DES
March
2016

Solitary bone lesions : How to look at radiographs ?

Bruno Vande Berg, Vicky Perlepe, Souad Acid,
Thomas Kirchgesner, Frédéric Lecouvet
MSK unit, Dpt of Medical Imaging
St Luc university Hospital , UCL
Brussels, Belgium

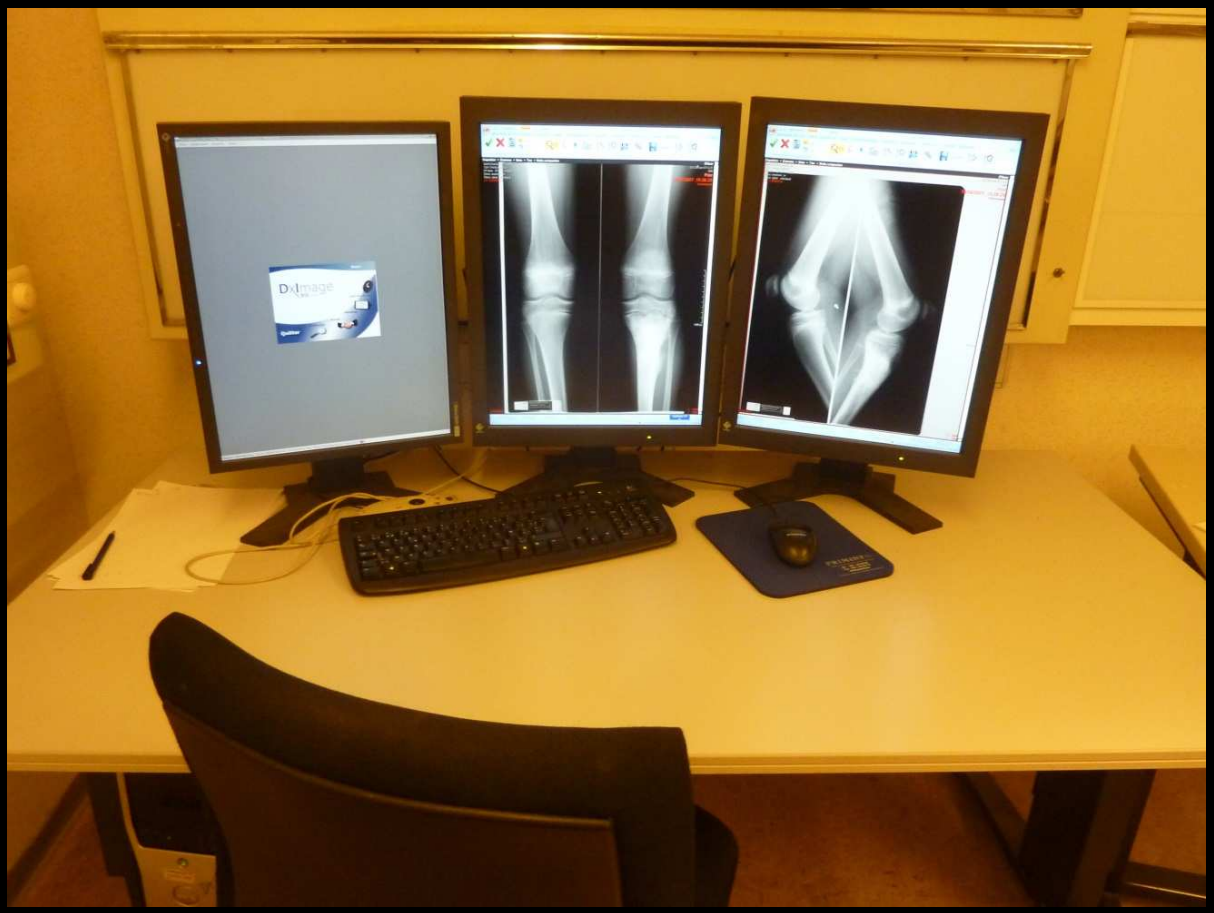
CLINIQUES UNIVERSITAIRES SAINT-LUC

UCL

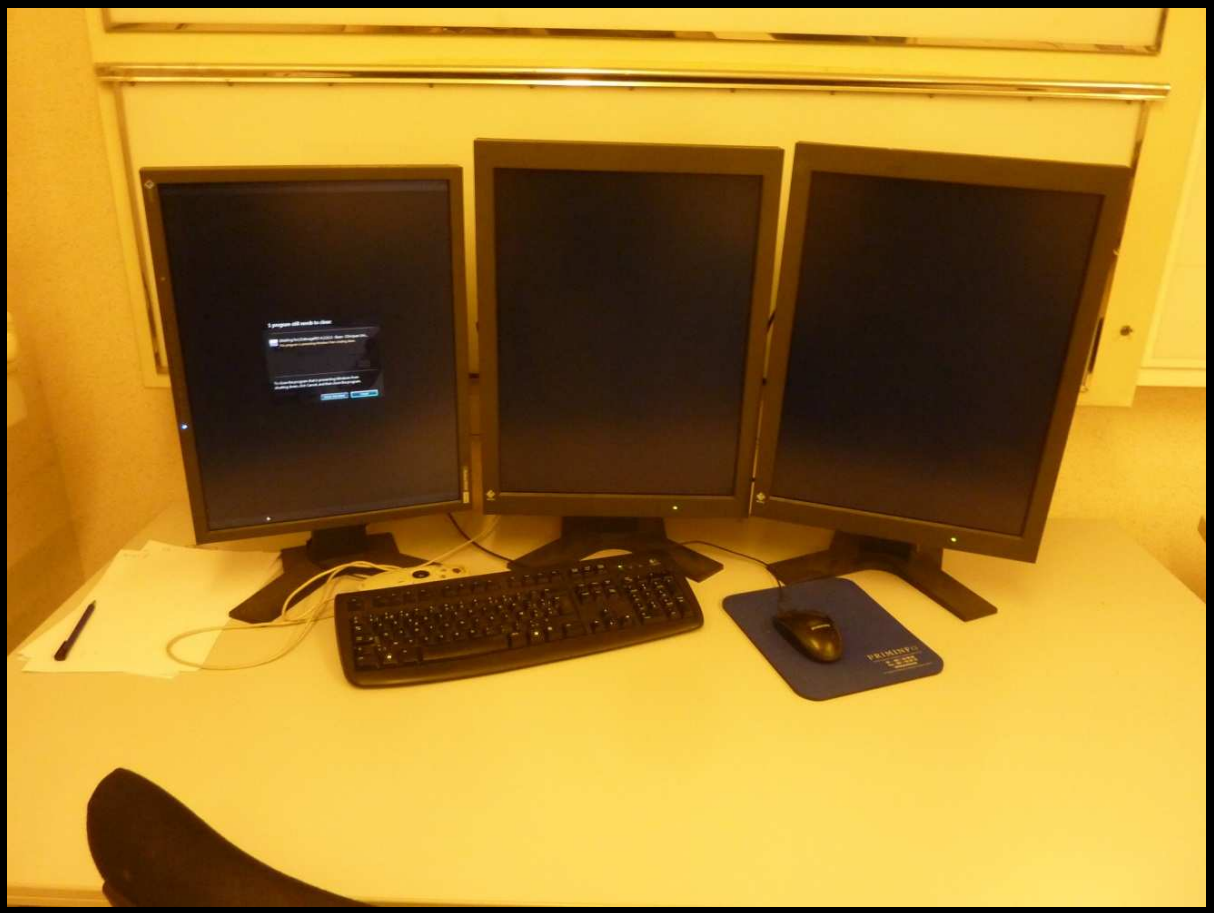
Solitary bone lesions:
We will not address

1. Complementary imaging modalities
2. Specific diagnoses
3. Axial skeleton
4. No soft tissue analysis !

Before to focus on radiographs ….



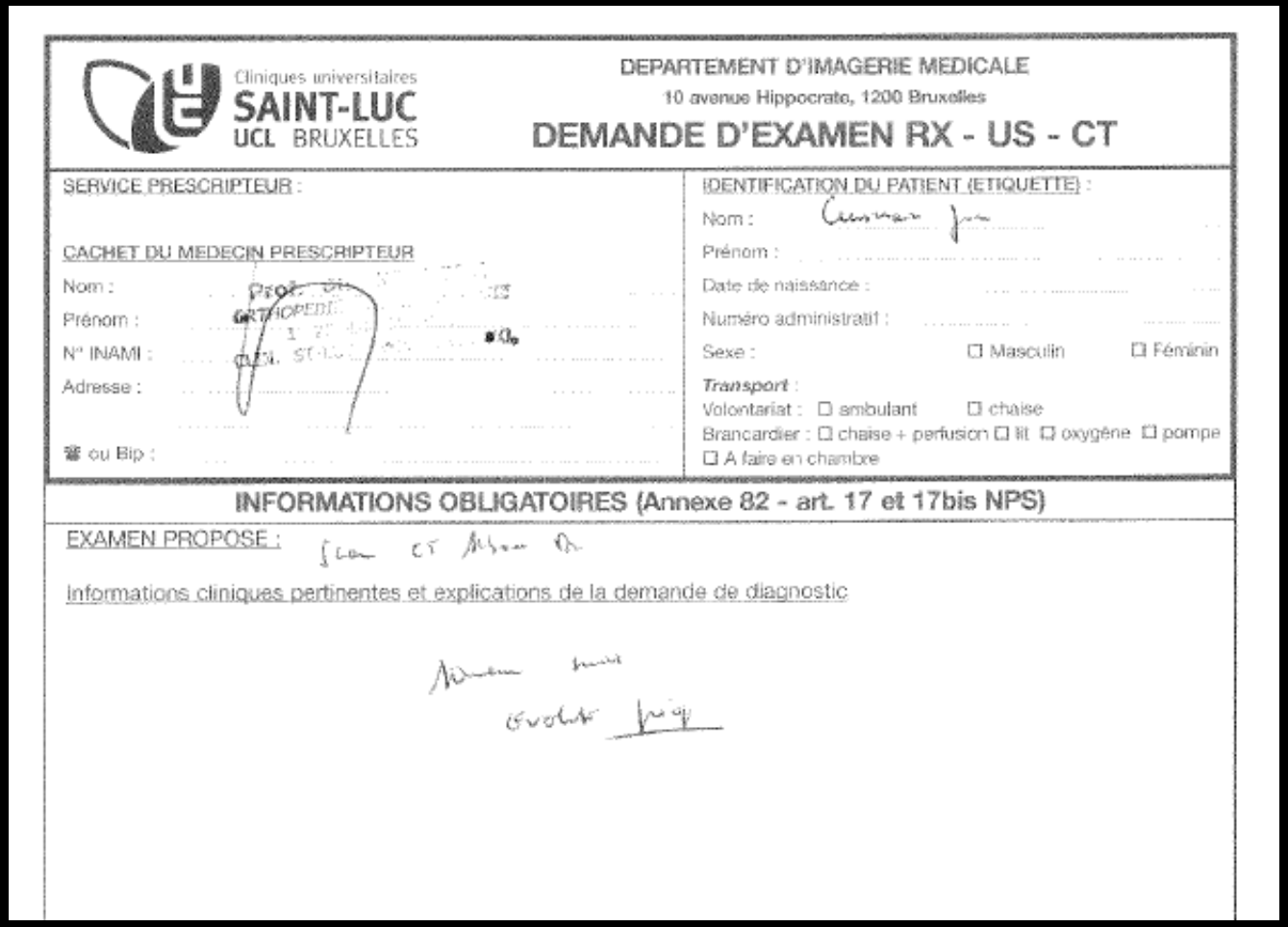
3 clinical features need to be recognized !



Solitary bone lesions
Clinical features

Should be present
on the request form !

Keep it short !



Cliniques universitaires SAINT-LUC UCL BRUXELLES

DEPARTEMENT D'IMAGERIE MEDICALE
10 avenue Hippocrate, 1200 Bruxelles

DEMANDE D'EXAMEN RX - US - CT

SERVICE PRESCRIPTEUR :

CACHET DU MEDECIN PRESCRIPTEUR
Nom :
Prénom :
N° INAMI :
Adresse :
ou Bip :

IDENTIFICATION DU PATIENT (ETIQUETTE) :
Nom :
Prénom :
Date de naissance :
Numéro administratif :
Sexe : ☐ Masculin ☐ Féminin
Transport :
Volontariat : ☐ ambulant ☐ chaise
Brancardier : ☐ chaise + perfusion ☐ lit ☐ oxygène ☐ pompe
☐ A faire en chambre

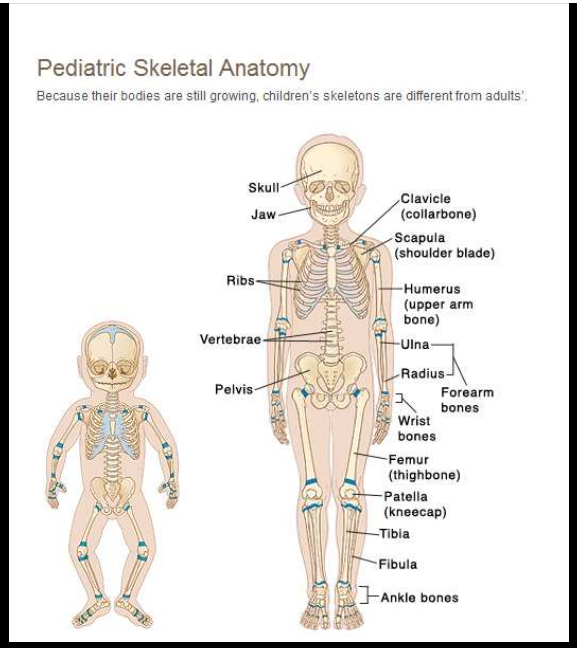
INFORMATIONS OBLIGATOIRES (Annexe 82 - art. 17 et 17bis NPS)

EXAMEN PROPOSE :

Informations cliniques pertinentes et explications de la demande de diagnostic

Solitary bone lesions
Clinical features

- Age of the patient
- Symptoms
- Target bone



1^{ary} bone tumors derive from active cells.

Bone cell activity is growth-related (age, metaphyses).

1ary bone tumors

- Young patients
- Metaphyses around knee, shoulder, hip, wrist

Solitary bone lesions
Clinical features

Age of discovery of malignant lesions :

< 6 years : metastatic neuroblastoma, leukemia.

6y – 15y : Ewing

12y – 25y : Osteosarcoma (metaphysis of growing bone)

> 50 years : metastasis, multiple myeloma, ……chondrosarcoma

Solitary bone lesions
Clinical features

- Age of the patient
- Symptoms
- Target bone

Symptoms

1. Silent (fortuitous discovery)

2. Pain

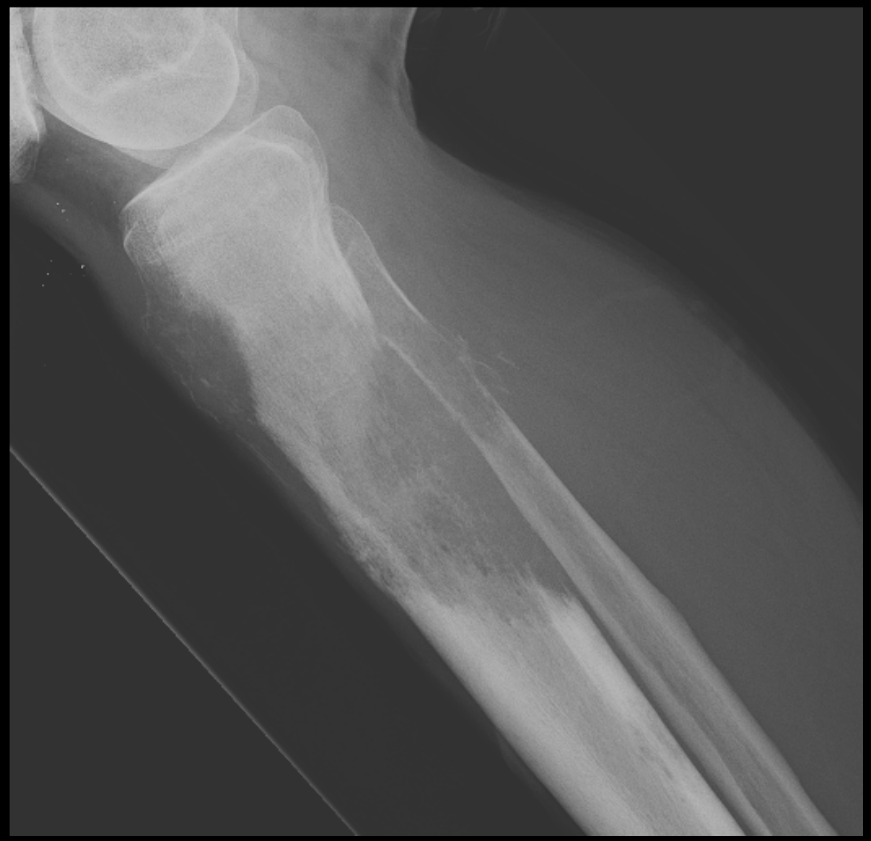
A. Tumor-related

B. Fracture-related

Symptoms

- Silent (fortuitous discovery)
- Pain
  - Tumor-related
  - Fracture-related

Fortuitous finding



Tumor-related pain

Fracture-related pain

SOBCOT
BRUSSELS
2014

Solitary bone lesions :
How to look at radiographs ?

Solitary bone lesions
Imaging features

- Topography
- Osseous margins
- Periosteal changes
- Matrix

Solitary bone lesions
Imaging features

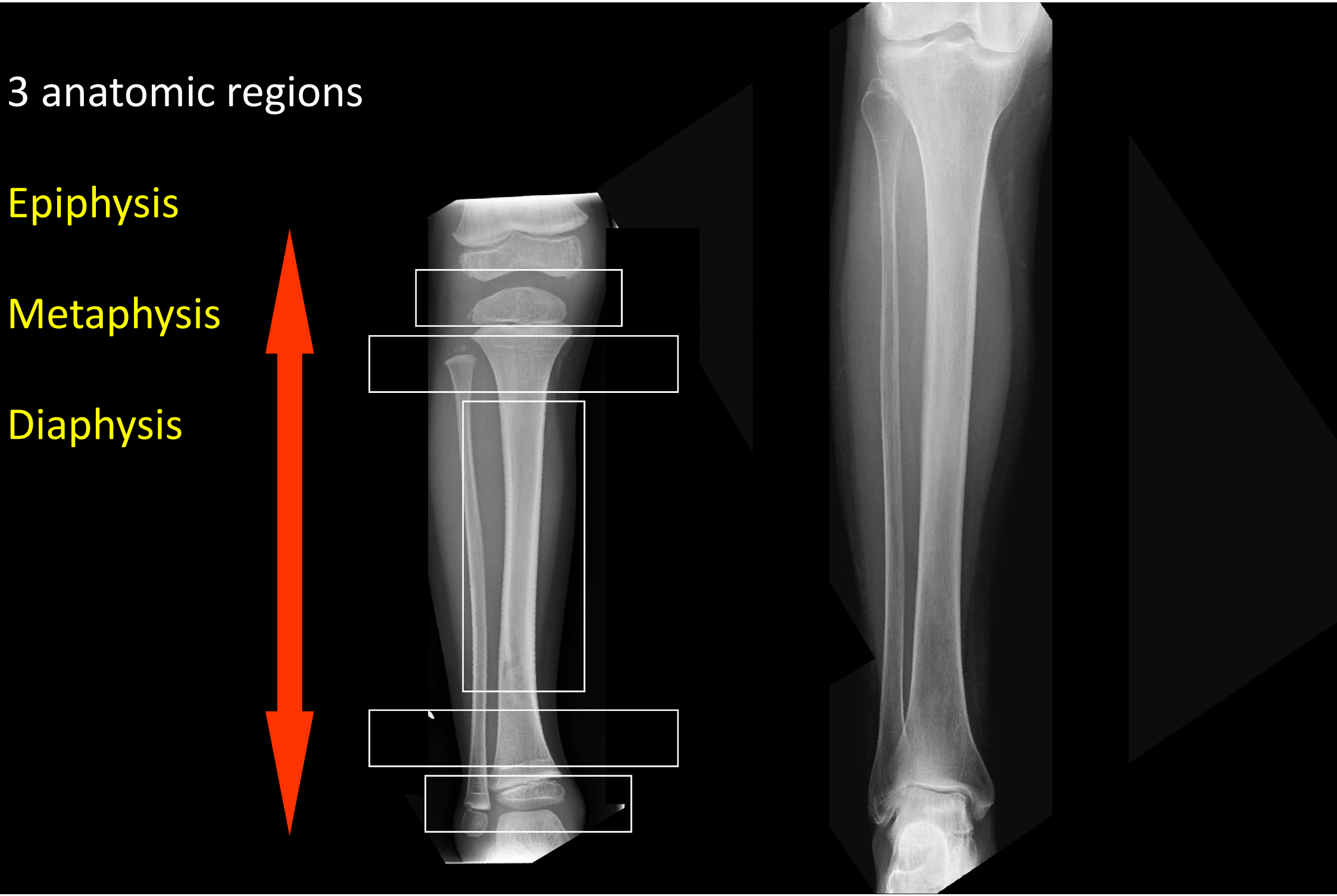
- Topography
- Osseous margins
- Periosteal reactions
- Matrix

3 anatomic regions

Epiphysis

Metaphysis

Diaphysis



Topography ?

A Epiphysis

B Metaphysis

C Diaphysis

D Other

Topography ?

A Epiphysis

B Metaphysis

C Diaphysis

D Other

Topography ?

A Epiphysis

B Metaphysis

C Diaphysis

D Other

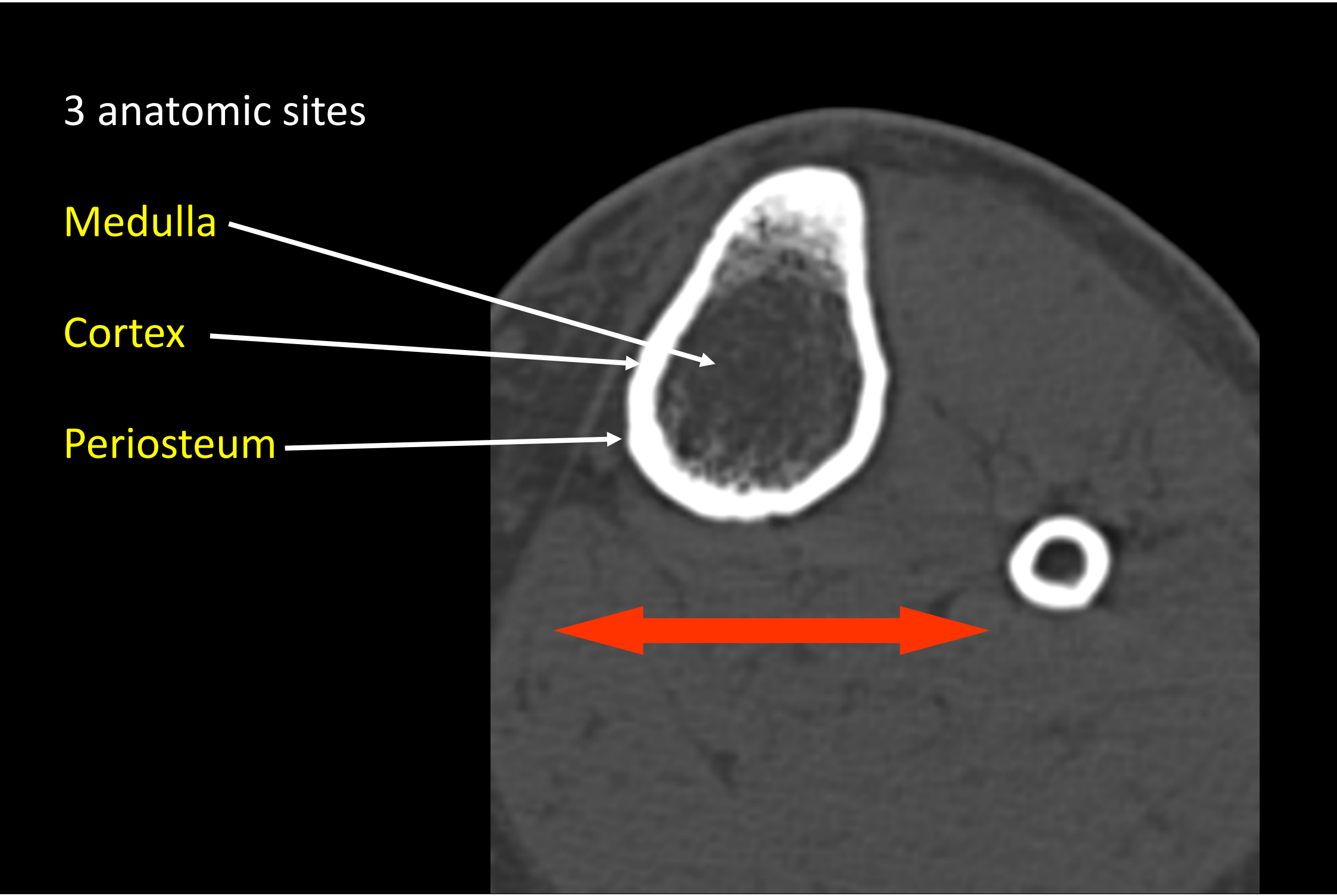
3 anatomic sites

Medulla

Cortex

Periosteum

3 anatomic sites



Anatomic site ?

