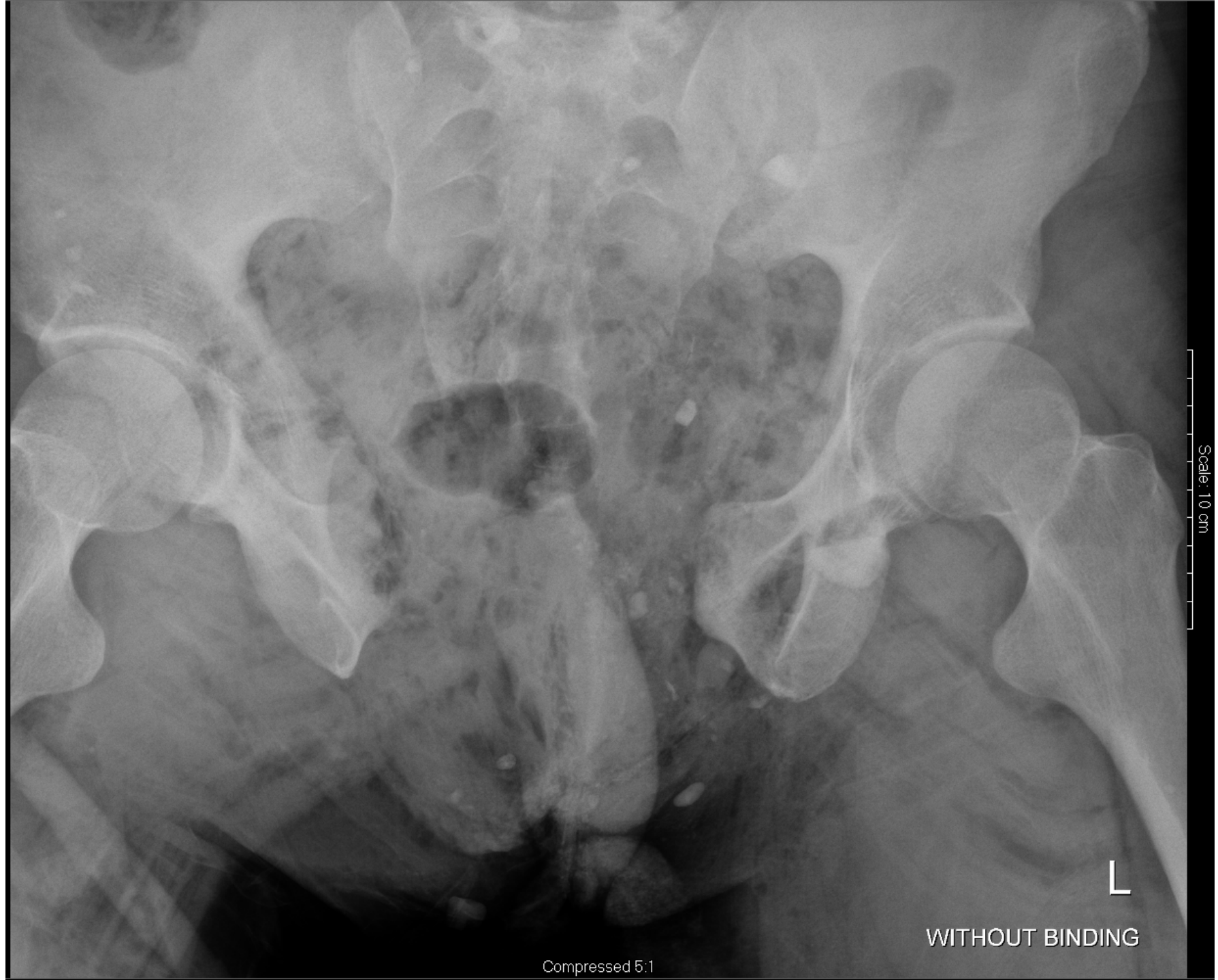
- Review trauma resuscitation principles
- Appreciate the multi-disciplinary needs of complex blunt trauma
- Recognize the importance of appropriate destination for transport of polytrauma patients
- Hear a couple of cool cases!

KM, 33yoM s/p MCC with helmet

- Found far from road after having gone through wire fence and irrigation ditch
- Obvious severe hemorrhage on scene:
  - Mangled RLE below knee
  - Severe perineal wound
  - Left hand/wrist wound with exposed tendon
- Hypotensive (thready peripheral pulses only)
- Remained awake and alert

KM, 33yoM s/p MCC

- On arrival at SARMC:
  - GCS15
  - HR 140’s
  - cool and clammy, pulses thready, blood pressure not detectable with manual or auto sphygmomanometer.
- Tourniquet R proximal thigh
- Ongoing hemorrhage from perineum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L
WITHOUT BINDING
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KM, 33yoM s/p MCC

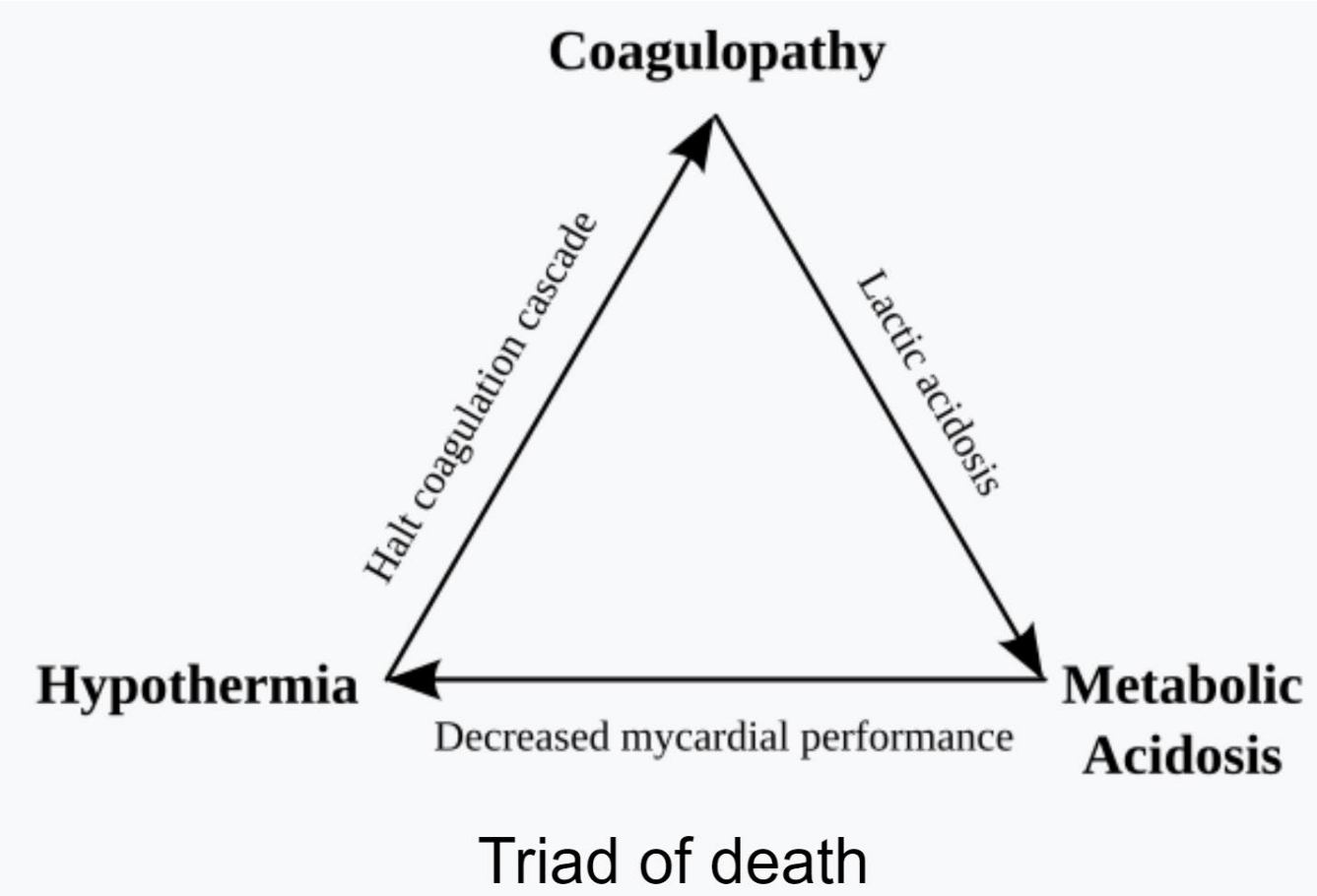
- Pelvic Binder applied
- MTP with Whole Blood
  - 9u WB transfused
- Perineum inspected and packed with hemostatic gauze
- FAST negative x2

