

How to Get the Most From Your Radiologist

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Objectives:

1. Identify some important 'do's and don'ts' of radiology ordering and requisitions.
2. Recognise common pitfalls of miscommunication between clinicians and radiologists.

Role of the Clinician:

Order the Appropriate Test

Appropriateness Criteria for a few common studies

Provide the Appropriate Clinical Information

History

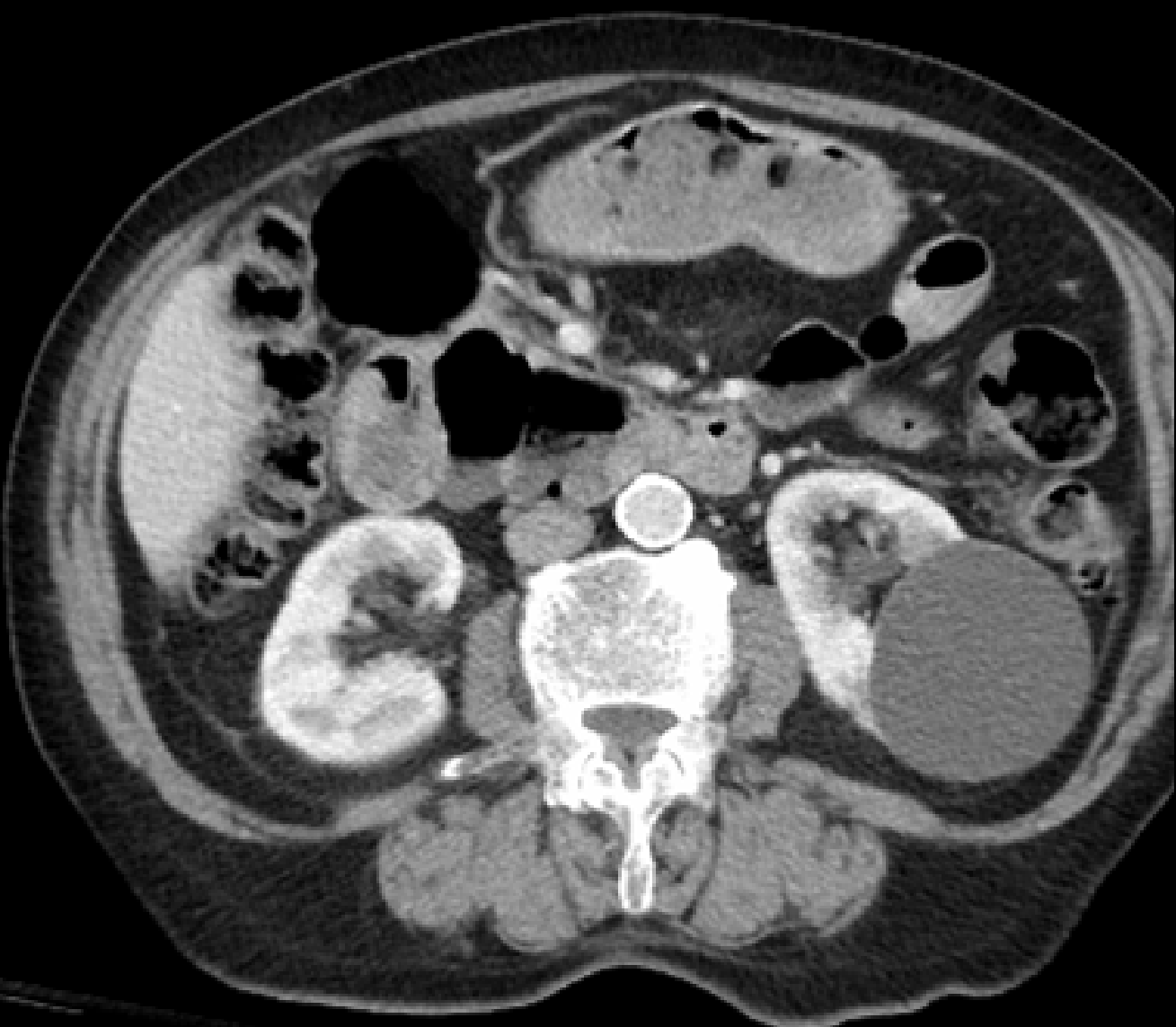
Presentation

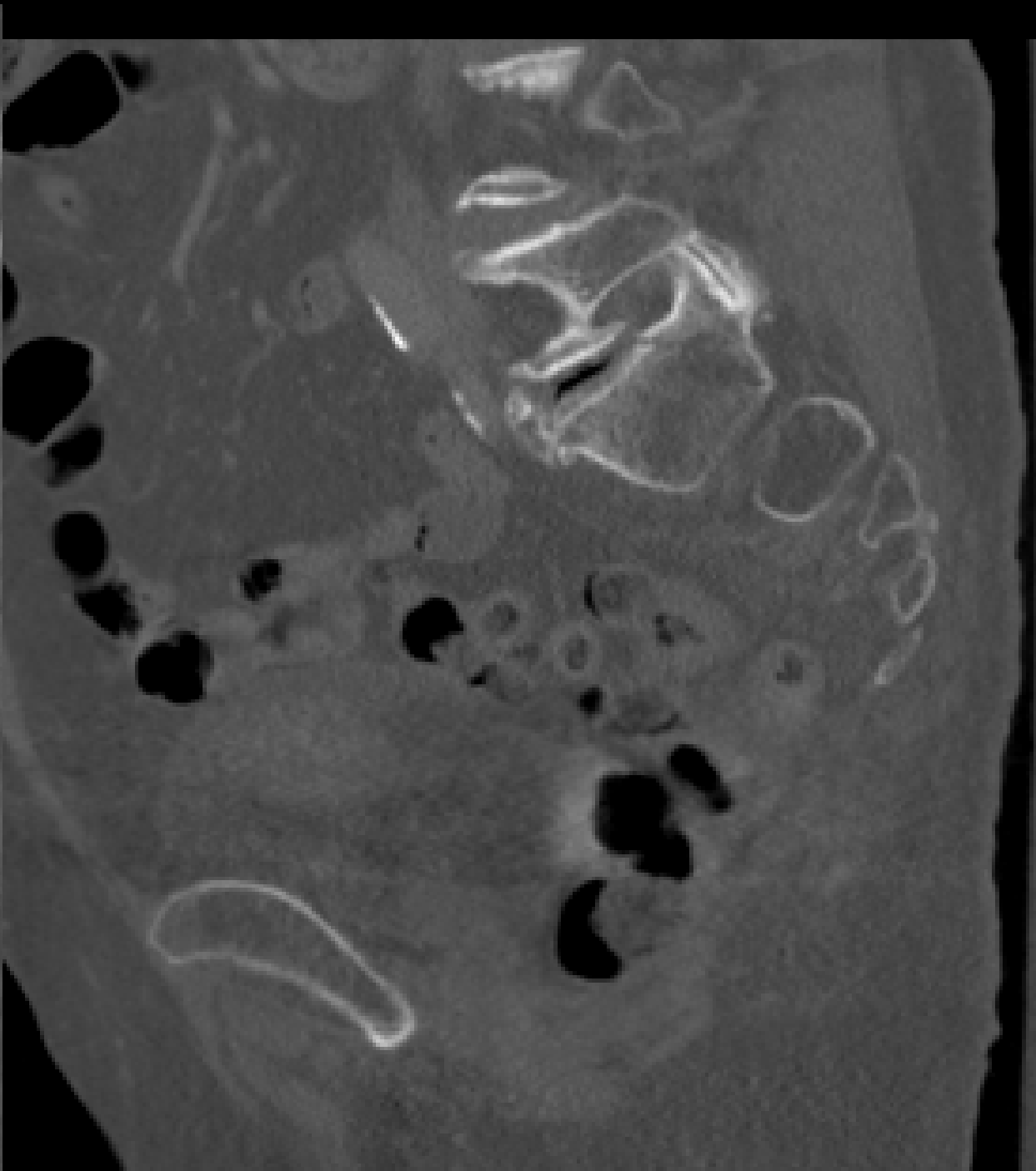
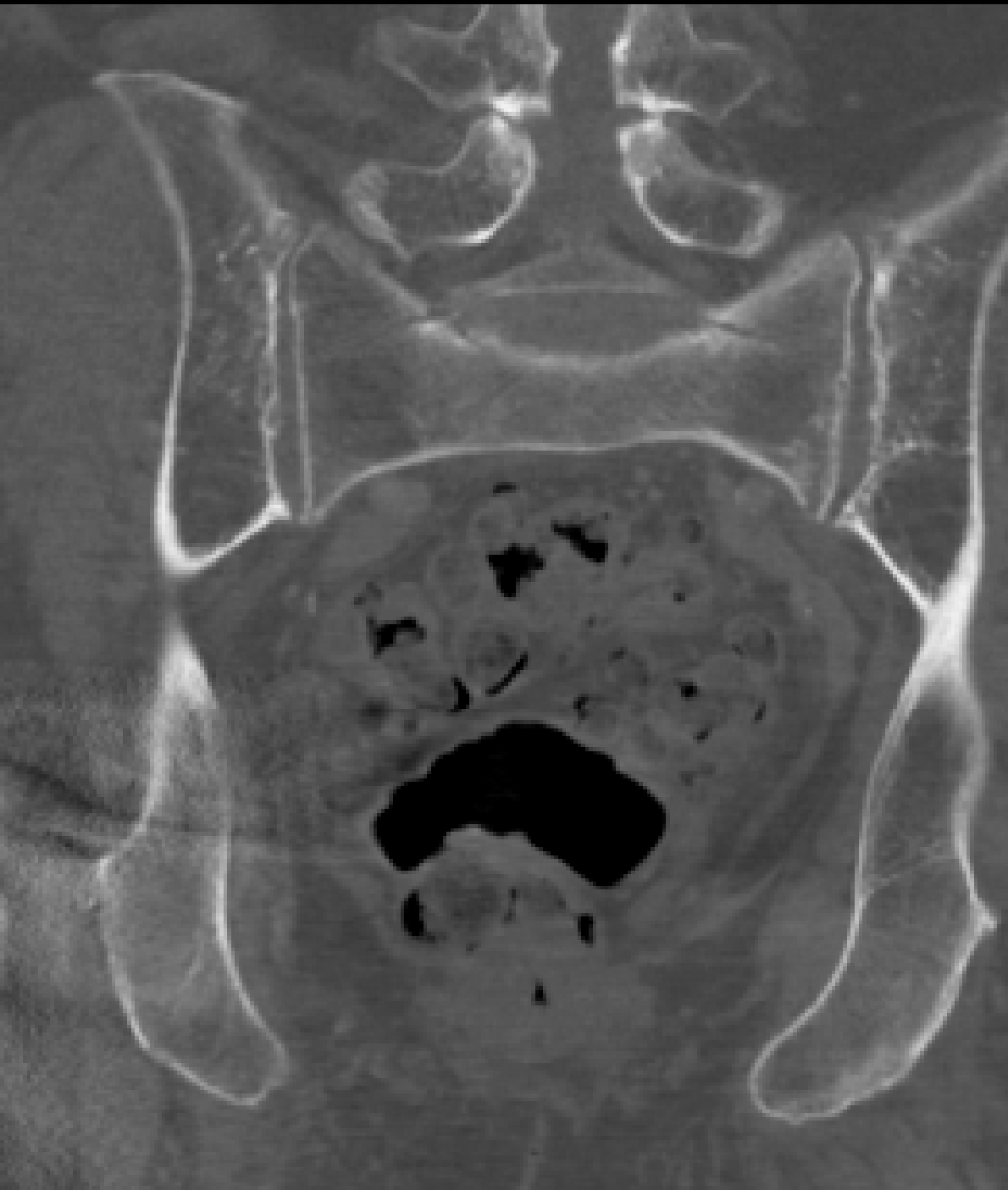
Differential

Progressive severe non-traumatic back pain.

On warfarin.

Occult fracture vs retroperitoneal bleed





Clinical History:

History

- a. relevant prior surgeries
- b. prior malignancy
- c. active conditions and relevant medications
 - i. does a diagnosis already exist?
 - ii. Interval treatment?