A Medulla

B Cortex

C Periosteum

D Other

Anatomic site ?

A Medulla

B Cortex

C Periosteum

D Other

Anatomic site ?

A Medulla

B Cortex

C Periosteum

D Other

Anatomic site ?

A Medulla

B Cortex

C Periosteum

D Other

Anatomic site ?

A Medulla

B Cortex

C Periosteum

D Other

Anatomic site ?

A Medulla

B Cortex

C Periosteum

D Other

Anatomic site ?

A Medulla

B Cortex

C Periosteum

D Other

Anatomic site ?

A Medulla

B Cortex

C Periosteum

D Other

Anatomic site ?

A Medulla

B Cortex

C Periosteum

D Other

Anatomic site ?

A Medulla

B Cortex

C Periosteum

D Other

Anatomic site ?

A Medulla

B Cortex

C Periosteum

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D Other

Anatomic site ?

A Medulla

B Cortex

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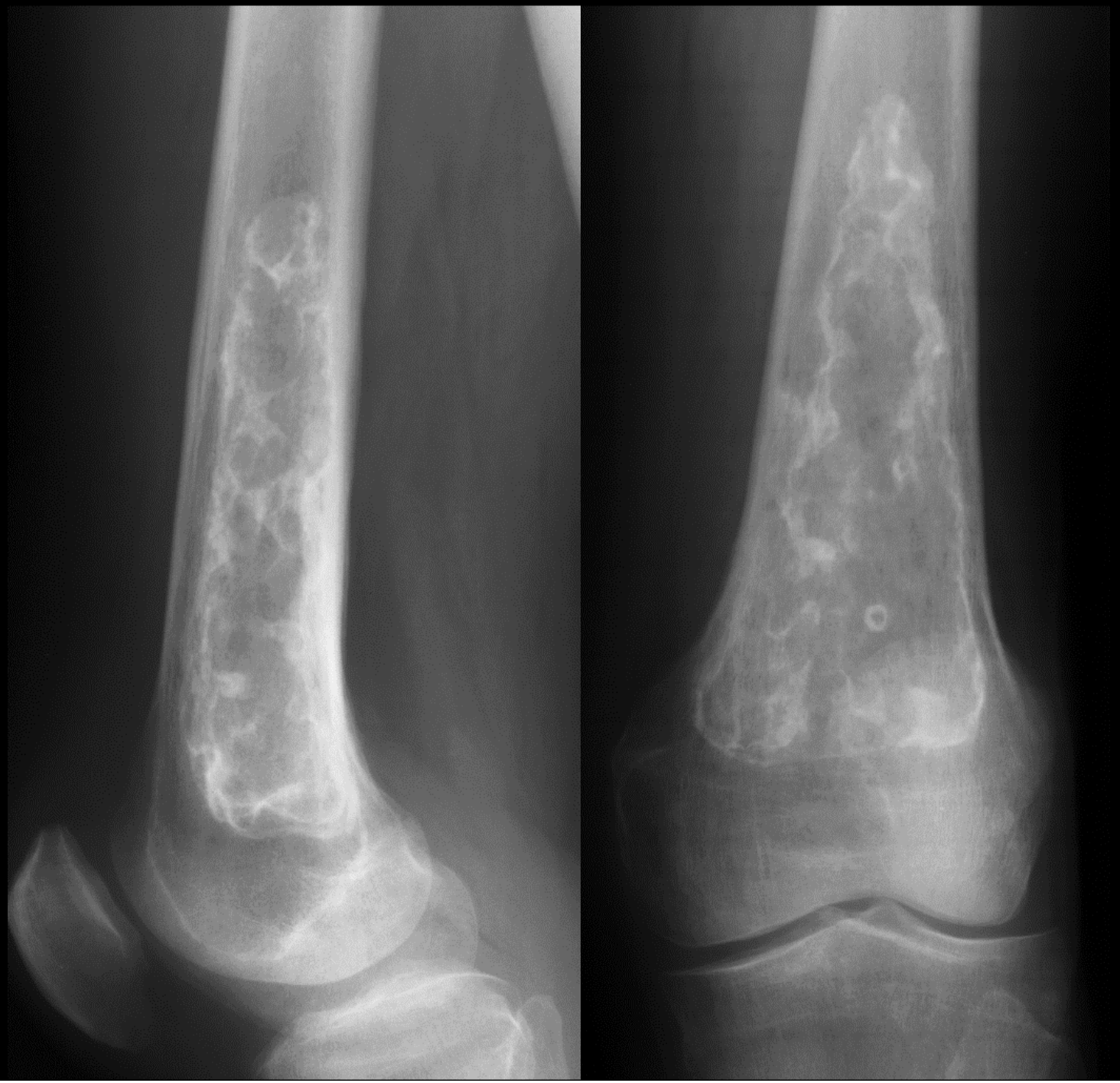


Anatomic site ?

A Medulla

B Cortex

C Periosteum

D Other

Anatomic site ?

A Medulla

B Cortex

C Periosteum

D Other

Anatomic site ?

A Medulla

B Cortex

C Periosteum

D Other

Lésion corticale et métaphysaire
Ostéolyse géographique avec liseré de sclérose

Sujet jeune, asymptomatique, unique
Fibrome non-ossifiant

Solitary bone lesions
Imaging features

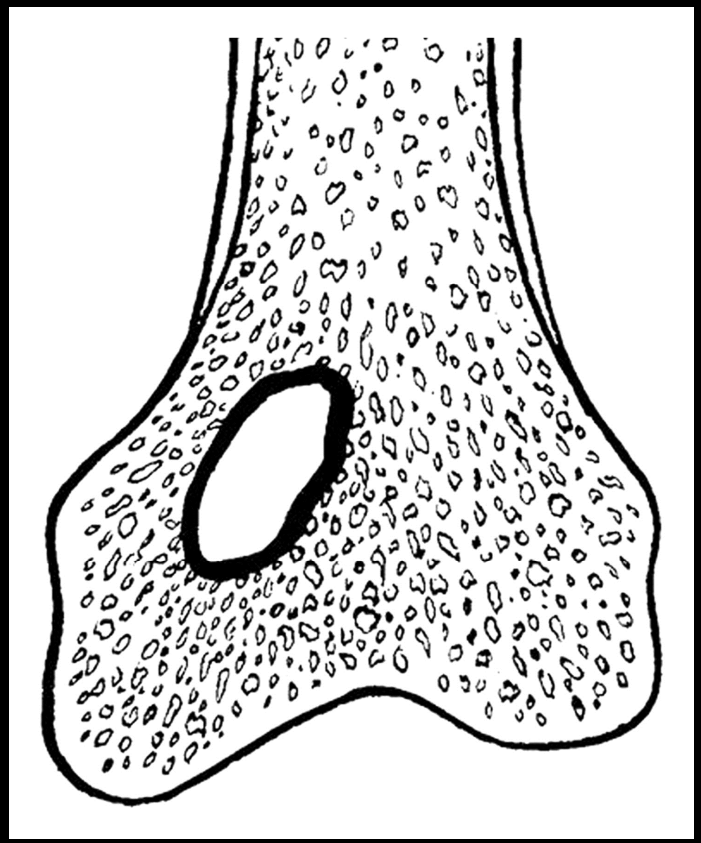
- Topography
- Osseous margins
- Periosteal reactions
- Matrix

Radiologic and pathologic analysis of solitary bone lesions.
I. Internal margins.
Madewell JE, Ragsdale BD, Sweet DE.
Radiol Clin North Am **1981**; 19: **715**–748.

II. Periosteal reactions.
Ragsdale BD, Madewell JE, Sweet DE.
Radiol Clin North Am **1981**;19:**749**–783. 3.

III. Matrix patterns.
Sweet DE, Madewell JE, Ragsdale BD.
Radiol Clin North Am **1981**;19:**785**–814.

Type 1A geographic lesion



Radiologic and pathologic analysis of solitary bone lesions.
I. Internal margins.
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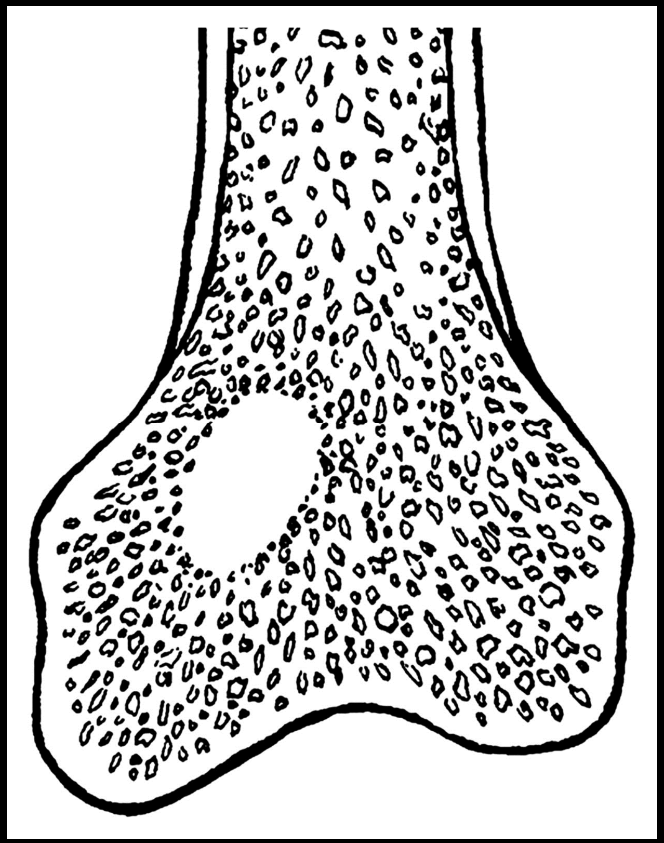
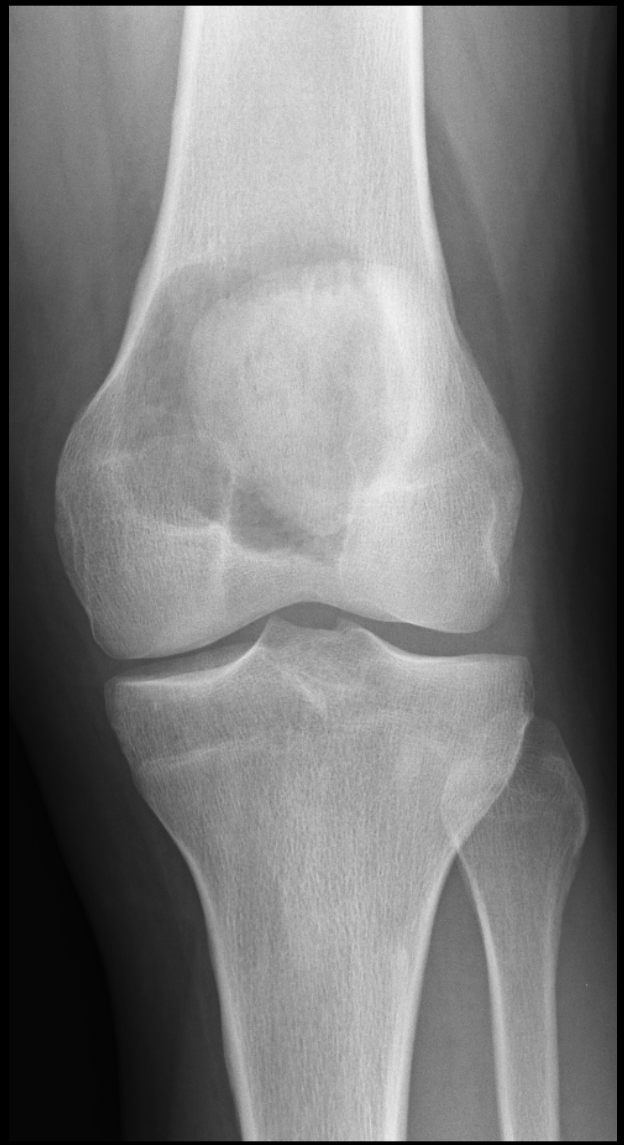
Type 1B geographic lesion





Radiologic and pathologic analysis of solitary bone lesions.
I. Internal margins.
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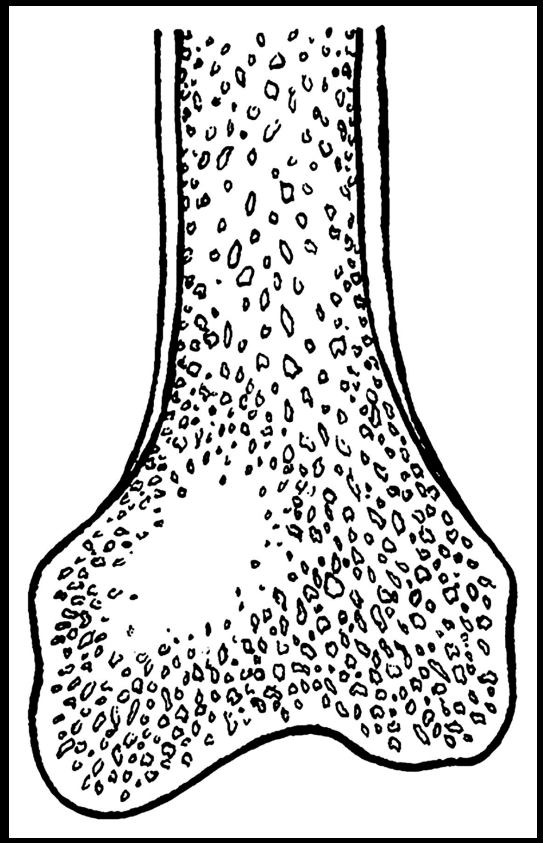
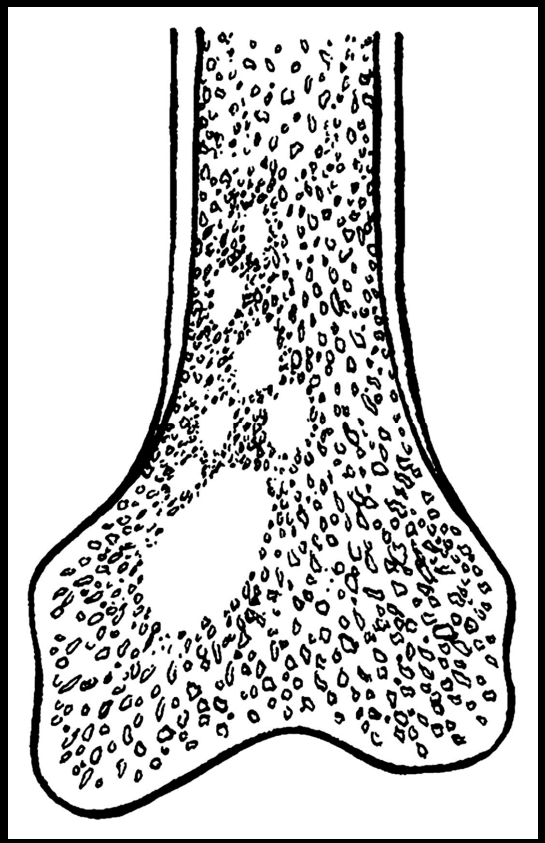
Radiol Clin North Am **1981**; 19: **715**–748.

Type 1C geographic lesion



Radiologic and pathologic analysis of solitary bone lesions.
I. Internal margins.
Madewell JE, Ragsdale BD, Sweet DE.
Radiol Clin North Am **1981**; 19: **715**–748.

Moth-eaten osteolysis or bone destruction



Radiologic and pathologic analysis of solitary bone lesions.
I. Internal margins.
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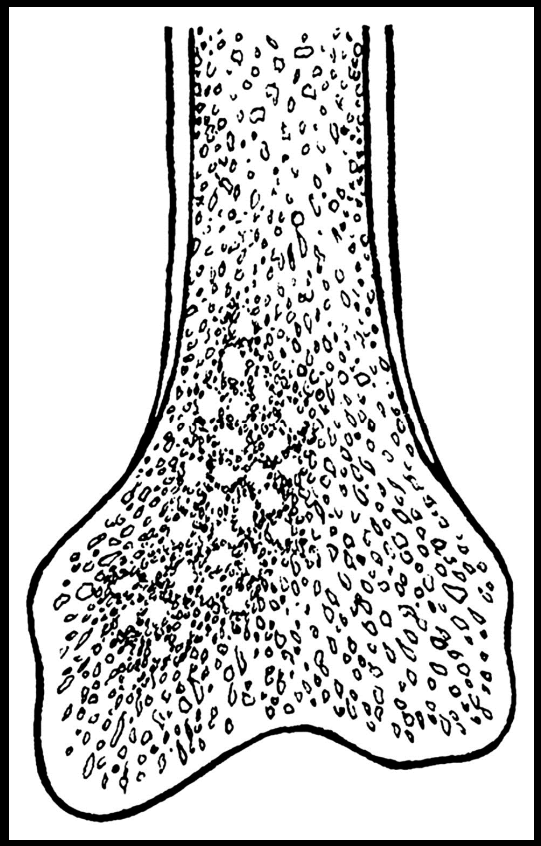
Permeative osteolysis or bone destruction



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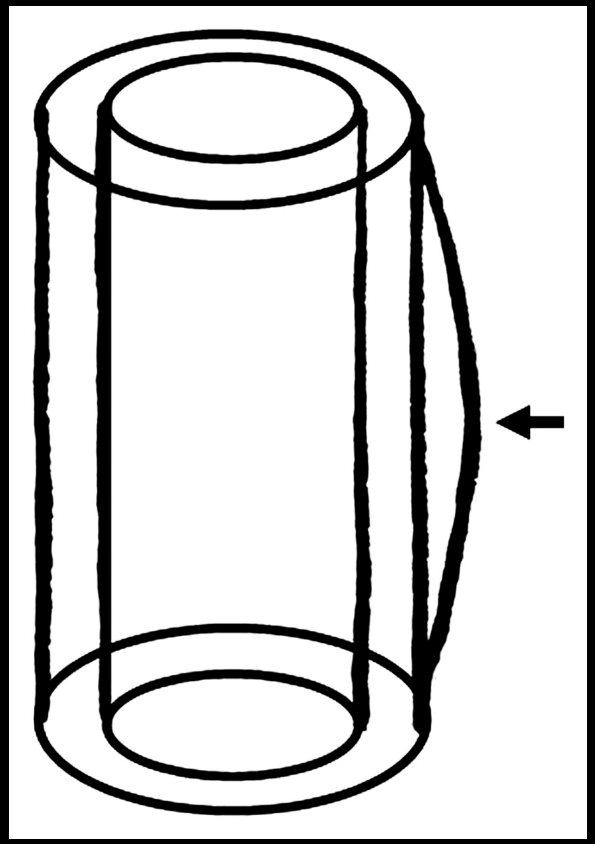
Solitary bone lesions
Imaging features

- Topography
- Osseous margins
- Periosteal reactions
- Matrix

Lamellar periosteal reaction



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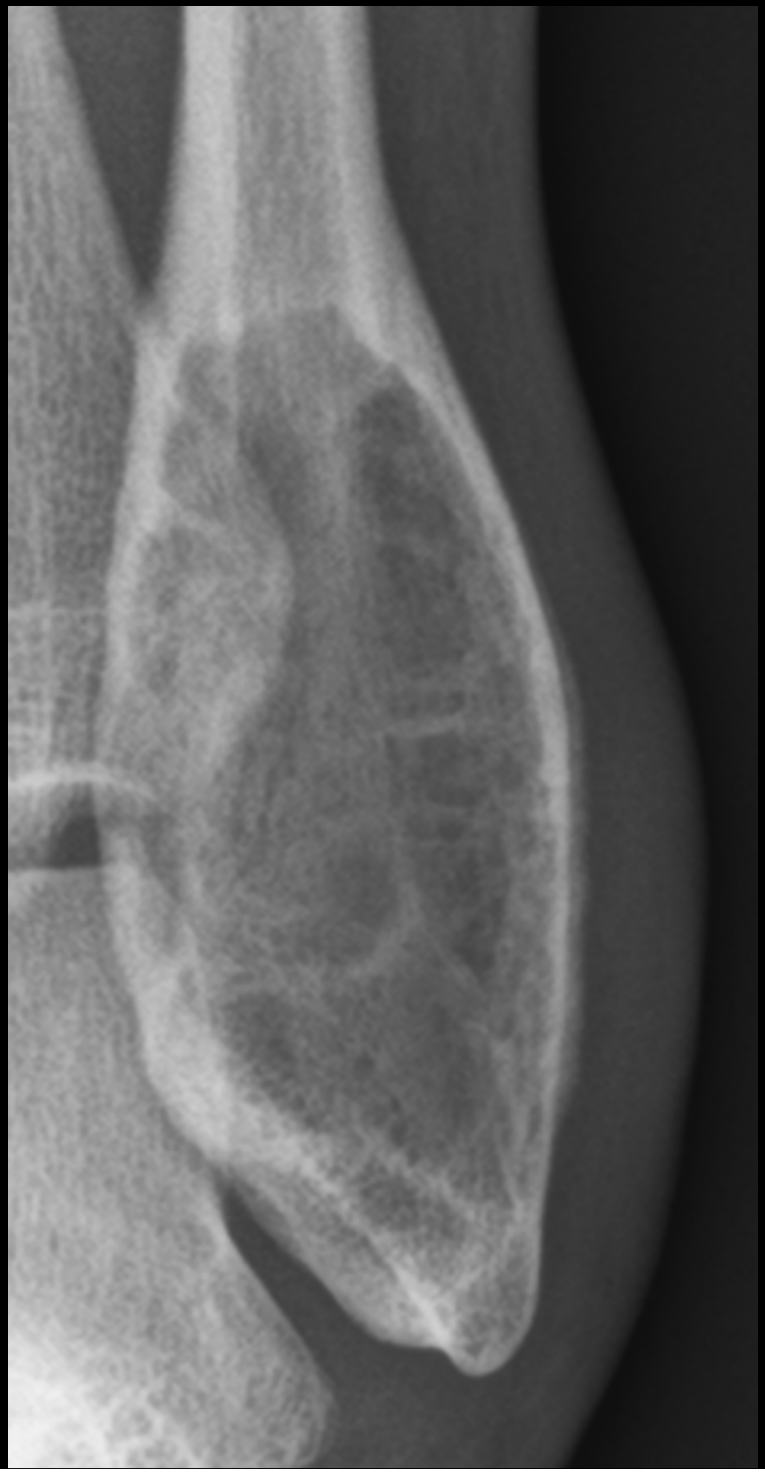
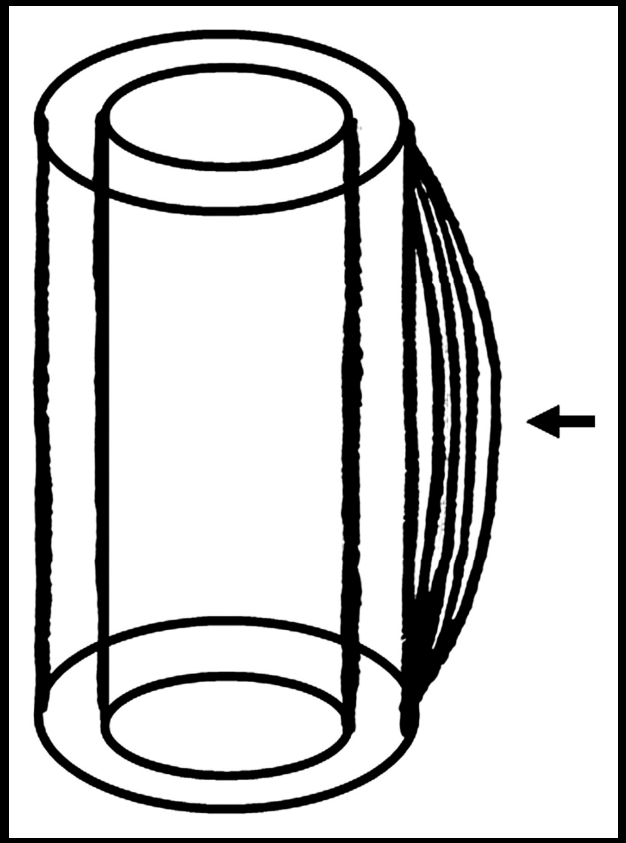


Multi-lamellar periosteal reaction
« Onion-skin »