Damage Control Resuscitation: Directly Addressing the Early Coagulopathy of Trauma

John B. Holcomb, MD, FACS, Don Jenkins, MD, FACS, Peter Rhee, MD, FACS, Jay Johannigman, MD, FS, FACS, Peter Mahoney, FRCA, RAMC, Sumeru Mehta, MD, E. Darrin Cox, MD, FACS, Michael J. Gehrke, MD, Greg J. Beilman, MD, FACS, Martin Schreiber, MD, FACS, Stephen F. Flaherty, MD, FACS, Kurt W. Grathwohl, MD, Phillip C. Spinella, MD, Jeremy G. Perkins, MD, Alec C. Beekley, MD, FACS, Neil R. McMullin, MD, Myung S. Park, MD, FACS, Ernest A. Gonzalez, MD, FACS, Charles E. Wade, PhD, Michael A. Dubick, PhD, C. William Schwab, MD, FACS, Fred A. Moore, MD, FACS, Howard R. Champion, FRCS, David B. Hoyt, MD, FACS, and John R. Hess, MD, MPH, FACP

J Trauma. 2007;62:307–310.

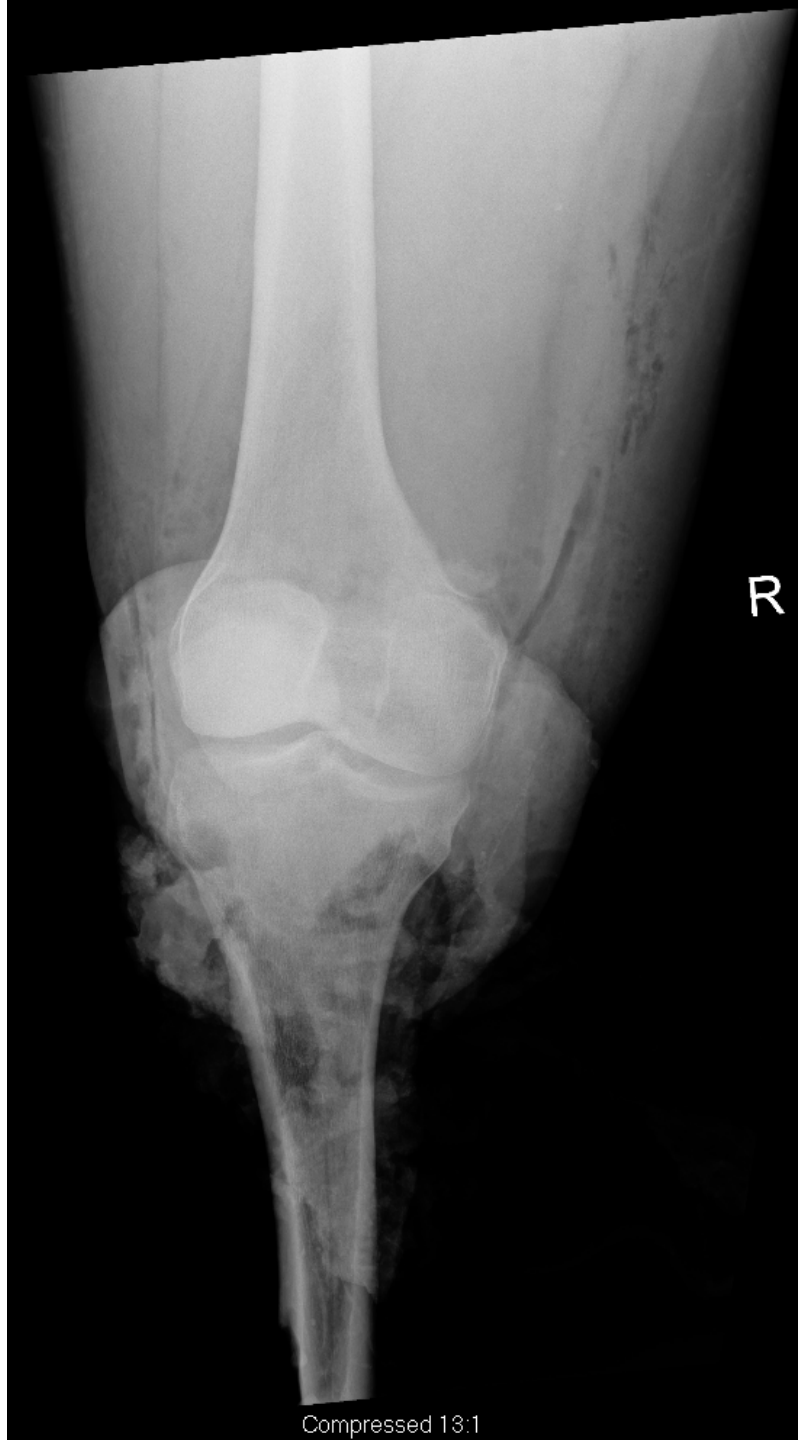
- Resuscitate to SBP 90 mmHg or less
- High plasma:RBC ratios approaching 1:1
  - Thawed plasma as primary resuscitative fluid
- Minimize use of crystalloid…seriously