Presentation

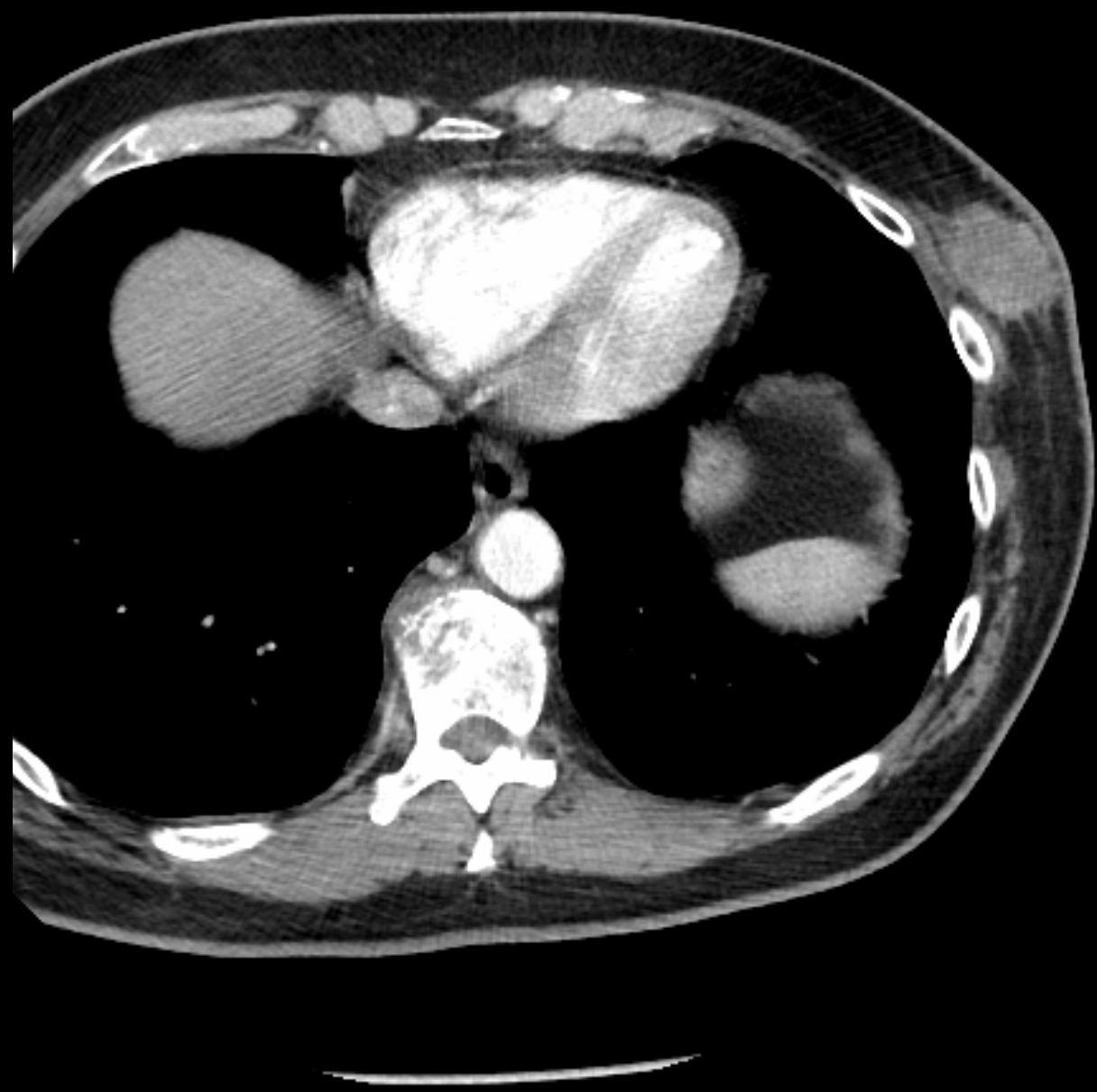
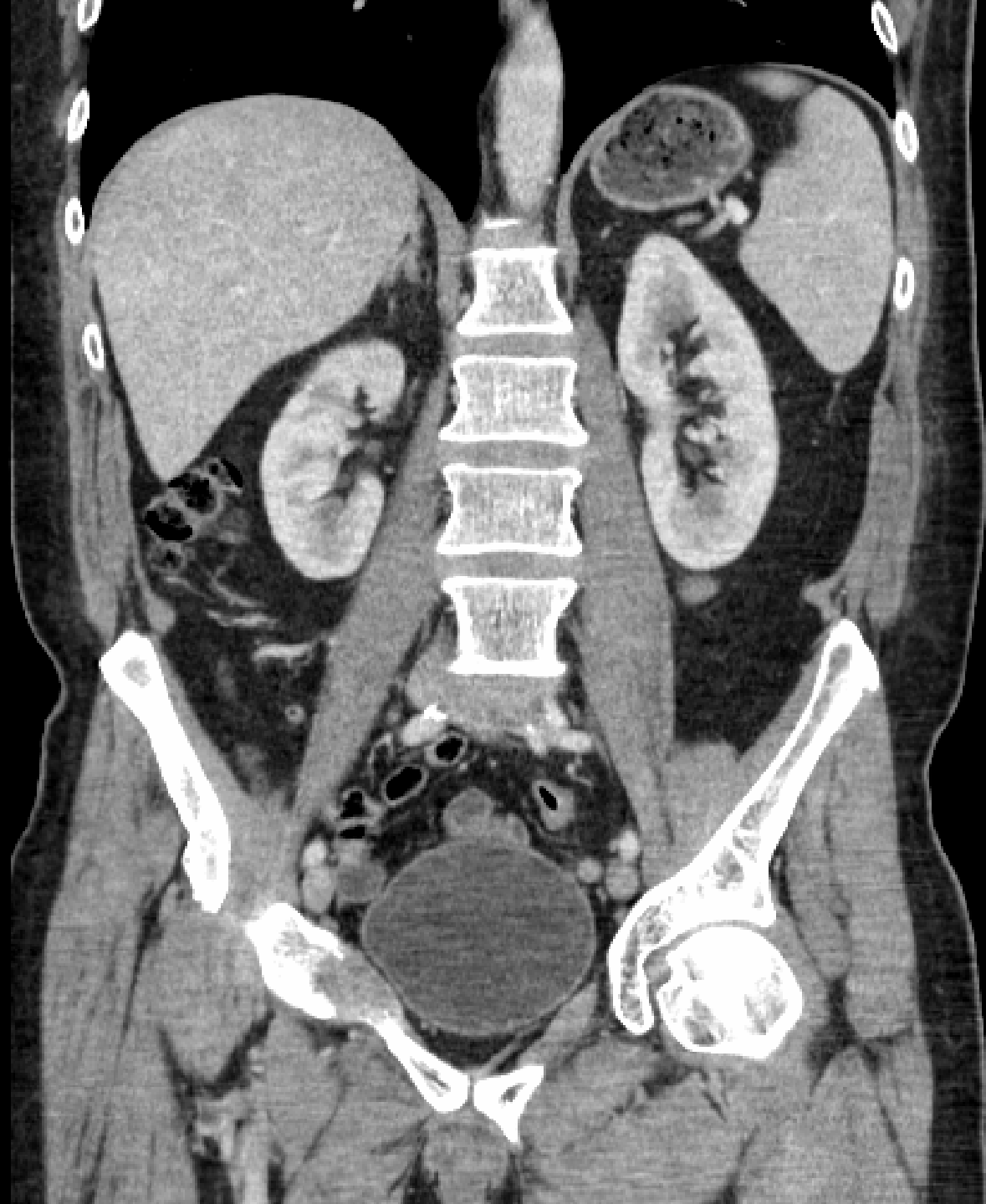
- b. Trauma? Localization
- c. Symptoms/Signs

Differential

Fall fom ladder

History of Cancer





Neuro (headache)

Appropriate Use of CT for Uncomplicated Headache in Adults

Objective: to guide decision-making regarding the use of head CT in adults with uncomplicated headache.

Rationale: CT of the head exposes the patient to radiation. The need for imaging with CT must be balanced against the risk of radiation. When in doubt, consult with the relevant specialist locally or through the RACE Line.

Recommendation: Imaging is not recommended for uncomplicated headache unless red flags are present.

Consider imaging in the following “red flag” situations:²

- sudden onset of severe headache (thunderclap)
- recurrent headache with unexplained focal neurological signs (reference: TOP Alberta)
- new onset in the setting of HIV or cancer
- abnormal neurological exam
- suspected intracranial infection
- new onset or worsening seizure
- new headache age>50
- headache causing awakening from sleep
- papilledema
- focal neurological deficit
- worsening headache frequency or severity in a patient with previous headache history or recent head trauma
- acute head trauma if indicated by CT head clinical decision rule

Appropriate Use of CT for Uncomplicated Headache in Adults

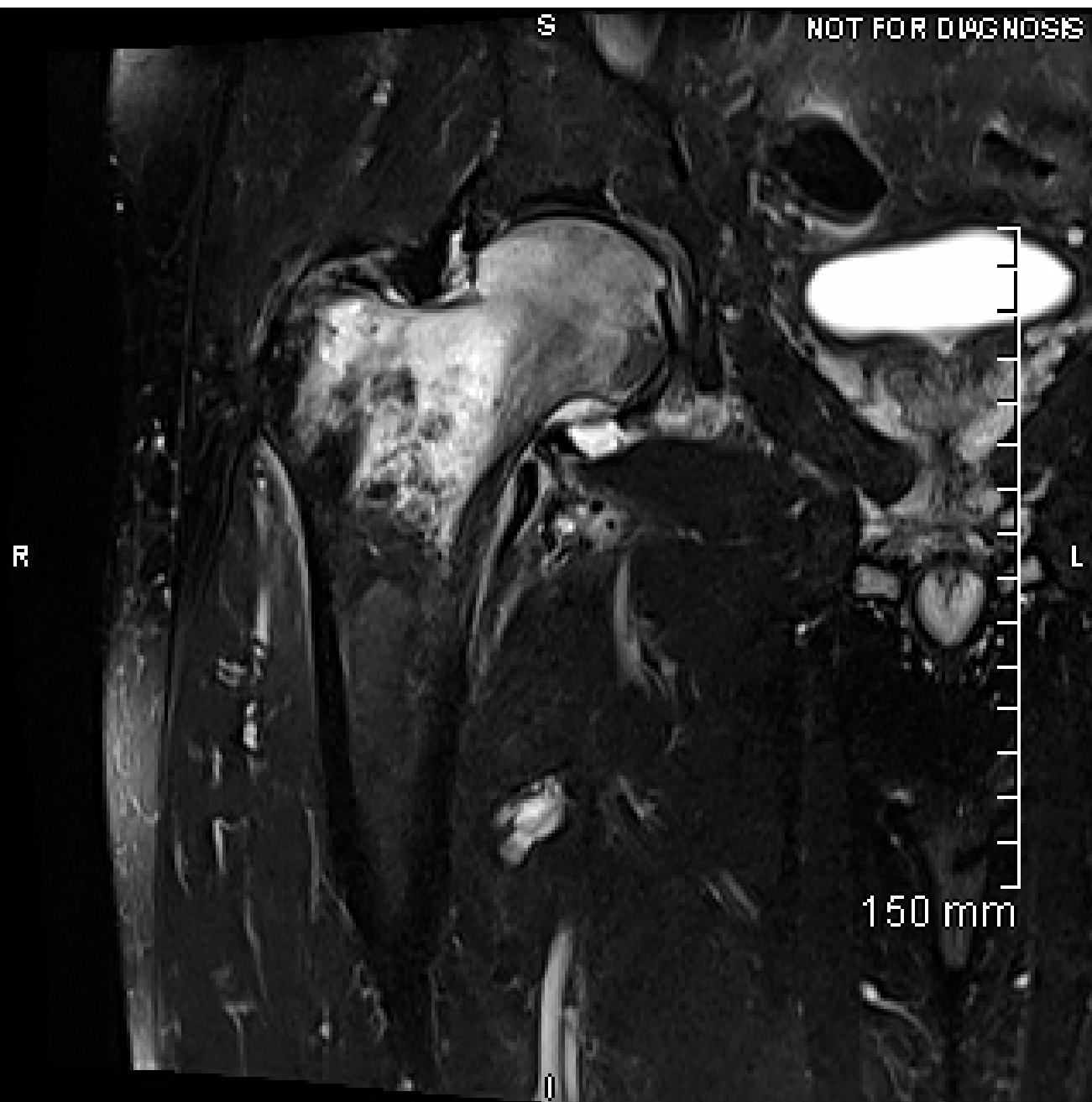
Objective: to guide decision-making regarding the use of head CT in

Think twice before requesting head CT for:

- migraine
 - syncope
 - temporal arteritis
 - multiple sclerosis
 - sinusitis
 - chronic post-concussion syndrome with normal neurological exam
-
- focal neurological deficit
 - worsening headache frequency or severity in a patient with previous headache history or recent head trauma
 - acute head trauma if indicated by CT head clinical decision rule

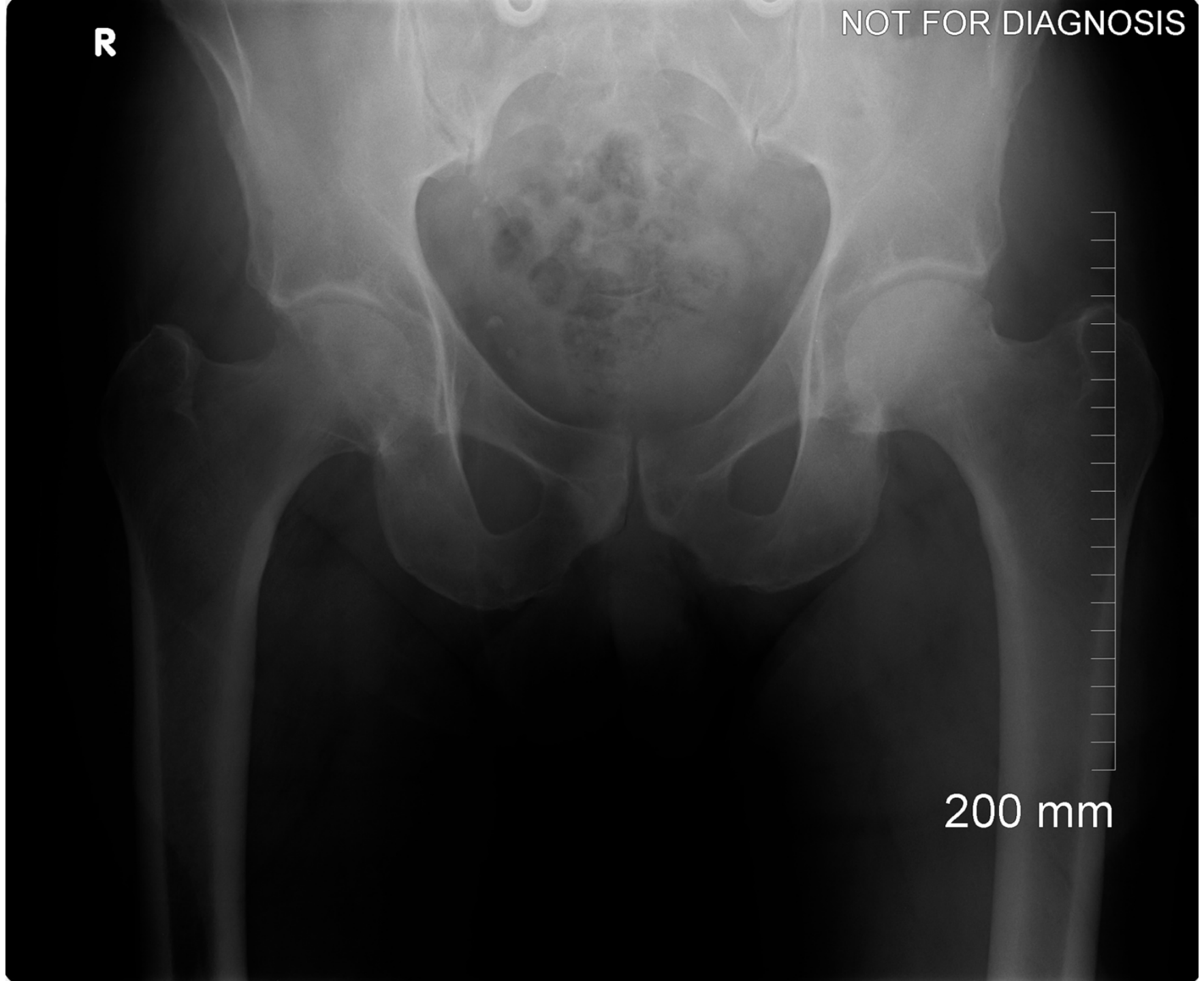
Lower Extremity (knee and hip)