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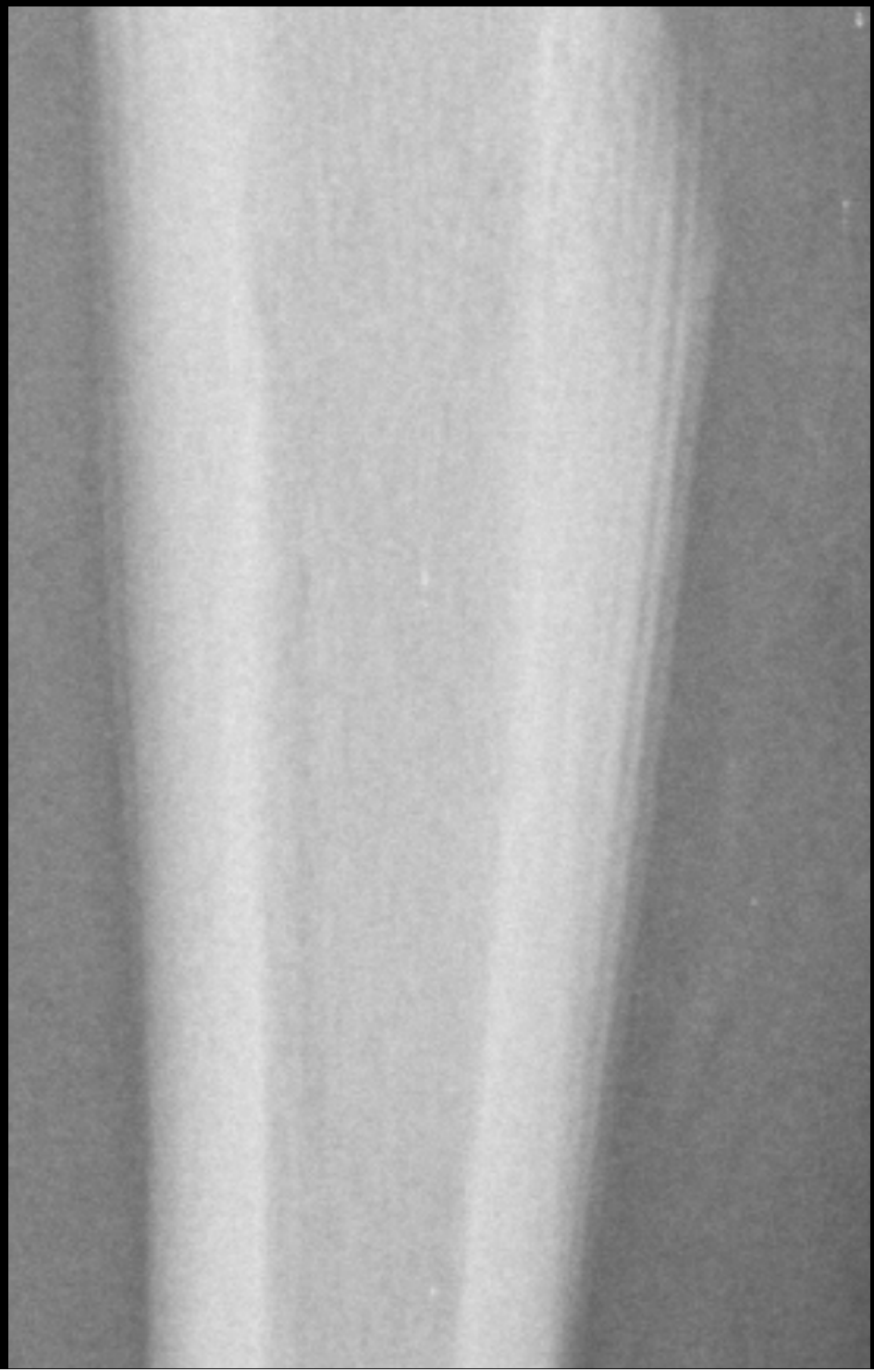
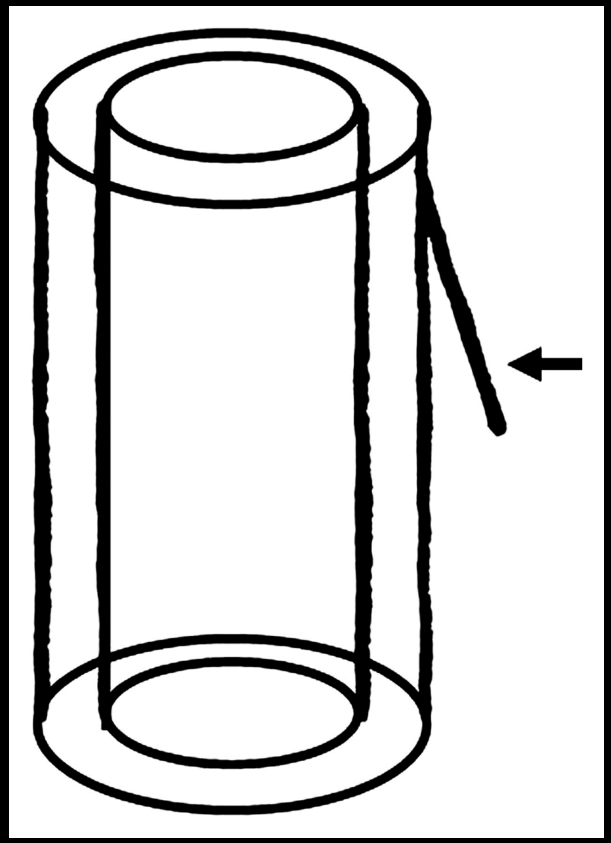


Codmann’s triangle



II. Periosteal reactions.
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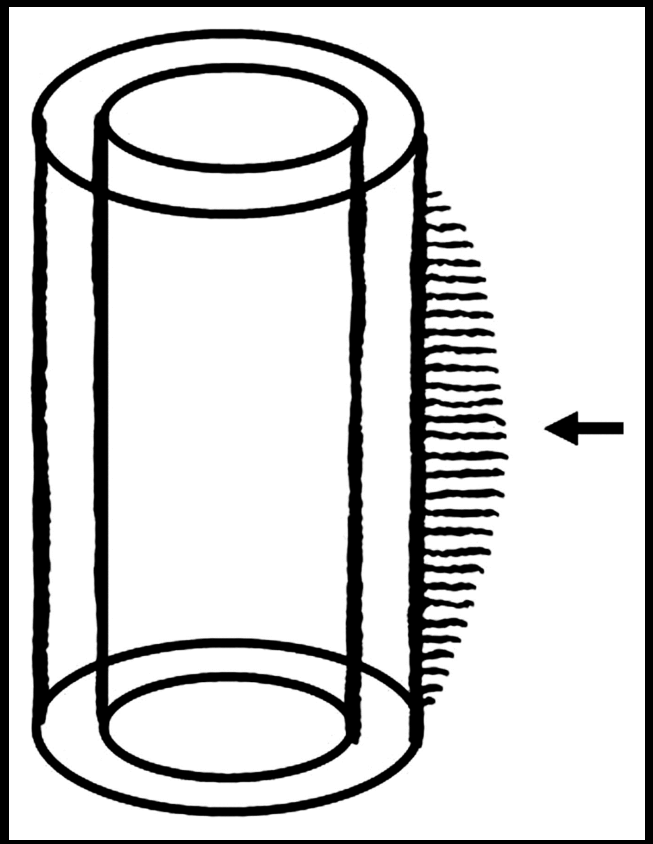
Radiol Clin North Am **1981**;19:**749**–783. 3.

Transverse periosteal reaction « Sun-burst »



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Solitary bone lesions
Imaging features

- Topography
- Osseous margins
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- Matrix

Chondroid matrix

Circular calcification
Nodules
« pop-corn »

III. Matrix patterns.
Sweet DE, Madewell JE, Ragsdale BD.
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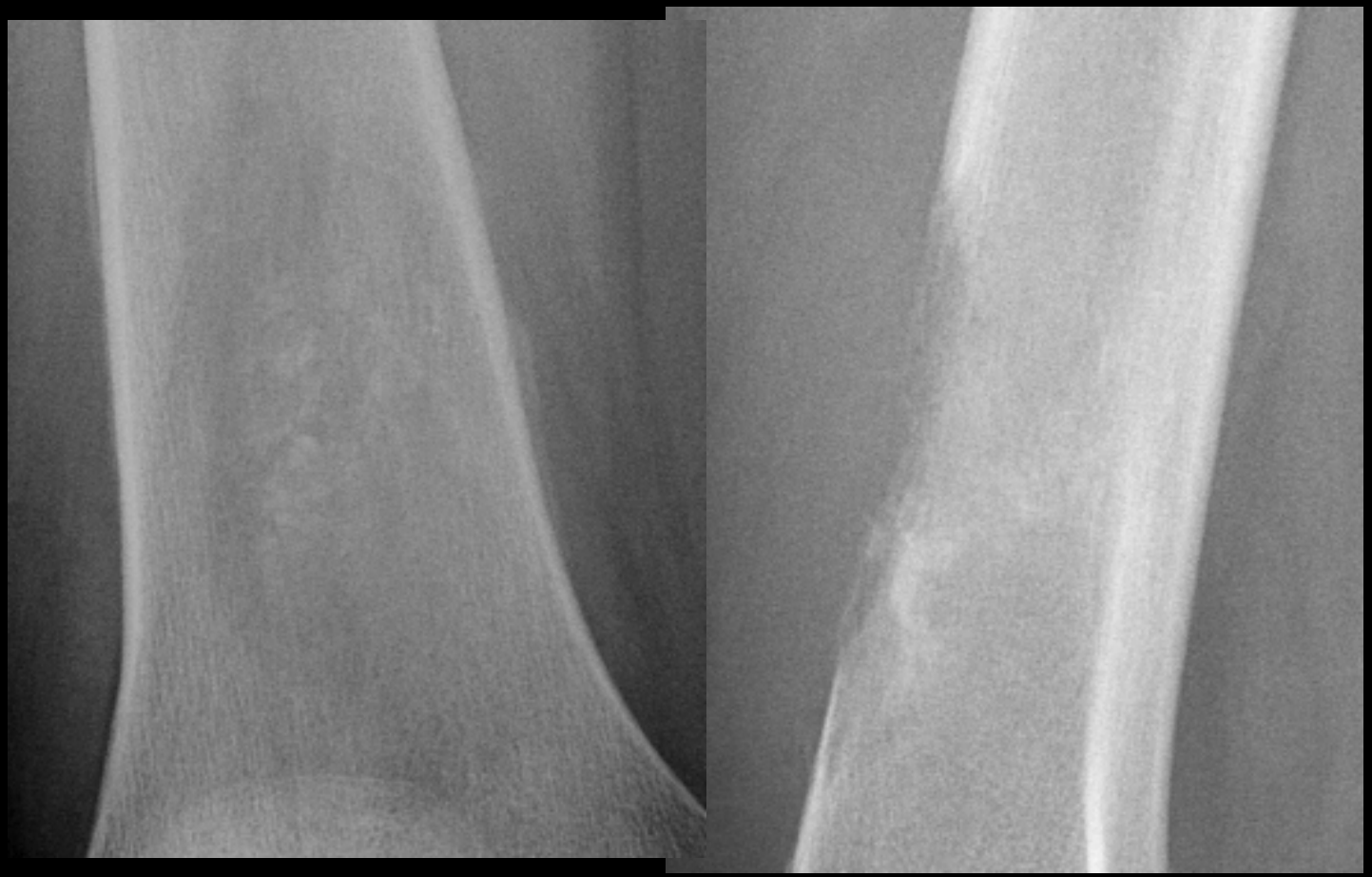
Chondroid matrix

Circular calcification
Nodules
« pop-corn »



Osseous matrix



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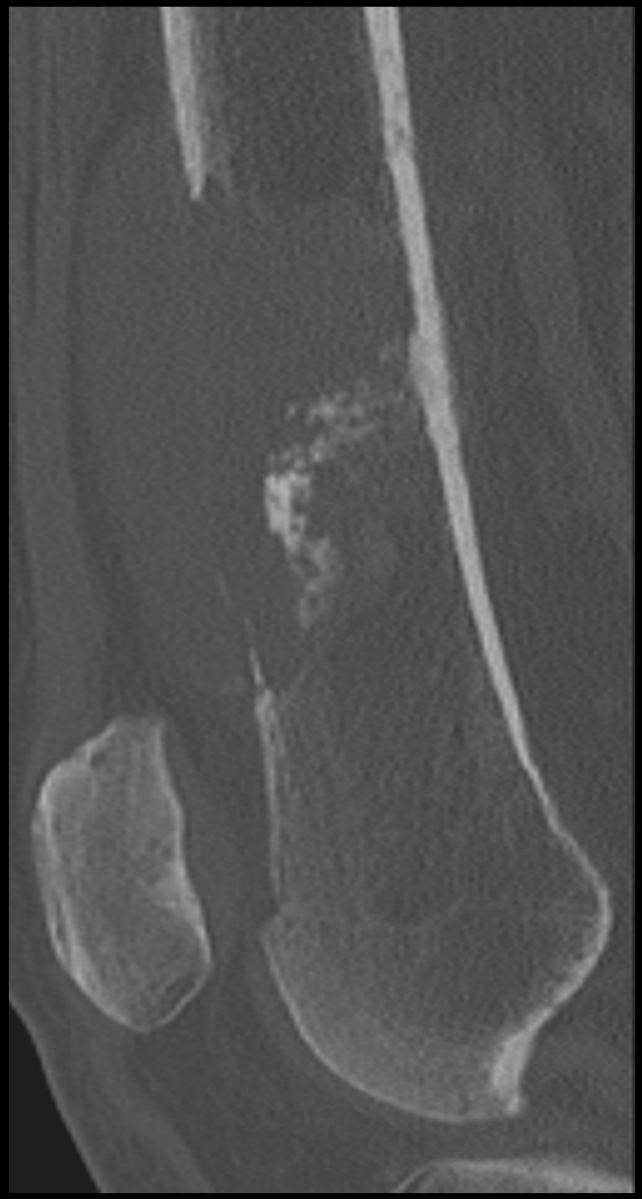
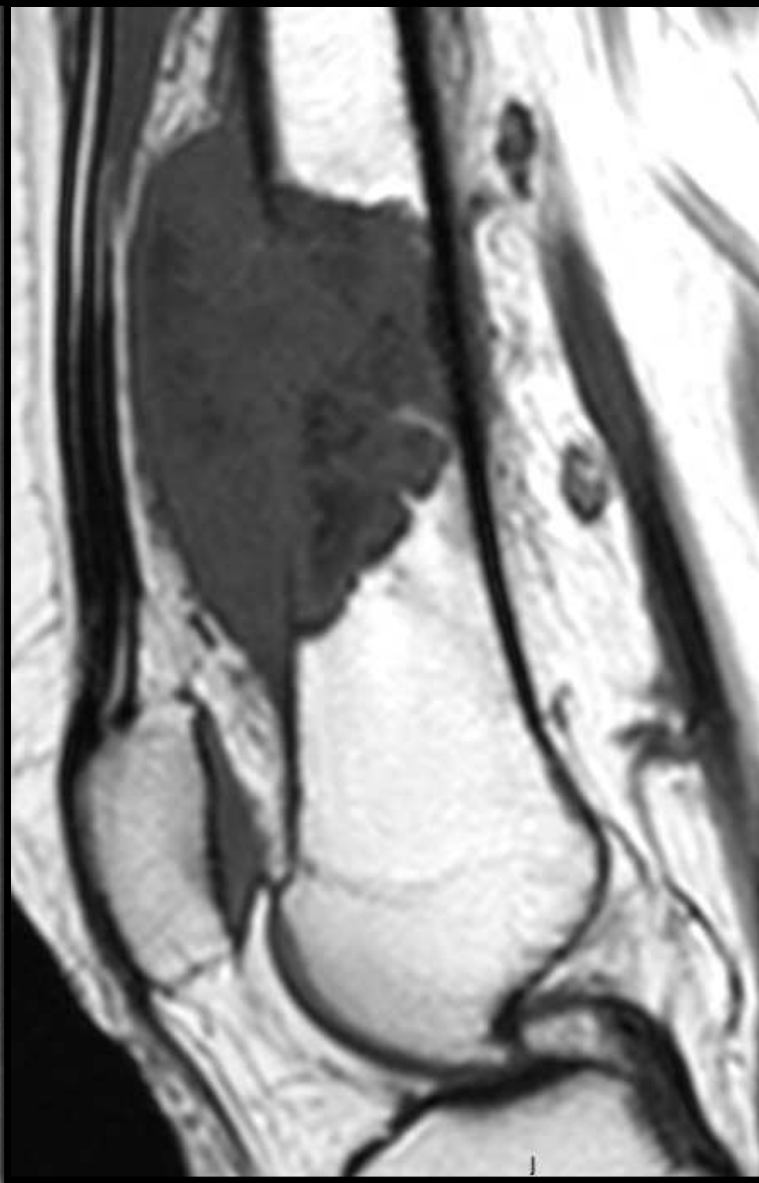
Osseous matrix





Fibrous matrix

« Ground-glass » appearance

III. Matrix patterns.
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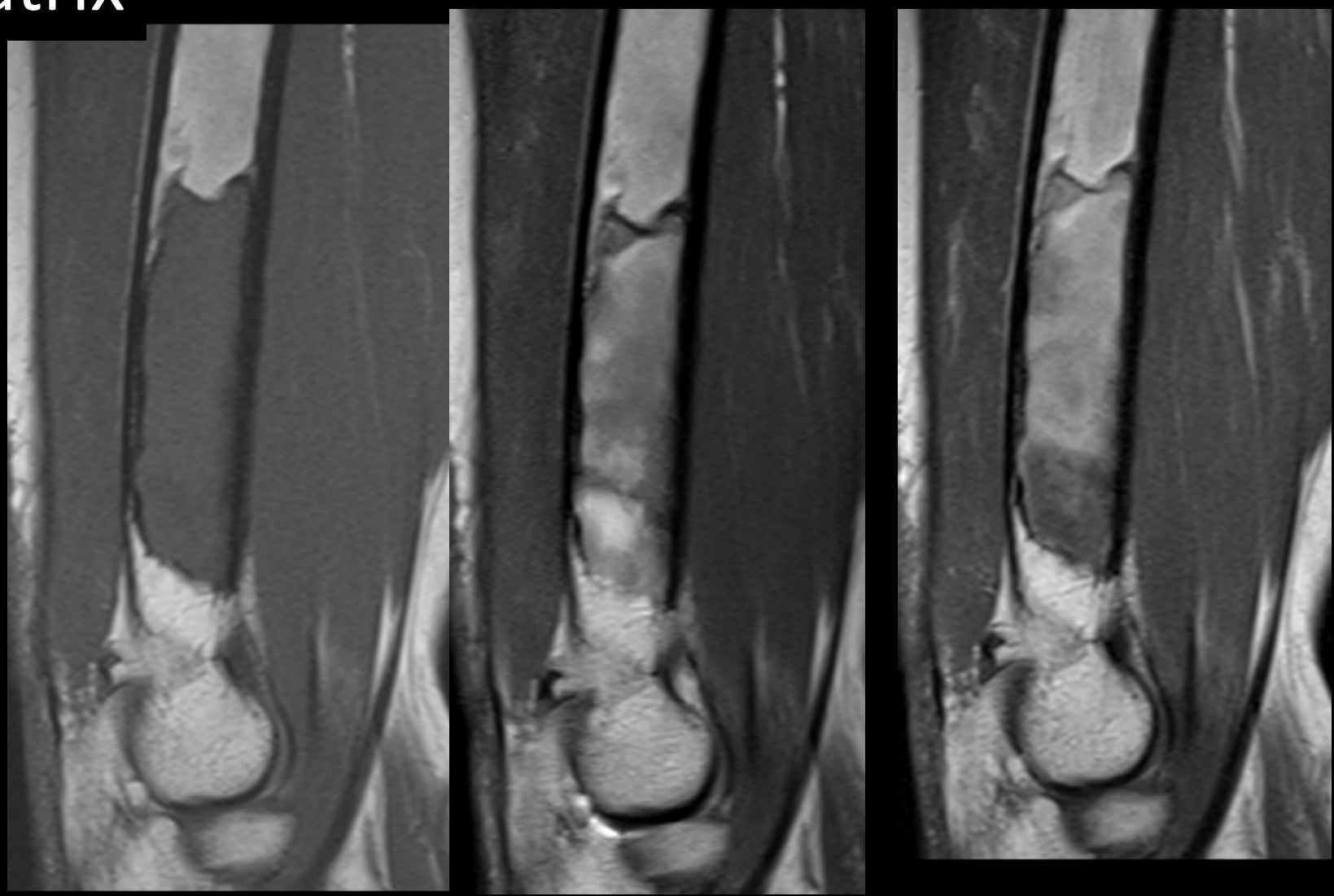
Fibrous matrix



