Slido.com #304 979

Approach to Hip Fractures

M5 Ortho SIP Program

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Goals Today

- Confidently manage a patients with a hip fracture acutely before registrar review
- Understand the principles in deciding definitive management for hip fractures in order to list patients for surgery

MS

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Ortho Made Simple Framework

1 Stabilize	2 History	3 Physical Exam	4 Initial Invx
5 Acute/ Initial Mx	6 Advanced Imaging	7 Definitive Mx	8 Post Op Review

OMS

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Framework for Elderly Hip Fractures

1. Stabilize
- ATLS Principles if required

2. History
- General History (for all patients) - Biodata, PMHx, Smoking, Drinking, Drug Allergy, Occupation, Sports
- Condition History
  - Mechanism of injury - "Mechanical Fall" [Screen Pre-fall, Fall, Post-fall]
  - Ask red flags such as "prodromal pain"
- Risk Factor History
  - Osteoporosis in elderly
  - Other PMHx that can result in falls/ osteoporosis

3. Physical Exam
- Check for open fracture
  - Take picture
- Check neurovascular status
  - Check foot drop, DP, PT pulses
- Check for compartment syndrome (unlikely)
- Secondary Survey for other injuries

4. Initial Investigations
- Imaging
  - AP pelvis and Hip Lateral
  - Sizing marker if planned for hip replacement (bipolar ot THR)
  - Full length femur XR to look for fracture extension
- Bloods
  - Pre-Op Bloods - FBC, RP, PT/INR, GXM, ECG, CXR
  - Risk Factors - Vit D, Ca Panel, TFT, LFT (osteoporosis)

5. Acute Management
- Analgesia as per WHO pain ladder
  - KIV Fascia Iliaca Nerve Block
- Temporary Stabilization with Bedrest
  - Consider traction if subtrochanteric fracture patterns
- DVT Prophylaxis
  - Calf pumps
- Manage blood thinners
  - Discuss with seniors if to stop or continue them

6. Advanced Imaging
- Typically not required if Fracture is visualized on XR
- Consider ***MRI with contrast*** if concerns of pathological fracture
- ***MRI scan*** is imaging of choice to look for occult hip fracture in the absence of fracture visualized on XR

7. Definitive Management
- Guided by the classification of the injury
- Non-Operative
  - Always a consideration for patients with poor co-morbids who are poor surgical candidates (risks >> benefits)
- Operative
  - **Neck of Femur Fracture**
    - Displaced = Replacement (due to higher risk of AVN) - Bipolar vs THR
    - Undisplaced = Fixation (but consider replacement if > 80) - FNS/ DHS/ CS
  - **Intertrochanteric Hip Fracture**
    - Stable = Fixation with EM device (DHS)
    - Unstable = Fixation with IM device (PFNA)
  - **Subtrochanteric Fracture or IT with Subtroch Extension**
    - Fixation with long IM device

8. Post Op Review
- Assess patient
  - Stability and vitals
  - GA Complications
- Assess operated limb/ site
  - Dressings - ensure not soaked
  - Distal neurovascular - DP, PT Foot drop
- Follow Post Op instructions for:
  - IV Antibiotics for prophylaxis
  - Analgesia as per WHO
  - DVT prophylaxis
  - Weight bearing status - typically FWBAT
  - Range of motion
  - STO timing - usually 14 days

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Case 1

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2. History

- General History (All patients)
- Specific History
  - Condition history
    - Mechanism
    - Pain
    - Red Flags
  - Risk Factor History

1 Stabilize	2 History	3 Physical Exam	4 Initial Invx
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88/Chinese/female
NKDA

General

PMHx

PMhx

1. DM with diabetic neuropathy
2. HTN
3. Cataracts
4. Possible underlying IHD
5. Incidental calcified meningioma
6. Progressive hearing loss

S/

1. Fall x 1 episode
- DOI: 13/3/2023 AM
- occurred at home kitchen

Red Flags

Pre-fall
- has long standing lower limb weakness bilaterally > not worsening before fall
- no pre-fall cardiac and neurological symptoms
- no fever
- no infective symptoms

Fall
- was trying to hang clothes out to dry
- not sure why she fell
- fell on her left side
- no HI and LOC

MOI

"Mechanical Fall"

Post-fall
- pain over left wrist and left hip
- unable to stand at all due to pain
- no headache
- no nausea and vomiting
- no new focal right sided weakness and numbness (cannot tell about left UL and LL), BOV and diplopia
- no neck and back pain
- no chest pain and SOB
- no abdominal pain

Severity

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3. PE

1. Open Fracture
2. Neurovascular Involvement
3. Compartment Syndrome
4. Secondary Survey

1 Stabilize	2 History	3 Physical Exam	4 Initial Invx
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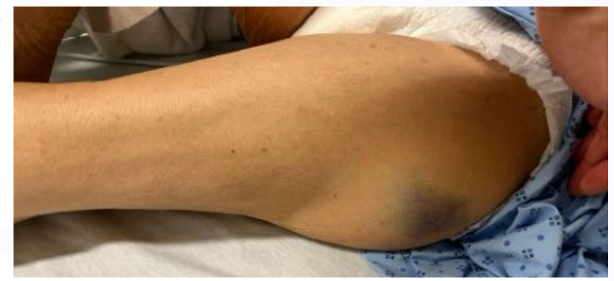
O/E

Alert, comfortable
Not toxic
Not in respiratory distress
No conjunctival pallor
No jaundice
JVPNE
Neck supple, ROM full and pain free

H S1 S2 no murmurs, regular rhythm, no radial-radial delay
L air entry fair and equal bilaterally, no crepitations and wheeze
A soft and non tender, Murphy's negative, renal punch negative bilaterally

Calves supple, no pedal edema bilaterally
Both UL also supple

PEARL 2 mm bilaterally
EOM full, no nystagmus and diplopia
No facial droop
CN 2 to 12 normal



Left LL
- no foot drop
- left knee ROM limited by left hip pain but grossly pain free from 0 to 90
- DP not palpable
- CRT 2 seconds

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4. Initial investigations

- Bloods
  - Pre Op - FBC, RP, PT/ INR, ECG, CXR
  - Risk factors - Vit D, Calcium panel, TFT, LFT
  - Stability - Lactate, ABG (mention if polytrauma)
- Imaging
  - Orthogonal views
  - "XR of entire bone"
  - "One joint above, one joint below"
  - Special views are bonus
  - ~~[Polytrauma Series] - CTTAP, CT Cervical Spine~~

Bloods

Vitamin D 25 hydroxy

Risk Factors

Albumin, Serum

Calcium

Coagulation Panel (P...

Full Blood Count

Glucose, Serum, Ran...

Renal Panel Extende...

Imaging

1 Stabilize	2 History	3 Physical Exam	4 Initial Invx
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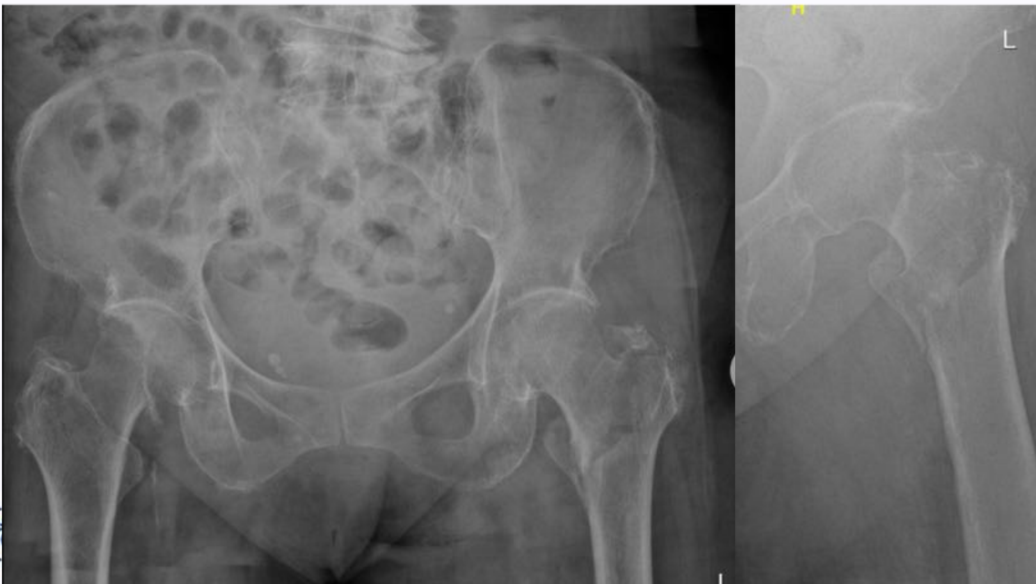
REPORT STATUS :
APPROVED

XR, CHEST, AP / PA

Pre-Op

Heart size is normal.
No consolidation, pleural effusion or pneumothorax is seen.