Hip Pain



R

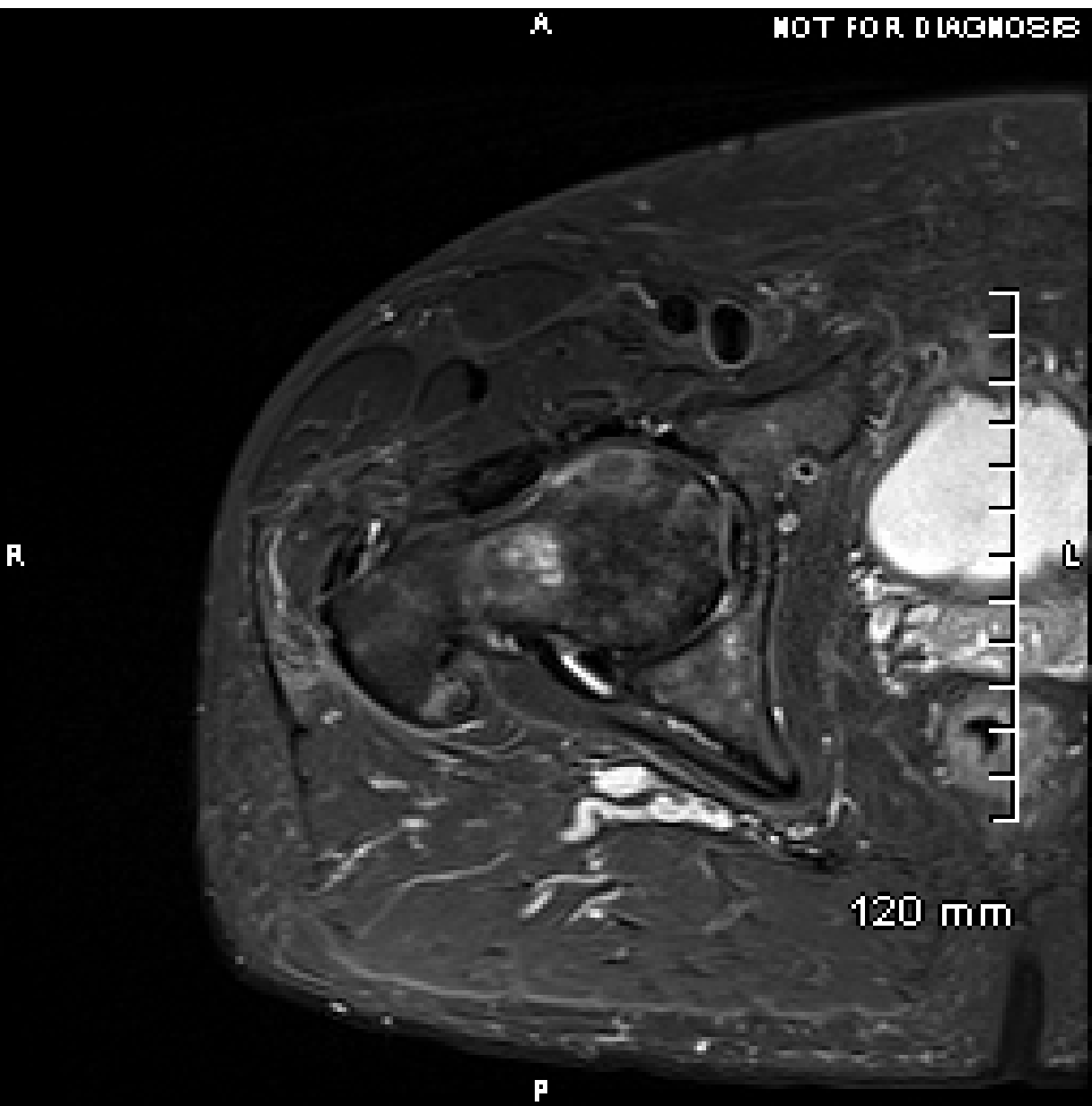
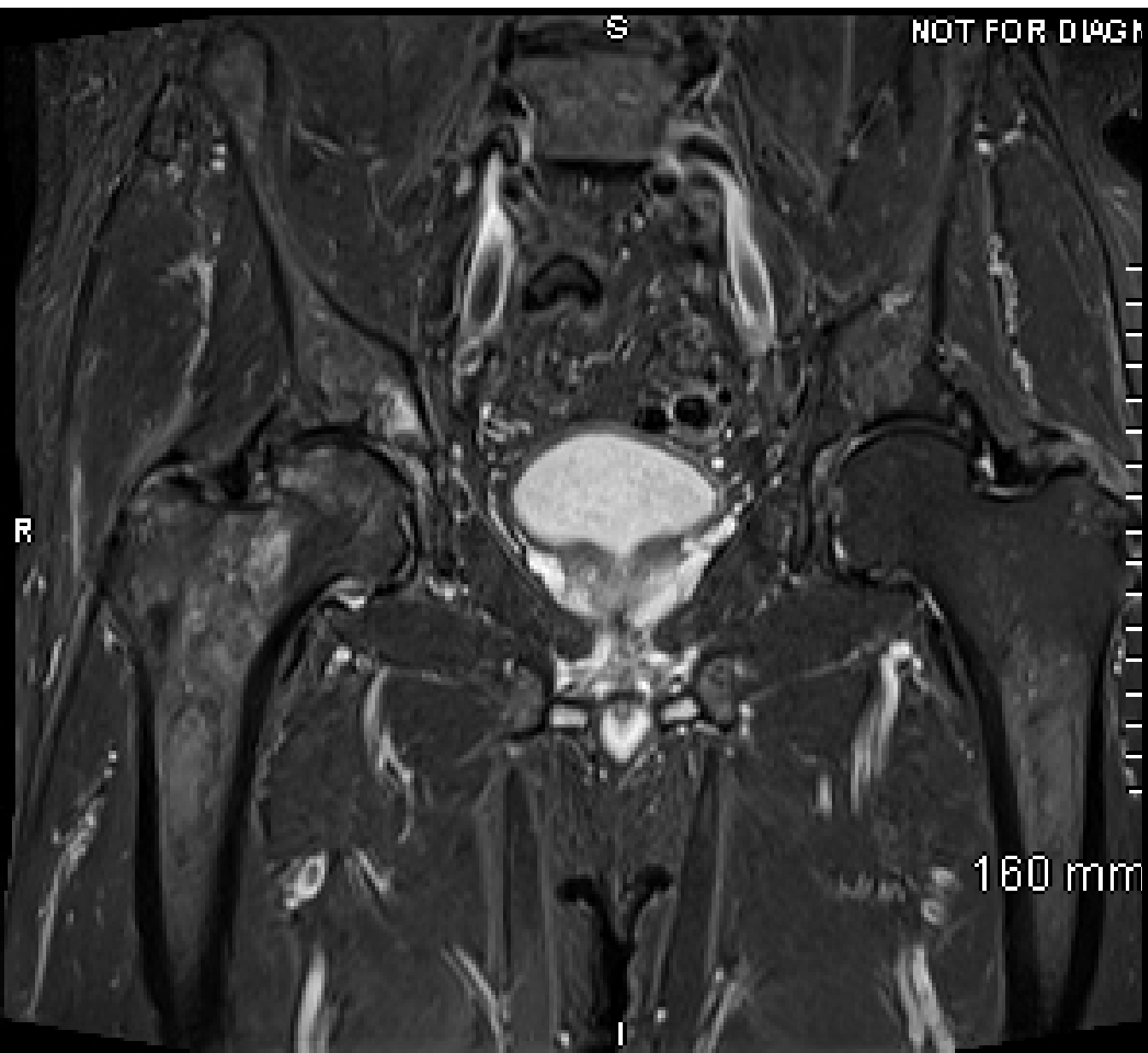
NOT FOR DIAGNOSIS



200 mm

Report:

- Transient osteopenia. Infection or stress response possible but unlikely
- Follow up XR and MRI recommended



Transient Osteopenia (Osteoporosis)

Symptoms

- Pain (often with acute onset)

- decreased ROM

- Middle aged men (3:1/M:F)

- Typically WITHOUT risk factors for AVN

Imaging

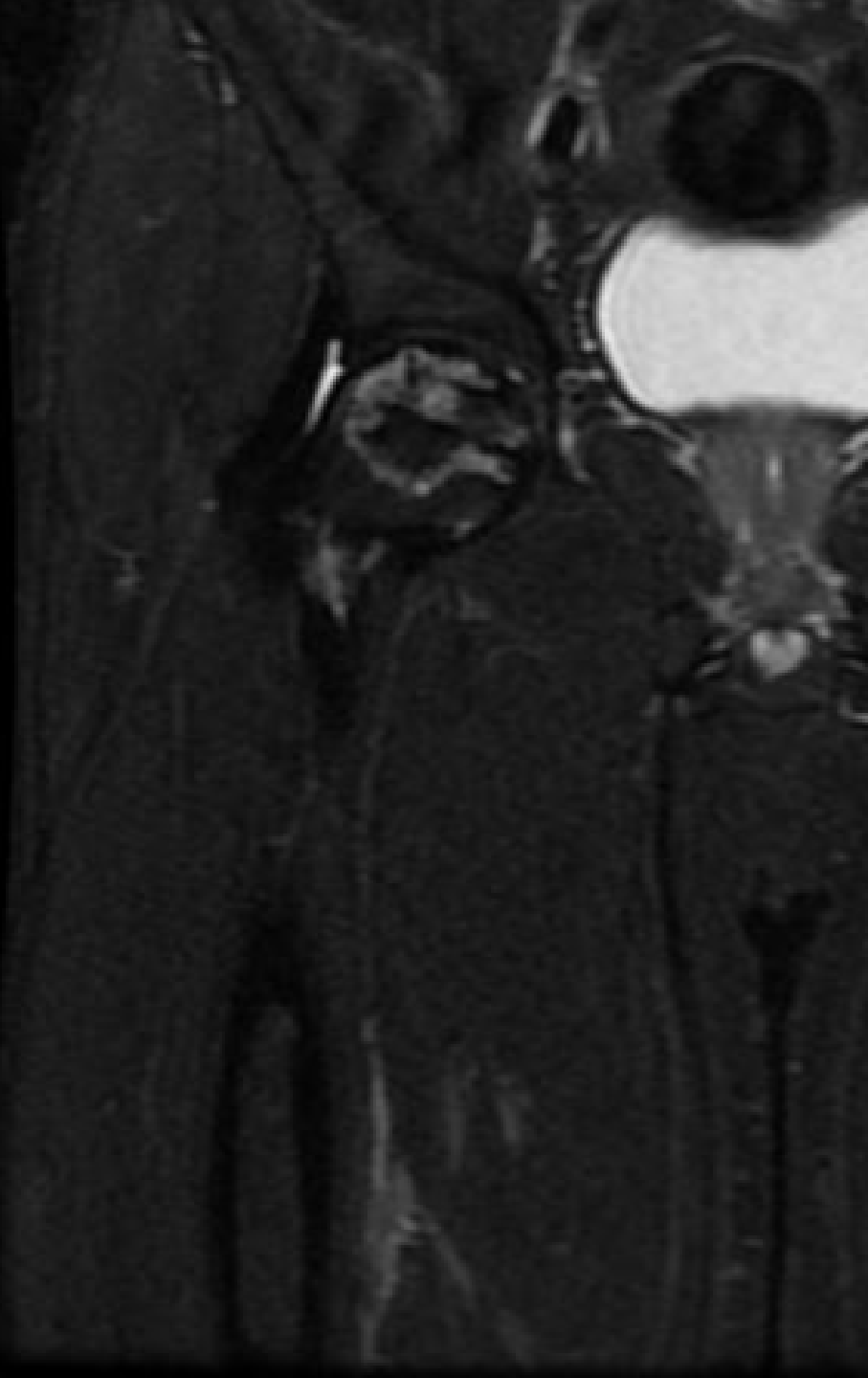
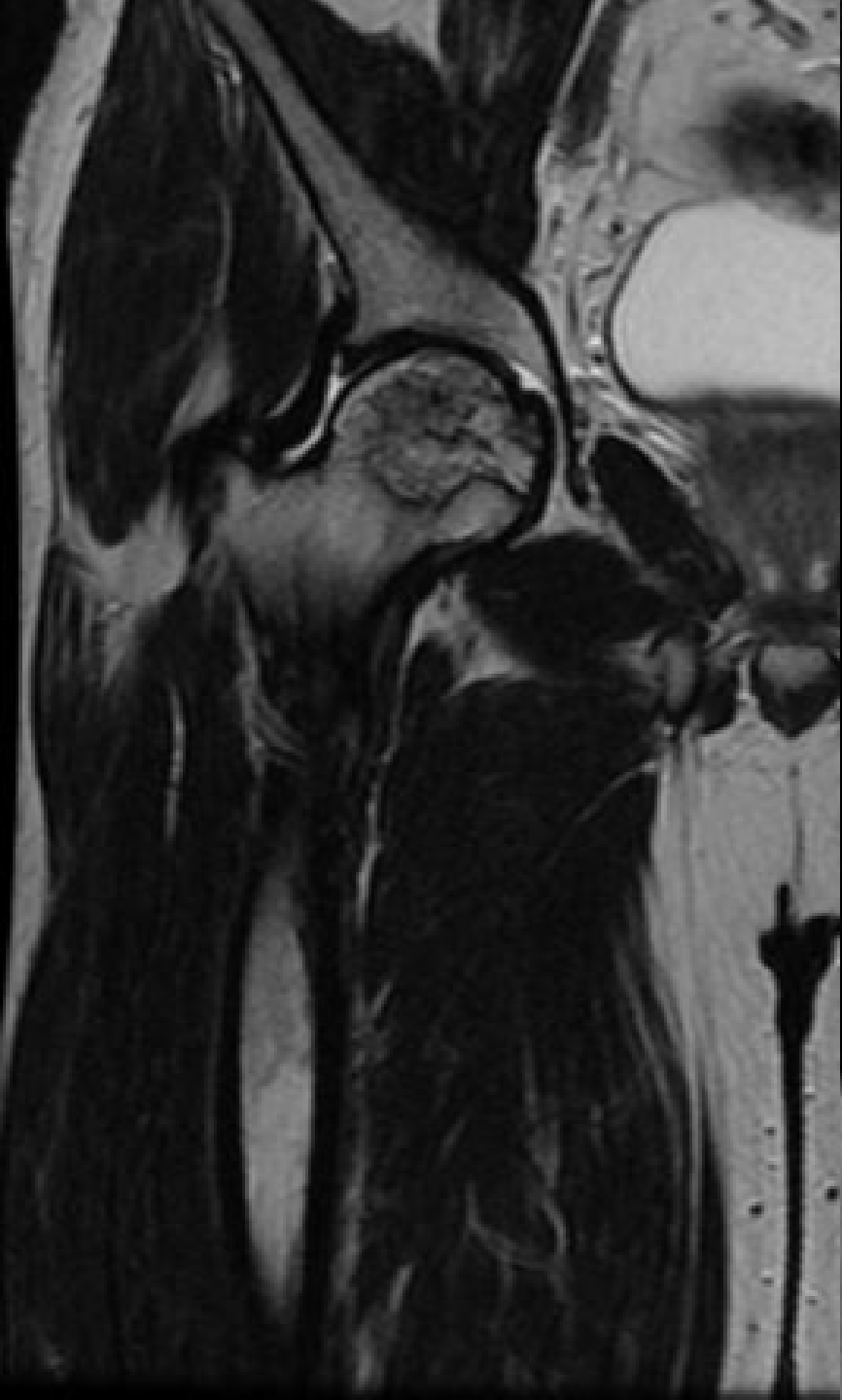
- lucent

- T2 bright

- Lacks serpiginous signal of AVN

Hip Pain





Avascular Necrosis

Symptoms

Pain (hip/groing/buttock)