Solitary bone lesions
Clinical features

- Age of the patient
- Symptoms
- Target bone

Solitary bone lesions
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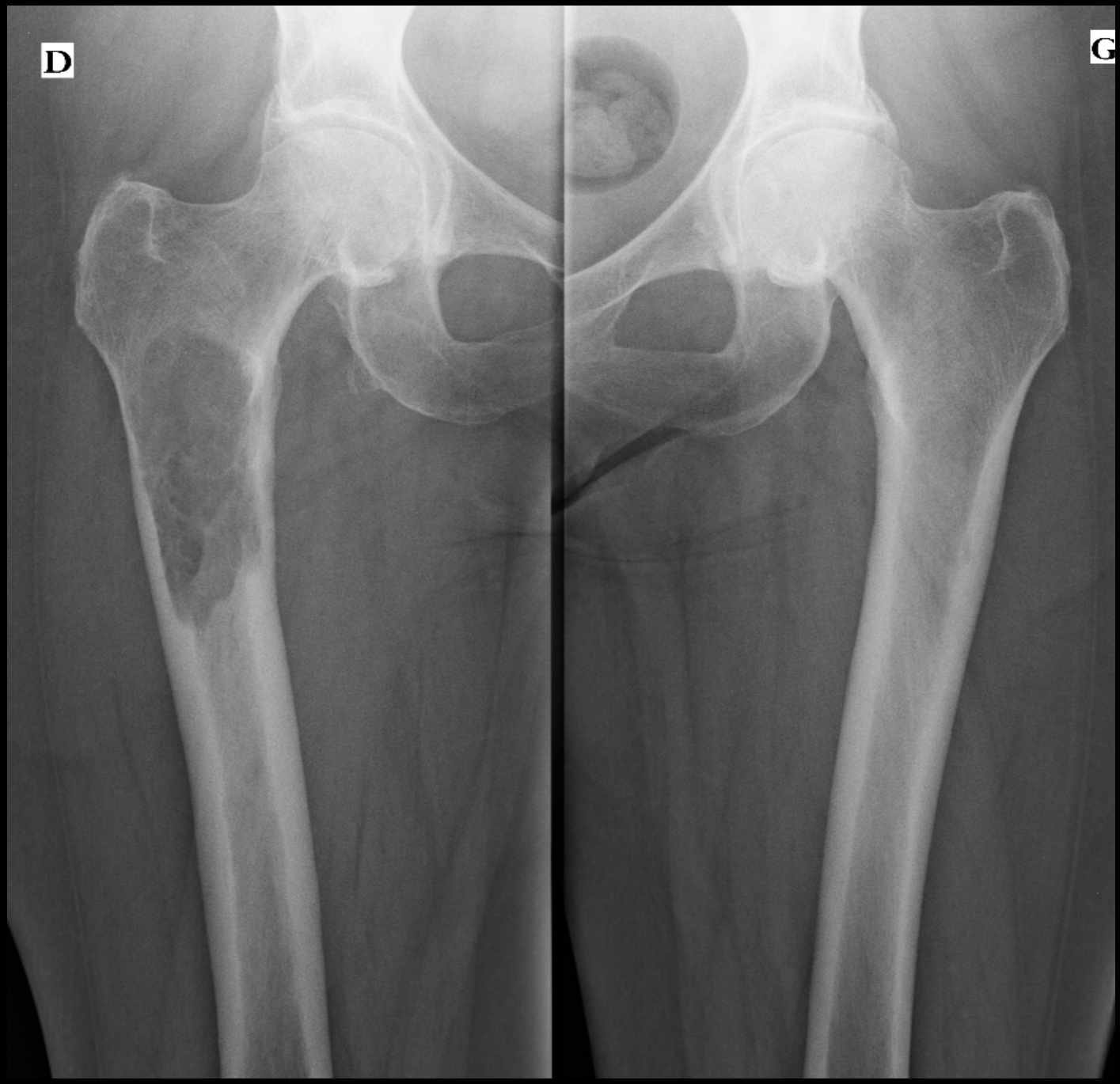
Cas
Femme 56 ans
Douleur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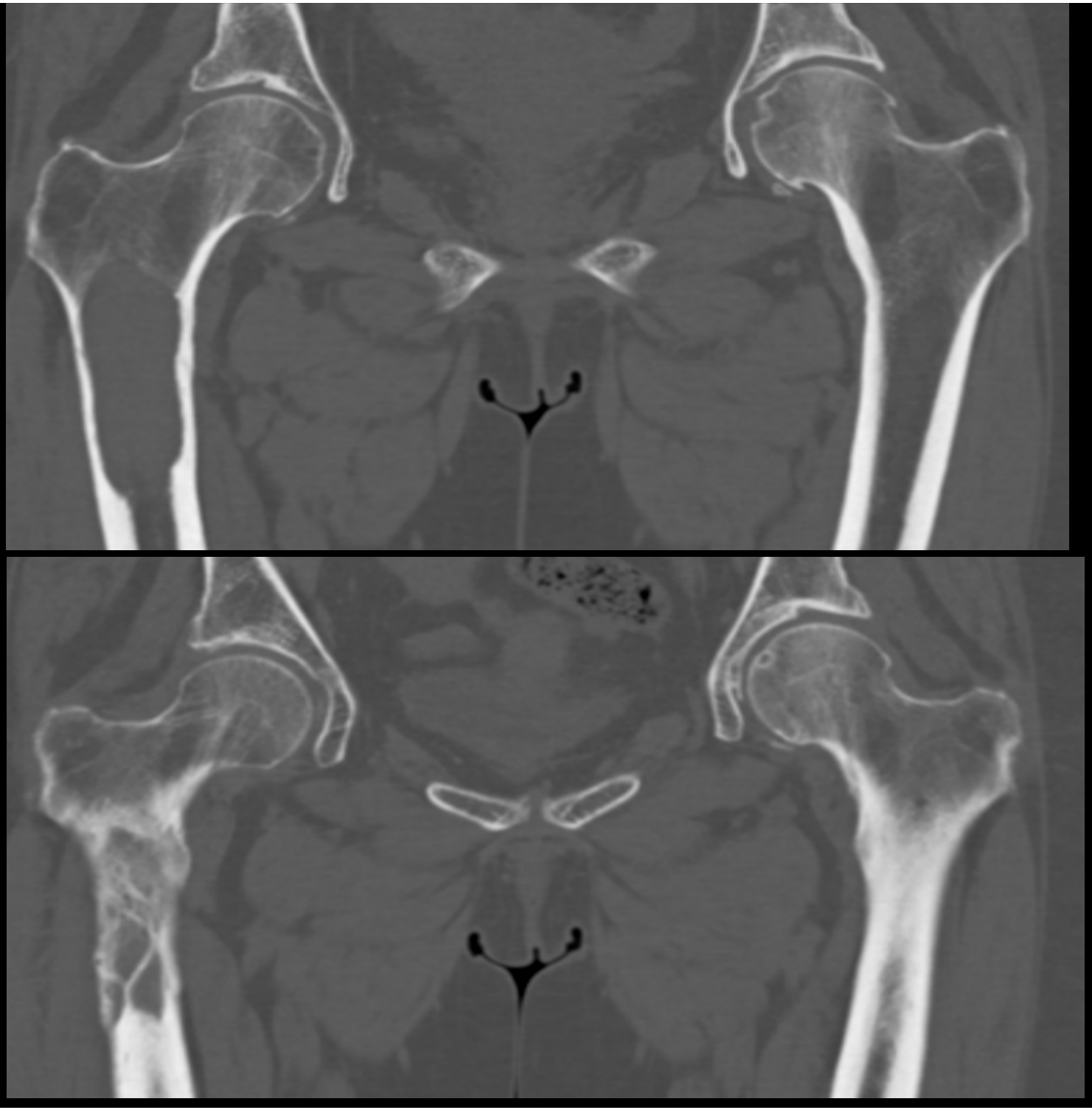
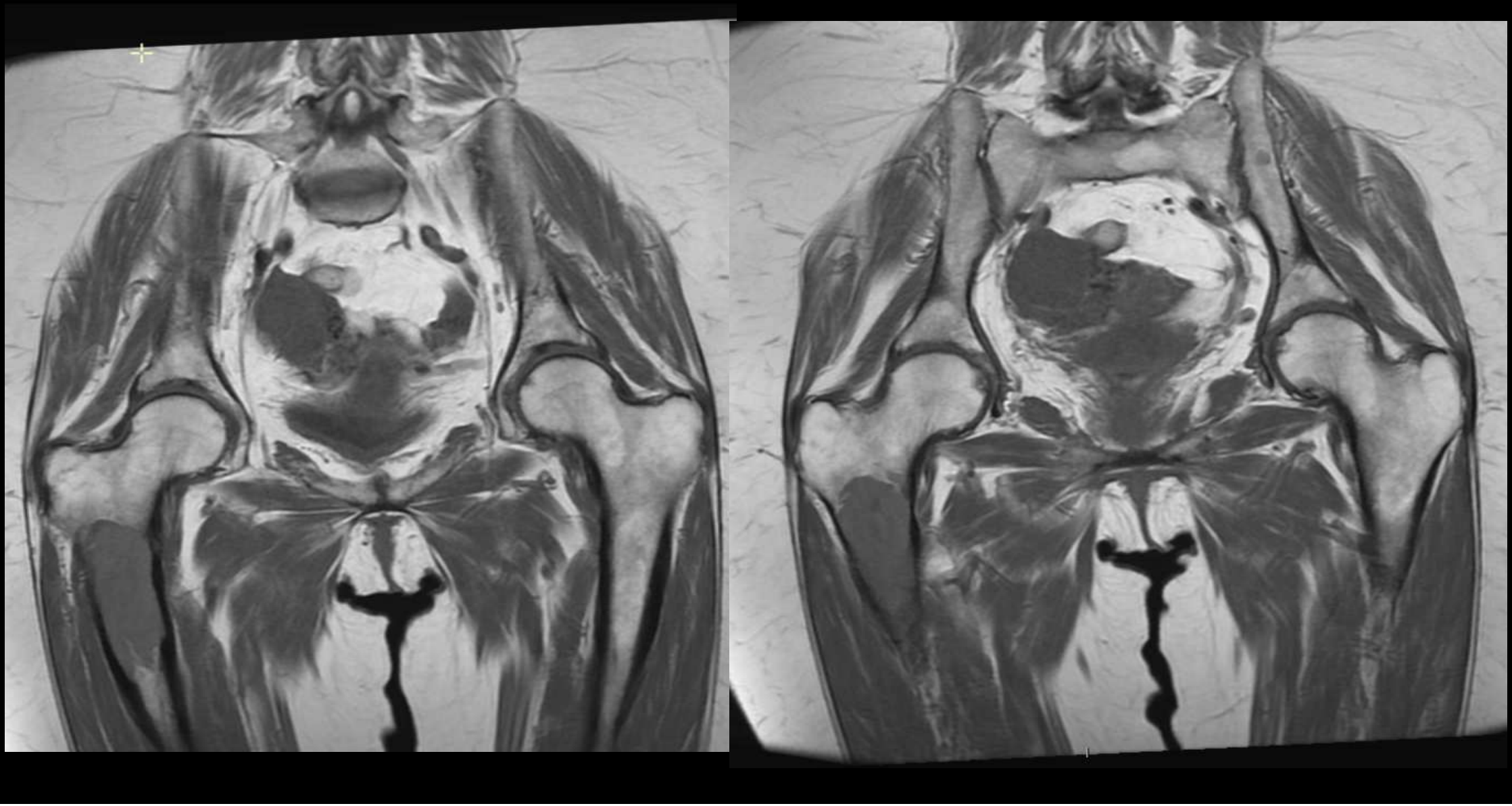
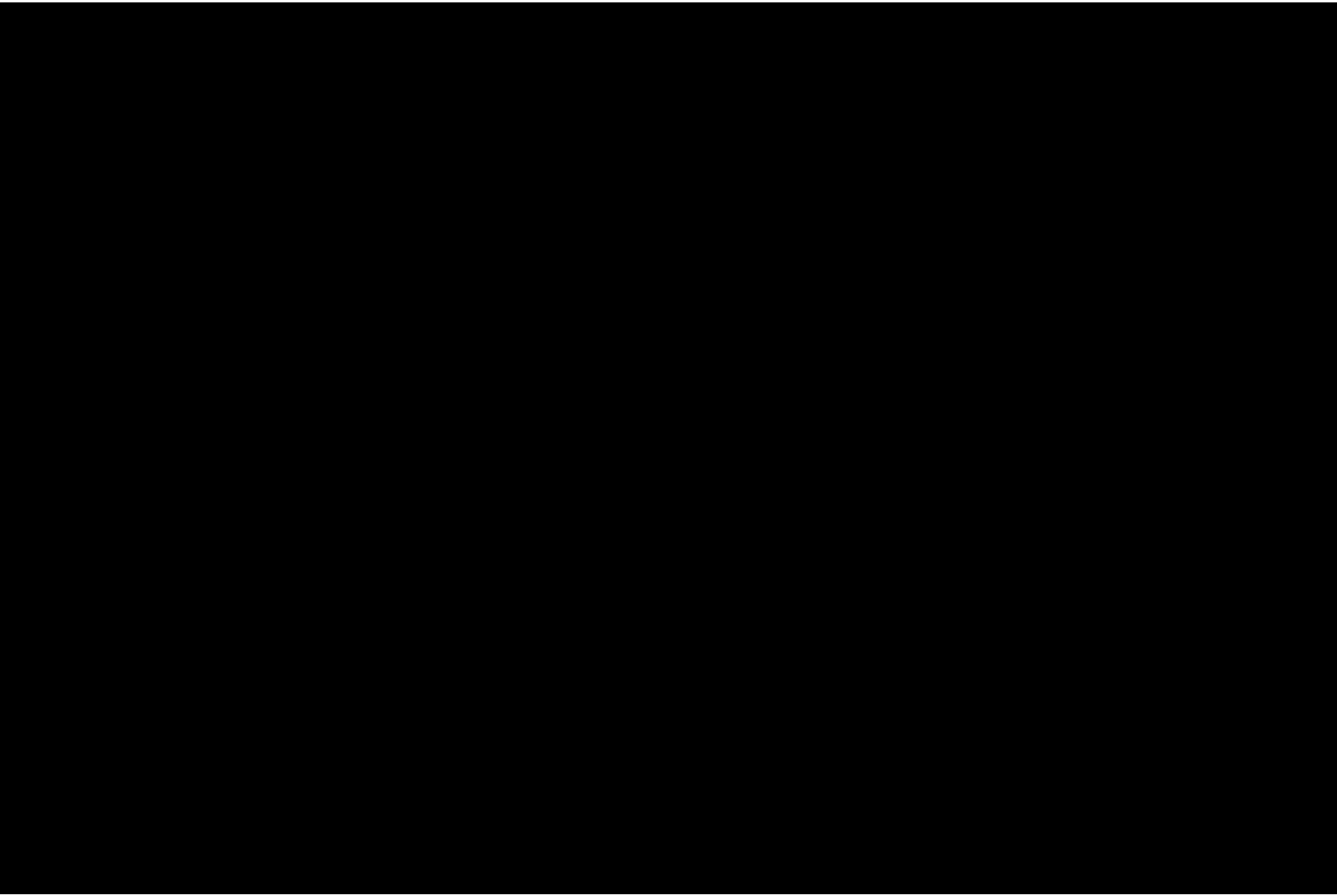
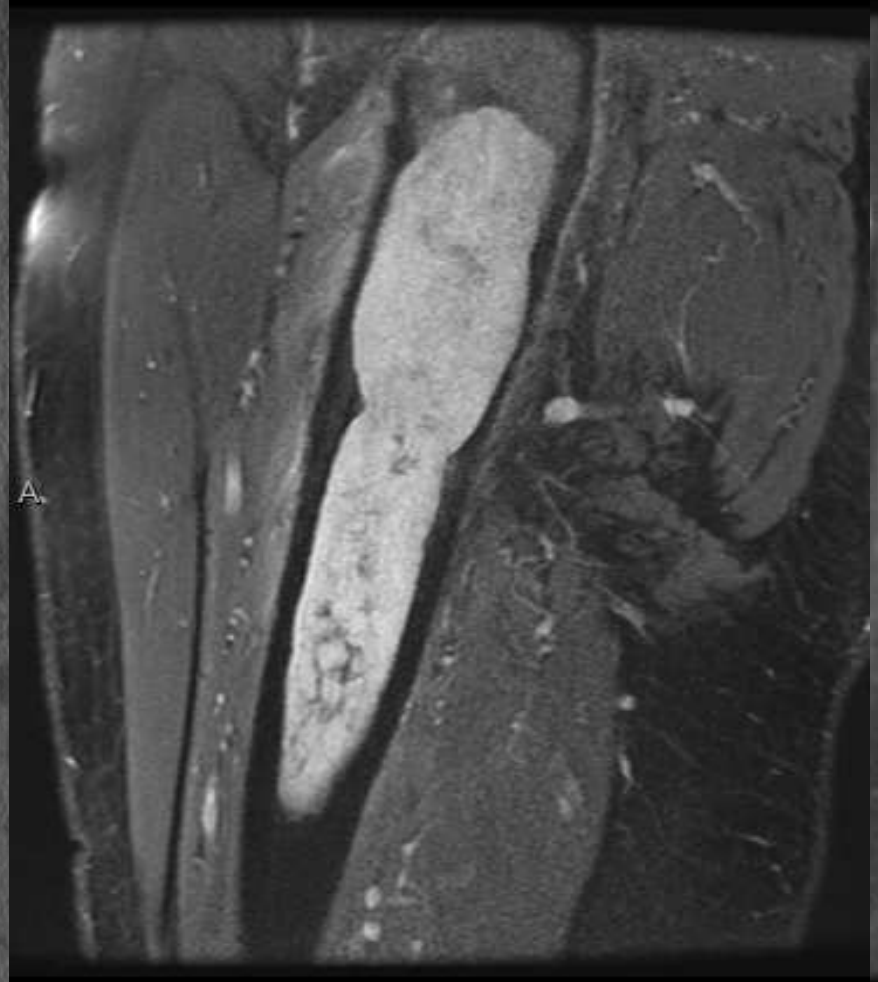






Cas
Homme 55 ans
Douleur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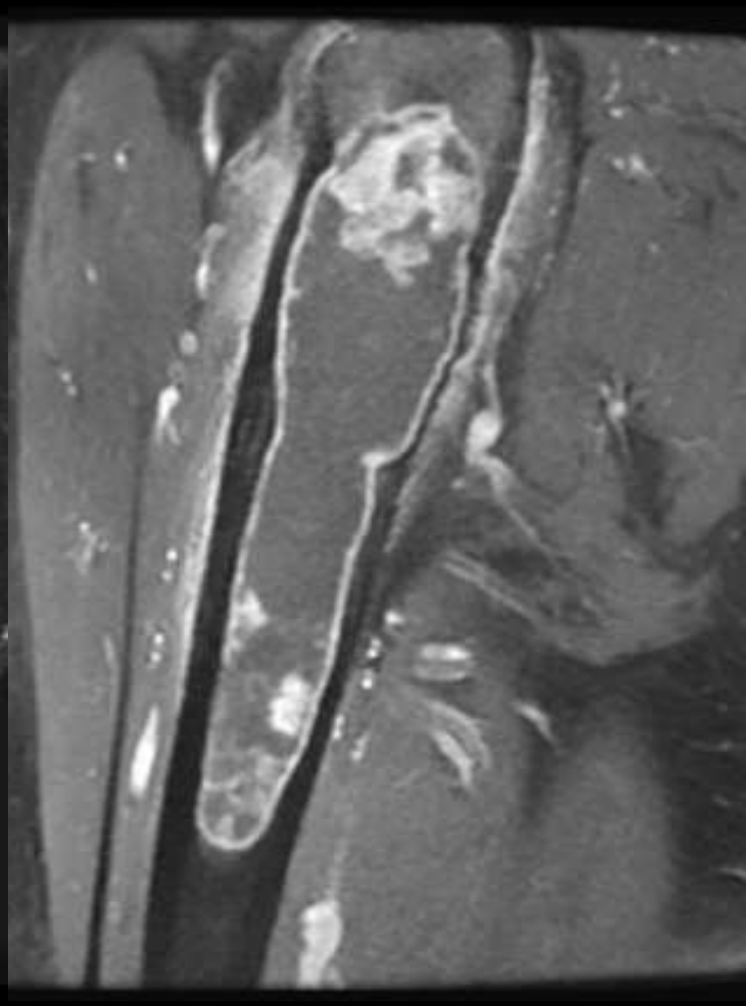

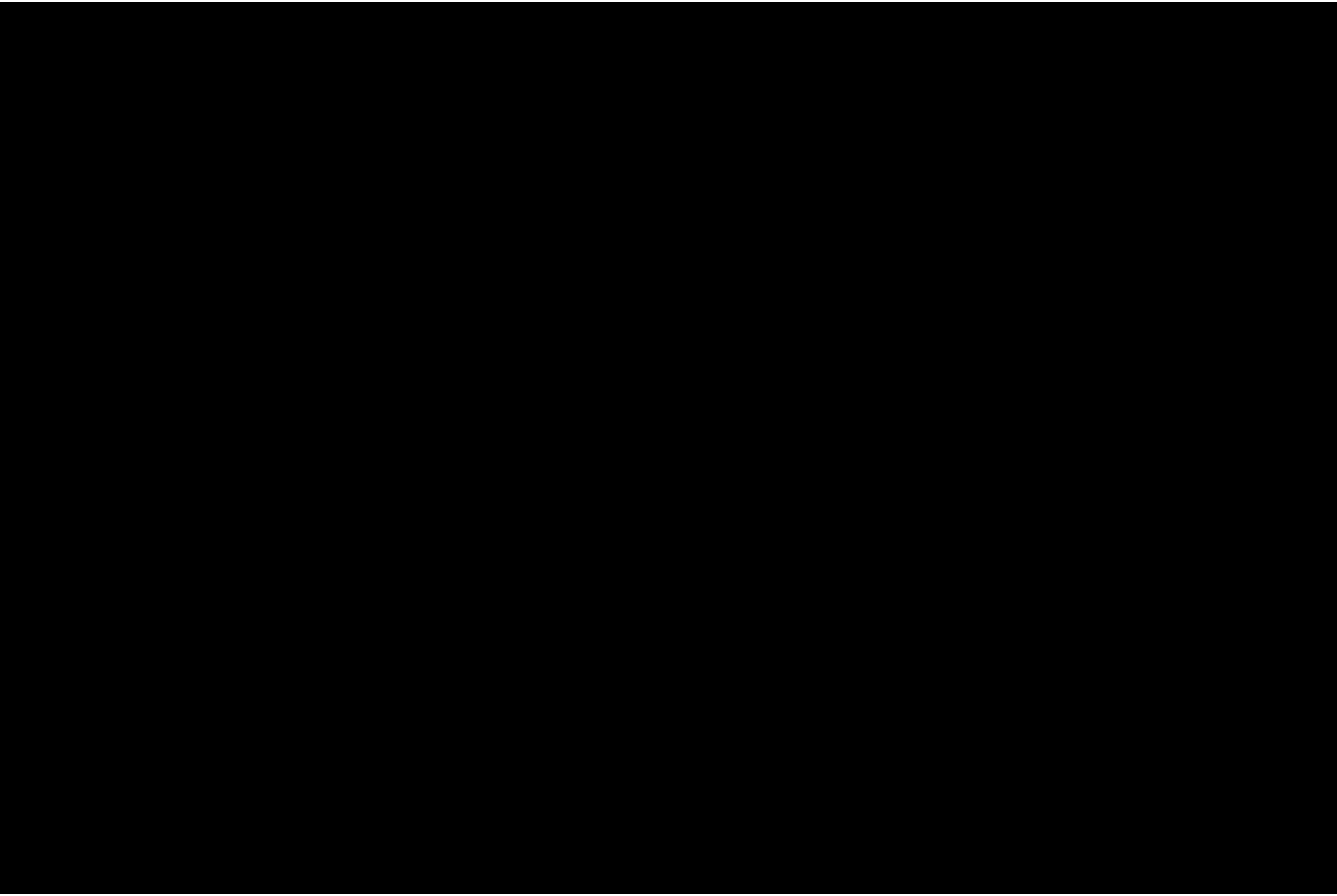


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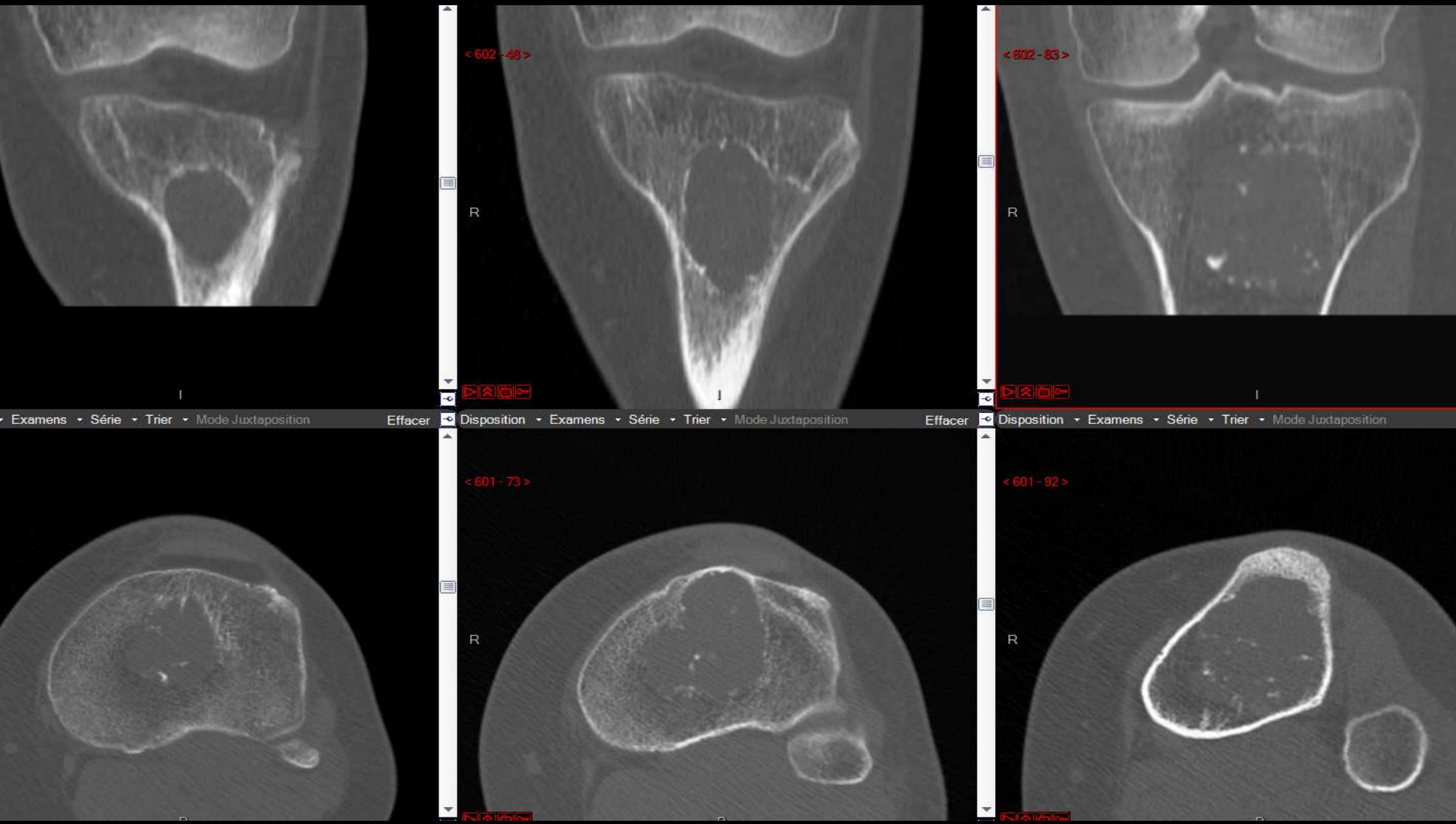
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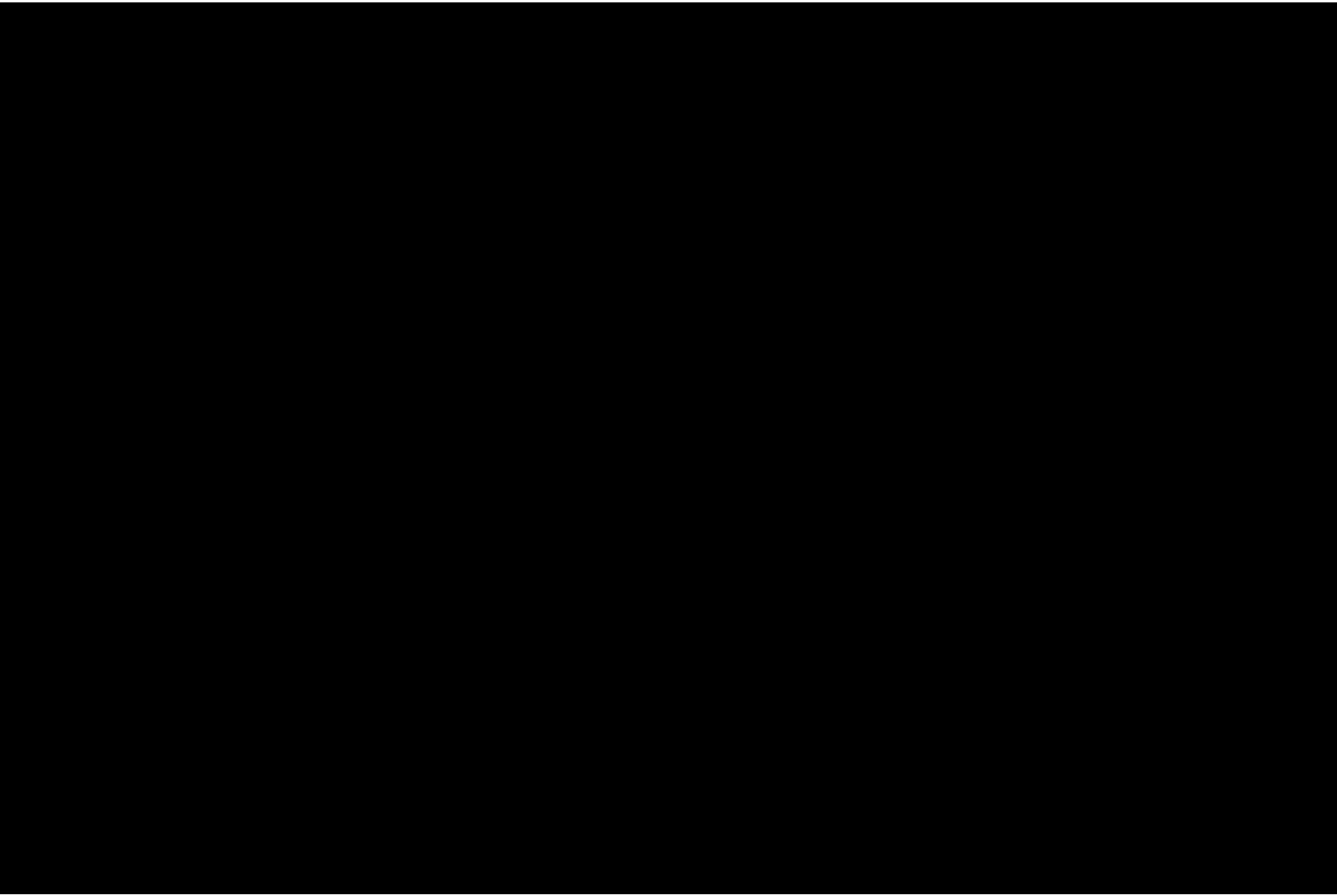