Triad of death

KM, 33yoM s/p MCC

- He became hemodynamically stable with resuscitation
- Plan:
  - CT Scanner → IR angio suite → OR
    - Consults:
      - Interventional Radiology
      - Orthopedic Trauma
      - Urology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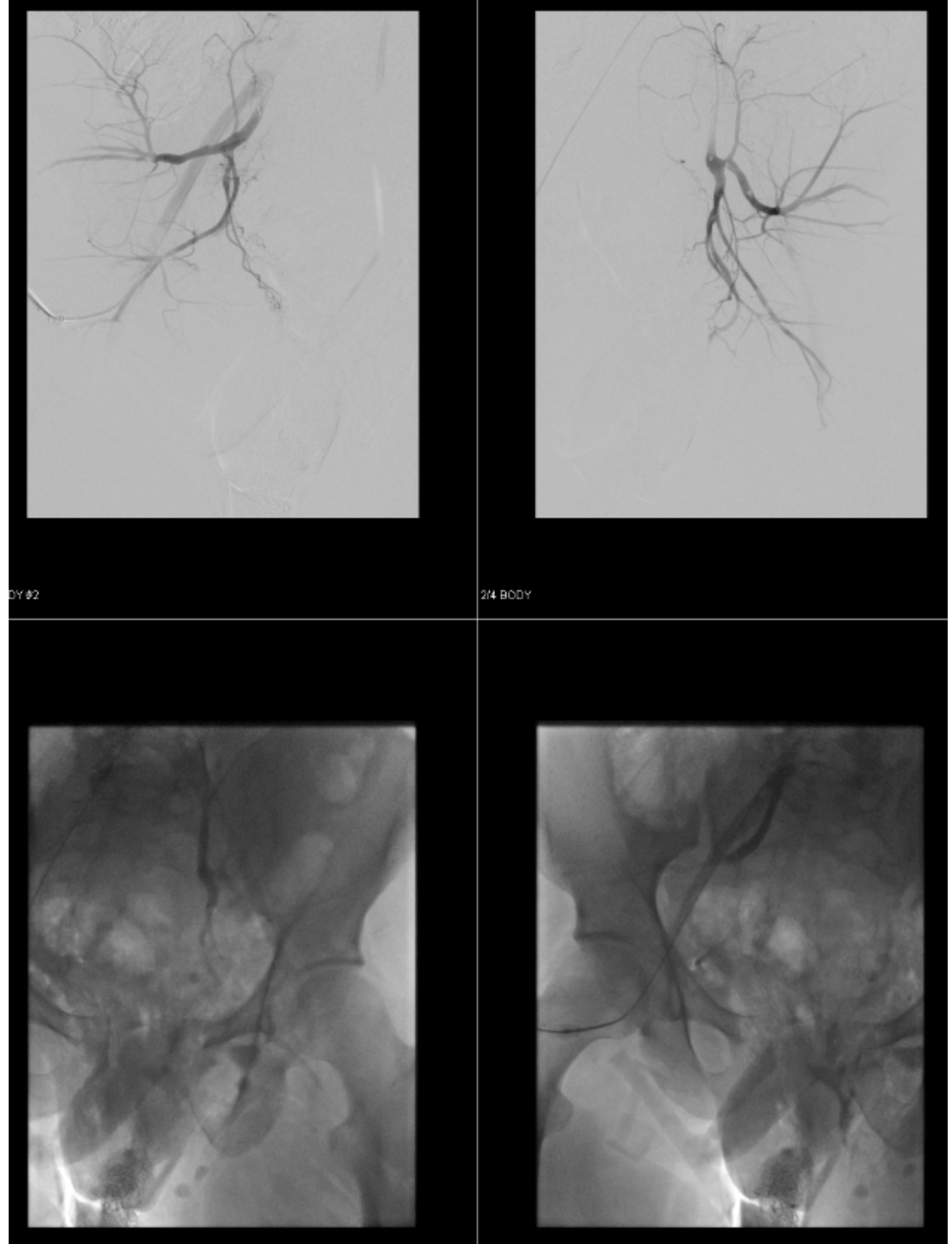
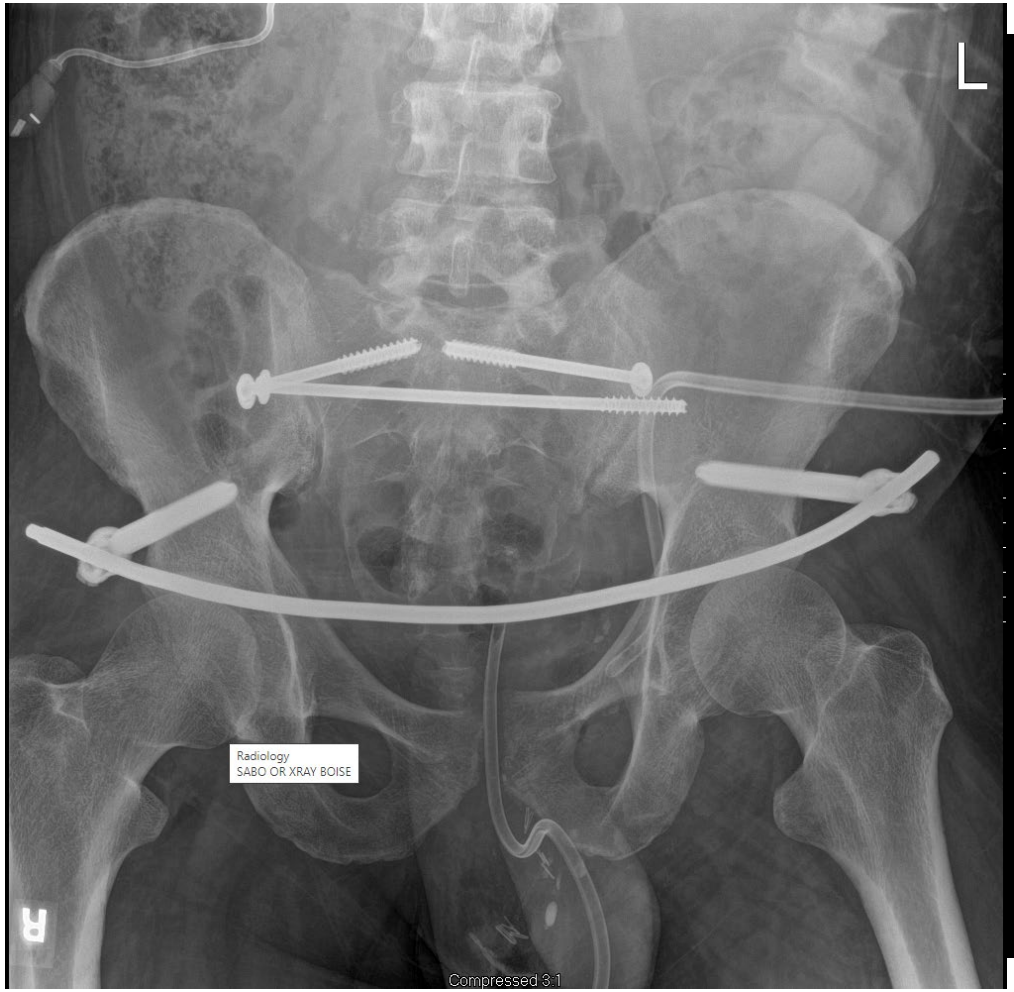

DY #2
2/4 BODY

KM, 33yoM s/p MCC

- OR:
  - Hasty through knee guillotine amputation
  - External Pelvic Fixation
  - Perineal and Genital Exam Under Anesthesia
  - Exploratory Laparotomy
    - Complex Bladder Repair x2
    - Suprapubic Catheter placement
    - Foley Catheter placement
    - Sigmoid resection
    - End Colostomy creation
  - Left hand wound irrigation and dressing

KM, 33yoM s/p MCC

- Prolonged SICU and hospital course
  - Many follow on procedures:
    - Ortho Trauma x6
    - Hand x1
    - Urology x2
    - Trauma x10
- He ultimately discharged to Rehab after a 45 days at SARMC
- He discharged to home after 48 days at Rehab hospital