Risk Factors

etOH

smoking

steroids

chemotherapy

vasculitis

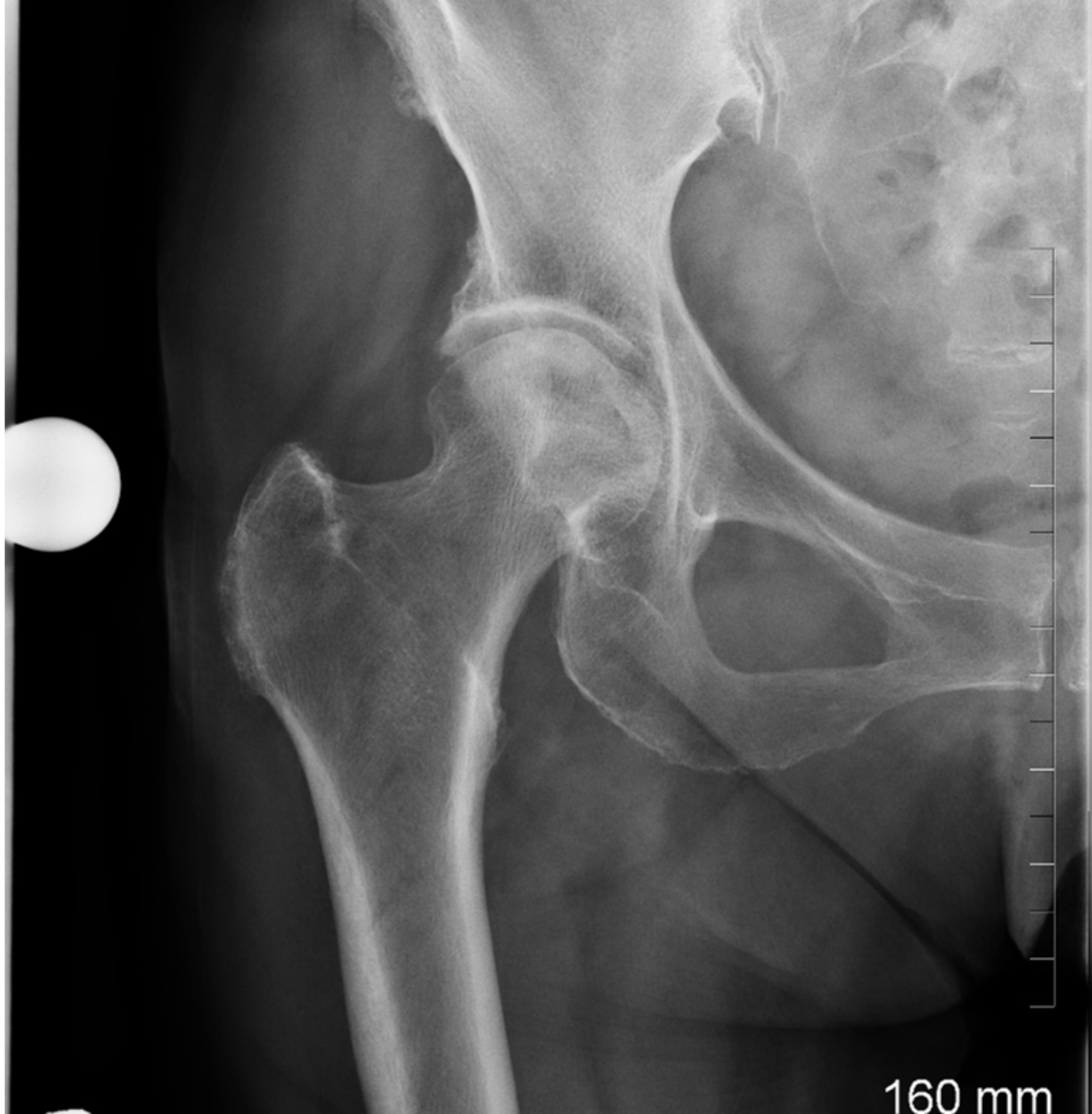
hemoglobinopathy

Imaging

Effusion

Sclerotic bands XR

T2 hyperintensity/T1 hypointensity



160 mm

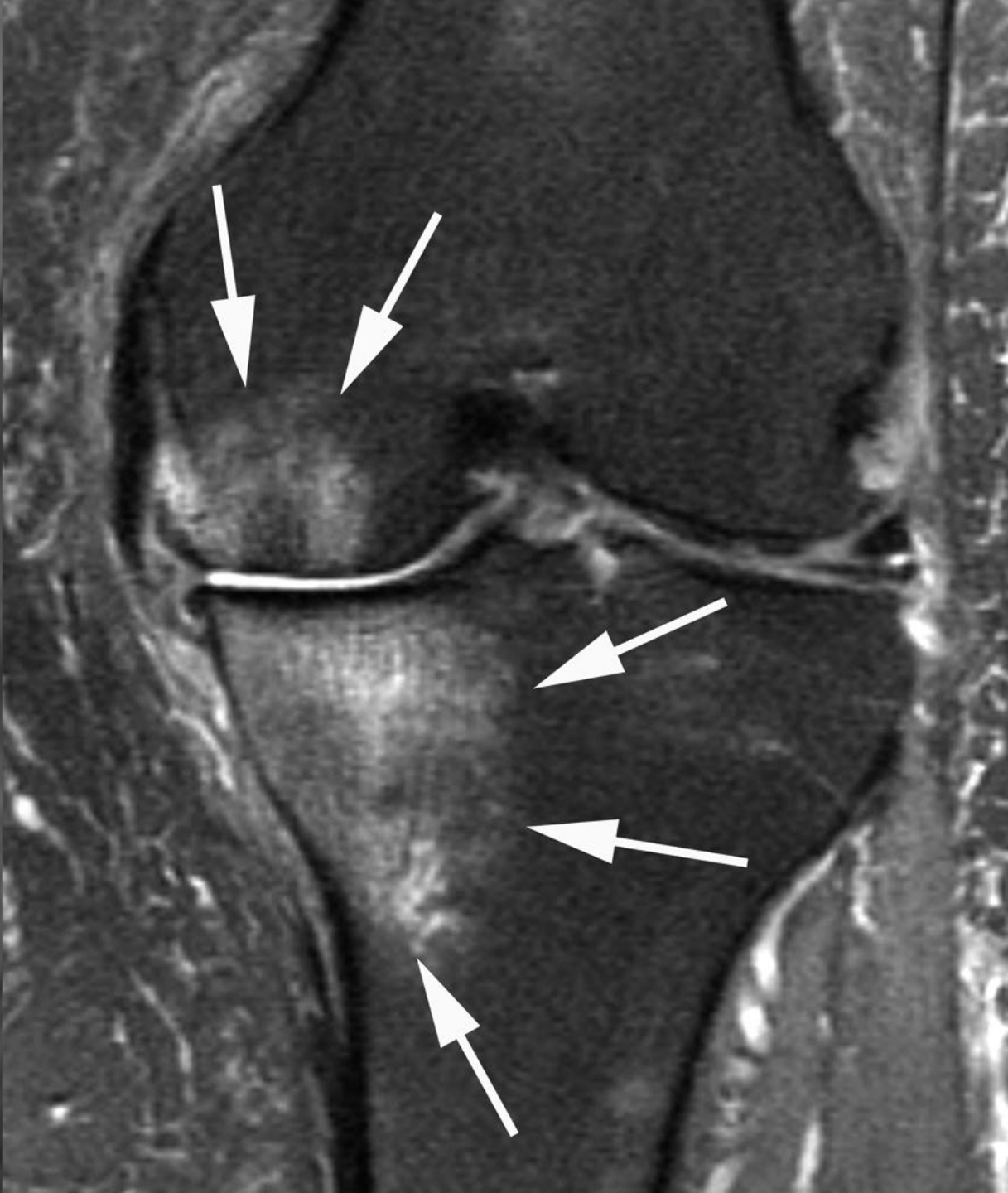
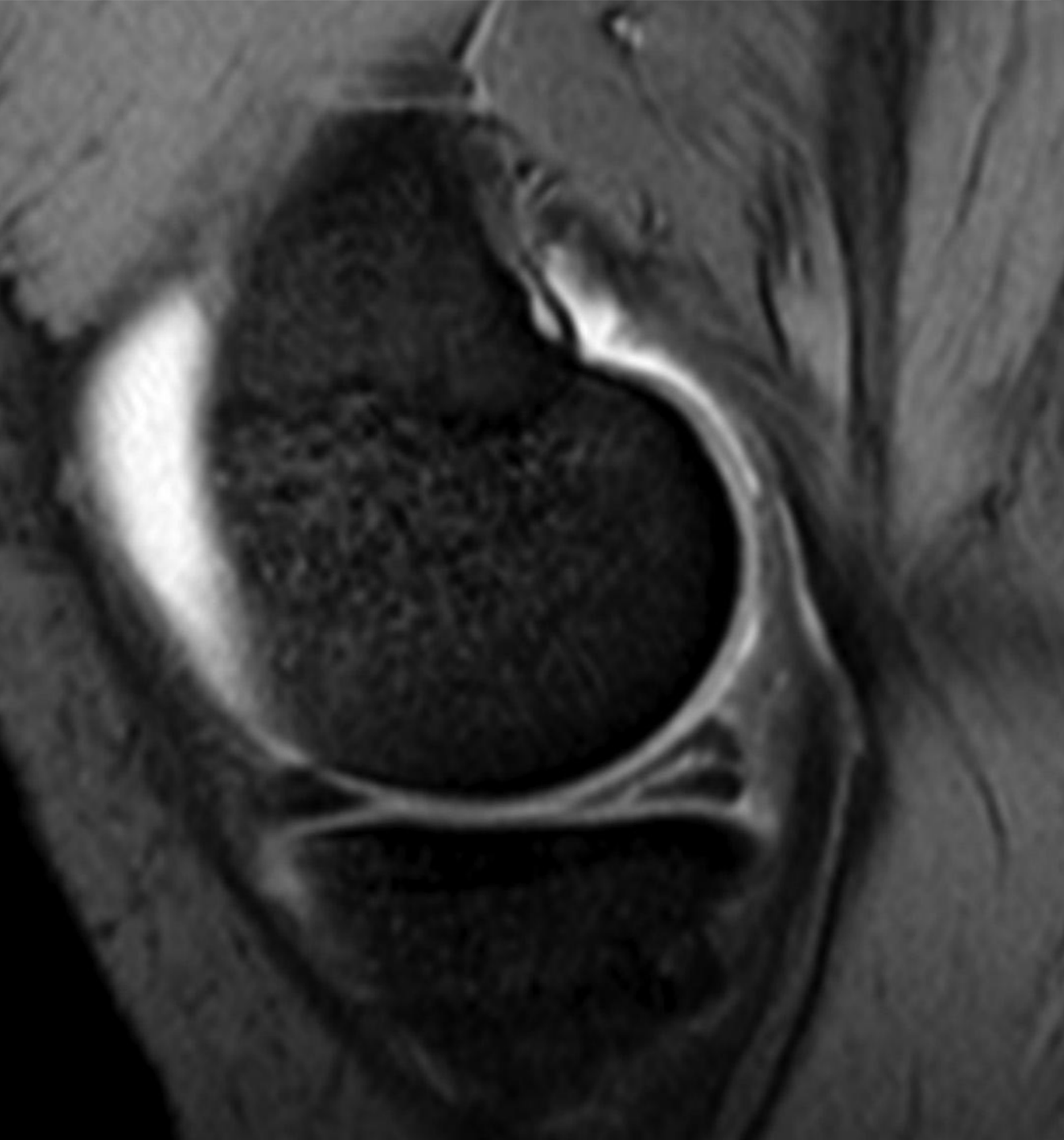
MRI Knee and Hip Appropriateness Criteria

For patients 40 years of age and older, one of the following red flags must apply in order to be eligible for MRI knee or hip:

- MRI was recommended on a previous imaging report (please attach report)
- Previous knee or hip surgery*
- Suspected infection*
- Suspected tumour
- Osteonecrosis
- Fixed locked knee*
- Patient had a weight-bearing x-ray within the past 6 months and referring clinician has confirmed mild or no evidence of osteoarthritis in the knee or hip

*Knee or hip pain in the settings of previous surgery, suspected infection, or fixed locked knee may be urgent or emergent. Consider discussion with an orthopedic surgeon prior to requesting an MRI. All orthopedic emergencies require immediate consultation.

Degenerative Meniscus



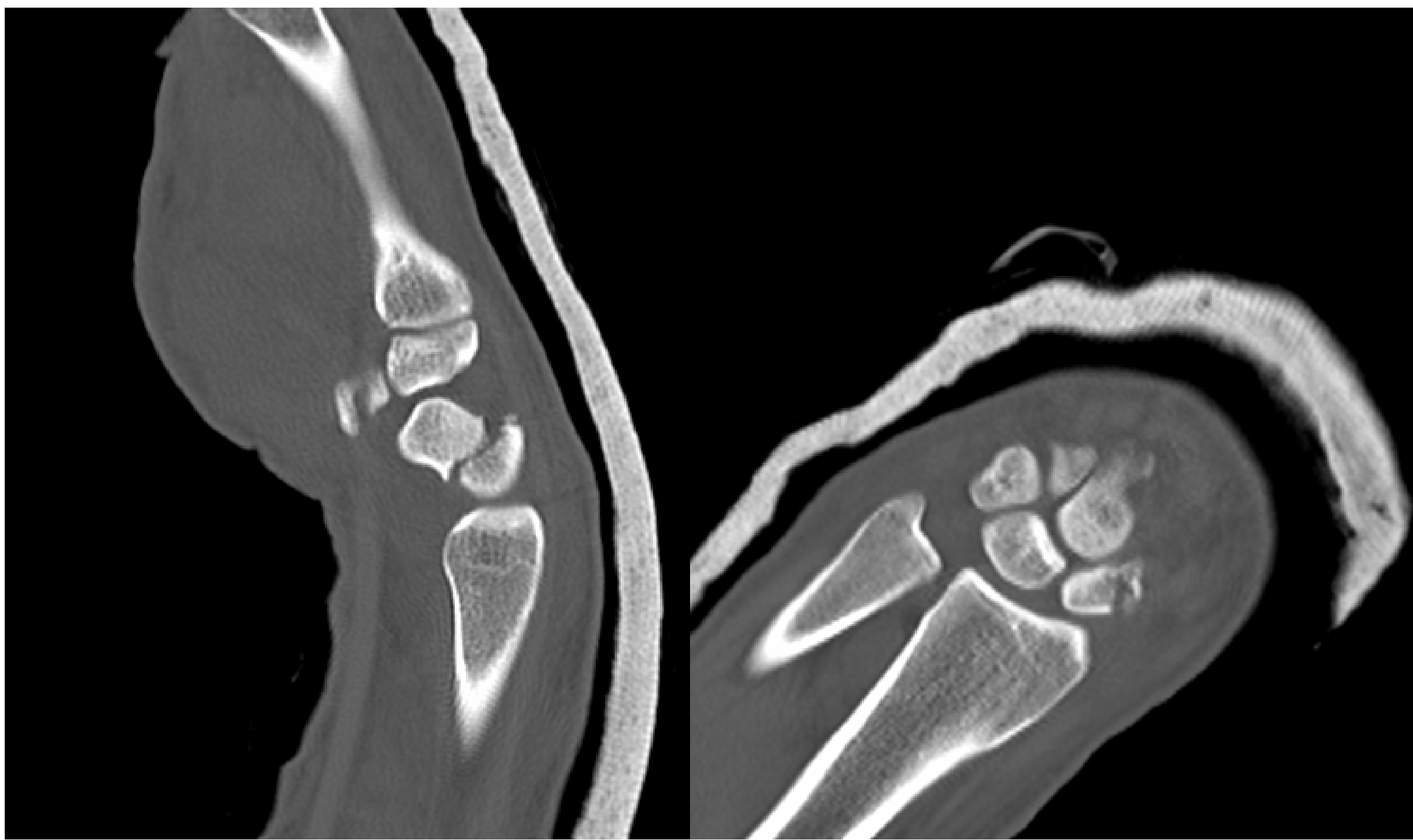
Risk Factors for Meniscal Tears: A Systematic Review Including Meta-analysis