ECG Final re... Today at 01:14



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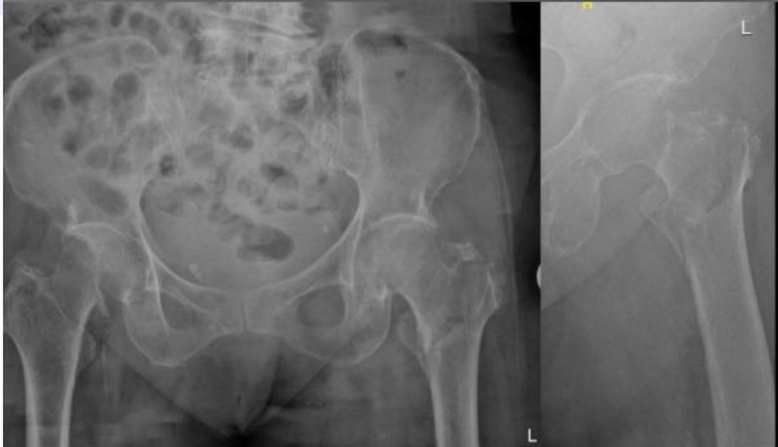
Q1



⏱ 39

What is the diagnosis?

- Right Neck of femur fracture
- Left inter-trochanteric hip fracture
- Right inter-trochanteric hip fracture
- Left neck of femur fracture
- Right subtrochanteric fracture

MS

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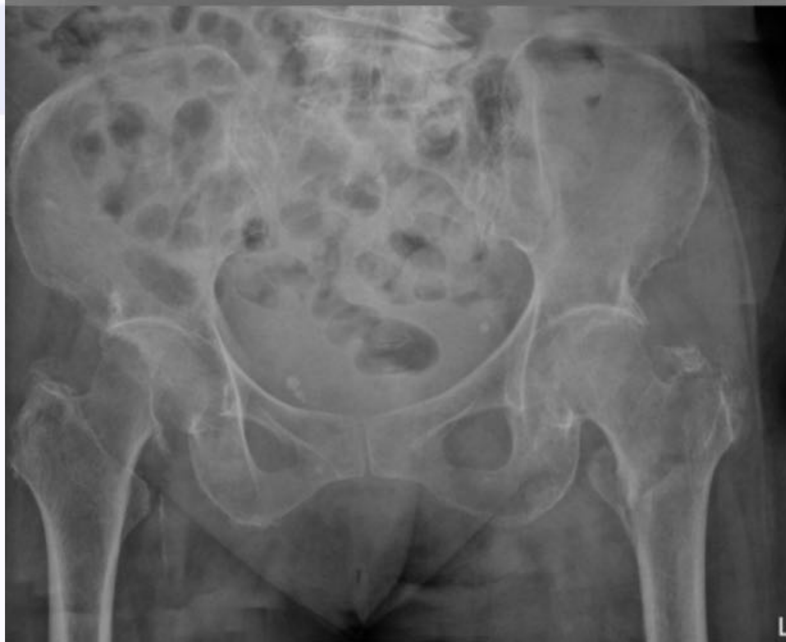
Q2



⏱ 37

Give me one other XR you will order as a house officer for this patient?

- Abdominal XR
- Femur XR
- Knee XR
- Ankle XR
- Lumbar XR

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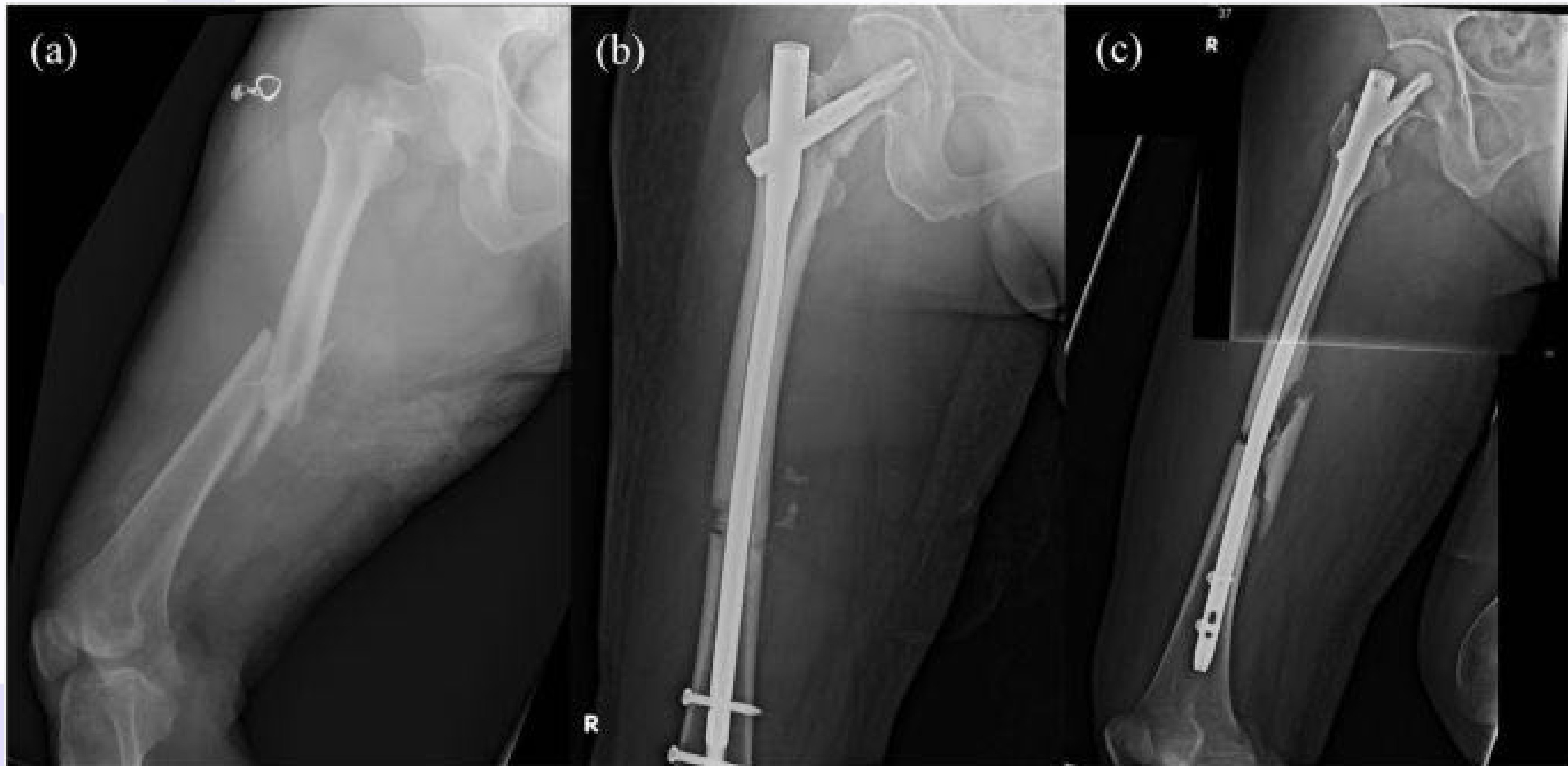
Femur XR Required



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5. Acute Management

"What will you do as the Junior doctor?"