L
Radiology
SABO OR XRAY BOISE
R
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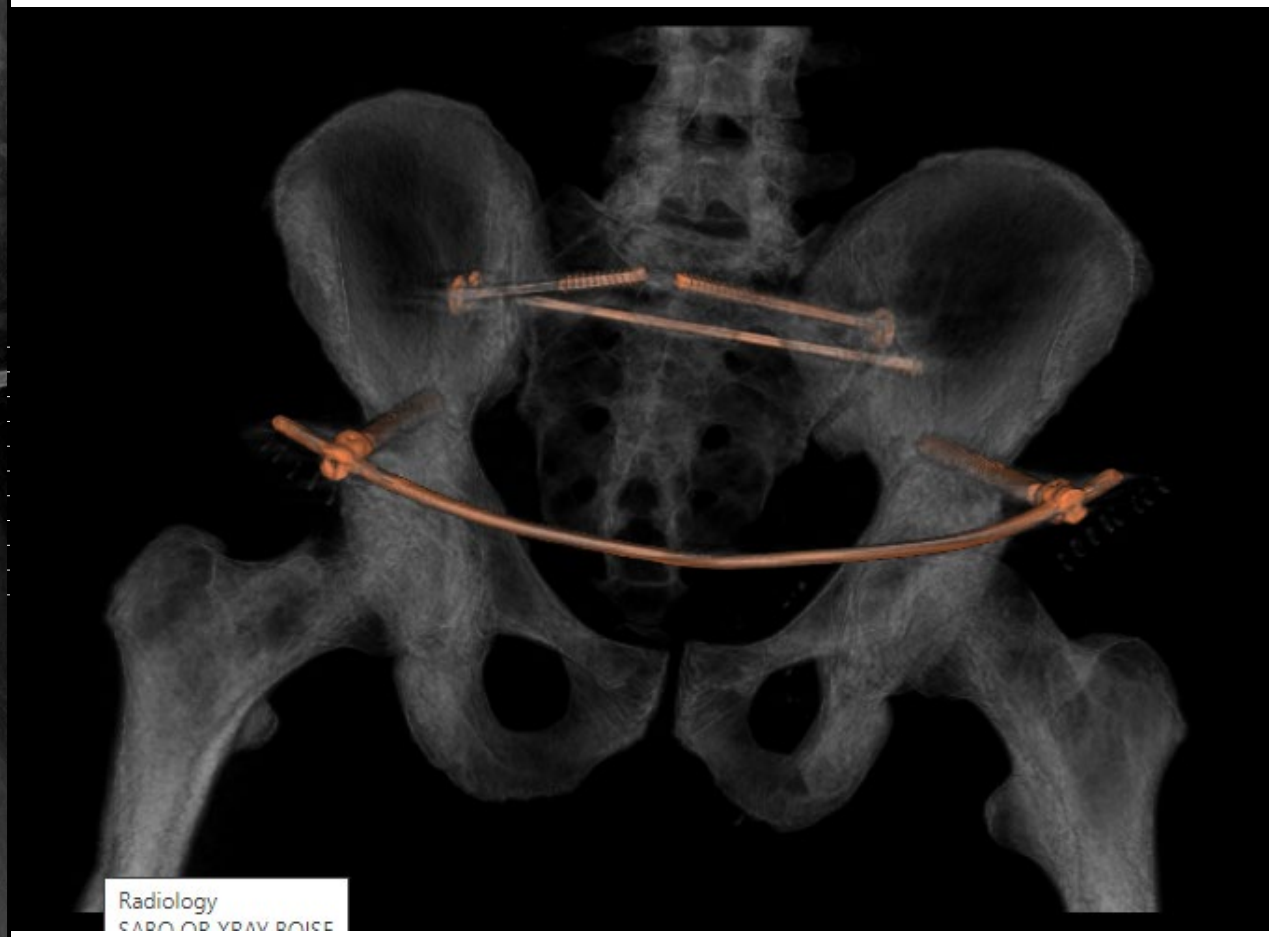
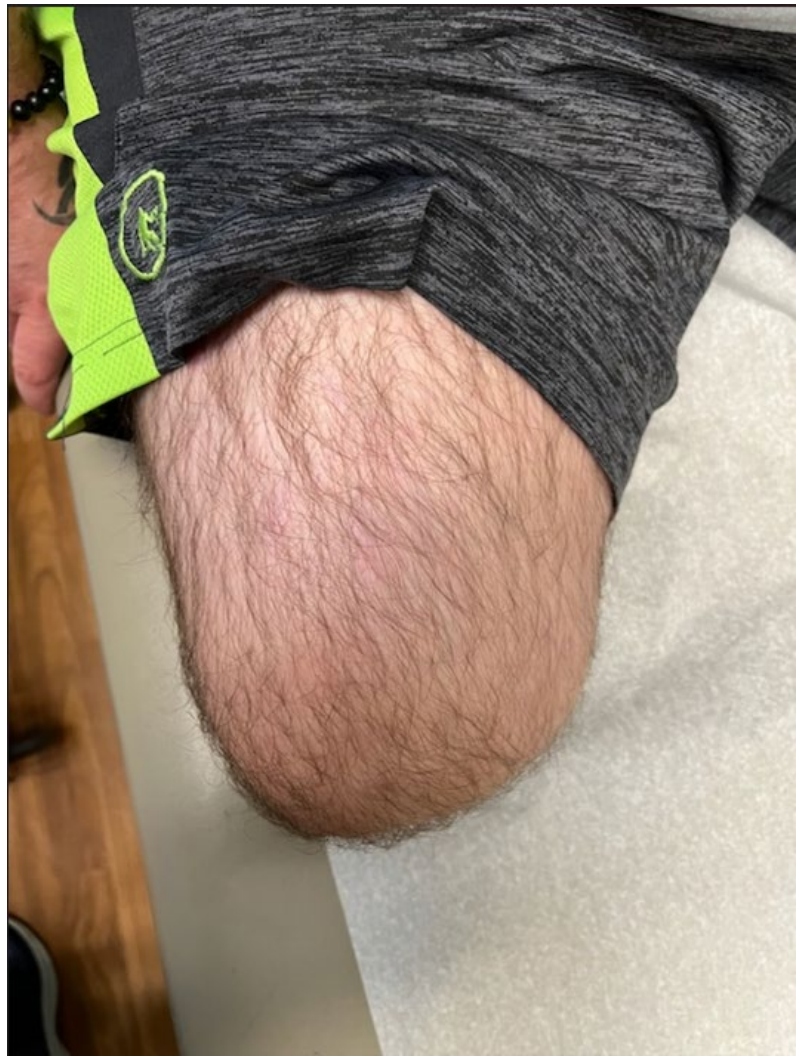

Radiology

KM, 33yoM s/p MCC

- Post DC he has been to the OR x2 (Ortho and Colorectal) at SARMC and once at University of Utah (Colorectal and Urology)
  - Anterior Pelvic internal fixation hardware is removed
  - All urinary drains/catheters removed and voiding via urethra
  - He is going through the prosthesis process and still working towards an Osseo-integration Prosthesis procedure



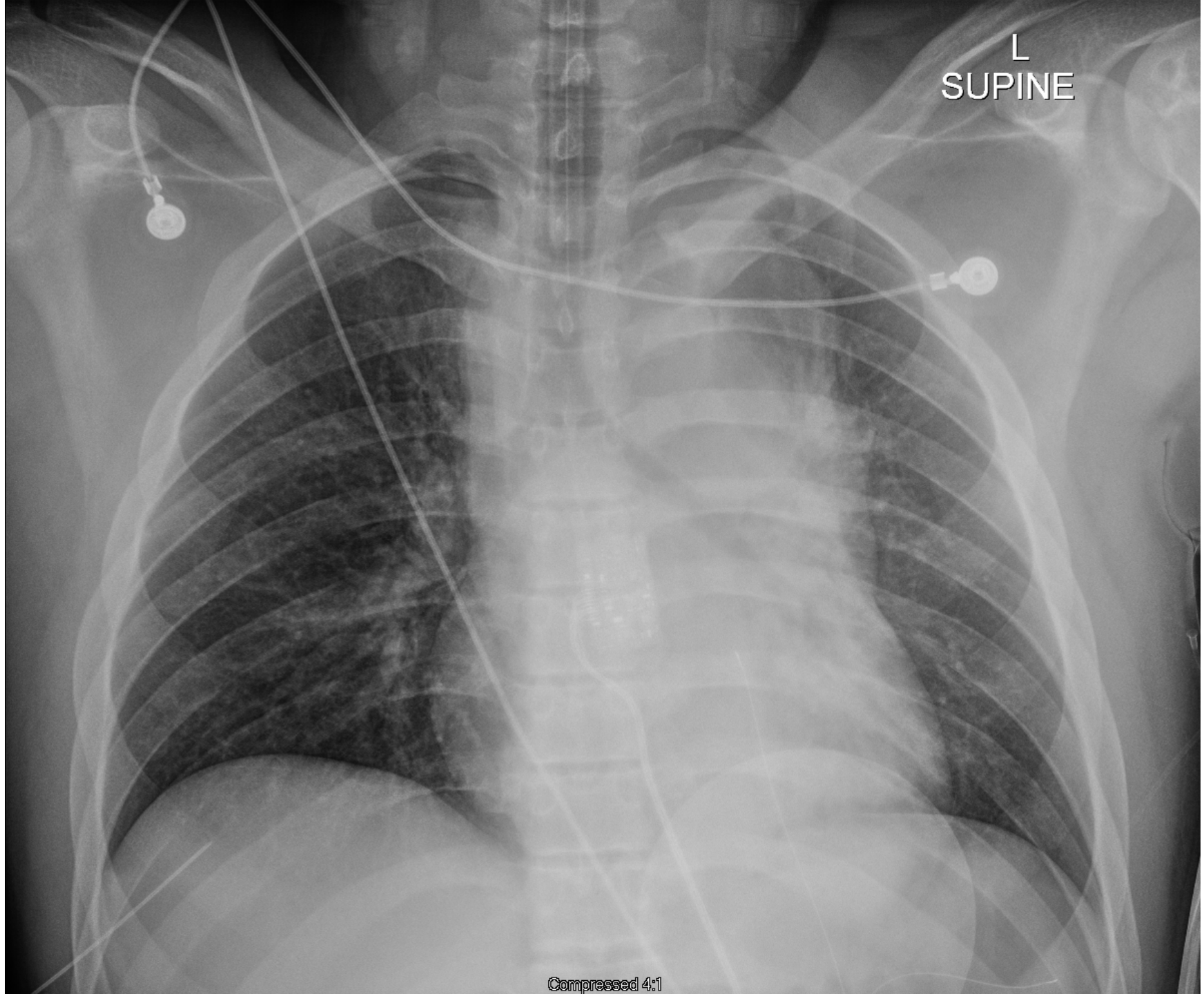
Questions or Comments?