The bottom line

- Degenerative meniscal tears are common and correlate poorly with symptoms; no clinical features are diagnostic
- Avoid routine magnetic resonance imaging in primary care unless the patient has a locked knee (sudden inability to fully extend) or serious disease is suspected
- First line treatment comprises non-operative modalities, such as education, self management, exercise, weight loss if overweight or obese, walking aids if indicated, paracetamol, non-steroidal anti-inflammatory drugs, and intra-articular glucocorticoids. Current evidence does not support a role for arthroscopic debridement, washout, or partial meniscectomy









Lumbar Spine



Recommendation: Diagnostic imaging (x-ray, CT or MRI) for low back pain of less than 6 weeks duration is not recommended unless one of the following red flags is present:^{2,9}

- severe or progressive neurologic deficit
- significant acute traumatic event immediately preceding onset of symptoms
- suspected compression fracture (risk factors include long term steroid use)
- suspected cancer, cancer related complication, or history of cancer
- suspected infection (e.g. discitis/osteomyelitis, epidural abscess; risk factors include history of IV drug use)
- suspected spinal epidural hematoma
- cauda equina syndrome
- older age with first episode of severe back pain

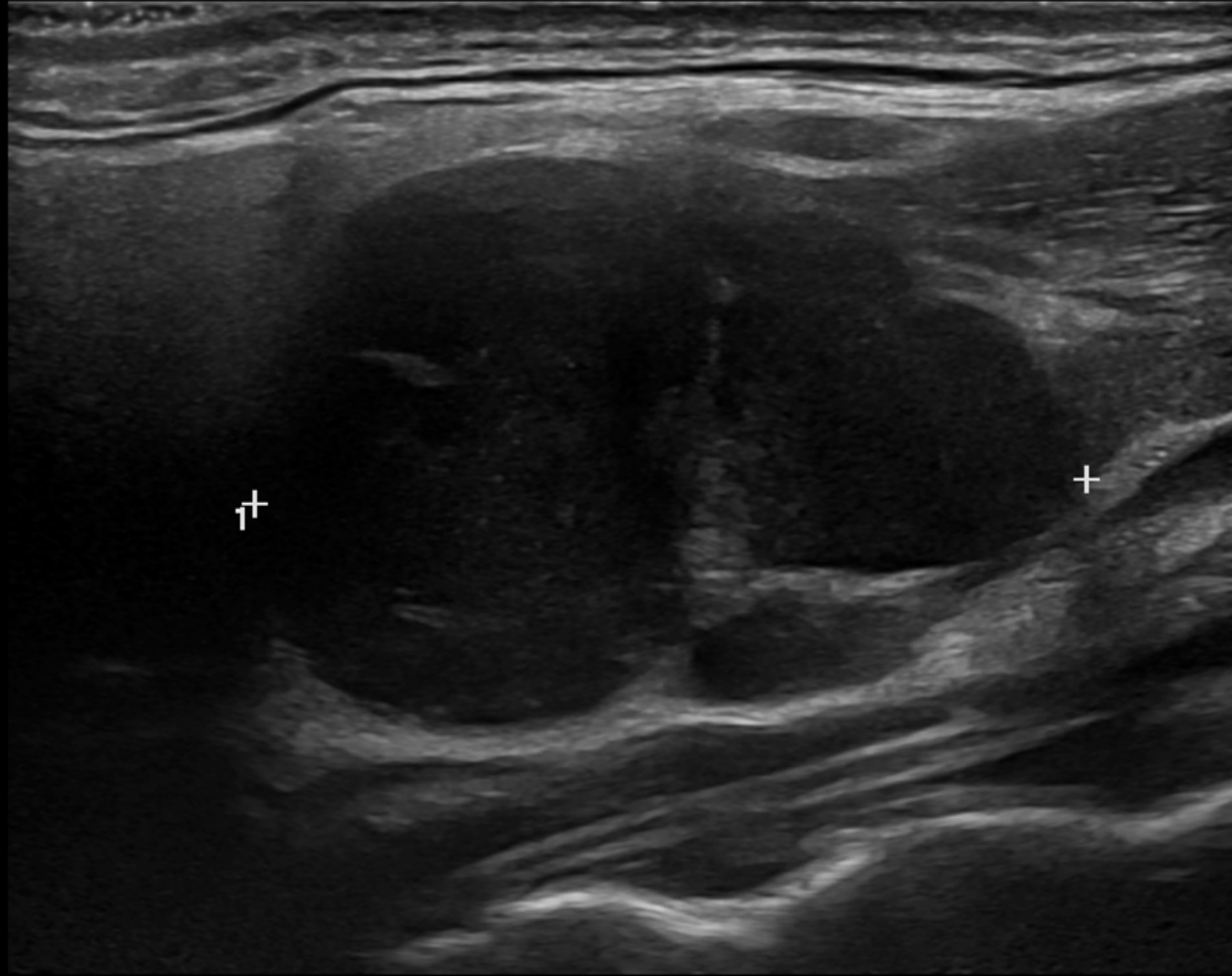
Section C: Spine (for Trauma see Section J)

Clinical/Diagnostic Problem	Investigation	Recommendation (Grade)	Dose	Comment
C06. Lower back pain <i>(continued)</i>	CT	Indicated in special circumstances [B]	⊕⊕	<p>Imaging is only indicated if there are “red flag” indications:</p> <p>If there is clinical concern about an epidural abscess or hematoma which may present with acute pain but no neurological symptoms, urgent imaging is required.</p> <ul style="list-style-type: none"> • Suspected cancer • Suspected infection. • Cauda equina syndrome • Severe/progressive neurologic deficit • Suspected compression fracture <p>In patients with suspected uncomplicated herniated disc or spinal stenosis imaging is only indicated after an unsuccessful 4- 6 week trial of conservative management.</p> <p>CT is only indicated if MRI is contraindicated or unavailable. CT can provide excellent imaging. In very large patients, image noise can be a problem. The radiation dose is also a consideration.</p>
	XR	Indicated only in specific circumstances [B]	⊕	<p>XR may be used if a compression fracture or a metastasis is suspected. However, it does not distinguish between an acute and an old fracture and it is not as sensitive as MRI for metastases.</p>

2 Months of Difficult Swallowing

LOGIQ

1 L 3.42 cm



- FR
- CHI
- Frq
- Gn
- S/A
- Map
- 1- D
- Zm
- DR
- AO%
-
-
- 2-
-
-
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- 3-
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- L 4-

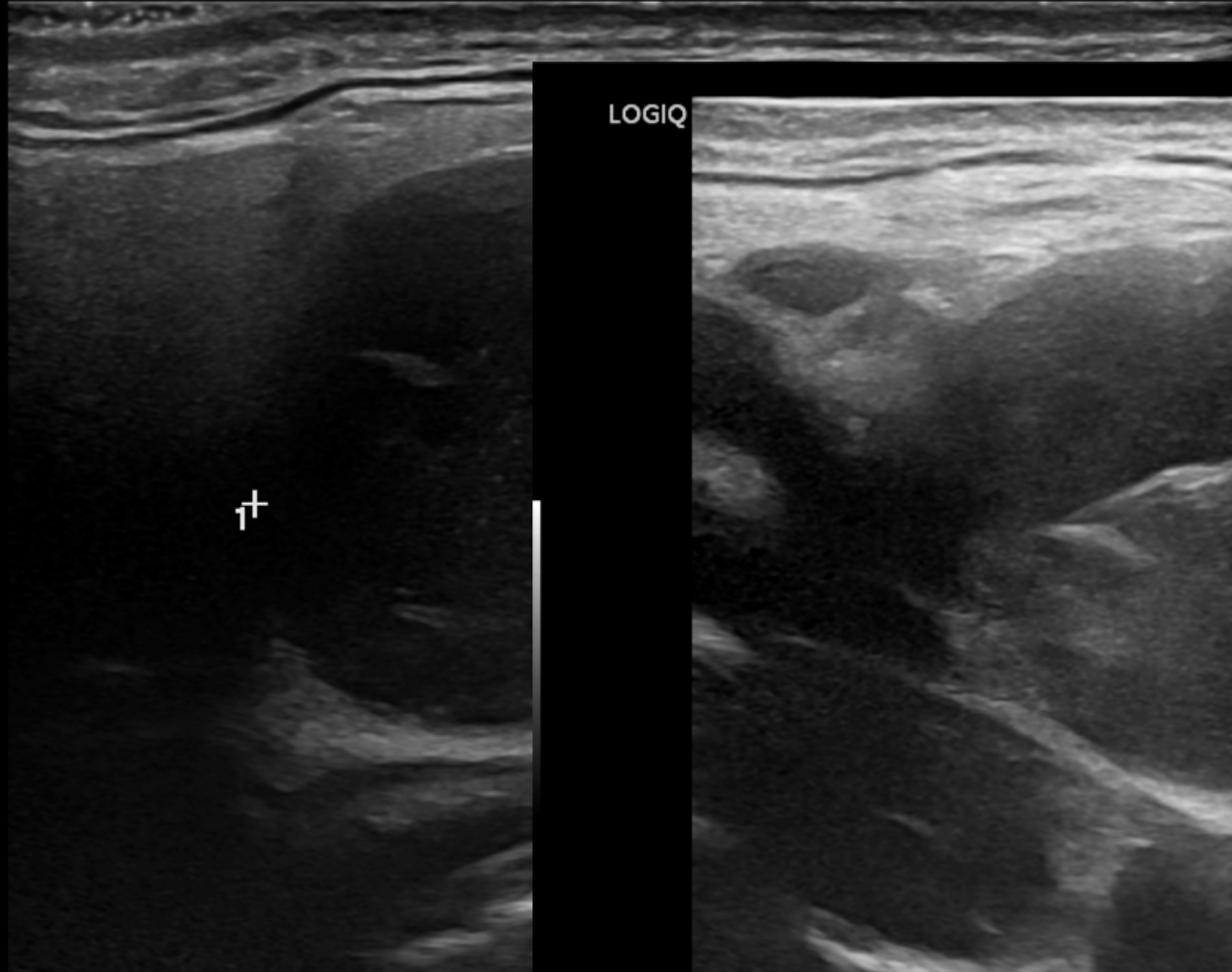
LONG LEFT NECK AT PALP

LOGIQ

FR

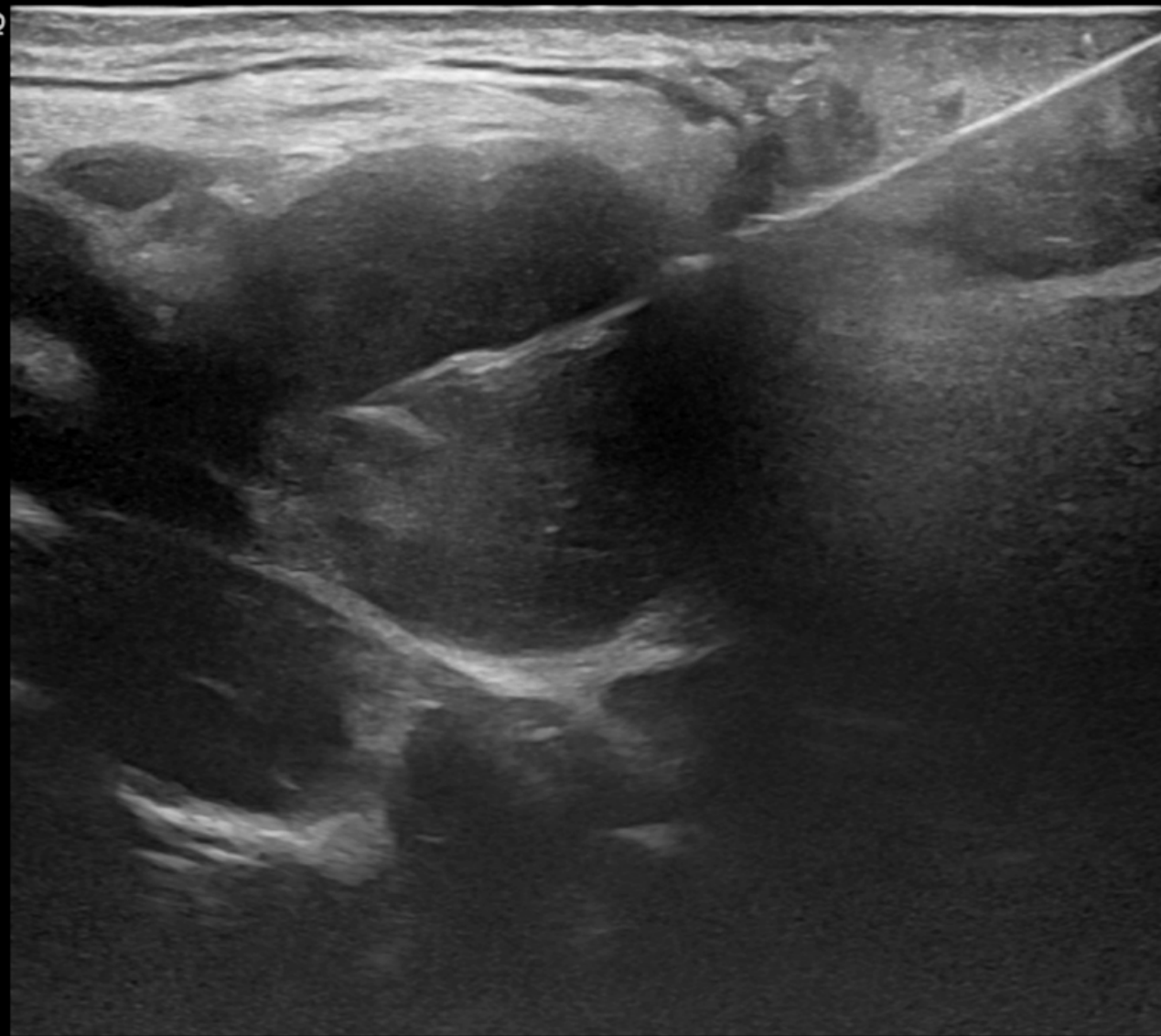
1 L 3.42 cm

CHI



LONG LEFT NECK AT PA

LOGIQ



LEFT NECK SUPERIOR BX

0

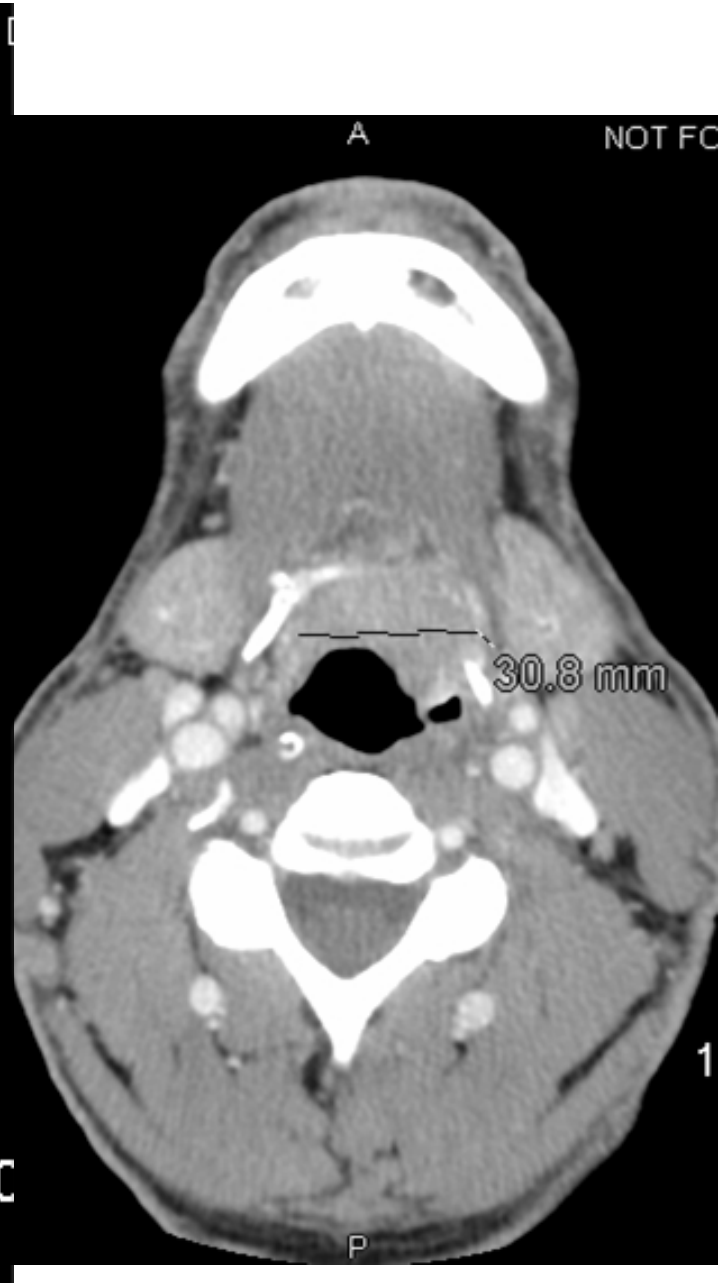
- CHI X
- Frq 14.0
- Gn 74
- S/A 7/3
- 1- Map F/0
- D 4.5
- Zm 0
- DR 63
- AO% 100