1. Analgesia based on WHO ladder
2. ~~Manipulation and Reduction (if required)~~
3. Temporary Stabilization
   - Hip Fracture - bed rest
4. Manage Blood thinners
5. DVT Prophylaxis
6. Chronic Disease management - DM, HTN

Paracetamol Tablet		
Omeprazole Capsule		
metoCLOPRAMIDE HCl Tablet		
Colecalciferol Tablet		
~~Etoricoxib Tablet~~	~~Oral~~	~~90 mg OM~~
Compound Sodium Lactate Infusion	Intra...	1 L/24 hours Continu...
traMADol HCl Tablet	Oral	50 mg TDS PRN
~~Paracetamol Tablet~~	~~Oral~~	~~1 g QDS PRN~~

1 Stabilize | 2 History | 3 Physical Exam | 4 Initial Invx | 5 Acute/ Initial Mx | 6 Advanced Imaging | 7 Definitive Mx | 8 Post Op Review

Plan
Hip fracture pathway
Q4h paras
NBM 12mn with judicious IV drip
CBG TDS + 10pm
Calf pumps
Heel protectors bilaterally
IO charting

Vit D CMPa GXM
Non urgent BMD

Continue aspirin
Analgesia
Continue chronic medications
Hold enalapril CM

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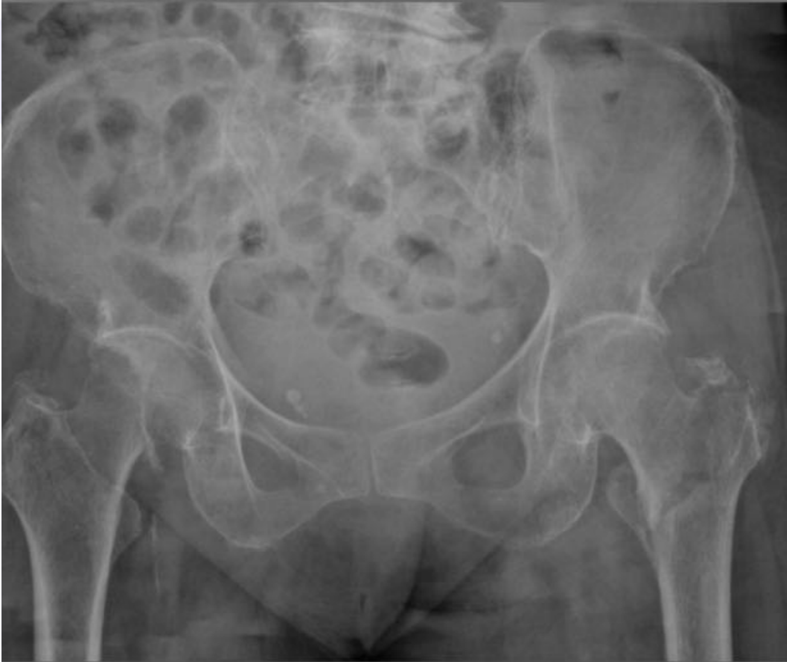
Q3



⏱ 28

Will you order any advanced imaging?

- No
- Yes - CT Scan
- Yes - MRI Scan
- Yes - US Scan

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1 Stabilize	2 History	3 Physical Exam	4 Initial Invx
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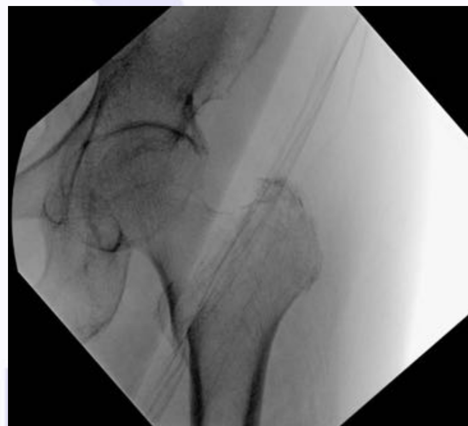
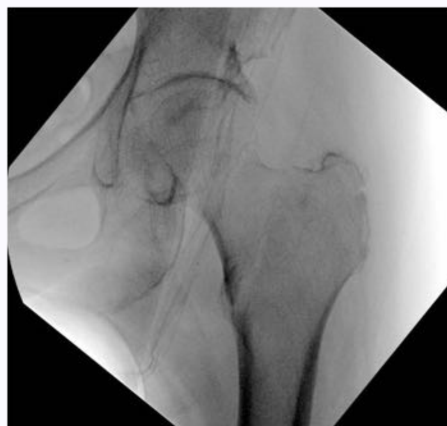
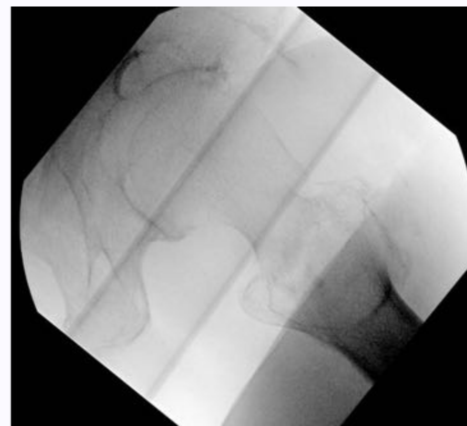
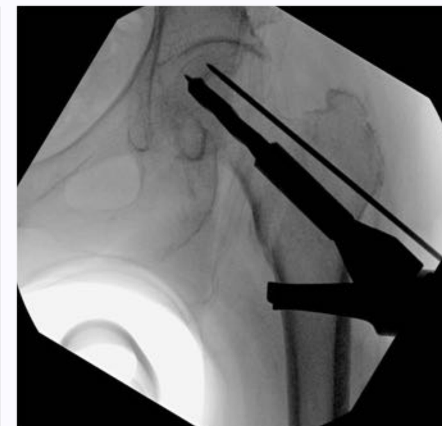
7. Definitive Mx

- Operative vs Non Operative
  - Patient factors
  - Injury factors (Classification)

List for EOT P2 for surgical fixation of L hip fracture at 12mn
- Special equipment: II, TT, DHS

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8. Post Op Review

1. Assess Patient
   a. Vitals
2. Assess Operated limb/ site
   a. Dressings
   b. Neurovascular status (be specific)
   c. Drain output (if present)
3. Review Post Op Notes
   a. Prophylactic Antibiotics
   b. Weight bearing status
   c. Order post op XR
   d. Consider DVT Prophylaxis if lower limb op

Post Operative Review

Operative details
s/p Surgical fixation of left hip fracture (4 hole DHS) on
S/p Closed reduction and percutaneous pinning of left
fracture on 15/3/23

Subjective
No chest pain / SOB / palpitations
No nausea / vomiting
No headache or dizziness
No weakness or numbness
Pain well controlled

Objective
Vital signs:

	14/03/23 17:38
BP:	160/74
Pulse:	66
Resp:	18
Temp:	36.4 °C
SpO2:	96%

0 L/min
None (Room air)

O/E
Alert comfortable
GCS15
Heart S1S2
Lungs clear
Abdo soft non tender
Calves supple
Moving all 4 limbs equally
No numbness

Dressings clean and dry
DP 2+, distal sensation intact, no foot drop

1 Stabilize	2 History	3 Physical Exam	4 Initial Invx
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Post Operative Orders & Instructions

To GW
Hourly paras X 6, Q4H paras if stable
Allow diet as tolerated when awake
IV Cefazolin 2g 8H for 24 hours
Analgesia
Bilateral calf pumps
Incentive spirometry, chest PT, SOOB TDS
PT review CM - FWBAT
FBC RP tomorrow on POD 1
Check XR pelvis AP, left hip lateral tonight

Plan
Hourly paras X 6, Q4H paras if stable
Allow diet as tolerated when awake
IV Cefazolin 2g 8H for 24 hours
Analgesia
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Op Notes

4 Components in Every Op Note

1. Surgery Performed
2. Surgical findings
3. Operative Procedure
4. Post Operative Orders and Instructions

Operation Details

Discipline:	Orthopaedics	**Operating Room:**	NUH MBOT 09
Anaesthesia Type:	General Anaesthesia	**ASA Score:**	II
Surgery Type:	Primary		

Post-op Diagnosis

* Intertrochanteric fracture [S72.11]

Surgery Performed

Procedure(s):
Surgical fixation of left hip fracture (4 hole DHS) - Wound Class: Clean

Surgery Findings

Left hip
Basicervical neck of femur fracture
Bone quality: Osteoporotic
No bony lesions to suggest CA

Final implants
4 hole DHS
Central blade 85mm
4 distal cortical screws

Operative Procedure

SPINAL - UNSUCCESSFUL
CONVERTED TO GA
SUPINE ON TRACTION TABLE
IV ABX, IV TRANEXAMIC ACID
CLOSED REDUCTION - SATISFACTORY
CLEANED AND DRAPED
N ALONG PROXIMAL FEMUR
CH
EWIRE INSERTED
RE INSERTED
WITH 135 DEG GUIDE