JD, 19 yoM s/p MCC with helmet

- MCC vs Automobile found unconscious
- Open below knee deformity with massive hemorrhage LLE
  - Tourniquet
- RUE both bone forearm unstable deformity
- Traumatic Arrest
  - Intubated
  - CPR

JD, 19 yoM s/p MCC

- CPR ongoing upon arrival, GCS 3T
- FAST neg; coordinated cardiac activity present but still pulseless
- MTP initiated while compressions resumed
  - 3u Whole Blood for ROSC
- BP improved to >100 and he even opened his eyes briefly prior to sedation initiation
- Orthopedic Trauma called


L
SUPINE
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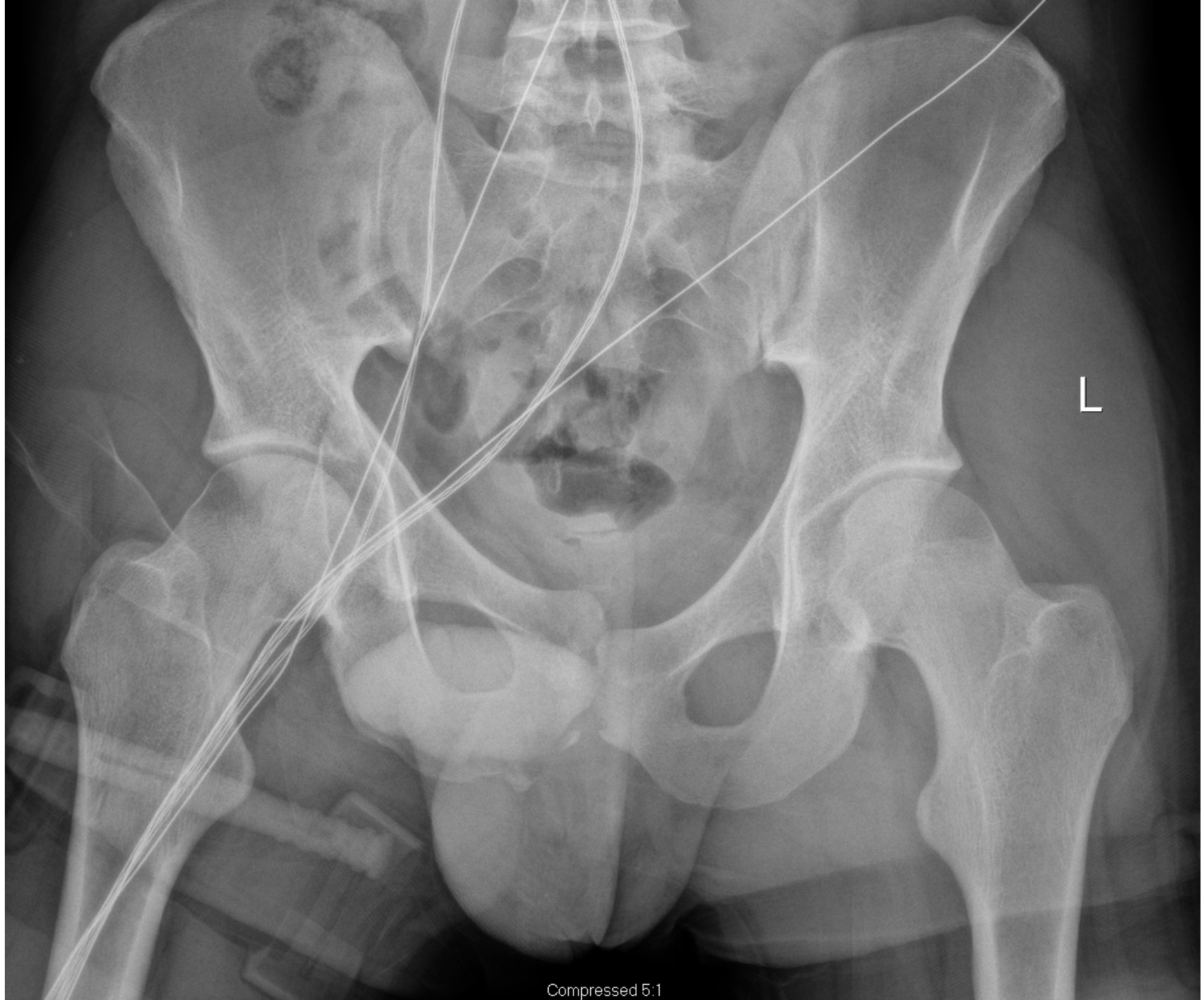
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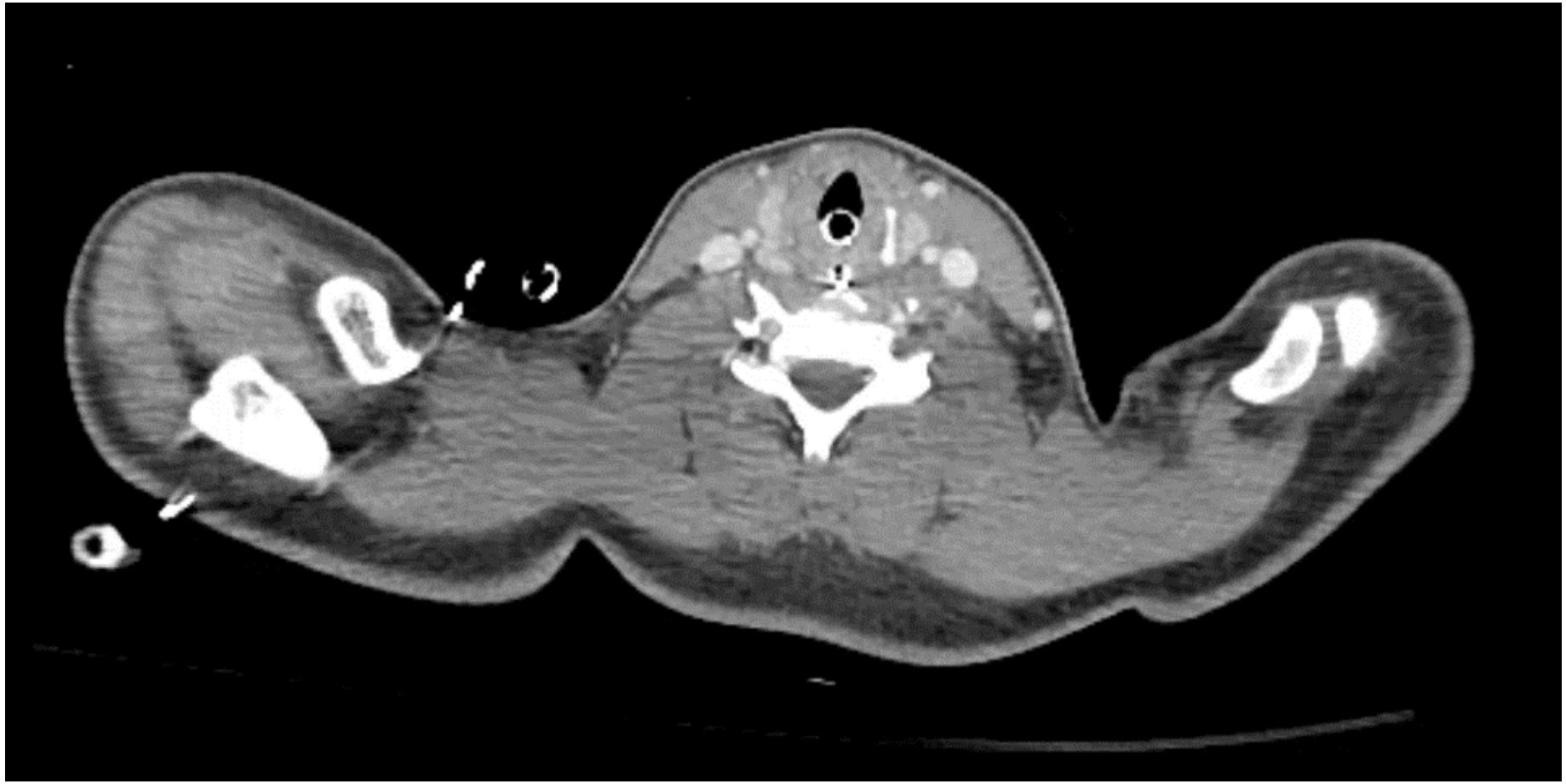
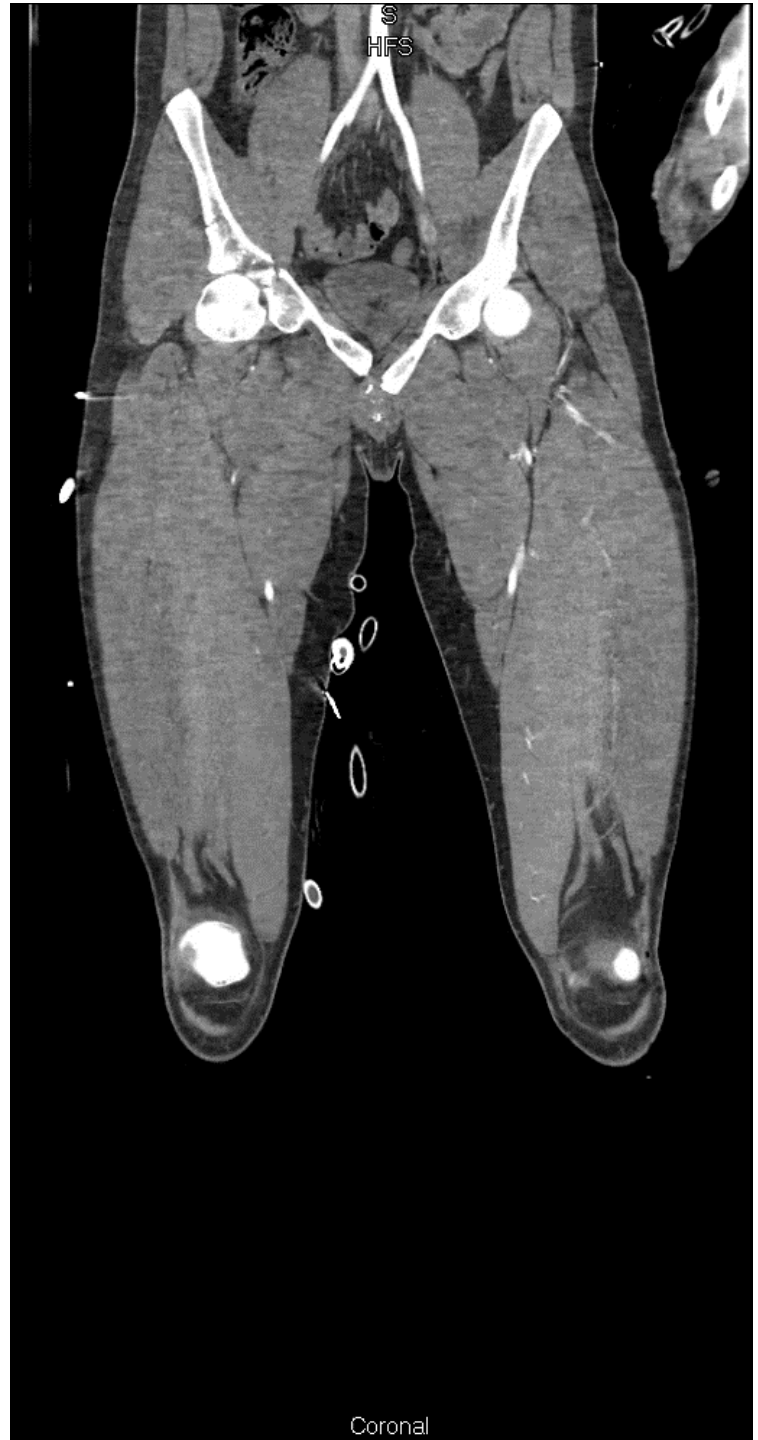



