RADY 401 Case Presentation

Brannon Inman MS4
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Focused patient history and workup

- **19 yo Male** s/p high speed MVC w/ air bag deployment w/o LOC
- Presents to UNC as yellow trauma as transfer from OSH
- At OSH:
  - CT performed
  - L Shoulder dislocation and L acetabular fracture
- Primary survey: no life-threatening injuries, GCS 15
- Secondary survey: L arm in sling, full ROM in all fingers, 2+ pulses throughout, noted to have L knee tenderness
- Trauma Surg and Ortho consulted
- Repeat post-reduction plain films of L shoulder, and L hip in trauma bay
- Maintain spinal precautions until review of OSH CT, and acquisition of thoracic and lumbar CT
List of imaging studies

- LOS 0 – XR Pelvis
- LOS 0 – XR L Shoulder
- LOS 0 – CT Thoracic spine w/o contrast
- LOS 0 – CT lumbar spine w/o contrast
- LOS 0 – XR L Knee
- LOS 0 – CT Pelvis
- LOS 1-2 Body, Neuro, and MSK interpretation of outside CT
Imaging studies from PACS 1

AP Pelvis Radiograph: “No acute fracture. Mild superior elevation of the left superior pubic ramus at the pubic symphysis. Approximated sacroiliac joints and hips bilaterally.”
Imaging studies from PACS 2

Left Shoulder Radiograph: “Comminuted, minimally displaced fracture of the greater tuberosity”
Sagittal CT images Thoracic spine without contrast: “Mild depression of the superior endplate of T7 with a Schmorl's node, concerning for compression fracture.”
Sagittal CT images Lumbar spine without contrast: “No CT evidence of acute fracture or listhesis of the lumbar spine.”
Imaging studies from PACS 5

AP and cross table lateral views of the left knee: “Small suprapatellar joint effusion without evidence of acute displaced fracture.”
Axial CT images of the pelvis: “Comminuted fracture of the posterior left acetabulum, which may represent sequelae of posterior dislocation of the femoral head. The femoral acetabular alignment appears preserved on the static images.”
Sagittal CT images Cervical spine without contrast: “No acute fracture or traumatic listhesis in the cervical spine.”
Imaging studies from PACS 8 - Interpretation of outside Body CT

CT chest images are presented for interpretation: “Question T7 compression fracture.”
Head CT images are presented for interpretation: “No acute intracranial abnormality.”
Axial CT images of the left shoulder for interpretation: “Anterior dislocation of the left shoulder with humeral head engaged at anterior inferior aspect of the glenoid. Displaced Hill-Sachs lesion. No osseous Bankart lesion identified.”

Multiple fracture lines seen in compression fx of humeral head = Hill Sachs lesion
Patient treatment or outcome

- Admit to Ortho
- Shoulder reduced at OSH
- Spine precautions lifted LOS 0 after spine CT
- Managed Non-Op
- Discharged LOS1
- Appropriate transition care in place/ PT established
Imaging discussion technical issues

- “Technically” poor X ray
  - Positioning of the knee
  - Inappropriate labeling (missing full label)
  - Not uncommon in trauma setting imaging

- OSH CT has artifact
  - Most notable in body images

When reviewing trauma studies:

- Have high degree of suspicion
- Know precisely where the pt hurts
- Obtain optimal positioned projections
- Know common fx, to include those commonly missed
- Avoid satisfaction search
Imaging discussion appropriateness: CT @ UNC

- Most of spine images included in OSH CT
- Repeated CT of thoracic and lumbar spine
- Repeated CT of pelvis
- Additional Radiation burden
  - Repeat CT Spine 6 msv P< 0.05 (1.5-10)$^1$
  - Repeat CT Spine 6 msv P< 0.05 (3.3-10)$^1$
  - Additional 12 msv, 4 years background radiation on a 19 yo$^1$
  - Additional radiation could be avoided if the outside CT images are available and interpreted in advance of patient presentation to ER
Imaging discussion appropriateness: CT @ UNC

- Cost for redundant studies
  - Repeat CT lumbar spine: $929 at UNC
  - Repeat CT thoracic spine: $929 at UNC
  - Repeat CT pelvis: $1,553 at UNC
  - Total cost for repeat studies: $3,411
Imaging discussion appropriateness: CT of shoulder

- Likely included in pan-CT at OSH
- Dislocation and associated Hill-Sachs/Bankart are typically seen in 3 view shoulder plain film
  - Hill-Sachs lesion: Cortical depression/fracture of humeral head from glenoid rim during dislocation
  - Bankart: Boney and soft tissue variety affect the glenoid and labrum
Hill-Sachs Lesion

- Cortical depression of posterior-medial humeral head from glenoid in anterior dislocation
- Often greater tuberosity fractures included
- Happen in 35-40% of anterior dislocations
- Best seen on AP plain film with arm internally rotated
- Posterior dislocations have inverse Hill-Sachs lesions
Bankart lesions³

- Soft Tissue Bankart: Anterior labrum torn off during dislocation
  - Seen in 90% of dislocations in pts < 30 yo
  - Poorly seen in plain film
  - Best seen in MR

- Boney Bankart:
  - Portion of the glenoid is avulsed with labrum
  - Seen in 5% of anterior dislocations
  - Seen on plain film

AP radiograph with avulsion of inferior glenoid tubercle, classic of boney bankart lesion. Associated disruption of the labrum not seen well on radiograph.⁵
Wrap Up

- In Traumas transferred from OSH, repeat imaging studies are currently needed to expedite discharge. These incur additional cost and radiation burden.\(^1,2\)

- Hill-Sachs and Bankart commonly accompany anterior shoulder dislocations\(^3\). These are often seen on plain films. Of the lesions, soft Bankarts are the most common but need shoulder MR to visualize well.
References