GUIDE
WITH GOLDEN GUIDE
WITH 4-HOLE PLATE
RTED
IOVED

1-0, VICRYL 2-0 AND MONOCRYL 3-0 TO SKIN

Post Operative Orders & Instructions

To GW
Hourly paras X 6, Q4H paras if stable
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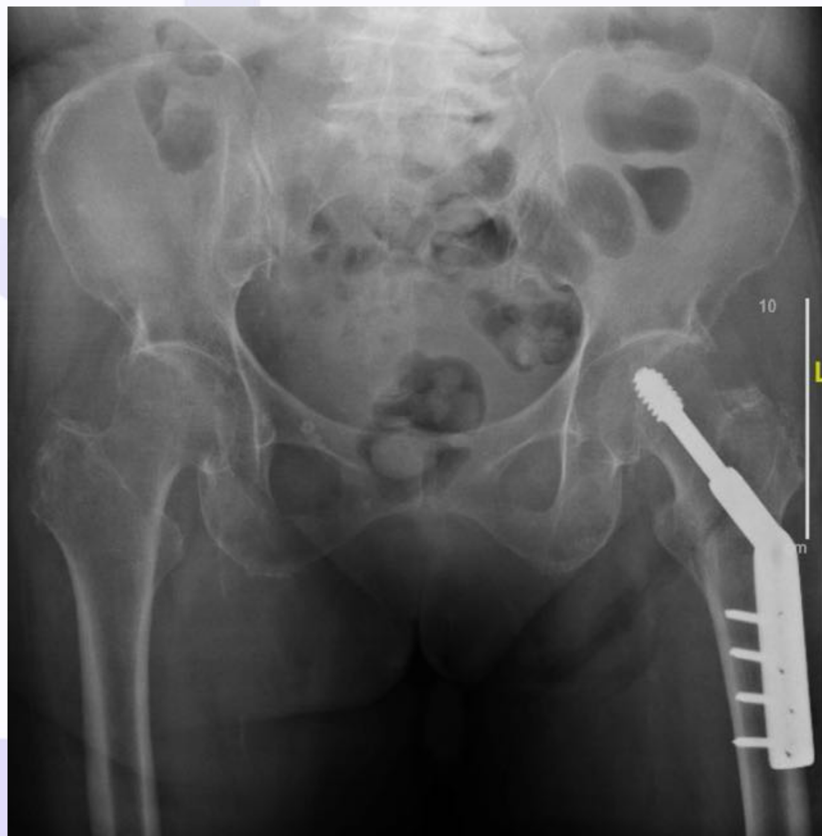
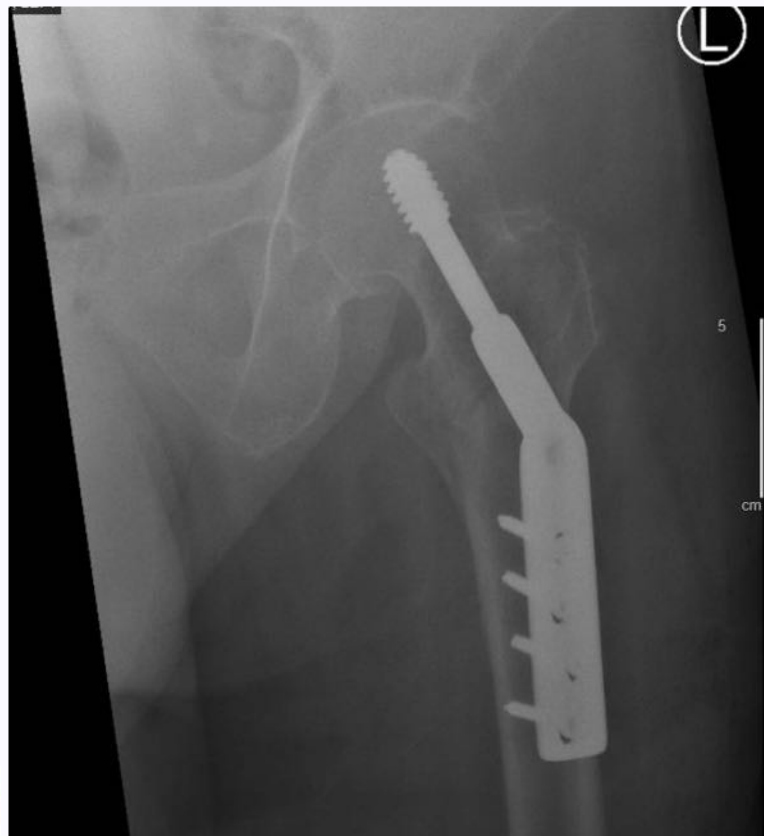
Post Op XR





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Case 2

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1 Stabilize	2 History	3 Physical Exam	4 Initial Invx
5 Acute/ Initial Mx	6 Advanced Imaging	7 Definitive Mx	8 Post Op Review

2. History

- General History (All patients)
- Specific History
  - Condition history
    - Mechanism
    - Pain
    - Red Flags
  - Risk Factor History

General

61 y.o. Chinese female
DA: Augmentin, metoprolol, rivaroxaban
Intellectual disability since childhood
Ambulate independently
ADL-I most activities, except wears diapers

PMhx

Past Medical History
1. HTN HLD DM
2. CCF - presented with anasarca to CGH 2009 - EF 40%, mod TR - no more recent echo
3. AF - documented as CHADSVASc 5 as of 2018

History of Presenting Complaint

MOI

Vomiting x 1/7
Subsequently had a fall this morning around 10am
Able to walk after first fall

Subsequently had another fall at 4pm today
Could not walk after

Red Flags - not covered here

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1 Stabilize	2 History	3 Physical Exam	4 Initial Invx
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3. PE

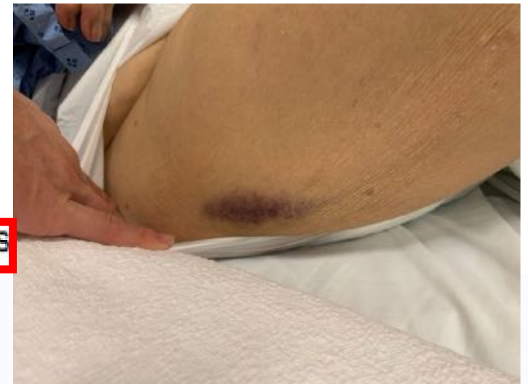
1. Open Fracture
2. Neurovascular Involvement
3. Compartment Syndrome
4. Secondary Survey

Objective
Temp: [38.9 °C] 38.9 °C
Pulse: [122] 122
Resp: [17] 17
BP: (136)/(84) 136/84
None (Room air)

O/E
Alert, comfortable
Not in distress, not toxic looking

Right hip axial loading +ve
DP PT + +
Sensation intact
No open wounds
No other areas of tenderness

OMS



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4. Initial investigations

- Bloods
  - Pre Op - FBC, RP, PT/ INR, ECG, CXR
  - Risk factors - Vit D, Calcium panel, TFT, LFT
  - Stability - Lactate, ABG (mention if polytrauma)
- Imaging
  - Orthogonal views
  - "XR of entire bone"
  - "One joint above, one joint below"
  - Special views are bonus
  - ~~[Polytrauma Series] - CTTAP, CT Cervical Spine~~

Vitamin D 25 hydroxy

Risk Factors

Albumin, Serum

Calcium

Bloods

Coagulation Panel (P...

Full Blood Count

Glucose, Serum, Ran...

Renal Panel Extende...

Imaging

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XR, CHEST, AP / PA

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Heart size is normal.
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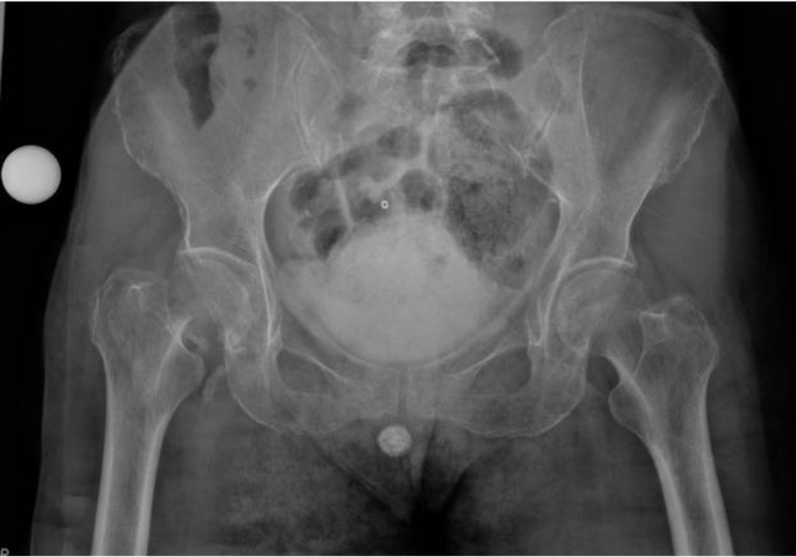
ECG Final re... Today at 01:14