S
HFS
Coronal

JD, 19 yoM s/p MCC

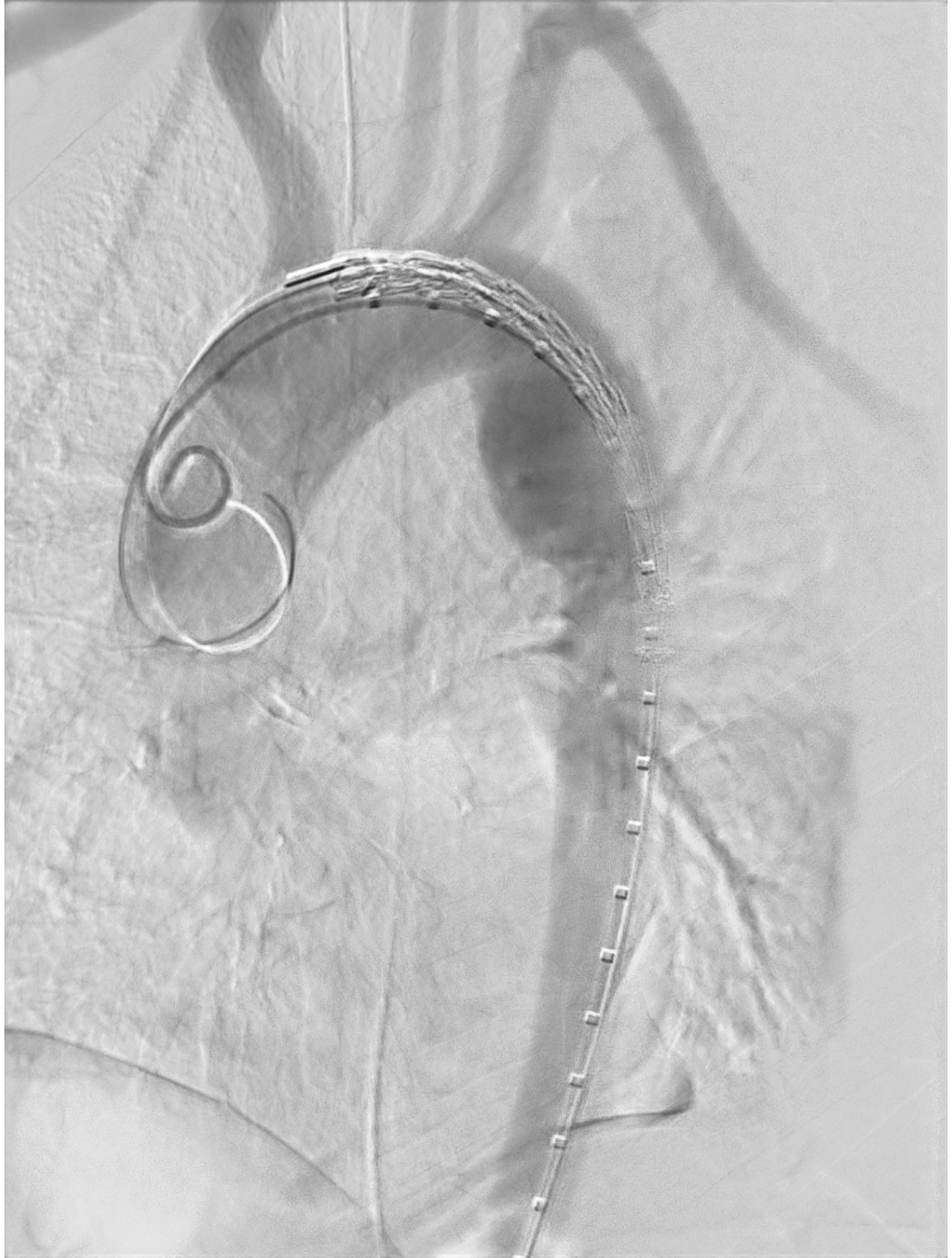
- Vascular Surgery called and OR notified of emergent combined case