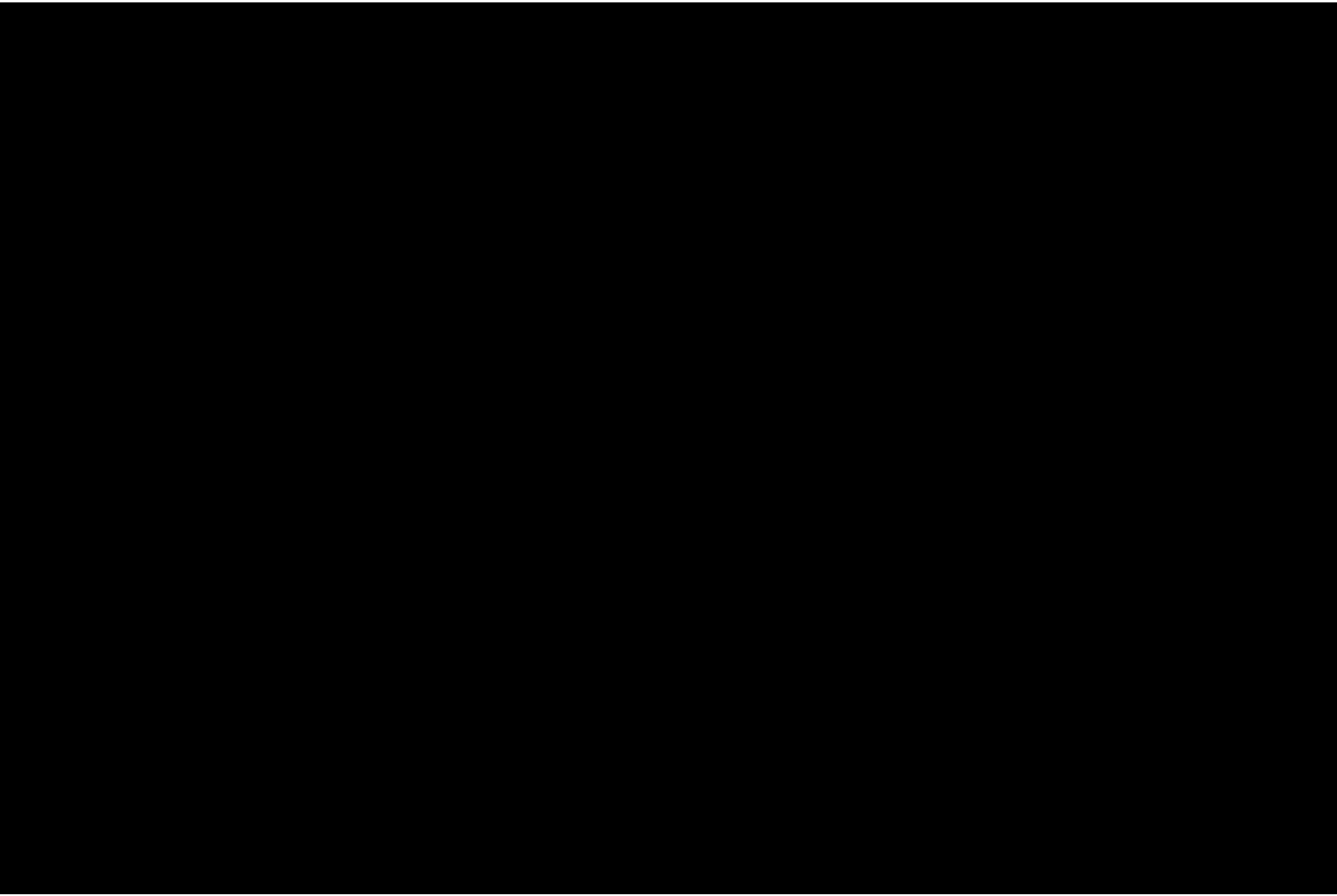

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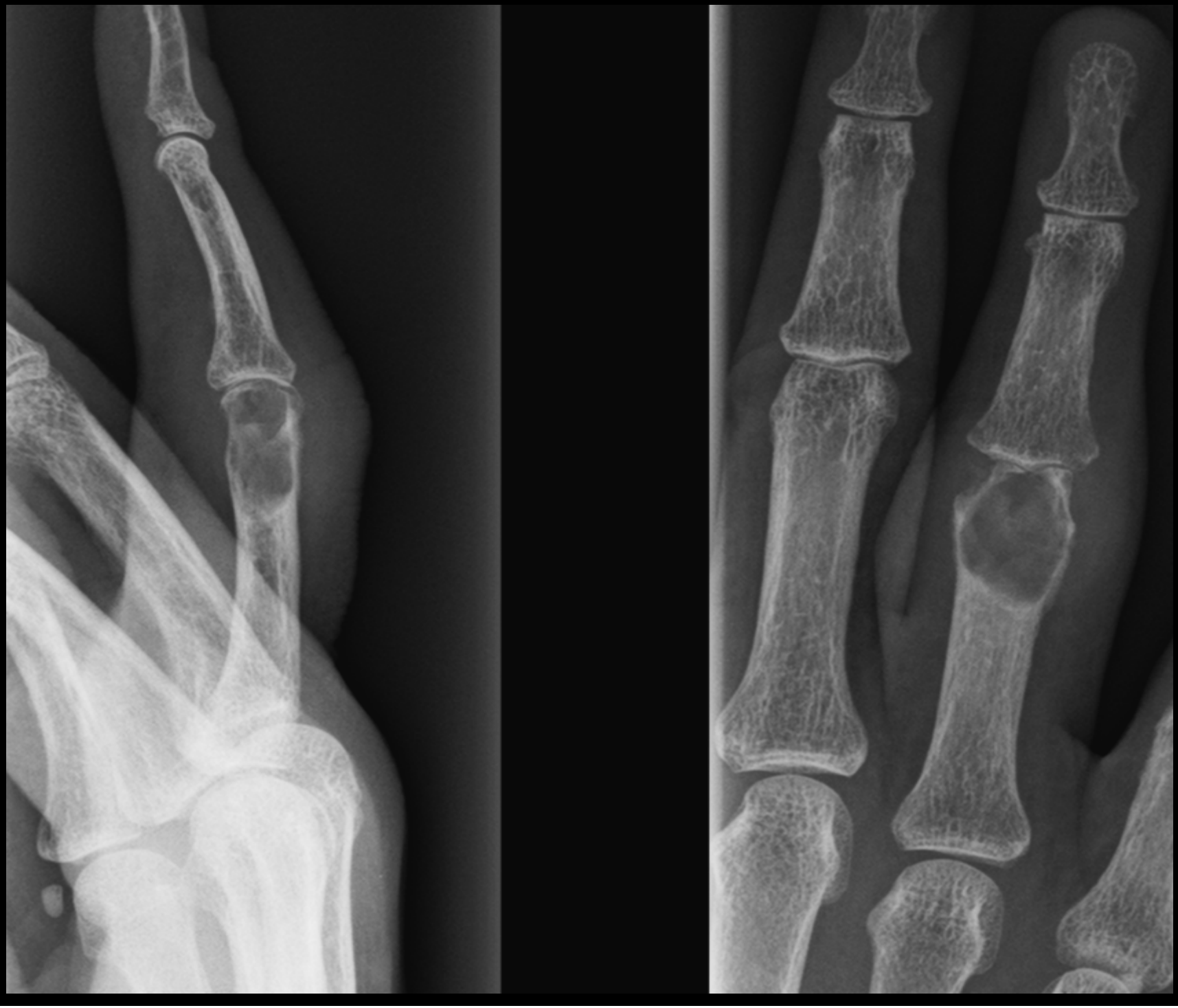

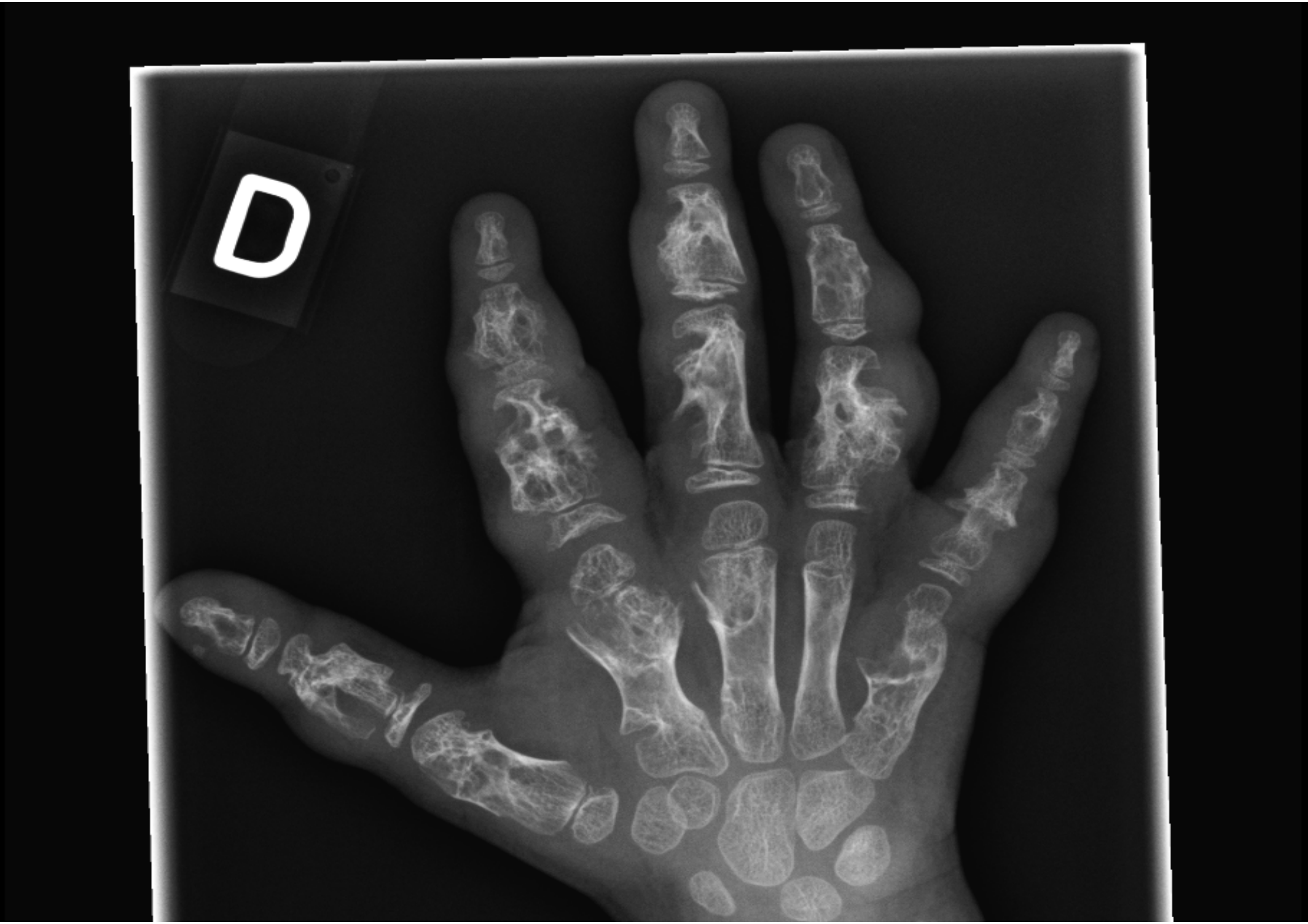
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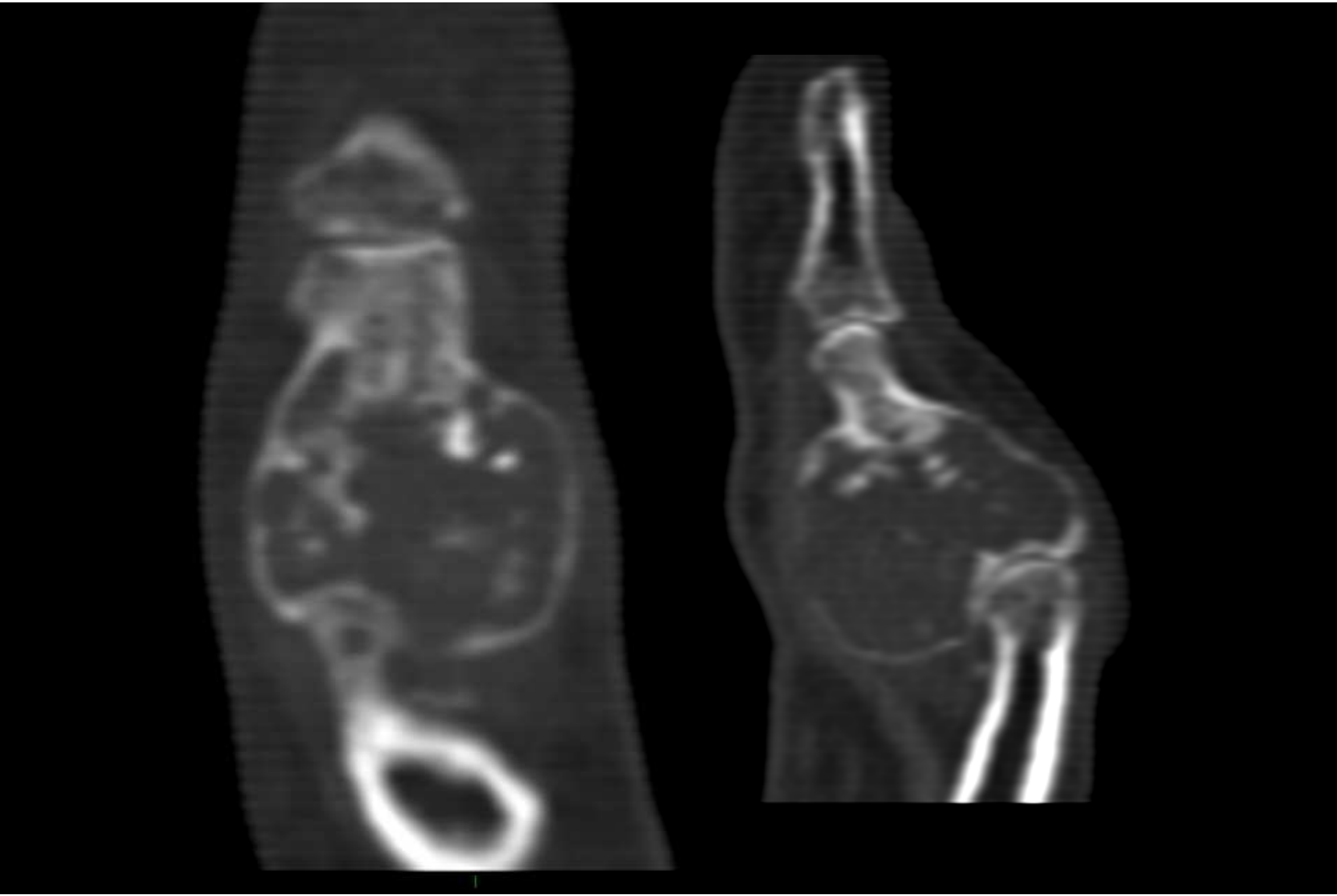

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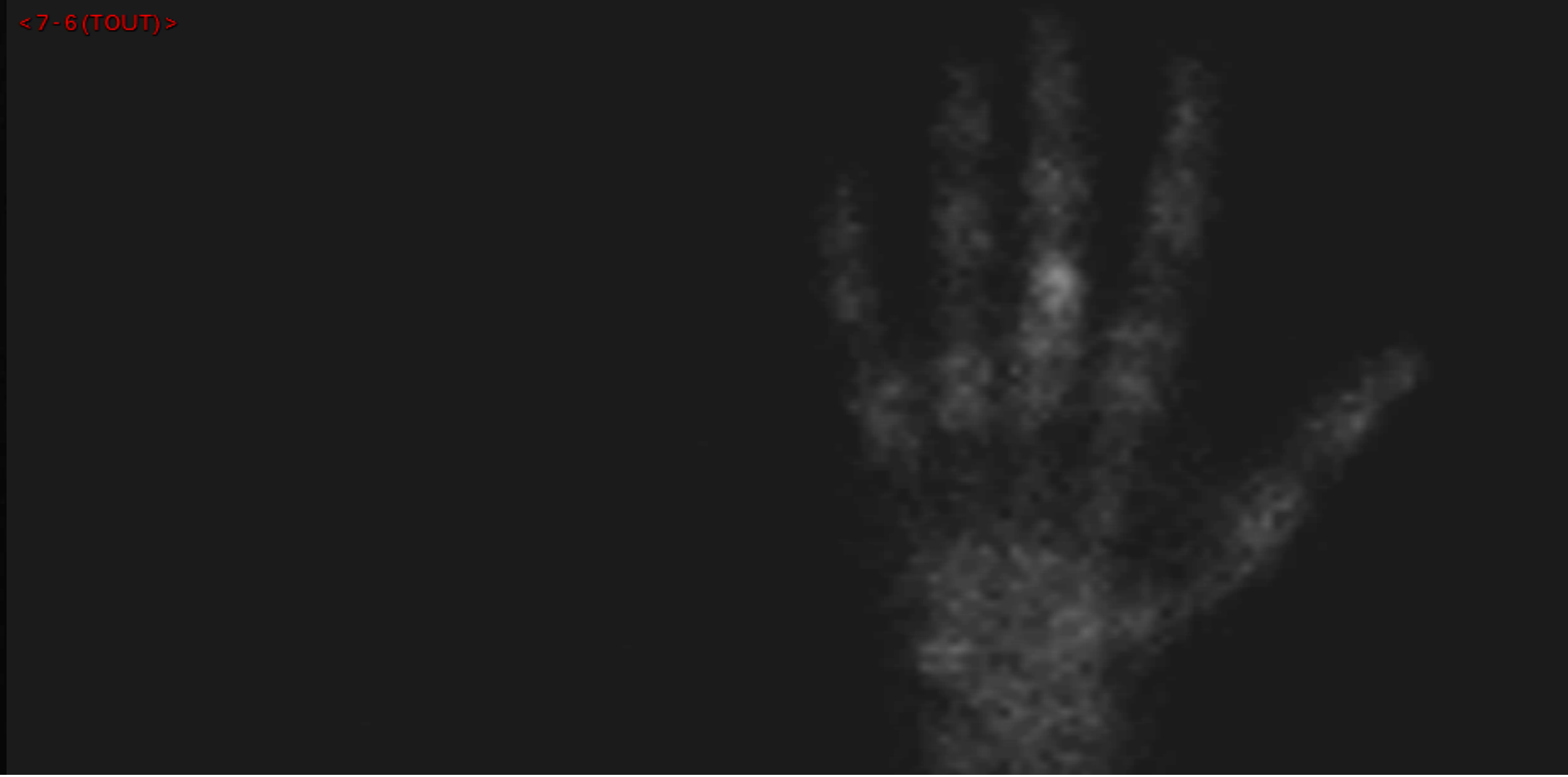