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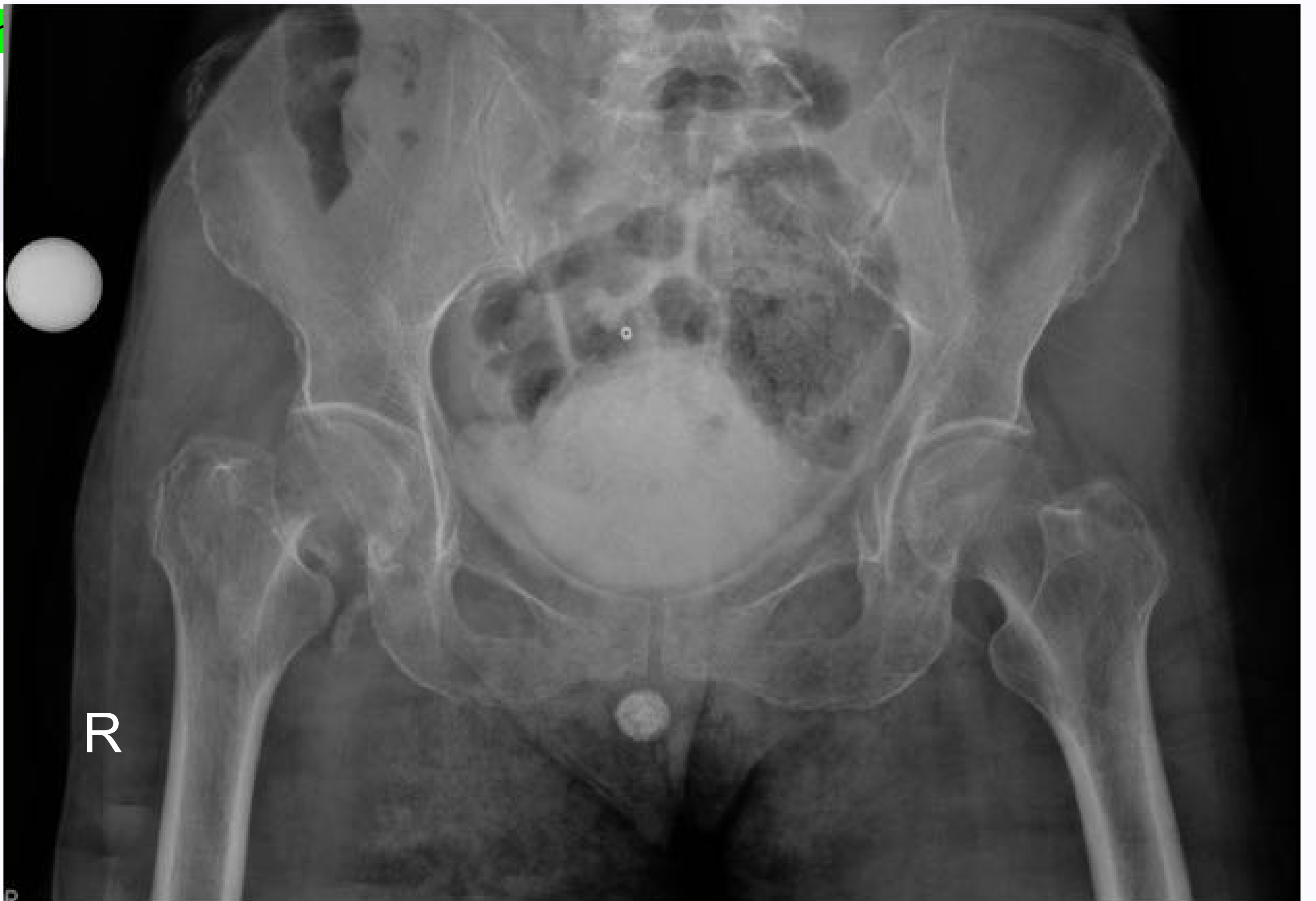

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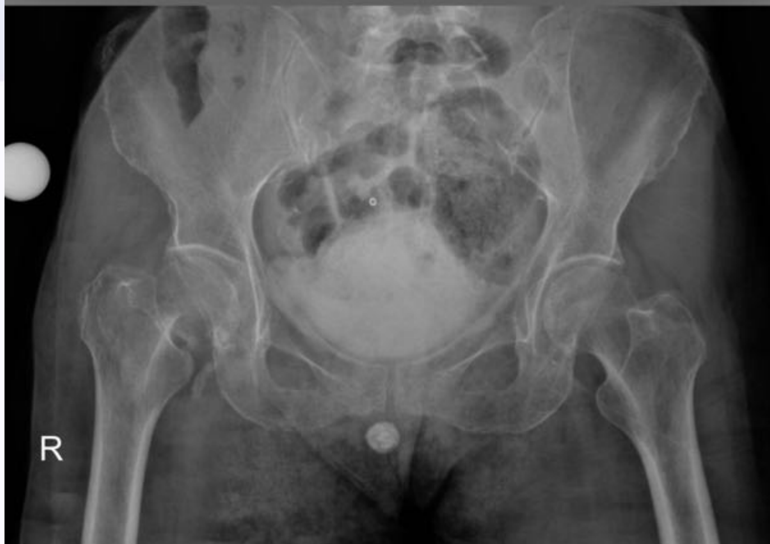
Q4



⏱ 27

What is the diagnosis?

- Left undisplaced neck of femur fracture
- Right undisplaced neck of femur fracture
- Right displaced neck of femur fracture
- Right inter-trochanteric hip fracture
- Left inter-trochanteric hip fracture

MS

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Q5

⏱ 25 **What position do you expect the leg to be in?**

- Shortened and internally rotated
- Shortened and externally rotated
- Lengthened and externally rotated
- Shortened and Adducted
- Shortened and flexed

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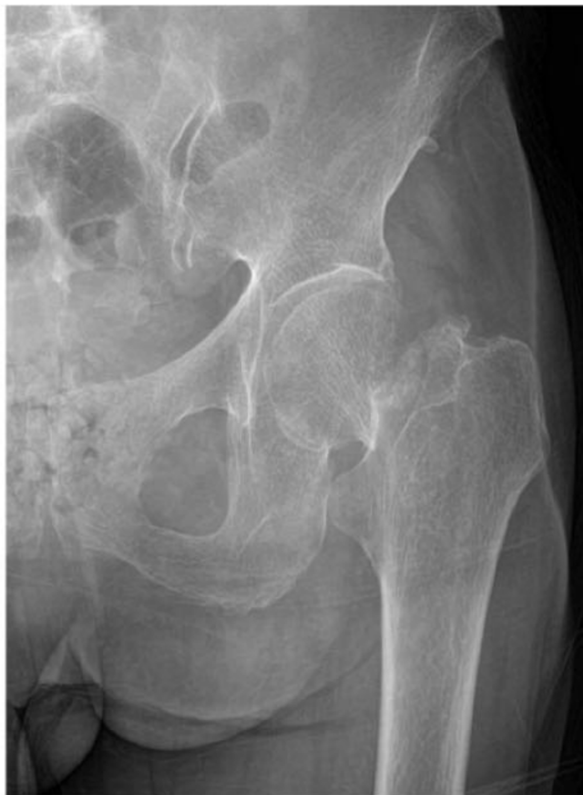
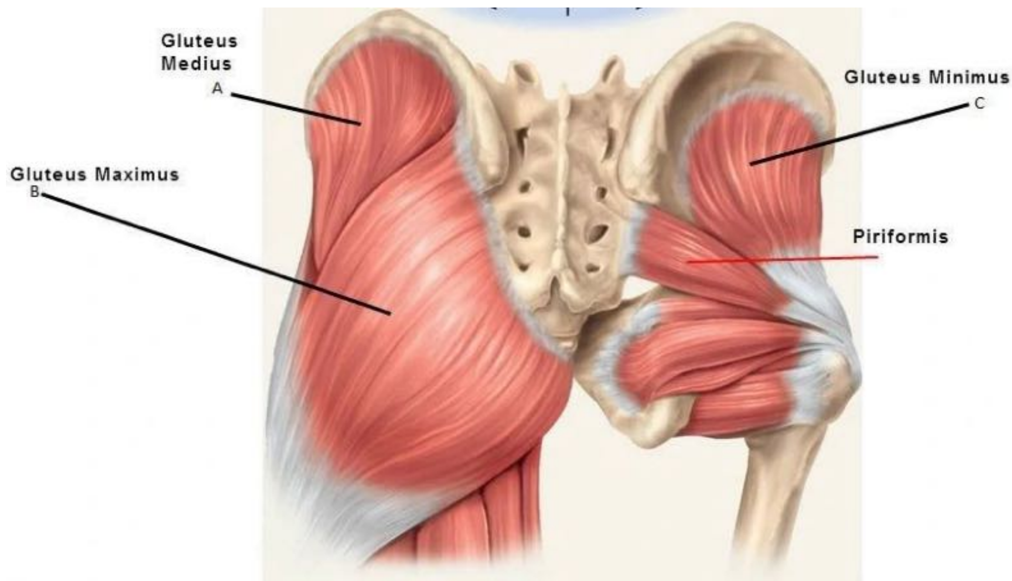
Leg is “Shortened and Externally Rotated”



- Due to pull of the external rotators e.g. Gluteus medius muscles that attach to the greater trochanter



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5. Acute Management

"What will you do as the Junior doctor?"