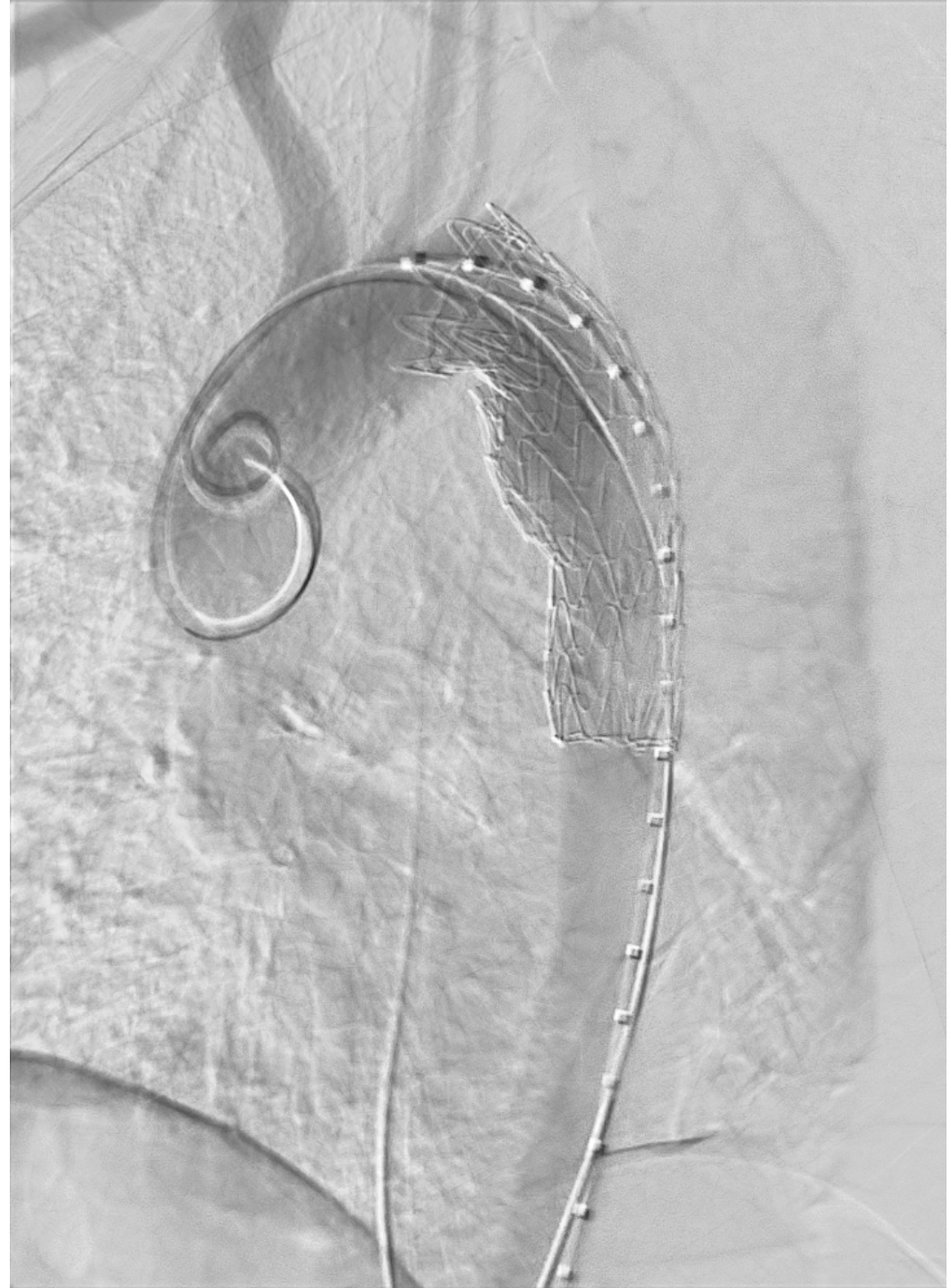
- Which injury should be intervened upon first?
  - Thoracic Aortic disruption with pseudoaneurysm

    …OR…
  - Popliteal transection due to open shattered proximal tibia with tourniquet

JD, 19yoM s/p MCC

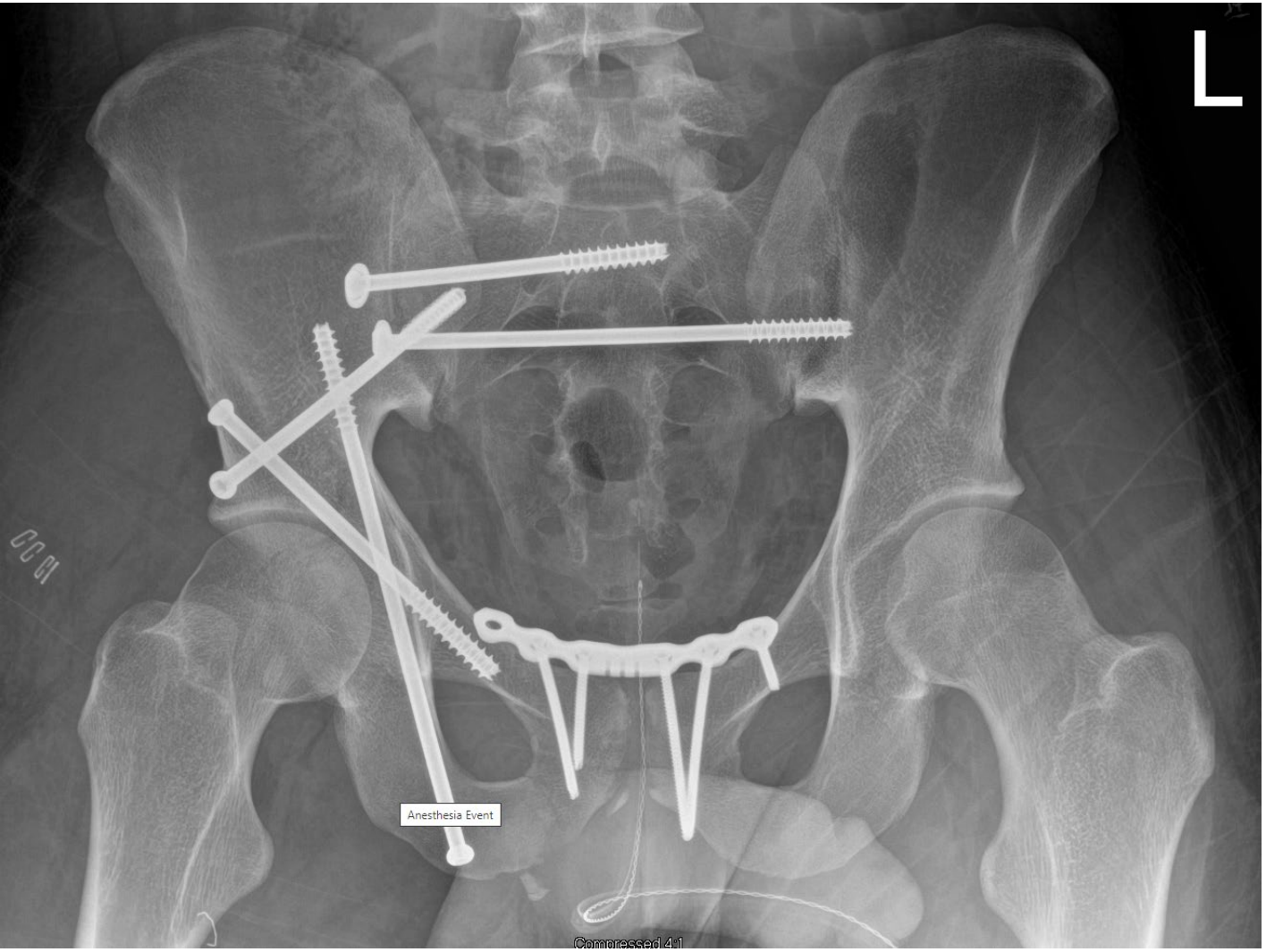
- OR:
  - Thoracic Endovascular Aortic Repair
  - Superficial Femoral Artery to Left below knee Popliteal Artery bypass with PTFE
  - 4 compartment fasciotomies with wound vac
  - Knee spanning external fixation and washout of left tibia
  - RLE wound repairs
  - RUE forearm fracture splinting
  - LUE wound repairs over exposed tendons





JD, 19 yoM s/p MCC

- Injuries:
  - Traumatic Cardiac Arrest
  - Hemorrhagic Shock
  - Thoracic Aortic disruption
  - Open Left tibial fracture
  - Left Popliteal Artery transection
  - Anterior and posterior pelvic ring fractures
  - Right acetabular fracture
  - Right both bone forearm fracture with elbow ligamentous disruption
  - Left radius fracture and middle finger tendon rupture
  - Hemopneumothorax
  - Right ACL/PCL/LCL injury