2

3

4

L



Section G: Gastrointestinal system

Clinical/Diagnostic Problem	Investigation	Recommendation (Grade)	Dose	Comment
G01. Difficulty in swallowing: high dysphagia (lesion may be high or low)	Ba esophagogram	Indicated [B]	⊕⊕	Ba esophagogram is the <u>best investigative modality for diagnosing motility disorders. It is also useful for demonstrating webs and pouches and may show subtle strictures not seen at endoscopy.</u>
G02. Difficulty in swallowing: low dysphagia (lesion will be low)	Ba esophagogram	Indicated only in specific circumstances [B]	⊕⊕	Endoscopy should be performed initially. Ba esophagogram should only be performed if endoscopy normal used to demonstrate a motility disorder or a subtle stricture.
G03. Heartburn/ chest pain: hiatus hernia or reflux	Ba esophagogram /UGI	Indicated only in specific circumstances [B]	⊕⊕	<p>Reflux is common and can usually be diagnosed clinically. Investigation is only indicated when medical therapy fails. pH monitoring is the gold standard for the diagnosis of reflux, but endoscopy will show early changes of reflux esophagitis and allow biopsy of metaplasia.</p> <p>Ba esophagogram may be ordered by a surgeon to assess esophageal motility prior to anti-reflux surgery.</p>

Section G: Gastrointes

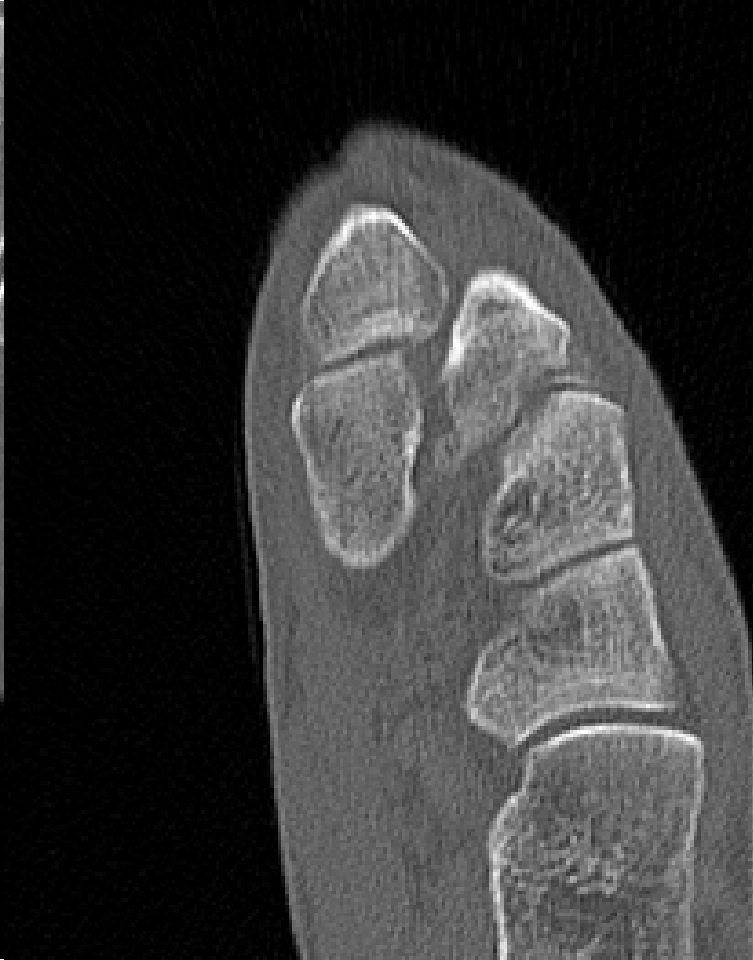
Clinical/Diagnostic Problem	Investigation
G01. Difficulty in swallowing: high dysphagia (lesion may be high or low)	Ba esophagogram
G02. Difficulty in swallowing: low dysphagia (lesion will be low)	Ba esophagogram
G03. Heartburn/ chest pain: hiatus hernia or reflux	Ba esophagogram /UG

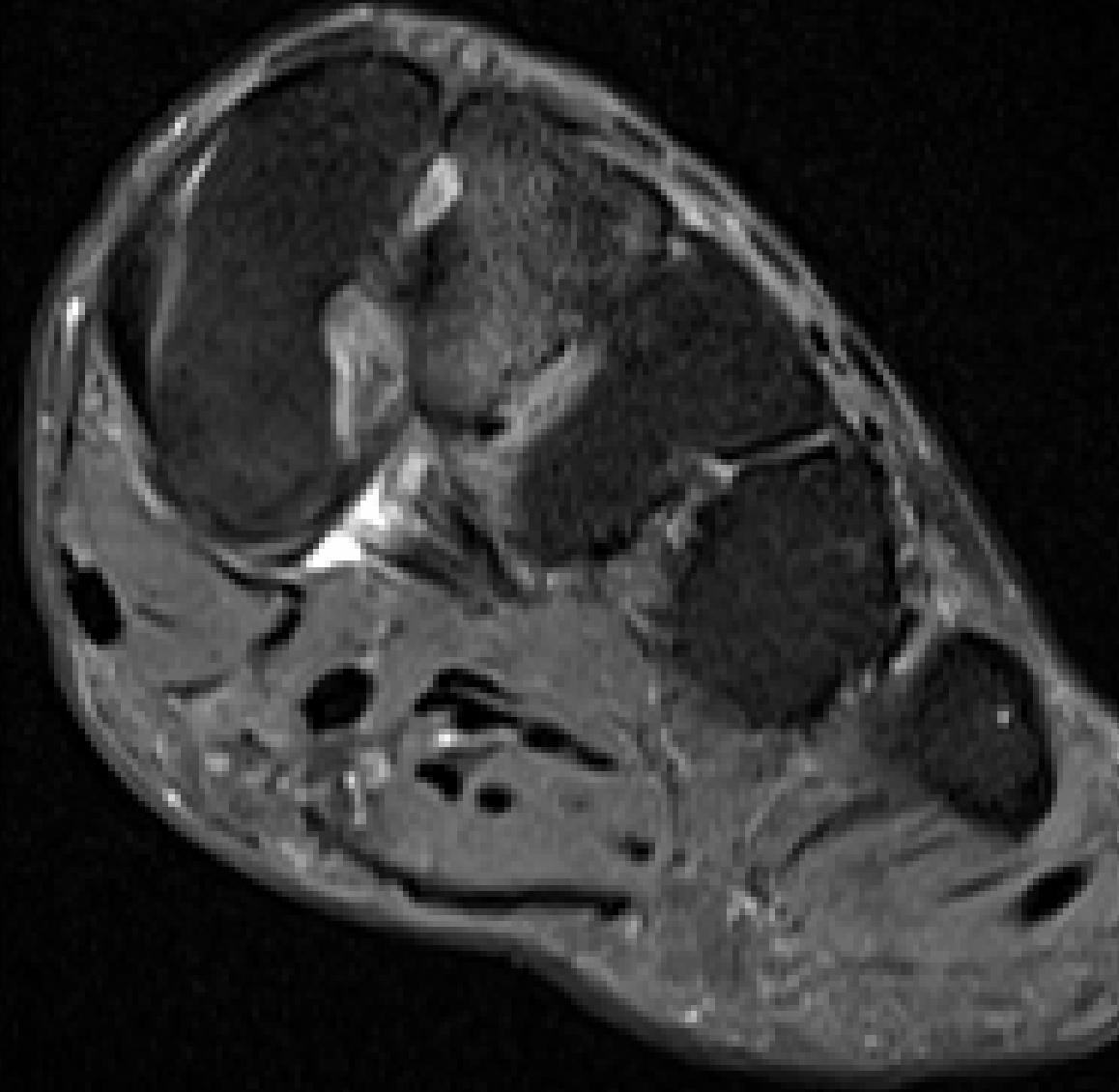
Clinical/Diagnostic Problem	Investigation	Recommendation (Grade)	Dose	Comment
Head and Neck				
K01. Diagnosis	CT	Indicated [B]	⊕⊕	Imaging is used mainly to diagnose patients with clinically suspected occult disease or patients presenting with locoregional or distant metastasis.
	MRI	Indicated [B]	0	Imaging is used mainly to diagnose patients with clinically suspected occult disease or patients presenting with locoregional or distant metastasis.
K02. Staging	CT	Indicated [B]	⊕⊕	Imaging is used to assess extent of the disease at the primary site, nodal involvement and distant metastasis. US is used to assess nodal metastasis. CT and MR are used to assess TMN staging. MR is more sensitive compared to CT to assess cartilage and bone involvement. Dynamic contrast enhanced CT and MR, CT and MR perfusion, DWI and MRS are emerging imaging techniques that could increase the diagnostic accuracy in lesion detection, characterization, and prediction of treatment response. Combining one or more imaging modalities could improve imaging test performance. US, CT and occasionally MR could be used as guiding tool for biopsy to confirm nodal or distant metastasis.
	MRI	Indicated [B]	0	MRI should be used to stage oropharyngeal and oral tumours.
	PET/CT	Specialized investigation [B]	⊕⊕⊕⊕	PET/CT is recommended for the staging of nasopharyngeal cancer. PET/CT is recommended in patients with metastatic squamous cell carcinoma presenting in neck nodes when the results of standard radiologic investigation do not reveal the primary site.
	Lymphoscintigraphy	Indicated [B]	⊕⊕	Recommendation for localization of sentinel lymph nodes in early stage oral cancers.
K03. Follow up	CT, MR PET/CT	Indicated [C]	Depends on modality used for surveillance	CT, MR are used in addition to clinical surveillance to assess for tumour response and recurrence in symptomatic and asymptomatic patients. PET/CT may be useful in the restaging of patients with recurrent squamous cell carcinoma of the Head and Neck when major salvage treatment is being considered.