1. Analgesia based on WHO ladder
2. ~~Manipulation and Reduction (if required)~~
3. Temporary Stabilization
   - Hip Fracture - bed rest
4. Manage Blood thinners
5. DVT Prophylaxis
6. Chronic Disease management - DM, HTN

Medication	Route	Dose
Paracetamol Tablet		
Omeprazole Capsule		
metoCLOPRAMIDE HCl Tablet		
Colecalciferol Tablet		
~~Etoricoxib Tablet~~	~~Oral~~	~~90 mg OM~~
Compound Sodium Lactate Infusion	Intra...	1 L/24 hours Continu...
traMADol HCl Tablet	Oral	50 mg TDS PRN
~~Paracetamol Tablet~~	~~Oral~~	~~1 g QDS PRN~~

1 Stabilize | 2 History | 3 Physical Exam | 4 Initial Invx | 5 Acute/ Initial Mx | 6 Advanced Imaging | 7 Definitive Mx | 8 Post Op Review

Plans
Q4H
Allow diet
Monitor BP
Stop empagliflozin and dabigatran
Continue all other regular medications
Regular analgesia - paracetamol tramadol PRN morphine
To call family and update on recommendation for right hip bipolar
2-consultant signature
CXR
HbA1c, Calcium panel, Vit D, GXM
Blood culture, CXR, UEFM and culture
Non-urgent BMD
Calf pumps when in bed
Hold off ABx unless septic or clearer source of infection - noted EMD started IV Ceftriaxone

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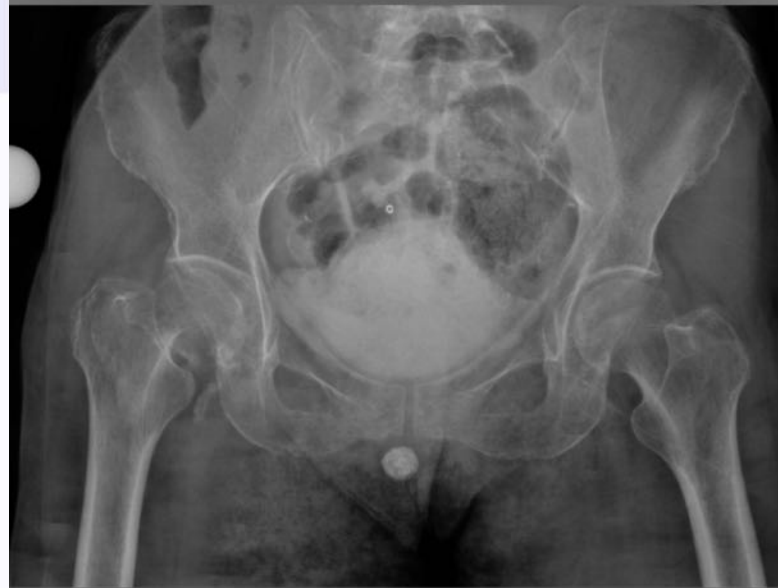
Q6



⏱ 27

Will you order any advanced imaging?

- No
- Yes - CT Scan
- Yes - MRI Scan
- Yes - US Scan

MS

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7. Definitive Mx

- Operative vs Non Operative
  - Patient factors
  - Injury factors (Classification)

From ortho POV, would recommend for right hip bipolar hemiarthroplastly
- Possibility of being able to ambulate after
- Especially since pt was able to ambulate independently

Alternative would be for conservative management for 6weeks
- However, chance of being able to ambulate after will be low, there is chance pt will become wheelchair bound
- Risk of DVT PE pressure sores

Daughter keen to proceed with operation
Explained that ivo of patient's multiple co-morbidities, we will need to optimise her before operation
She was also on empa and dabigatran prior, will need to hold off at least 72hrs prior to operation
We will also need dental review for shaky teeth ivo op will be done under GA
As such, we will need time to optimise her prior to surgery
Will also await anesthesia pre-op assessment first

In the interim, we have referred to APS for nerve block to optimise patient's pain control
Noted that they have spoken to family earlier
All concerns were addressed

4 Initial Invx

8 Post Op Review

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8. Post Op Review

1. Assess Patient
   a. Vitals
2. Assess Operated limb/ site
   a. Dressings
   b. Neurovascular status (be specific)
   c. Drain output (if present)
3. Review Post Op Notes
   a. Prophylactic Antibiotics
   b. Weight bearing status
   c. Order post op XR
   d. Consider DVT Prophylaxis if lower limb op

PORV

POD0 Right hip bipolar hemiarthroplasty
IOF:
Right hip NOF displaced fracture
Right knee very stiff ROM 0-20 deg preop

Final implants
Stryker Exeter 37.5mm size 0 stem
Neutral head
44mm shell

Subjective/
Well, comfortable
No post-op pain

Noted SBP 200s during review

No chest pain/SOB/palpitations
No nausea/vomiting
No giddiness
No weakness/ numbness

Objective/
Temp: [36.6 °C-37.5 °C] 36.9 °C
Pulse: [67-94] 94
Resp: [18-20] 20
BP: (124-189)/(70-94) 174/82

Alert, conversant
L clear
H S1S2
A SNT, nil guarding

Right LL:
Wound clean and dry
No hematoma
Able to DF PF foot, no foot drop
Sensation grossly intact
CRT <2sec
DP PT 2+

Imp/
Clinically well post op
Hypertensive urgency

1 Stabilize	2 History	3 Physical Exam	4 Initial Invx
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Post Operative Orders & Instructions

To GW
Hourly paras x 6, 4hrly after if stable
Allow DOC as tolerated
Analgesia
IV cefazolin 24 hours
Xr AP pelvis and right hip lateral, right knee AP/Lat
PT/OT
FWBAT
Discharge planning
Check FBC tonight, keep Hb >9
No need STO

Plan/
Hourly paras x 6, 4hrly after if stable
Allow **DOC as tolerated**

Analgesia
IV cefazolin 24 hours
Amlodipine 5mg once

Xr AP pelvis and right hip lateral, right knee AP/Lat
FBC, RP tonight 8pm, keep Hb >9 (handed over to NF to trace)

KIV restart dabigatran cm
KIV restart empagliflozin cm once patient take oral shares well
KIV restart metformin and telmisartan if AKI improving
PT/OT - FWBAT
> Discharge planning

No need STO

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Op Notes

4 Components in Every Op Note

1. Surgery Performed
2. Surgical findings
3. Operative Procedure
4. Post Operative Orders and Instructions

Surgery Performed

Procedure(s):
Right hip bipolar hemiarthroplasty

Surgery Findings

Right hip NOF displaced fracture
Right knee very stiff ROM 0-20 deg preop

Final implants
Stryker Exeter 37.5mm size 0 stem
Neutral head
44mm shell

Operative Procedure

GA
Left lateral position
C&D
Lateral incision
Modified Hardinge approach
Femoral neck osteotomy
Femoral head delivered and measured to 44m
Femoral canal broached to 37.mm size 0 stem
Trial with neutral head and 44mm shell
Good stability, ROM and limb length
Femoral head prepared for cementing
Small cement restrictor inserted
Cementing performed
Actual implants inserted
Femoral head reduced
Good stability, ROM and limb length with final implants
Wash
Capsule closure
Closure in layers

Post Operative Orders & Instructions

To GW
Hourly paras x 6, 4hrly after if stable
Allow DOC as tolerated
Analgesia
IV cefazolin 24 hours
Xr AP pelvis and right hip lateral, right knee AP/Lat
PT/OT
FWBAT
Discharge planning
Check FBC tonight, keep Hb >9
No need STO

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Other Hip Fracture Mx Pearls