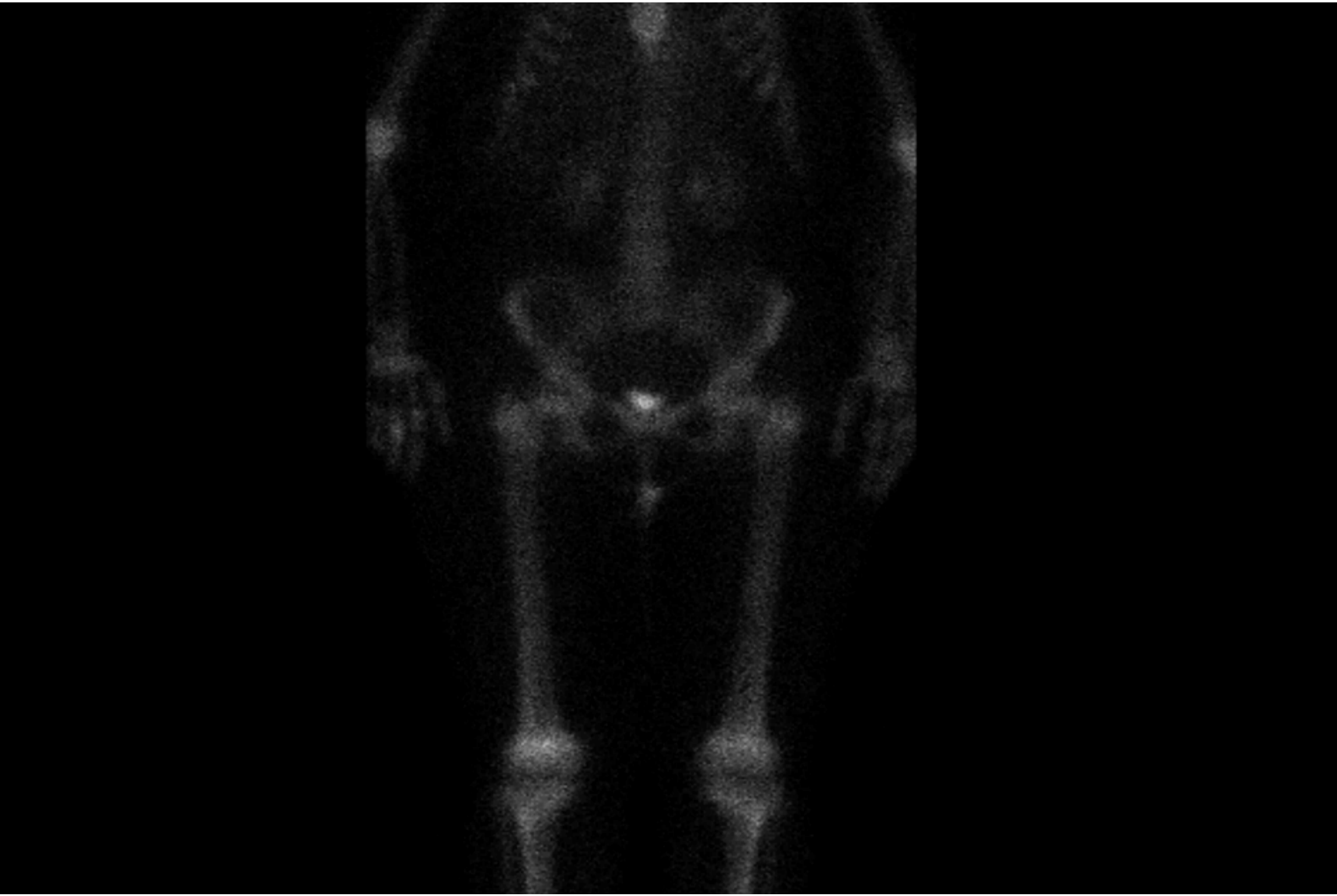

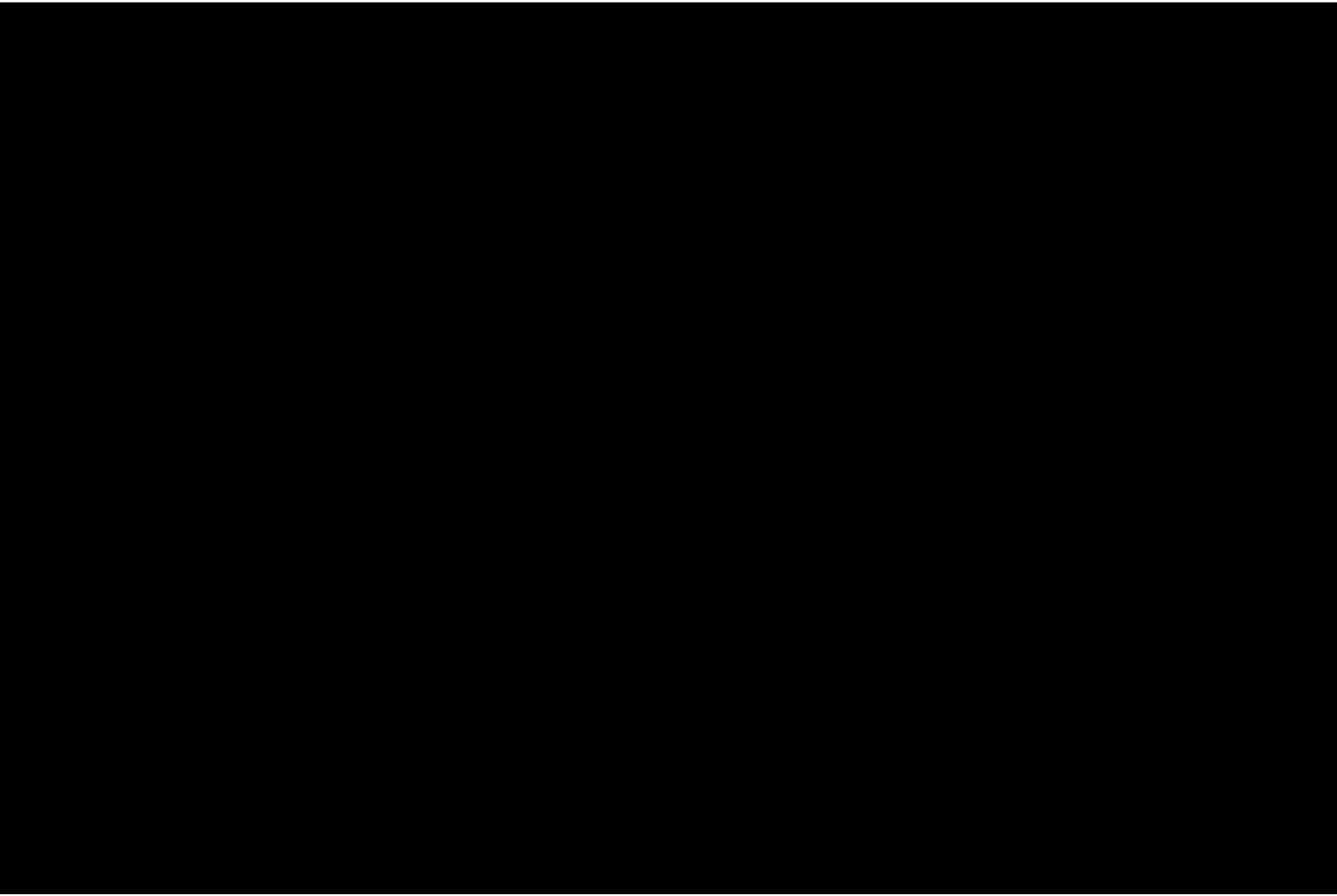

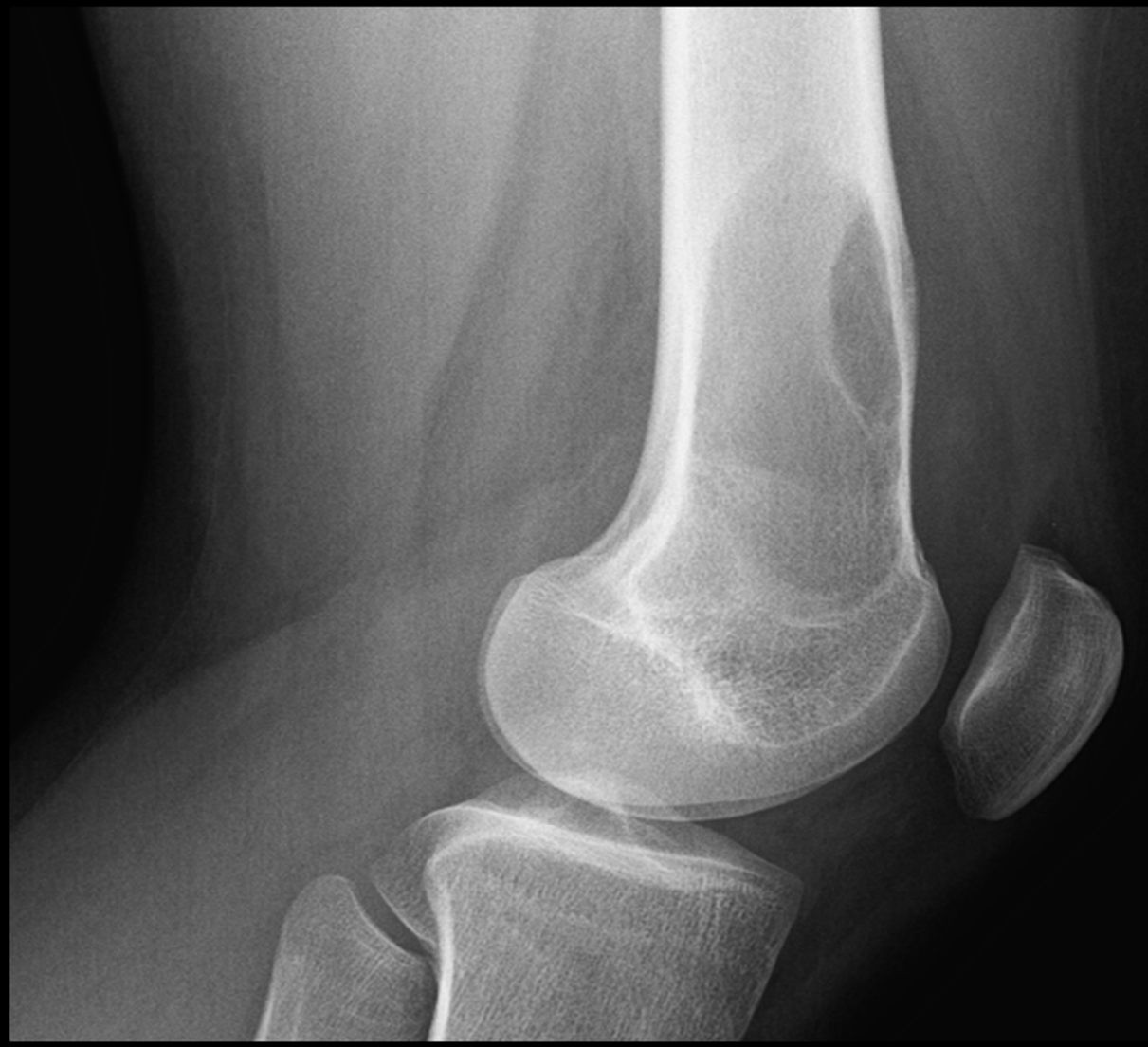

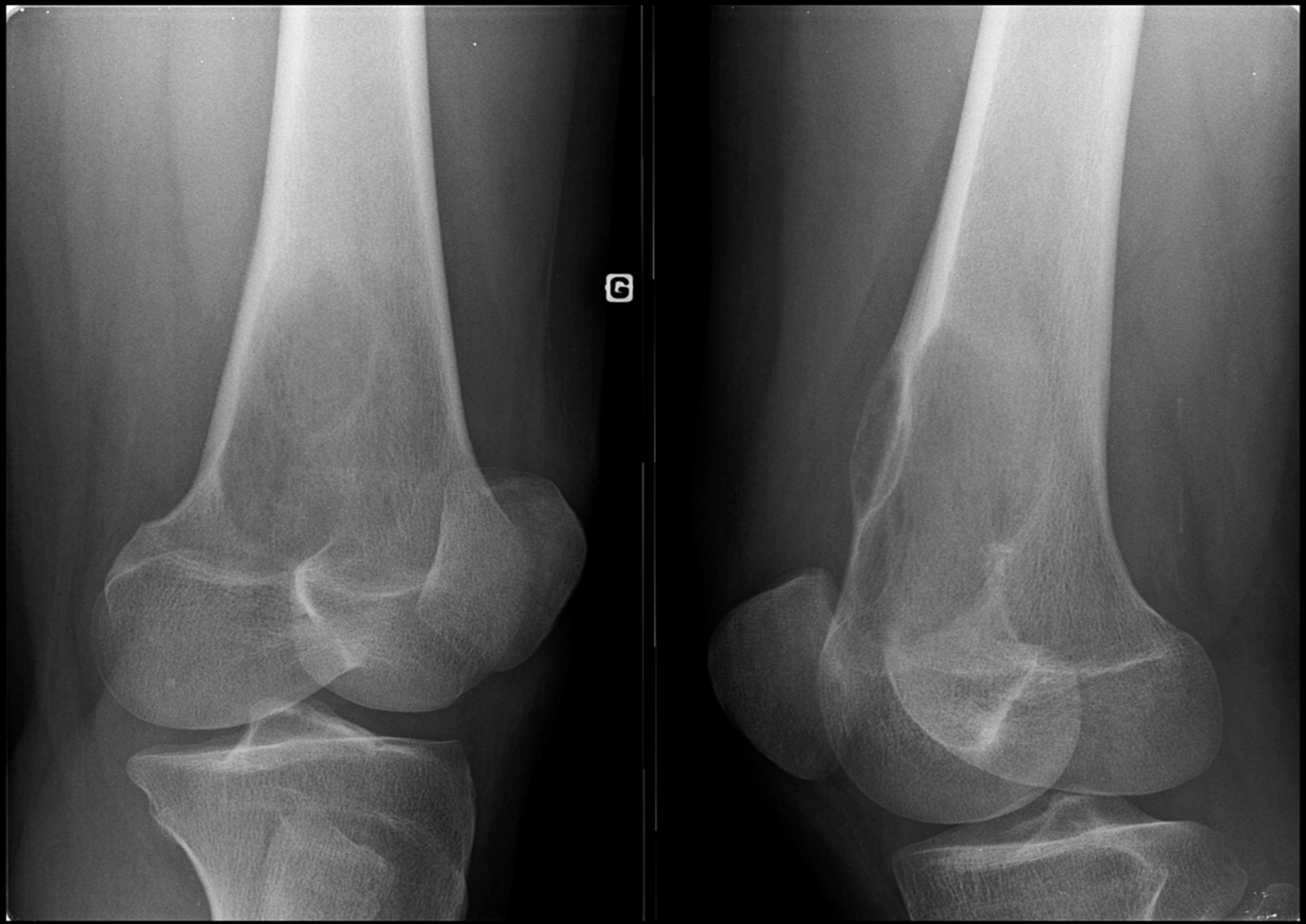


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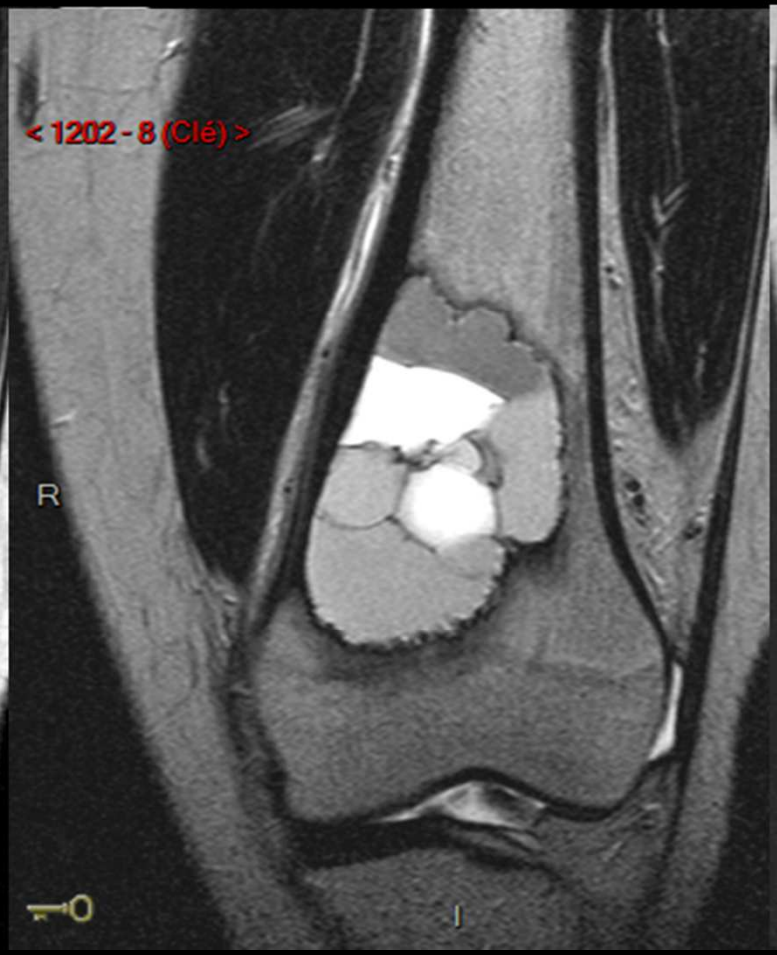
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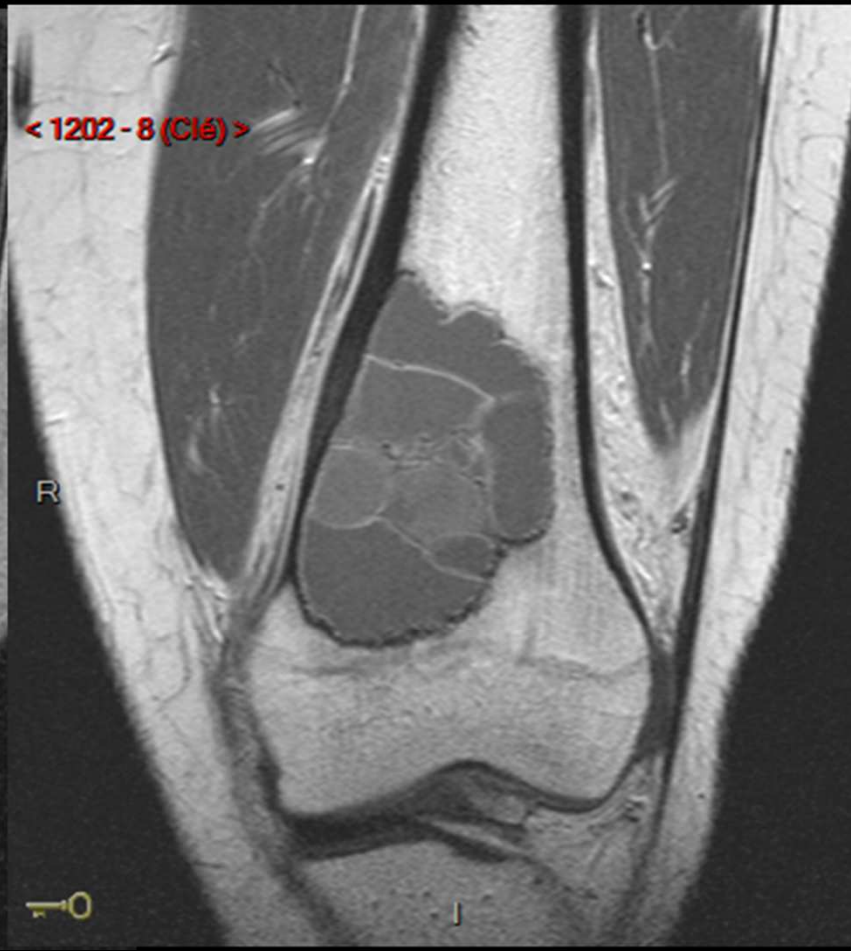
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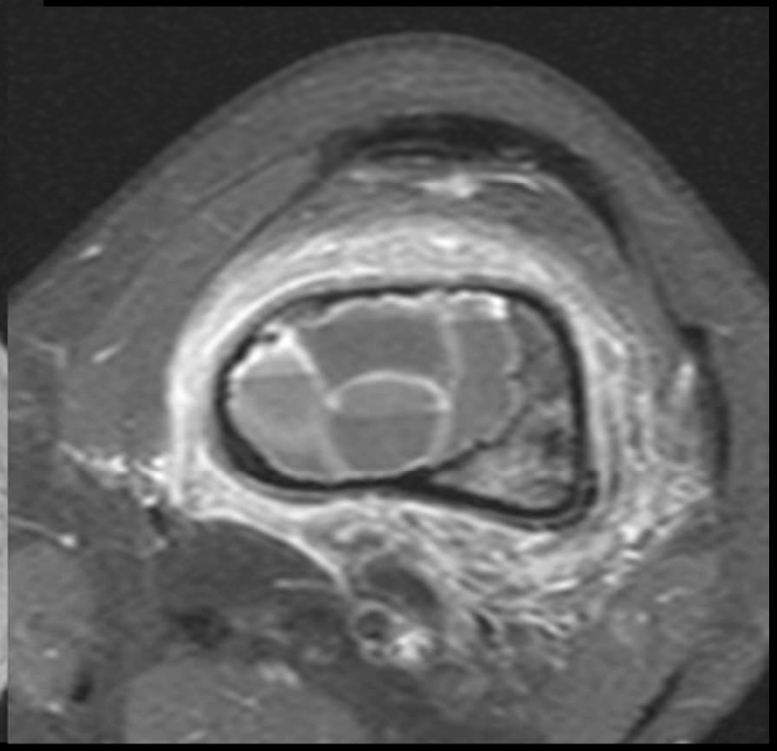

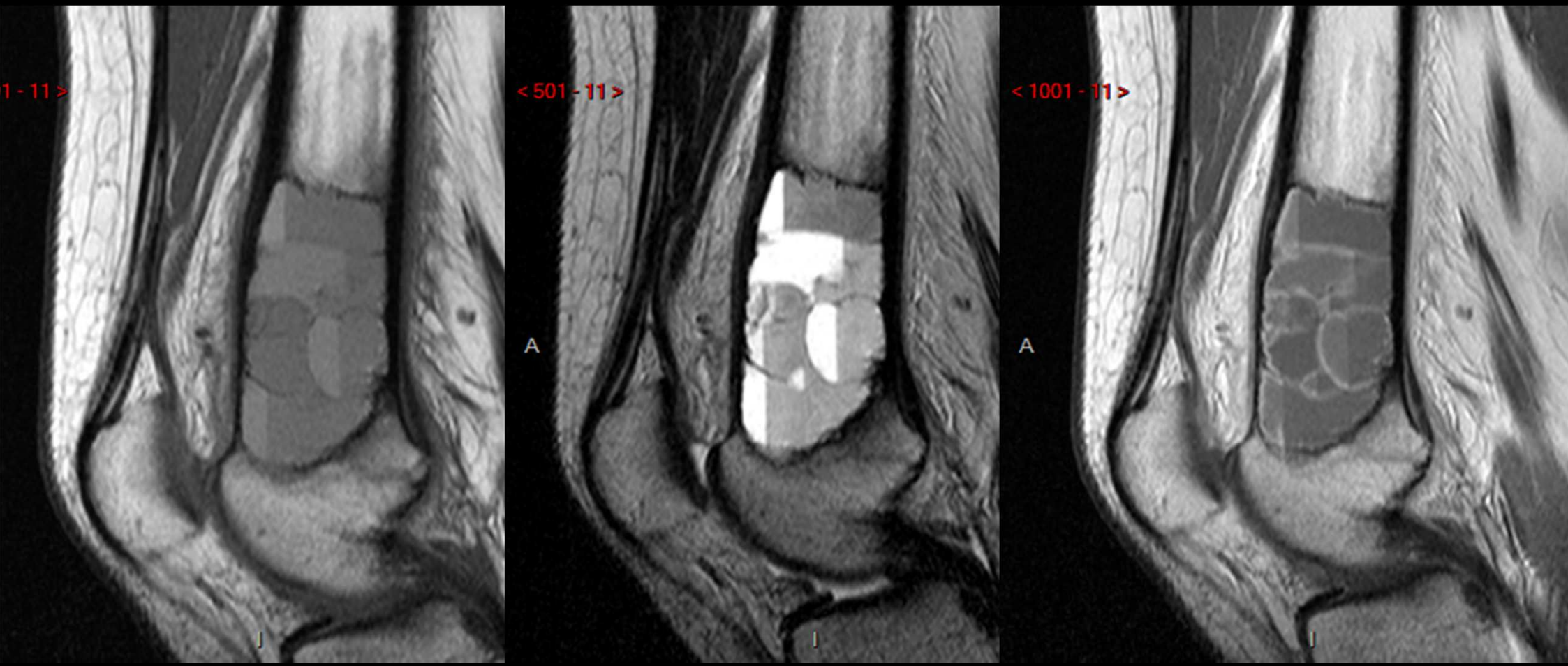
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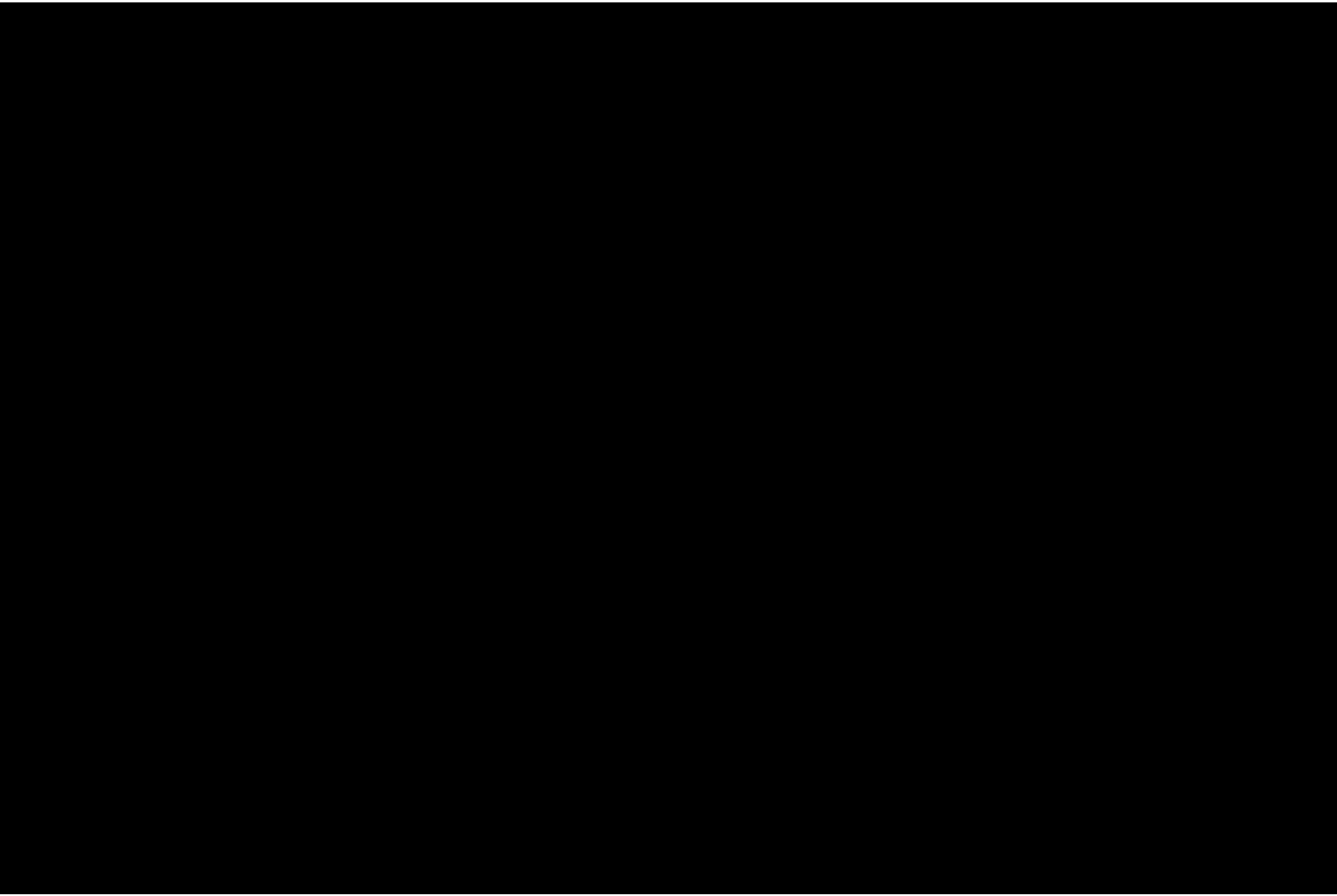