L
Anesthesia Event
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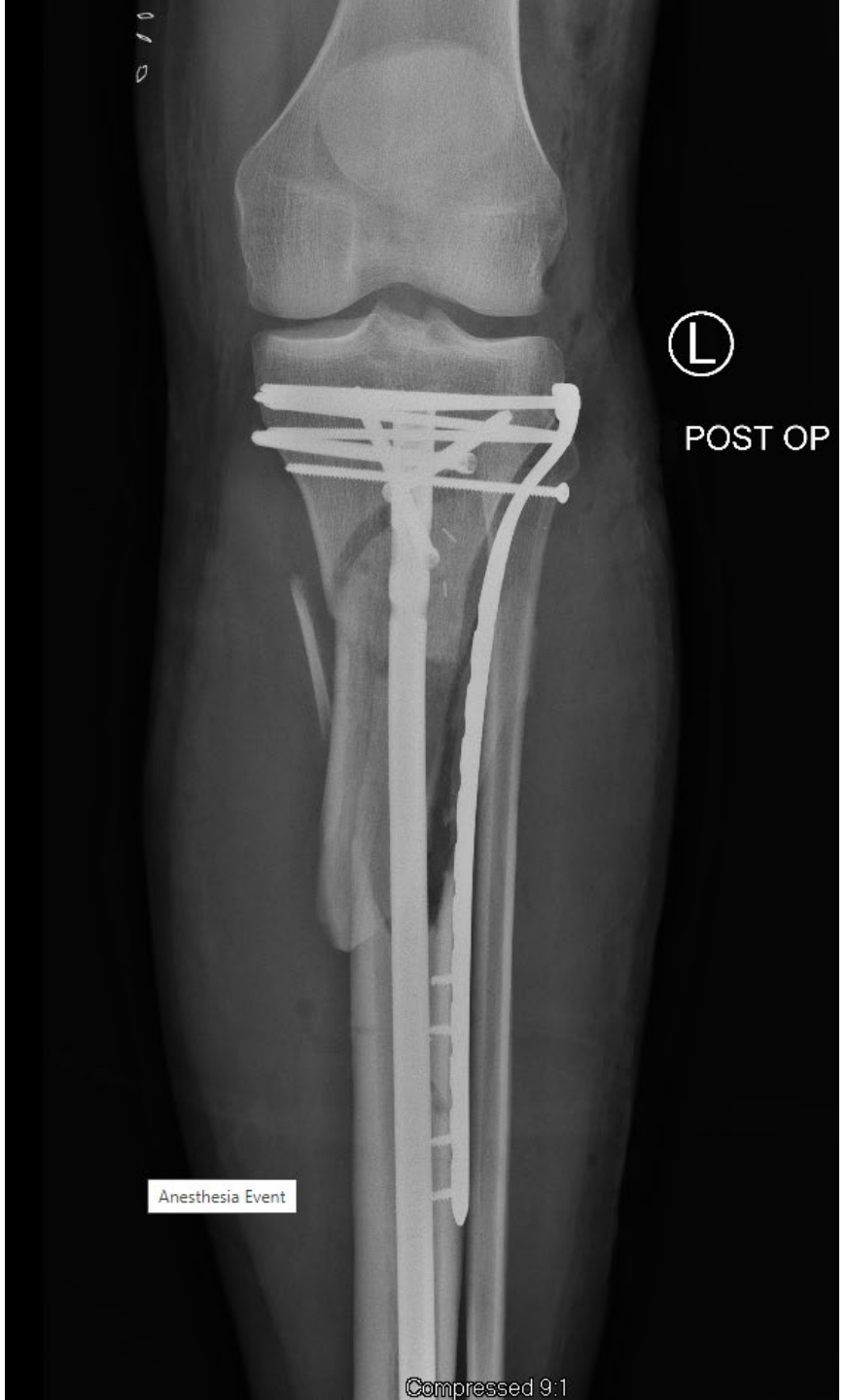
L
POST OP
Anesthesia Event
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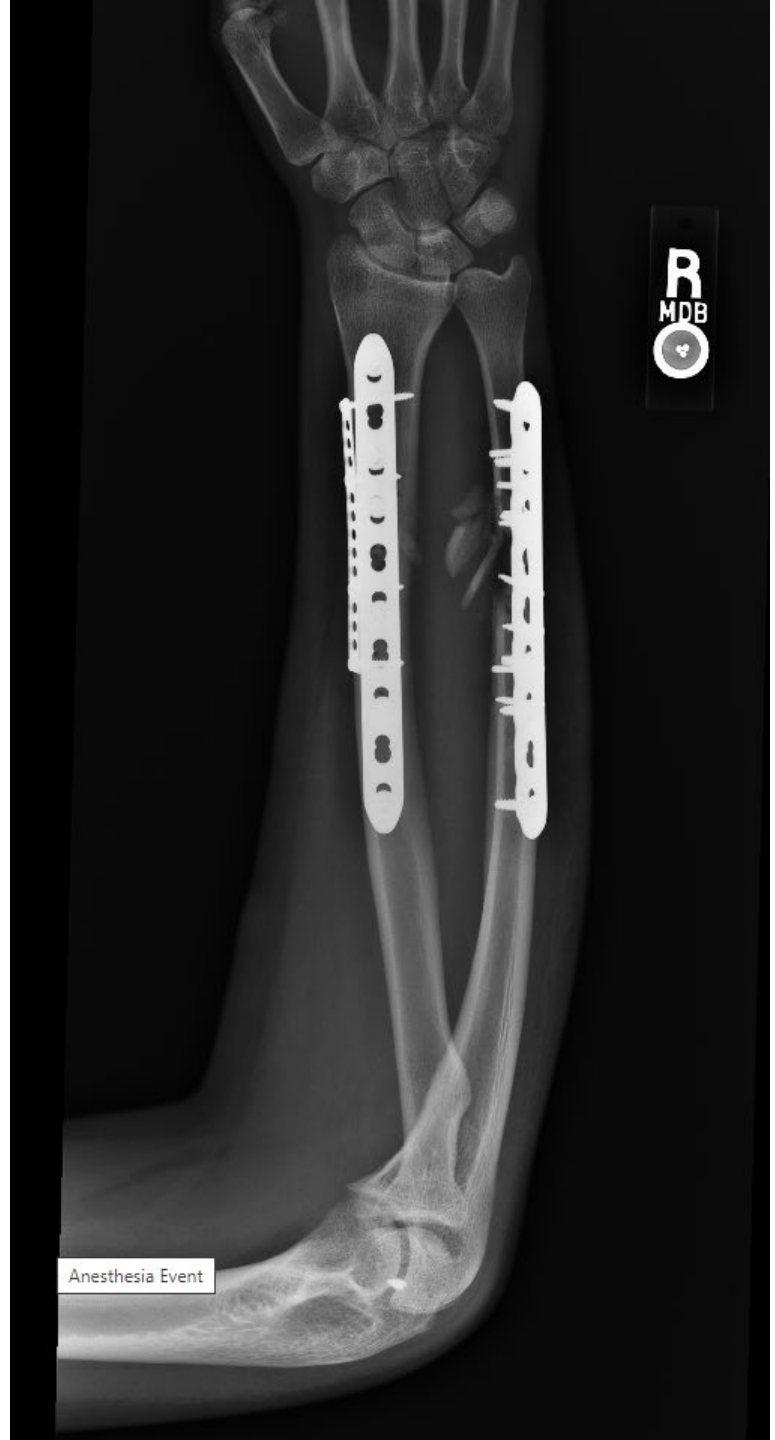
R
MDB
Anesthesia Event

JD, 19 yoM s/p MCC

- Discharged to Rehab Hospital at post-injury day 16
  - Completely neuro-cognitively intact
  - Non-Weight Bear all 4 extremities
  - Left foot drop due to myonecrosis of left anterior compartment
  - Right partial foot drop due to peroneal nerve stretch
- Discharged to home after 30 days in Rehab hospital
- OR with ortho x2 as outpatient
  - Now weight bear as tolerated throughout

Conclusion

- Correct field interventions make a difference
- Resuscitation matters
  - It starts in the field!
  - Remember basic Damage Control Resuscitation principles to fight the “Lethal Triad”
    - Do all you can for hemostasis
    - Crystalloid is bad for hemorrhagic patients
    - Permissive Hypotension
- Appropriate destination of transport is vital in complex trauma
- Multi-disciplinary coordination is key to good outcomes

Questions or Comments?