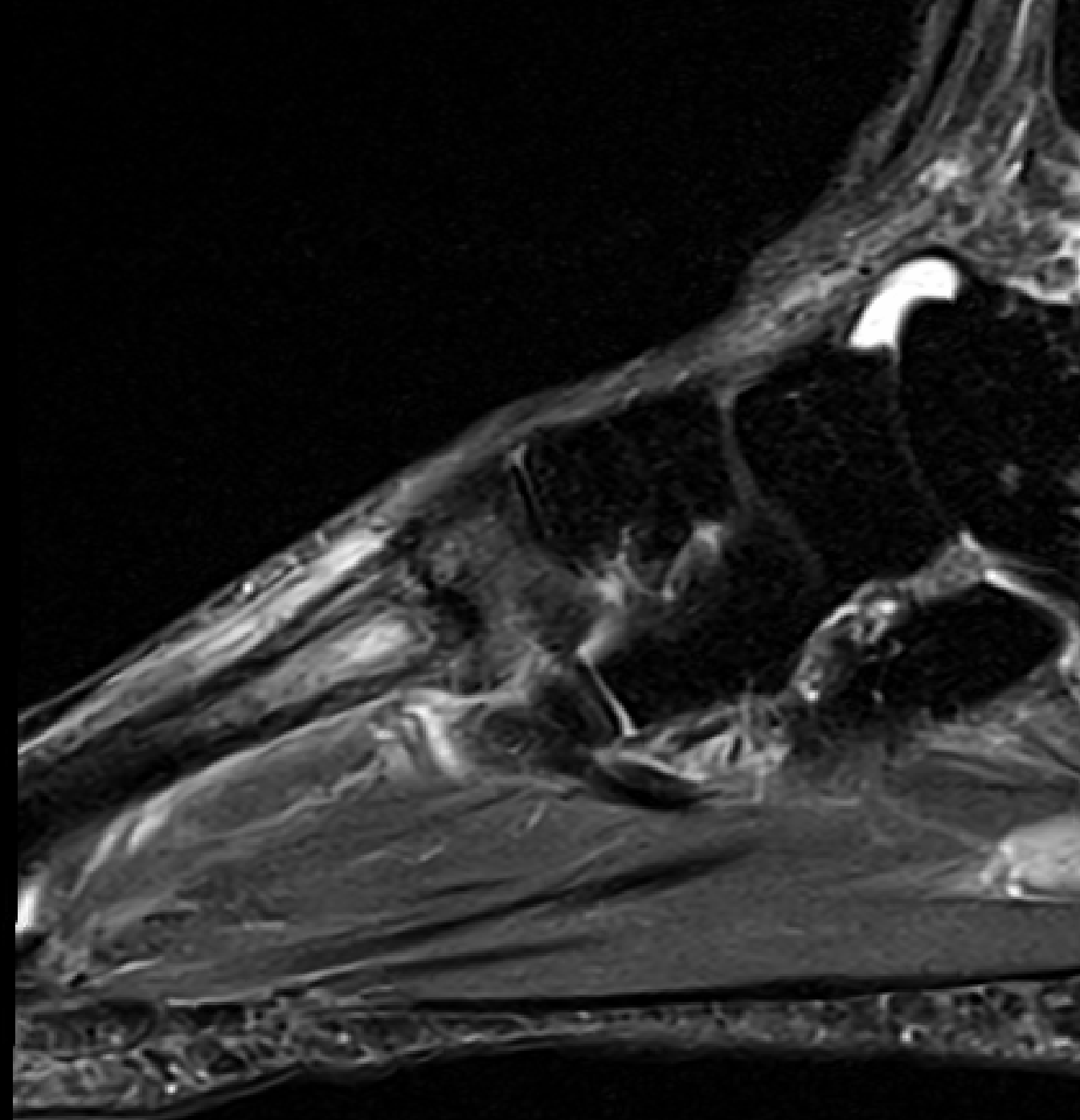
Foot pain

Rule out stress fracture second metatarsal





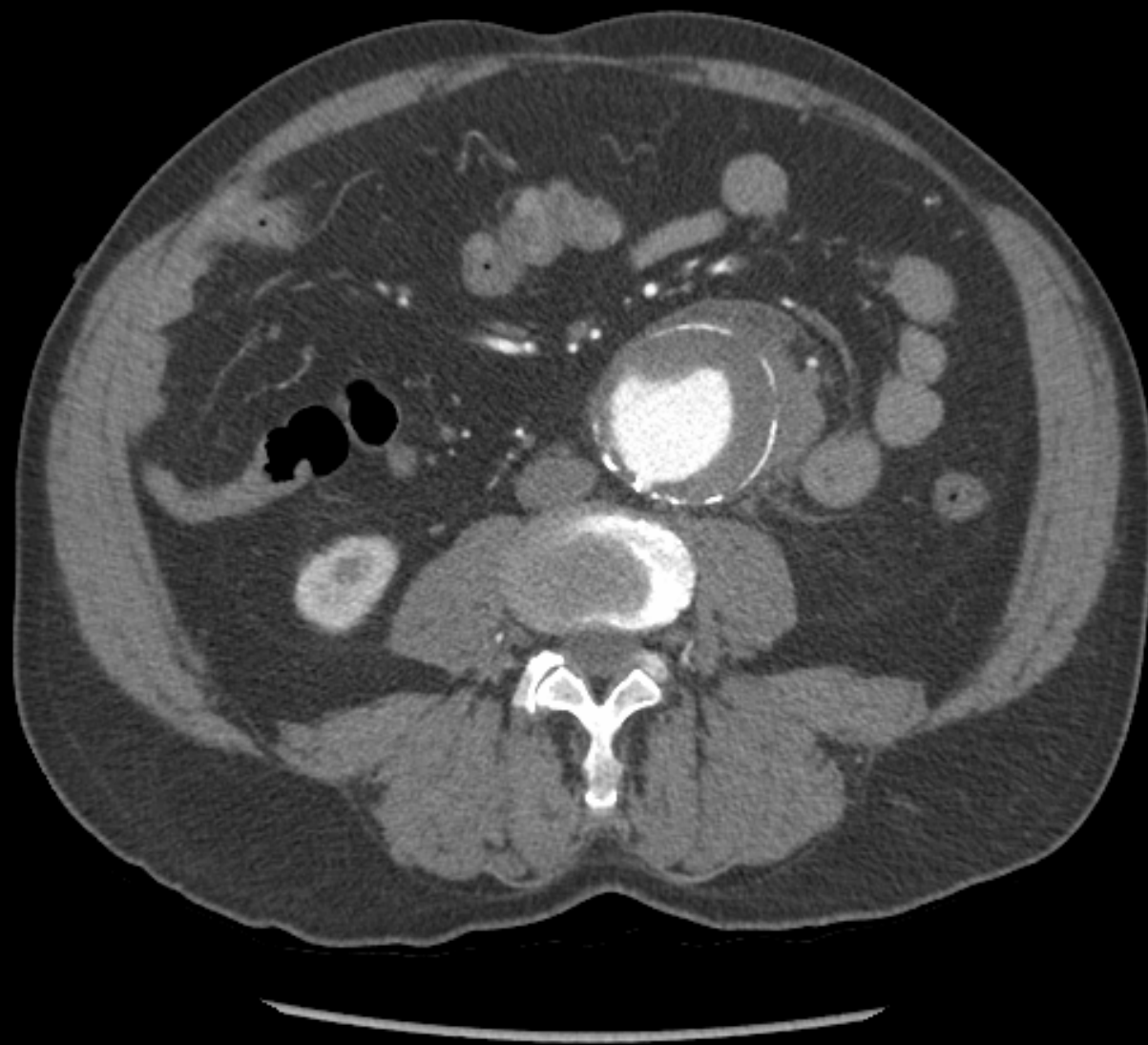




75 year old with HTN

Abdominal pain

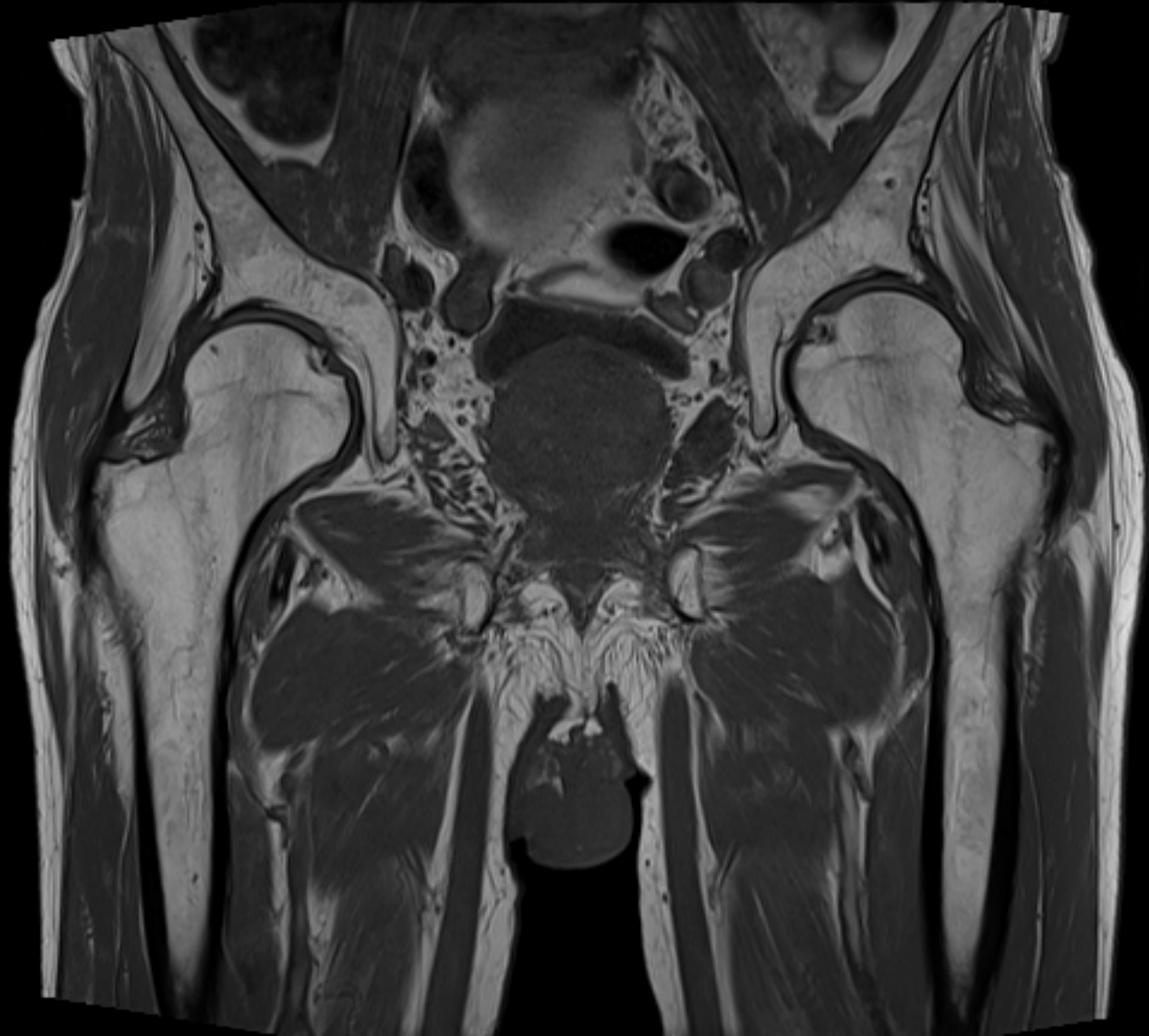
Bedside US suspicious for AAA

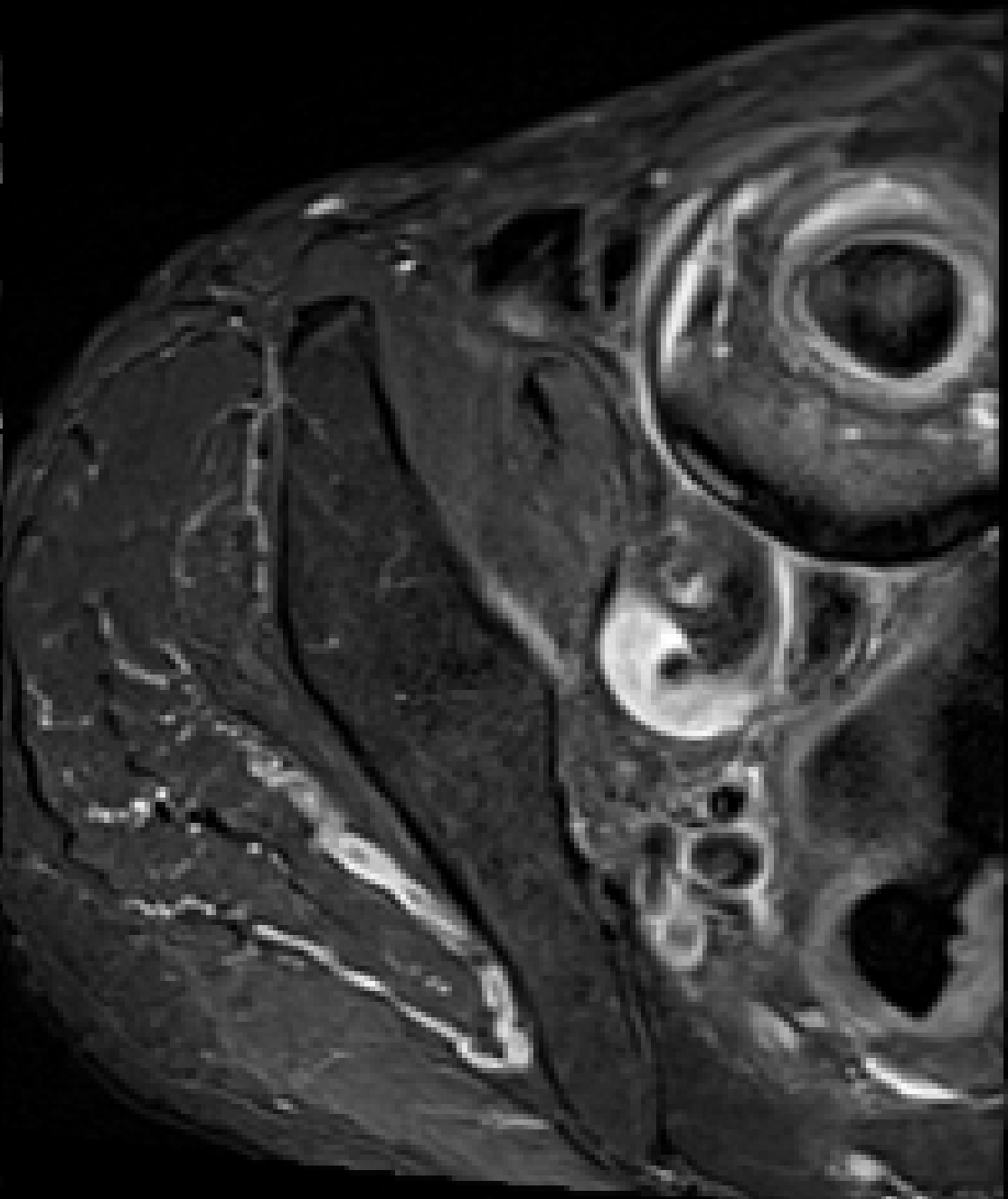
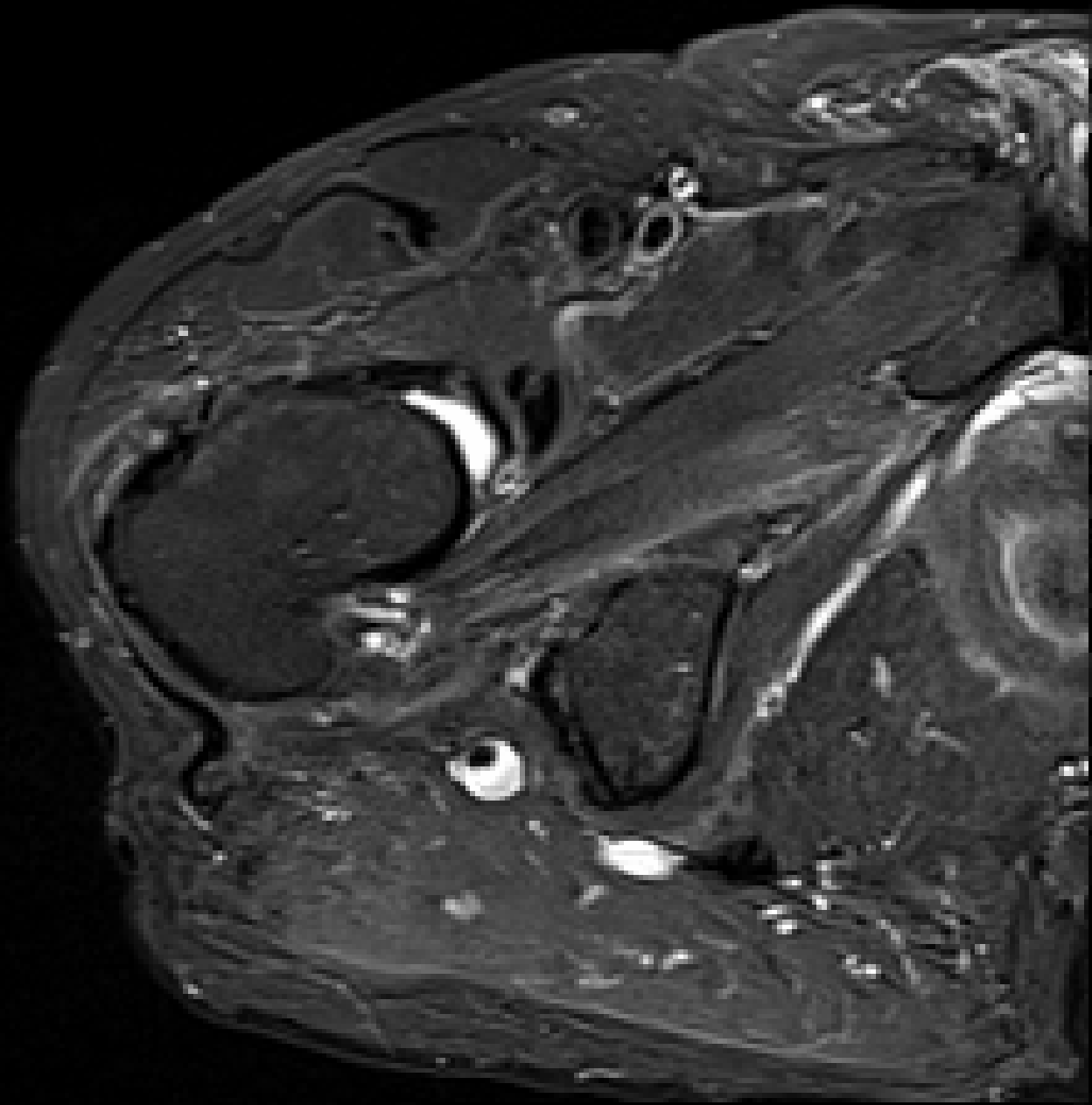