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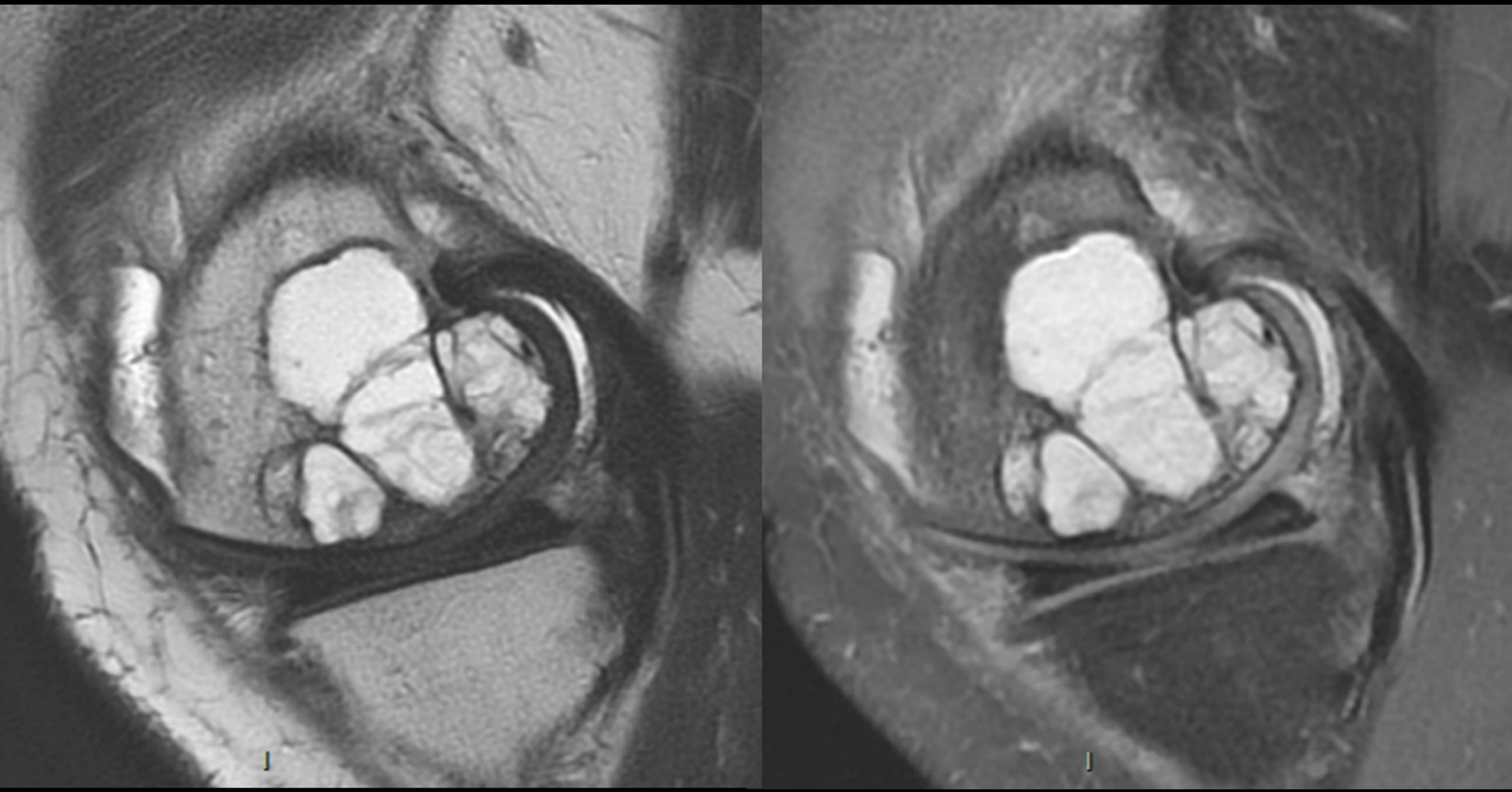

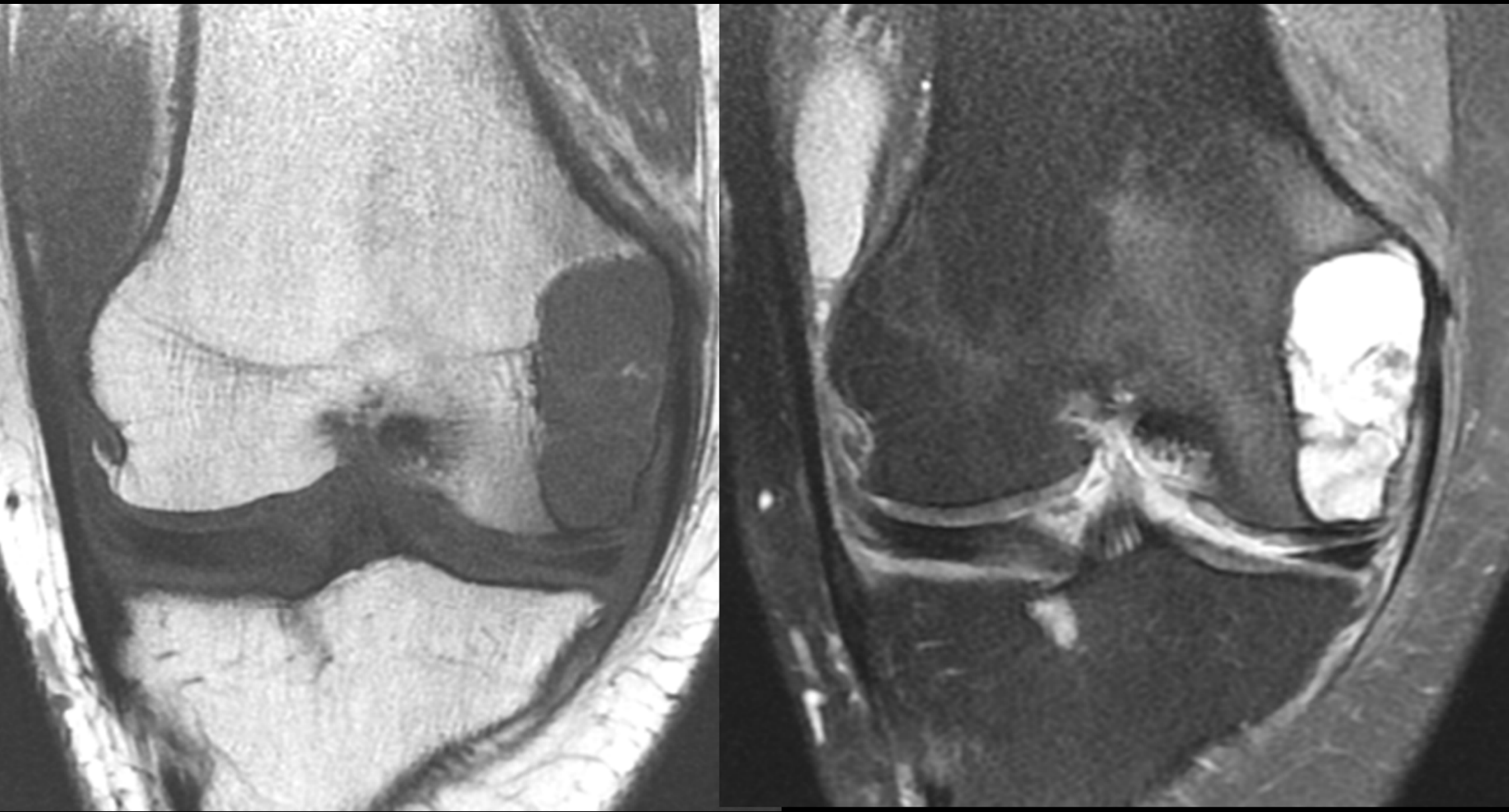


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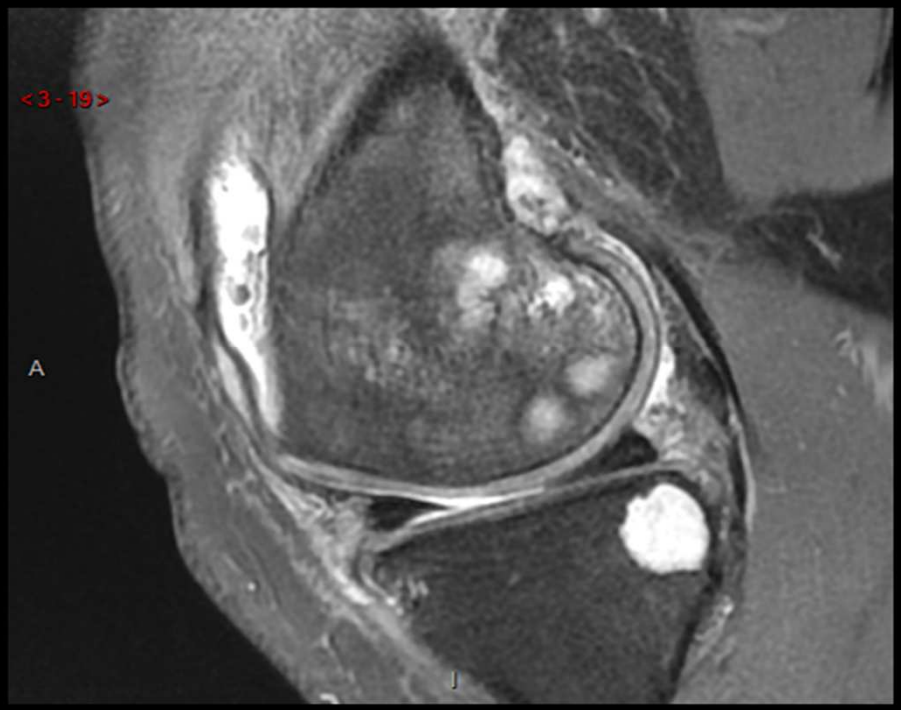
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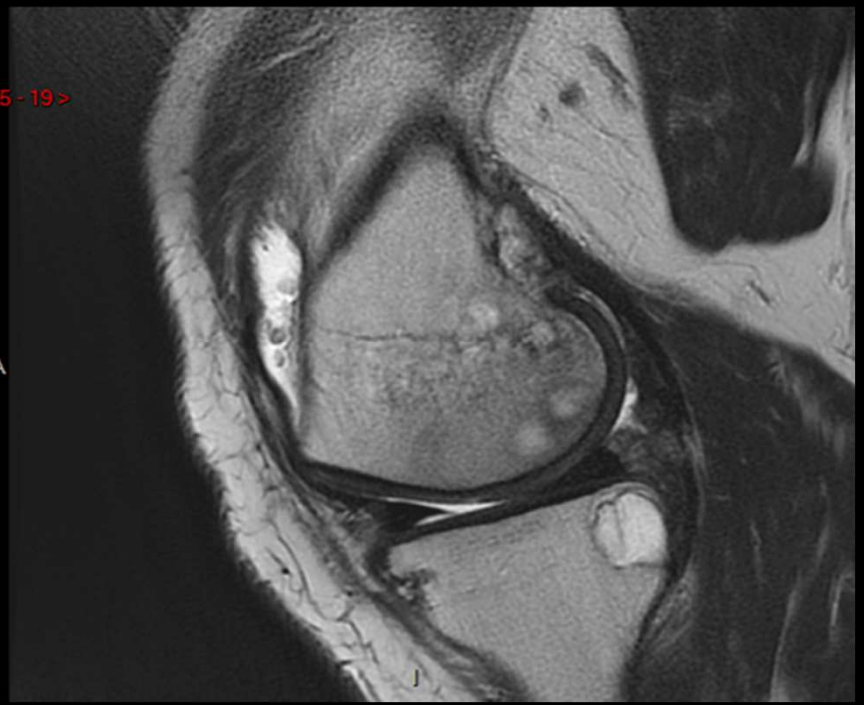
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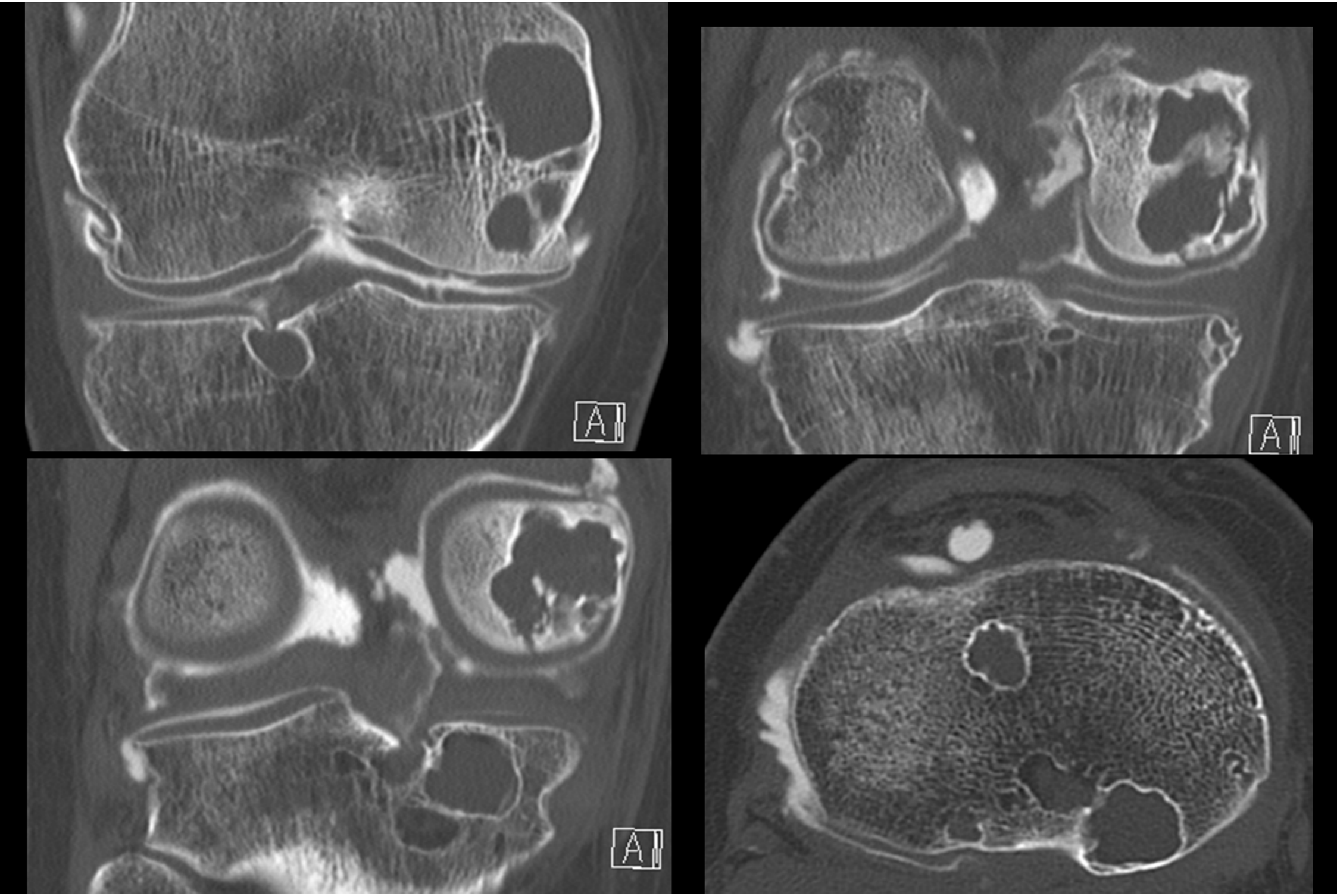


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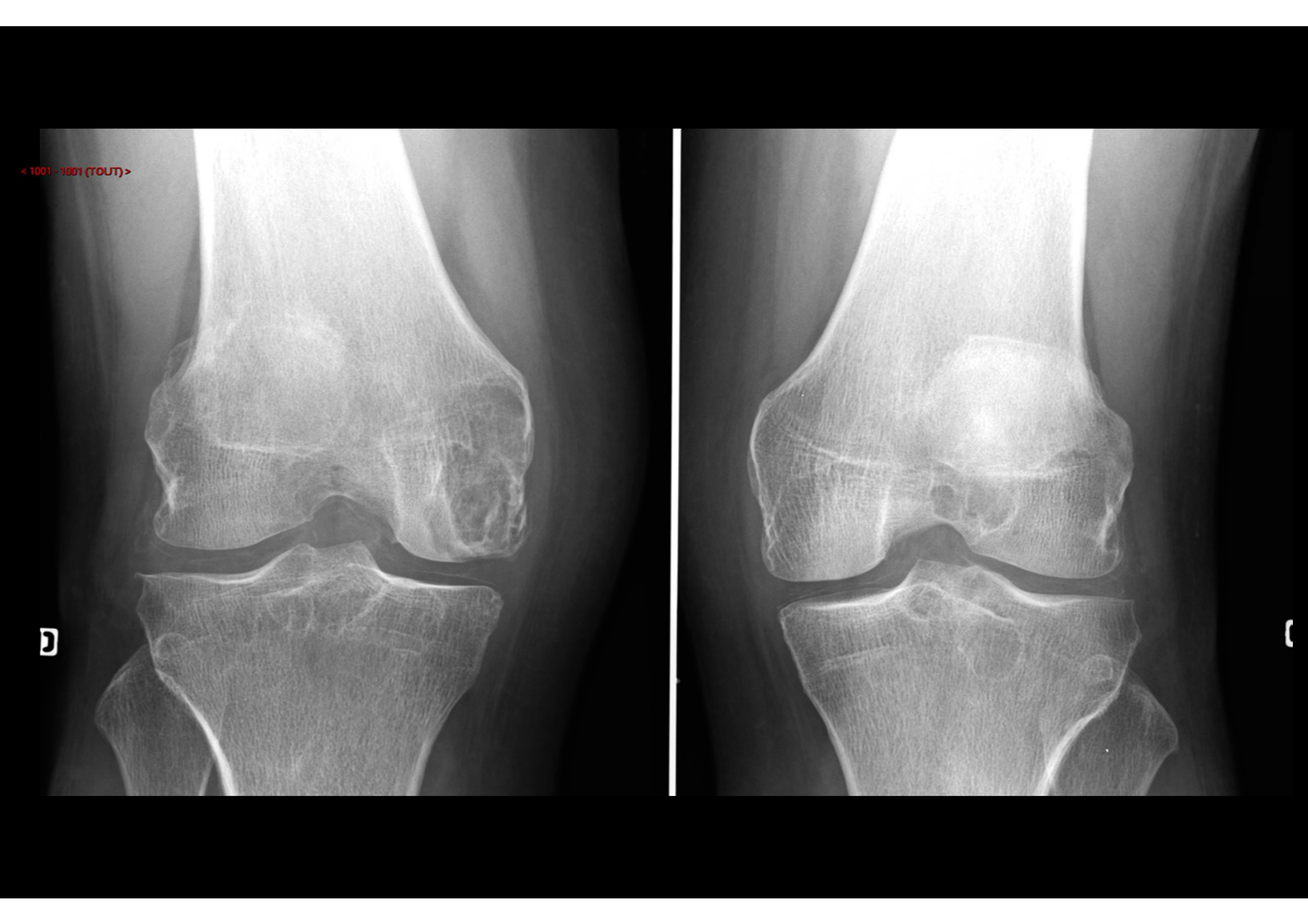
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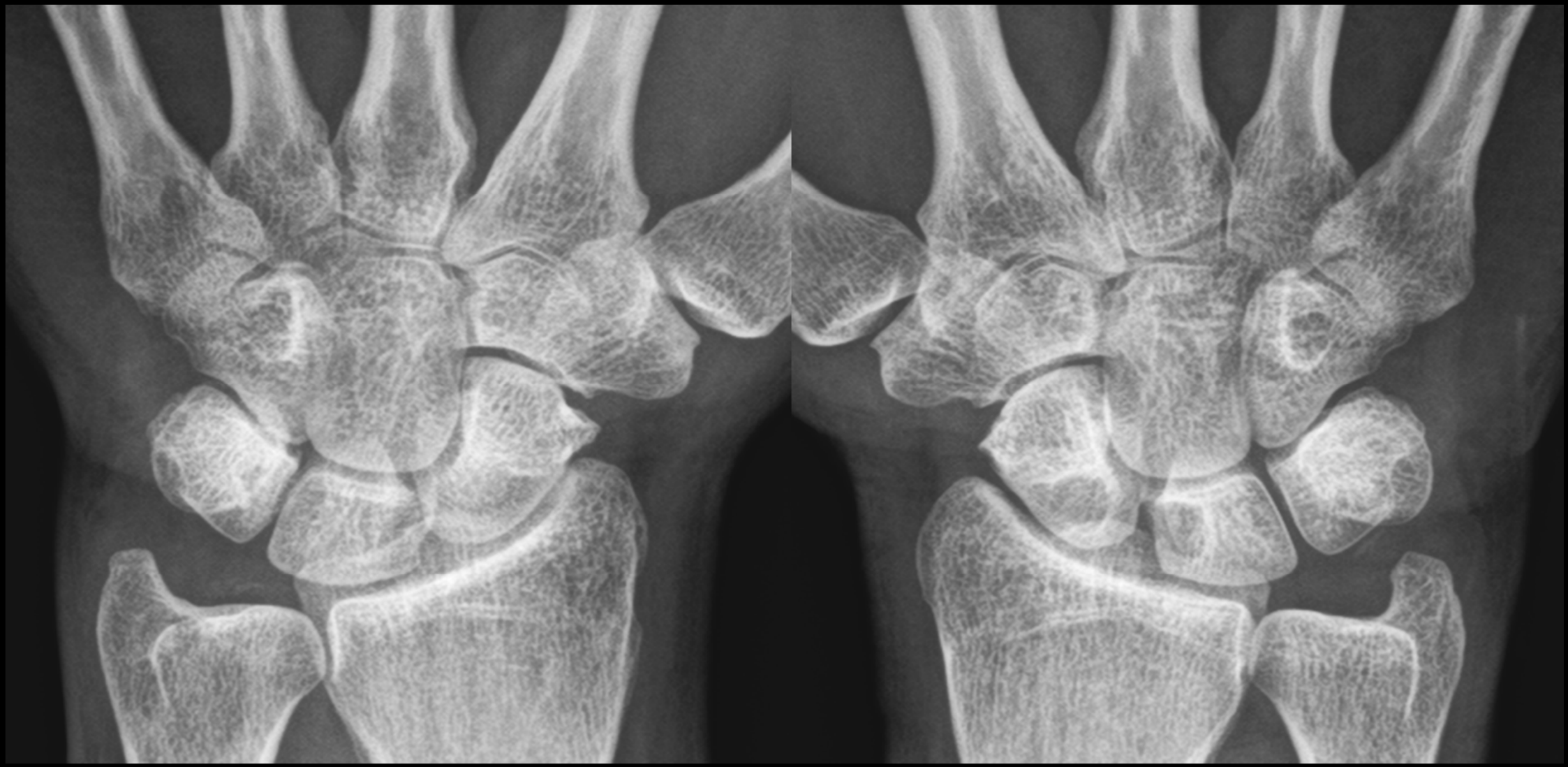