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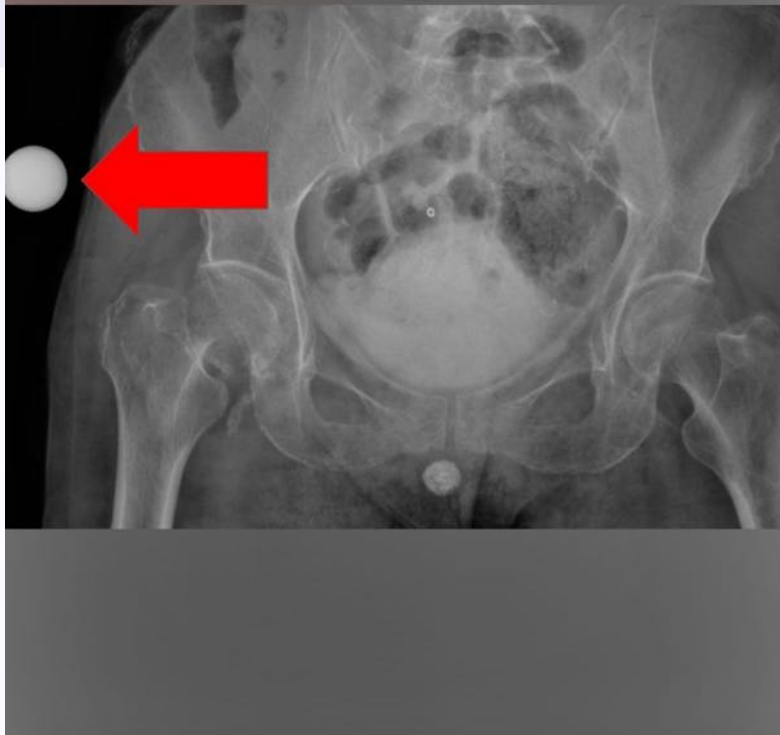
Q7



⏱ 27

What is this and for what surgery do you need to have this?

- Artifact e.g. Button
- Sizing marker, Fixation surgeries
- Sizing Marker, Replacement Surgeries
- Sizing marker, all hip surgeries

MS

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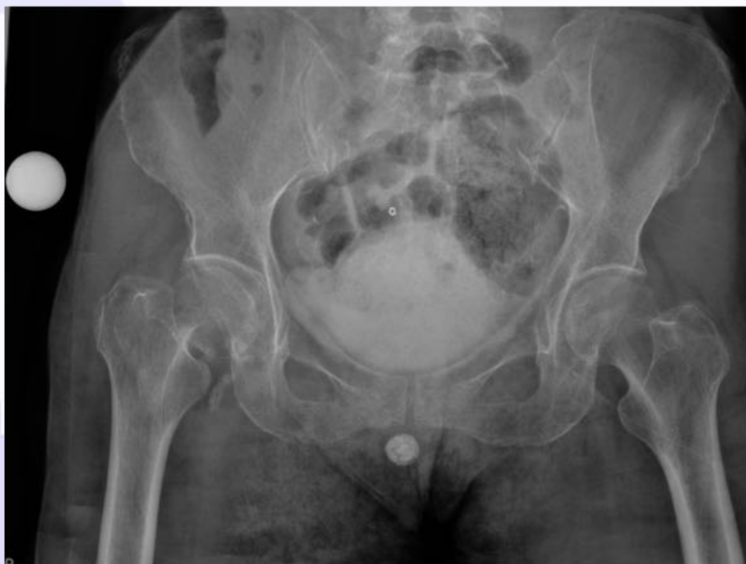
When do we need sizing marker XR?

- Typically for hip replacement, hemiarthroplasty surgeries
- For Pre-op planning



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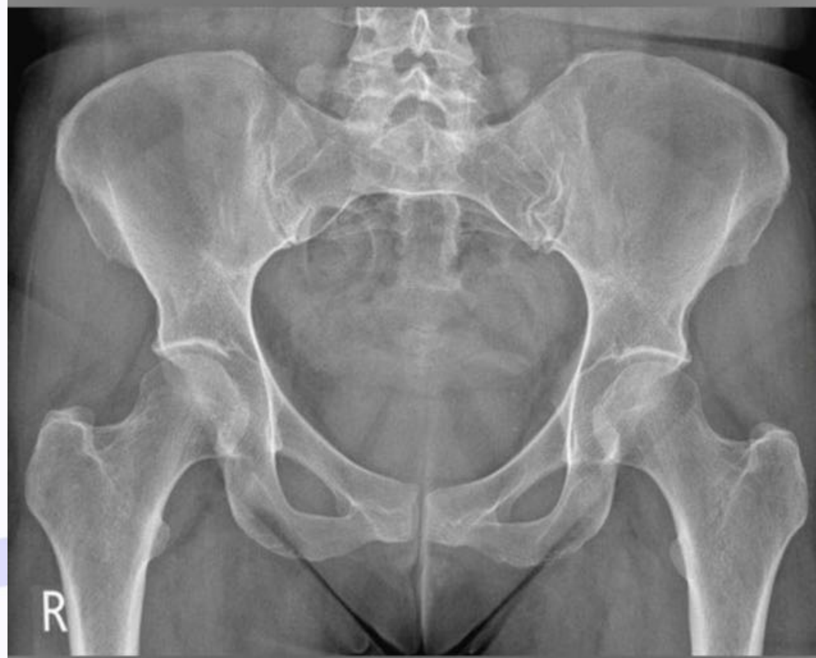
Q8



27

80yo Female mechanical fall, now has Right groin pain. XR normal. What will you do?

- Allow trial of weight bearing
- MRI Scan to look for occult fracture
- CT scan to look for occult fracture
- US scan to look for occult fracture

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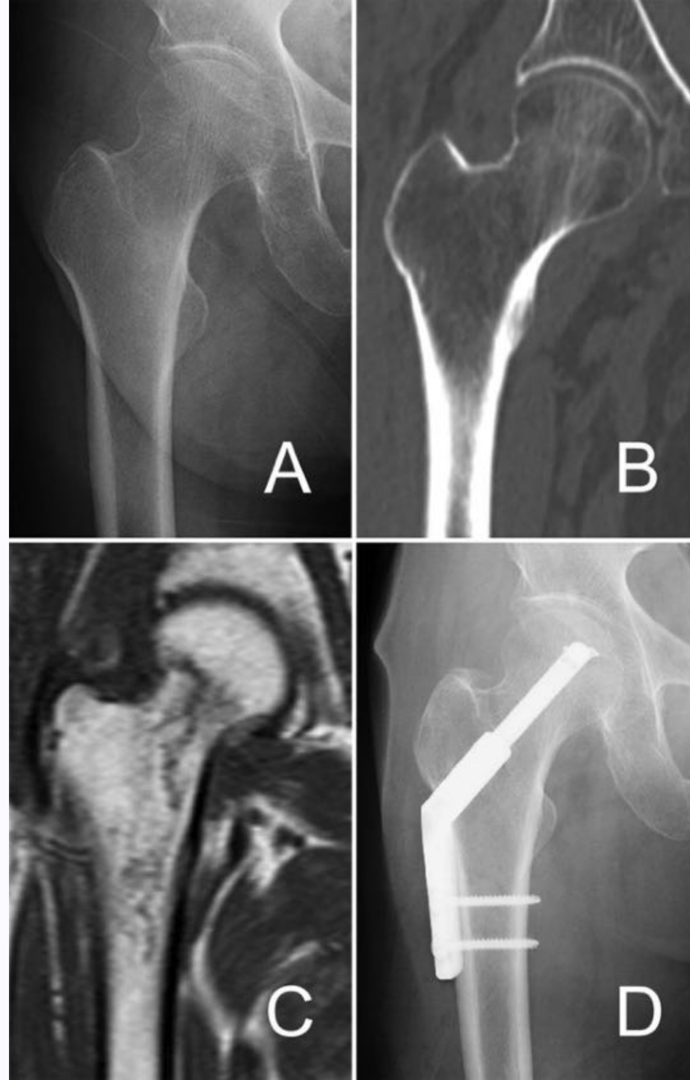
MRI Scan - When?