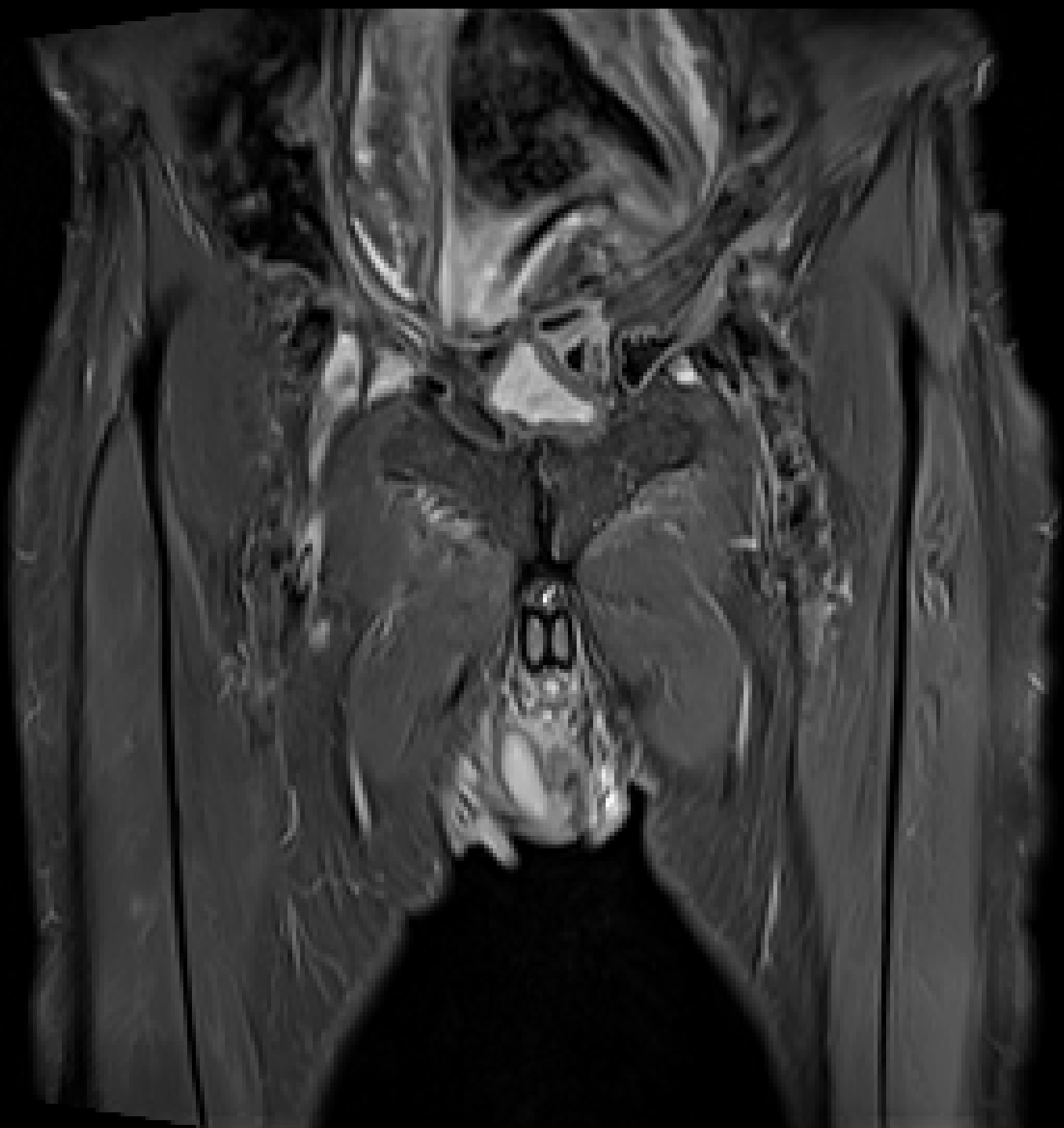
Mid/proximal femur pain/stiffness.

Worse in morning.

Mild CRP elevation.



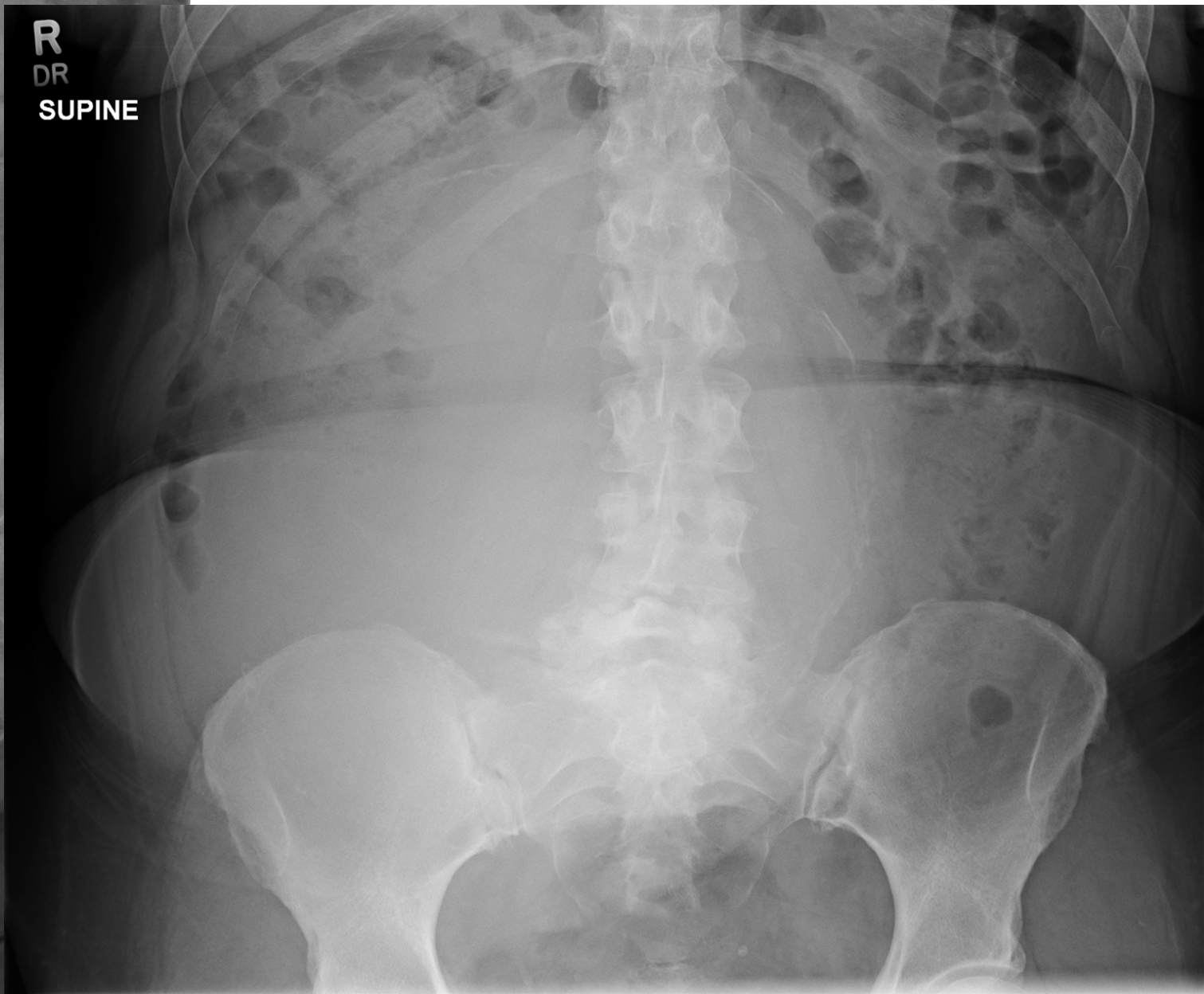
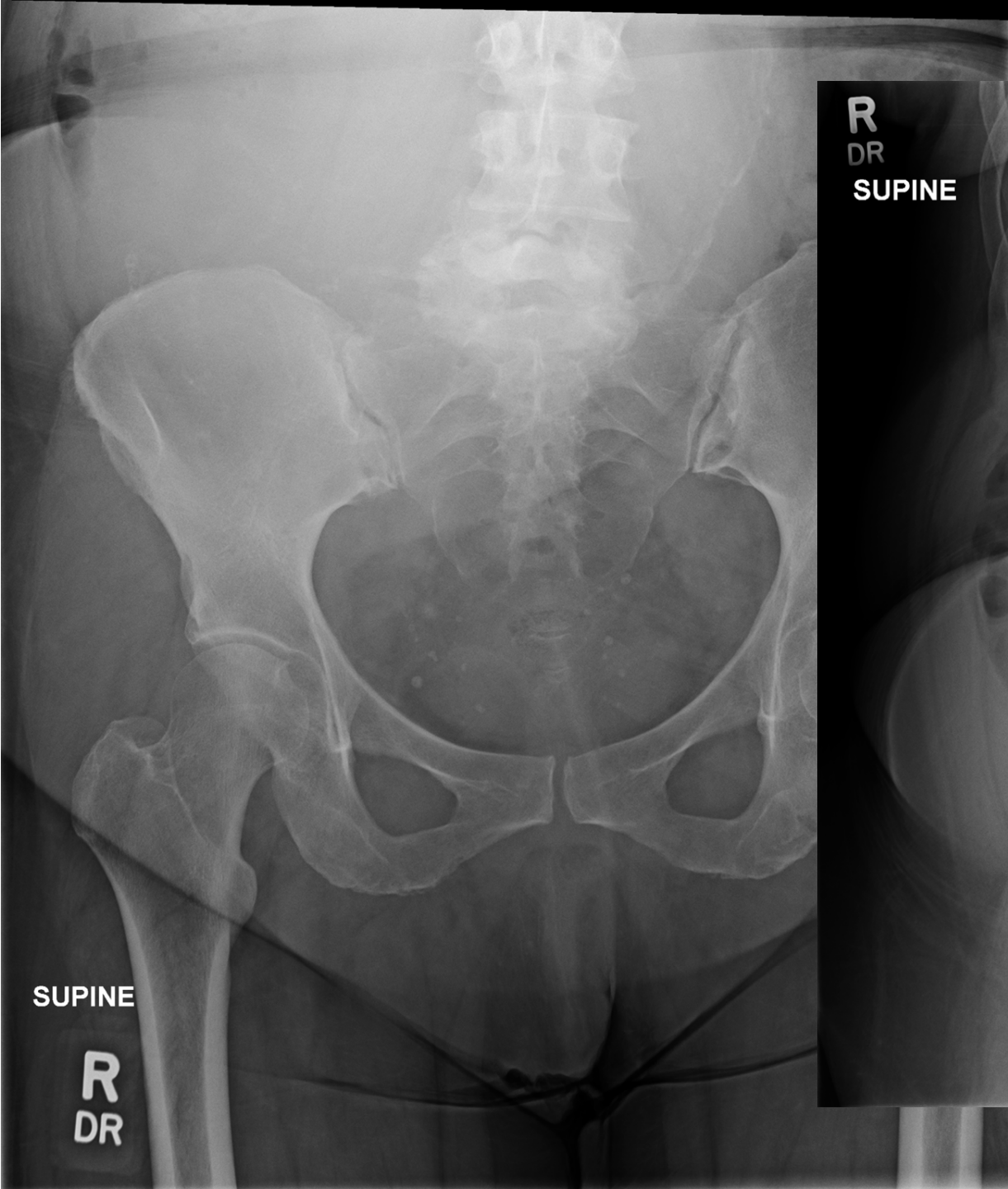


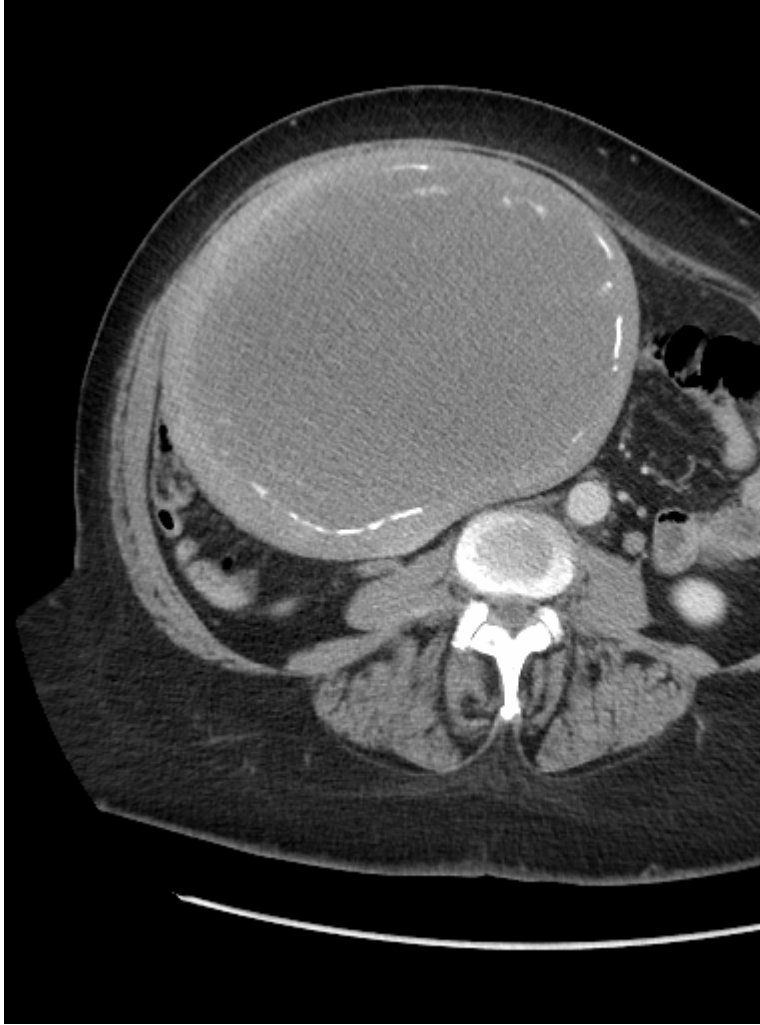






Abdo Pain





References

<https://choosingwiselycanada.org/recommendation/headache/>

<https://car.ca/patient-care/referral-guidelines/>

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[Risk Factors for Meniscal Tears: A Systematic Review Including Meta-analysis.](#)
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Buchbinder R, Harris I A, Sprowson A. Management of degenerative meniscal tears and the role of surgery *BMJ* 2015; 350 :h2212 doi:10.1136/bmj.h2212

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Jayakar, R., Merz, A., Plotkin, B. *et al.* Magnetic resonance arthrography and the prevalence of acetabular labral tears in patients 50 years of age and older. *Skeletal Radiol* **45**, 1061–1067 (2016). <https://doi.org/10.1007/s00256-016-2392-9>

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