"XR cannot see fracture, want TRO soft tissue injury or occult fracture"

- Picks up injury by the presence of edema (increased water content)

- OR MRI with Contrast if presence of red flags, concerns of pathological fracture e.g. underlying tumor



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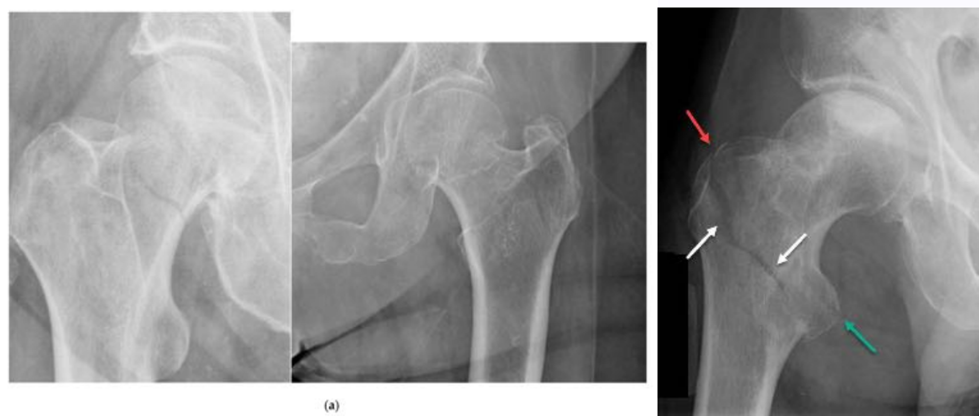
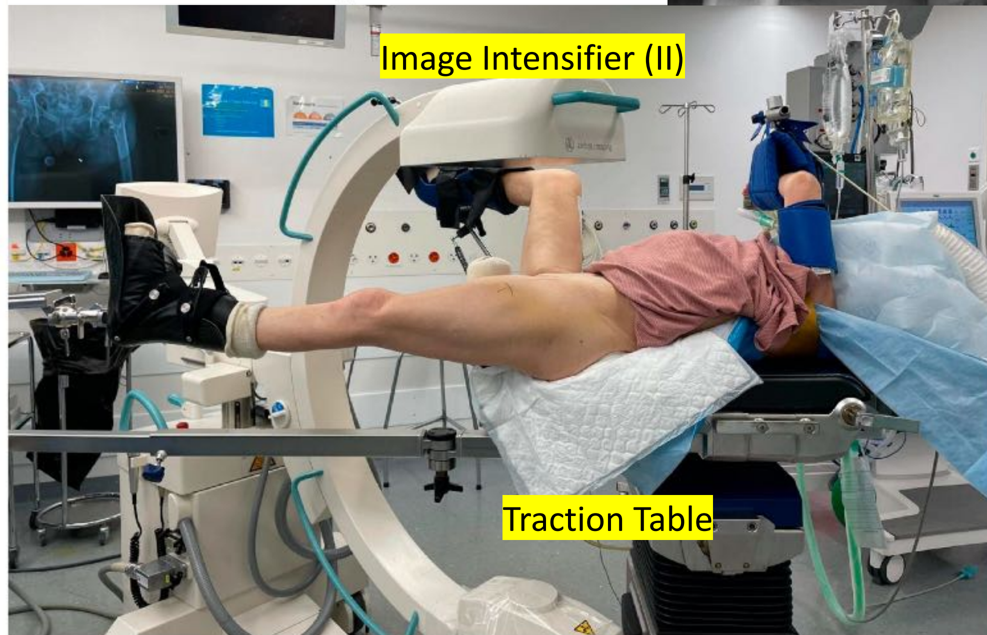
Listing for Hip **Fixation**

- Types of fractures
  - Undisplaced Neck of femur fracture
  - Intertrochanteric Hip fractures

- Image Intensifier
- Traction Table
- Implant of choice and brand (Verify with Senior)
  - Dynamic Hip Screw
  - "Synthes" Femoral neck System
  - "Synthes" Proximal Femoral Nail Antirotation (PFNA)





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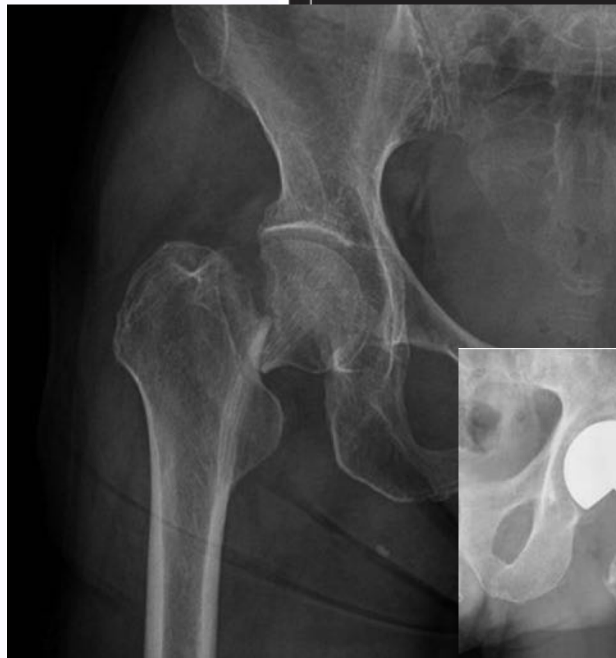
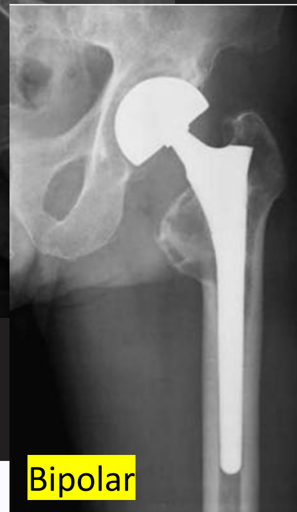
Listing for Hip **Replacement**

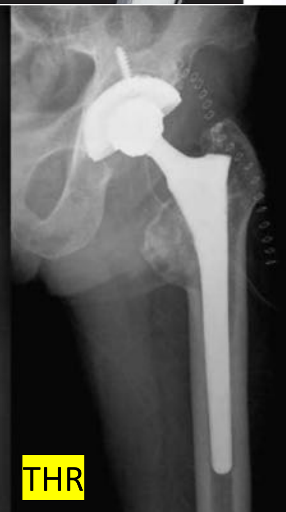
- Types of Fracture
  - Displaced Neck of femur fractures

- No need II
- No need traction table
- Hemiarthroplasty or a total hip replacement?
- Cement vs cementless?

- Implant of choice (Verify with senior)
- Cement of choice







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Q9

⏱ 32 Which of the following XR shows an atypical fracture?

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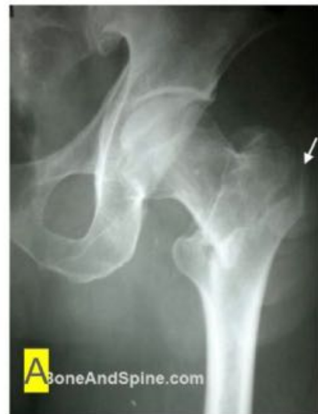

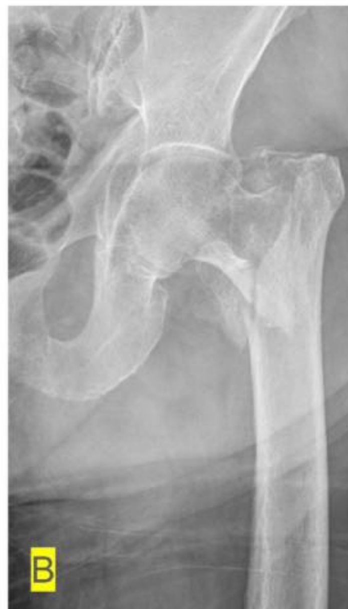

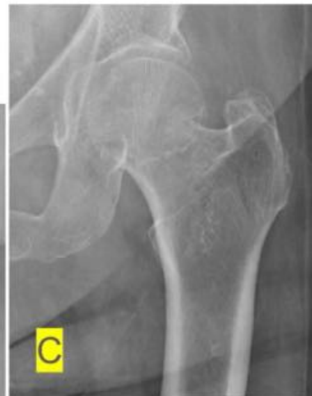

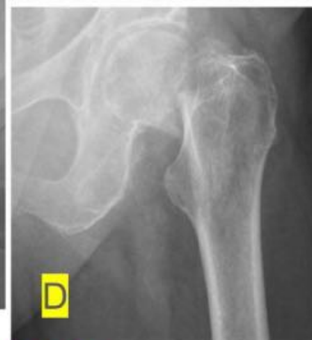

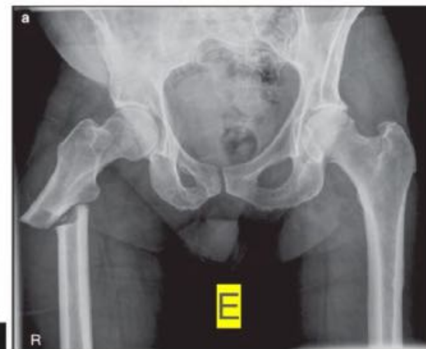

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Post Lecture Quiz

- 12 Hip Fracture XRs
  - Diagnose the Fracture
  - Answer a management question

https://docs.google.com/forms/d/e/1FAIpQLSfJhhJmHkoL5JFNPUziGSRAZvQcQ9aCkxG_iZ0W6CsbIVUGMg/viewform?usp=sf_link

MS