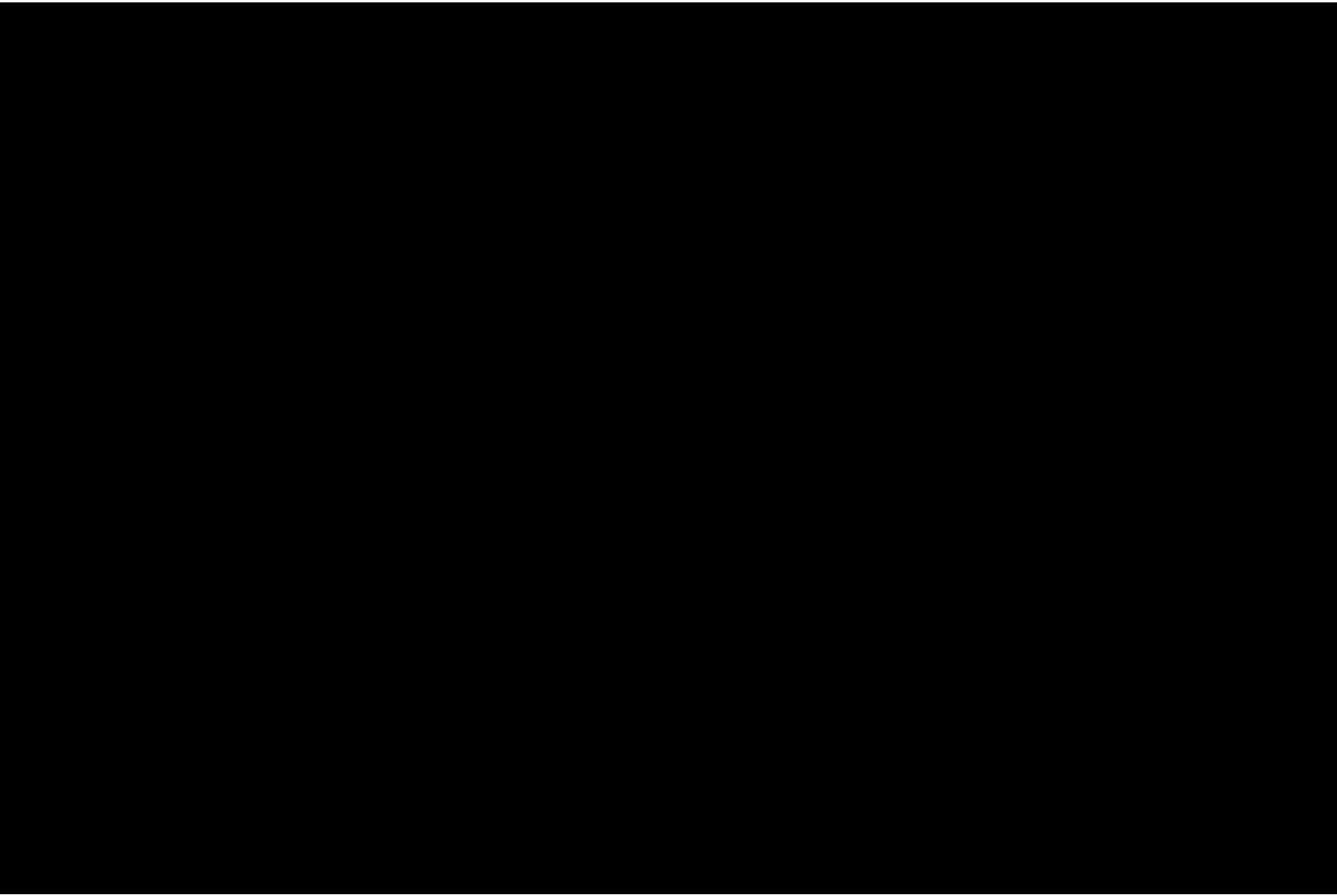

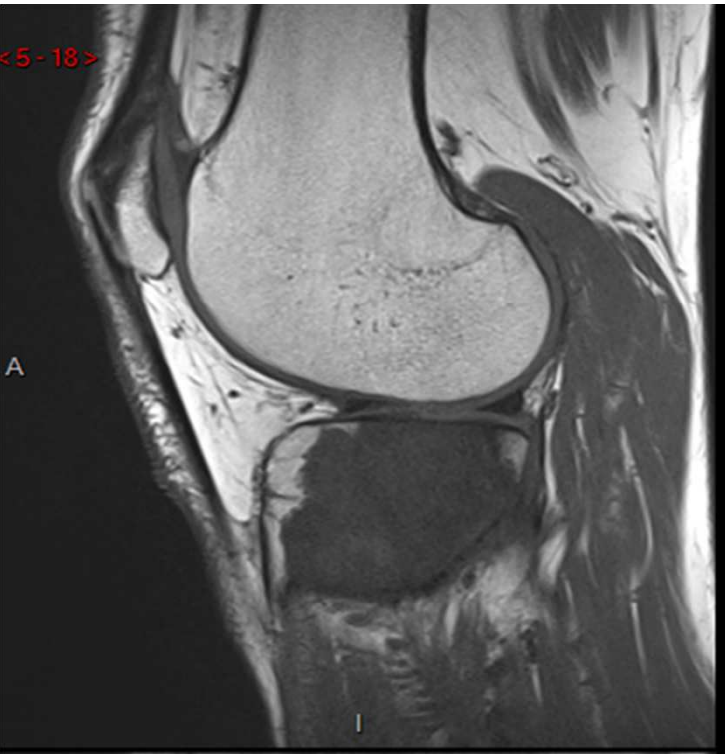
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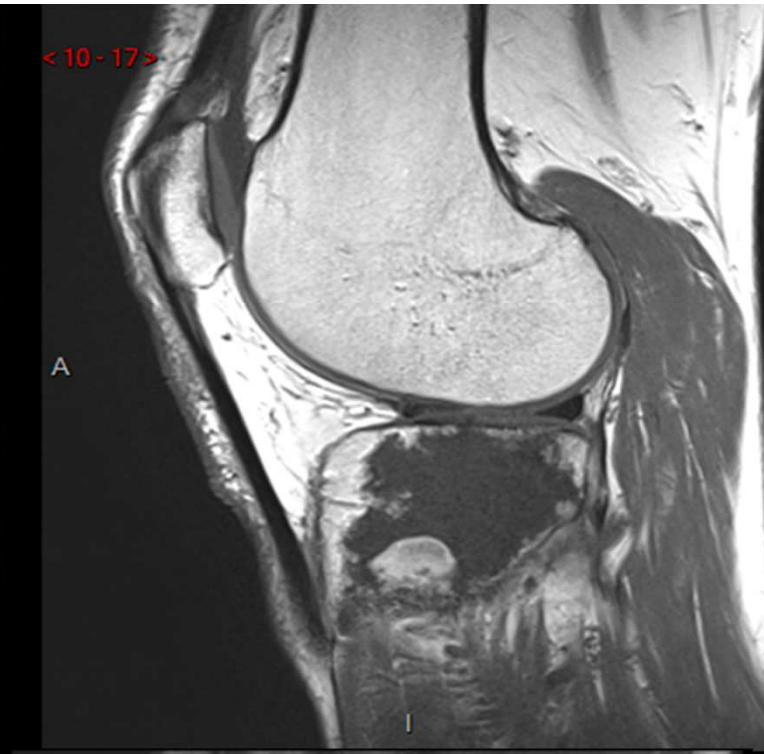
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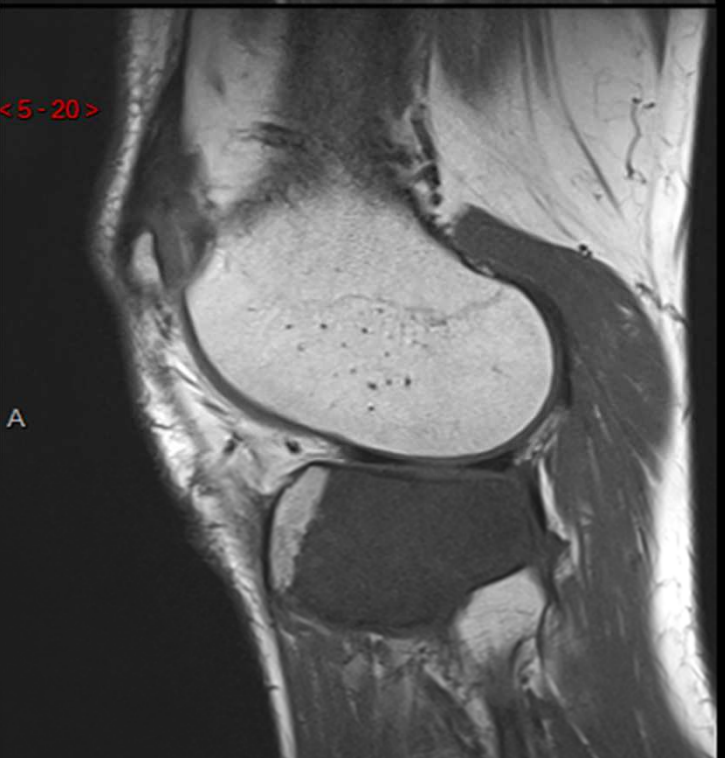
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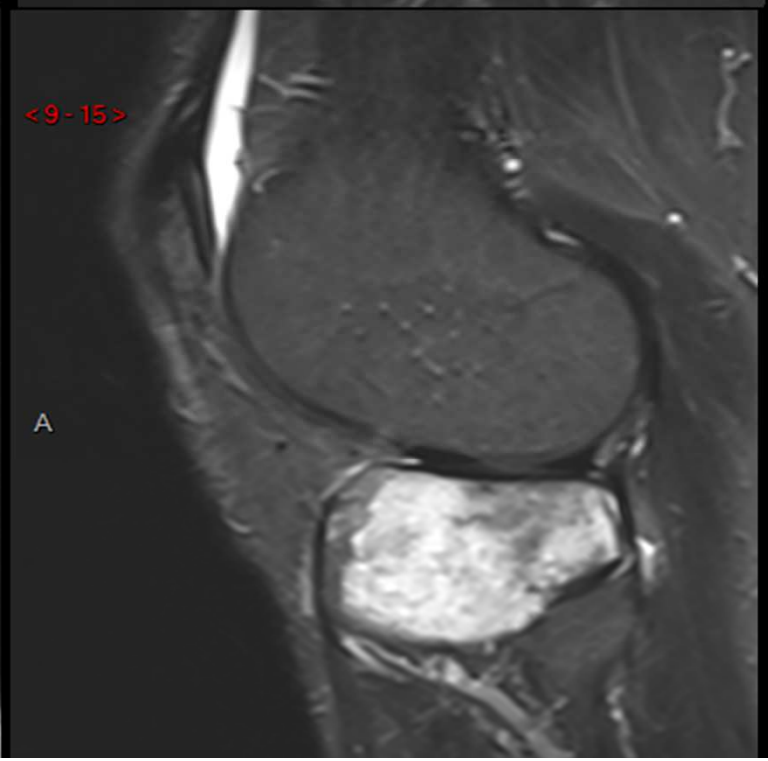
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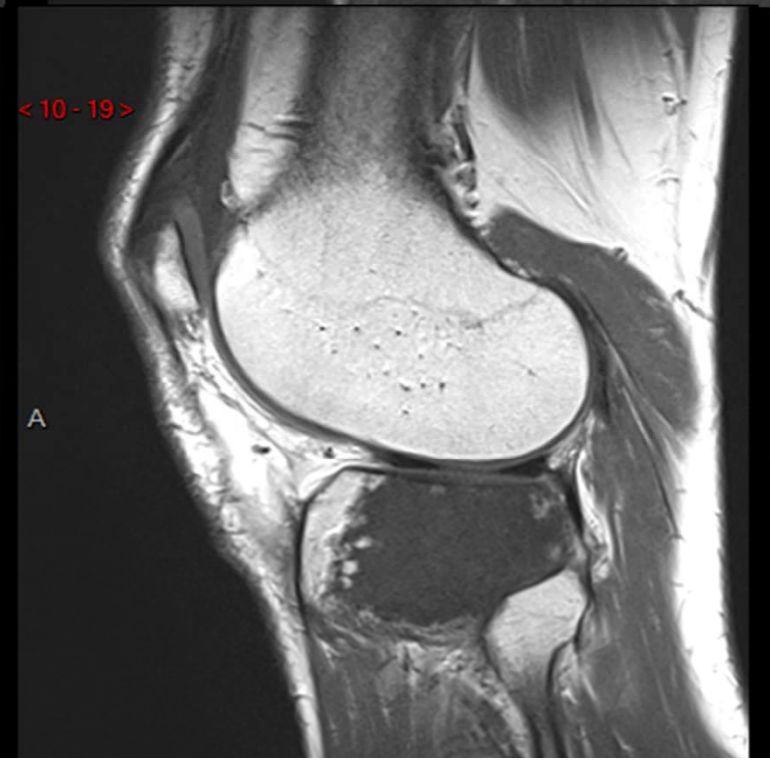
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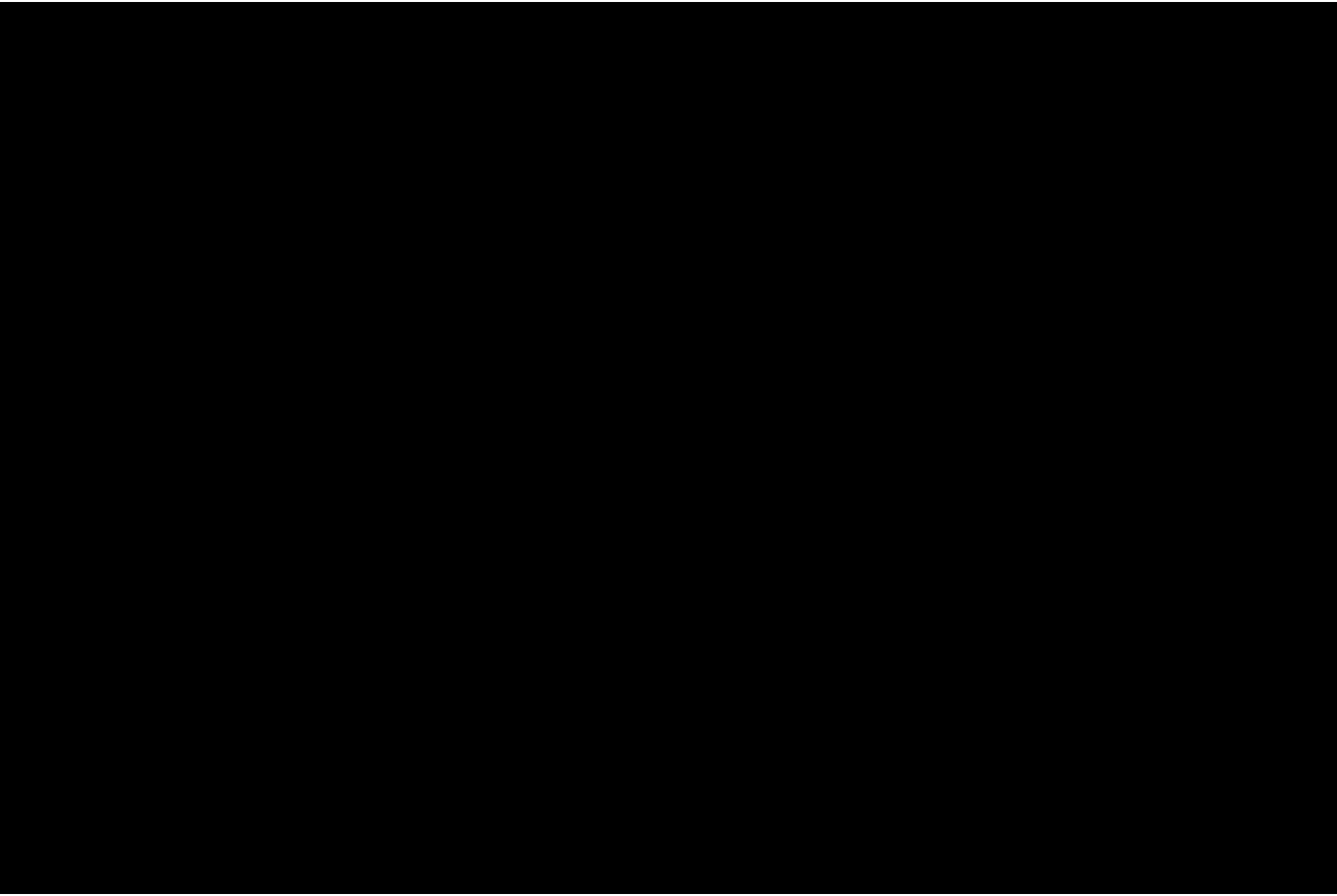
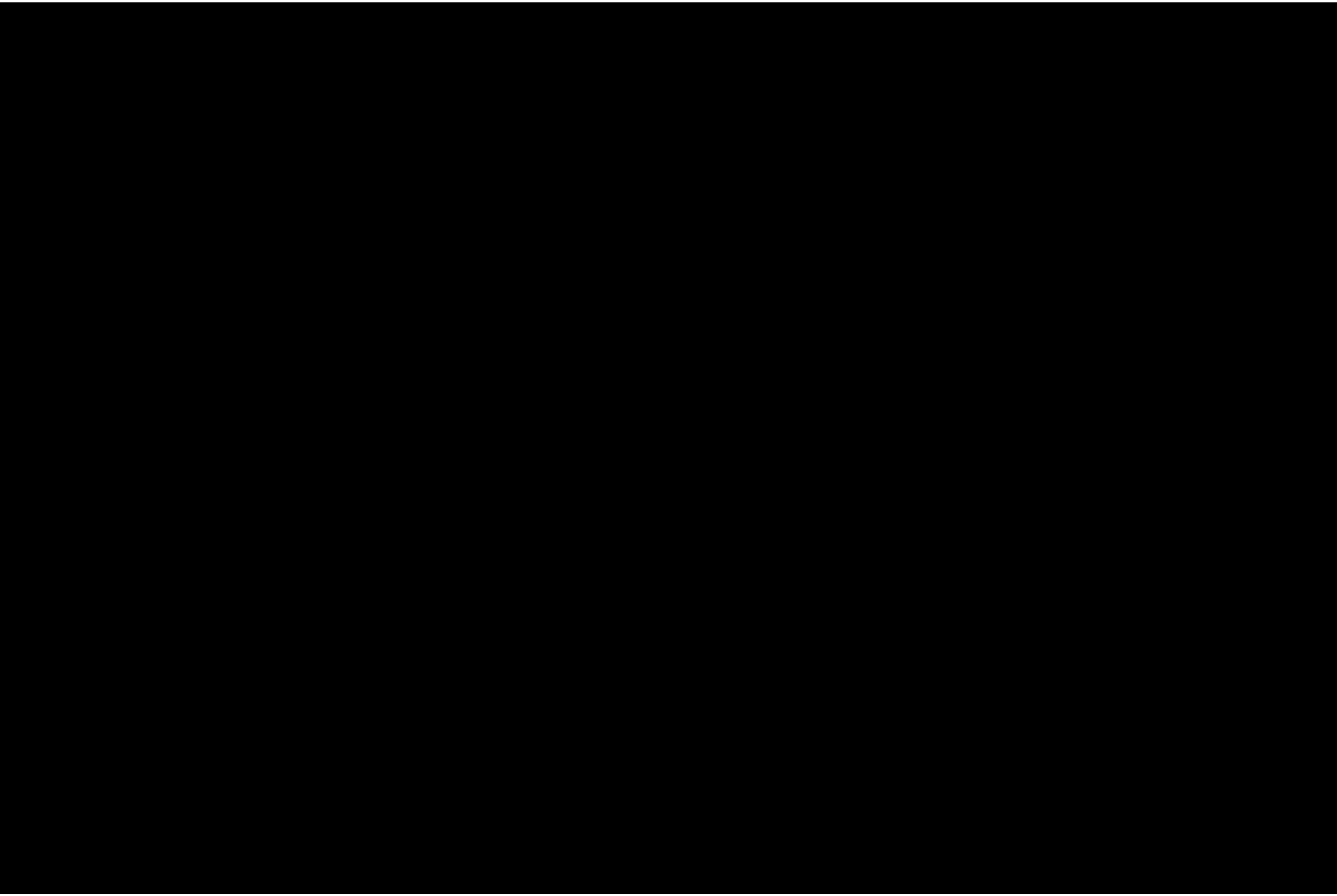
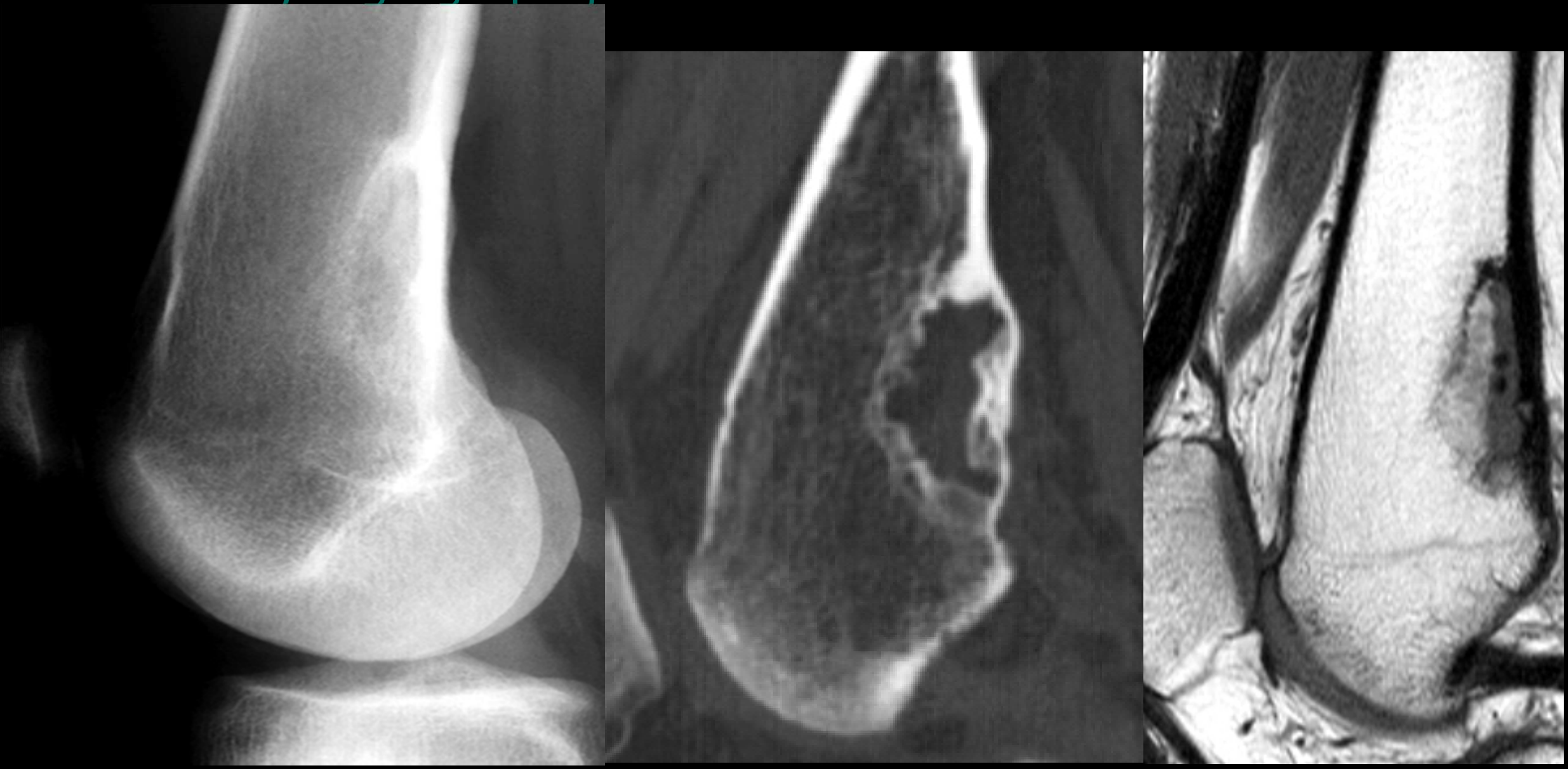
Avril 2014

Octobre 2014

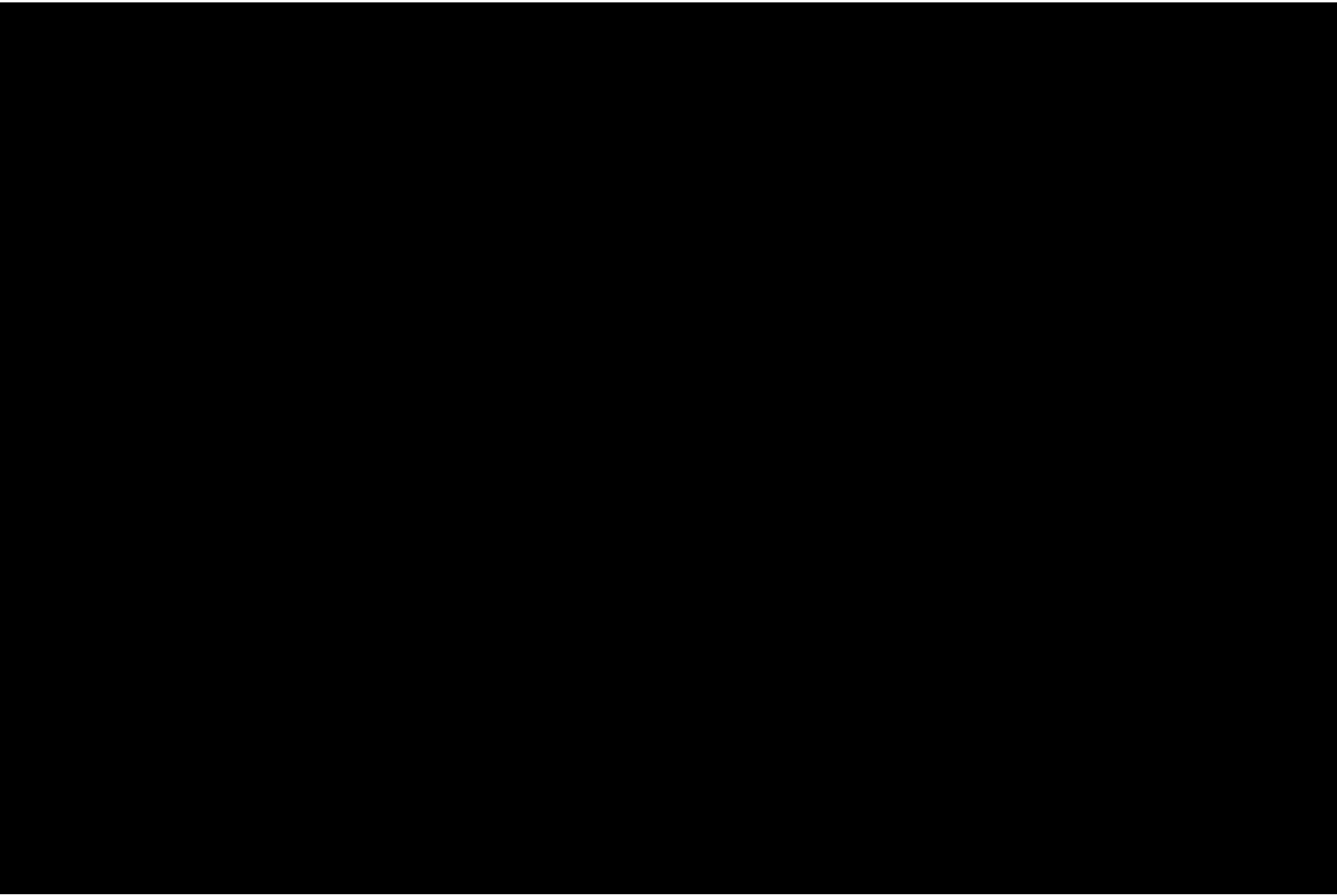




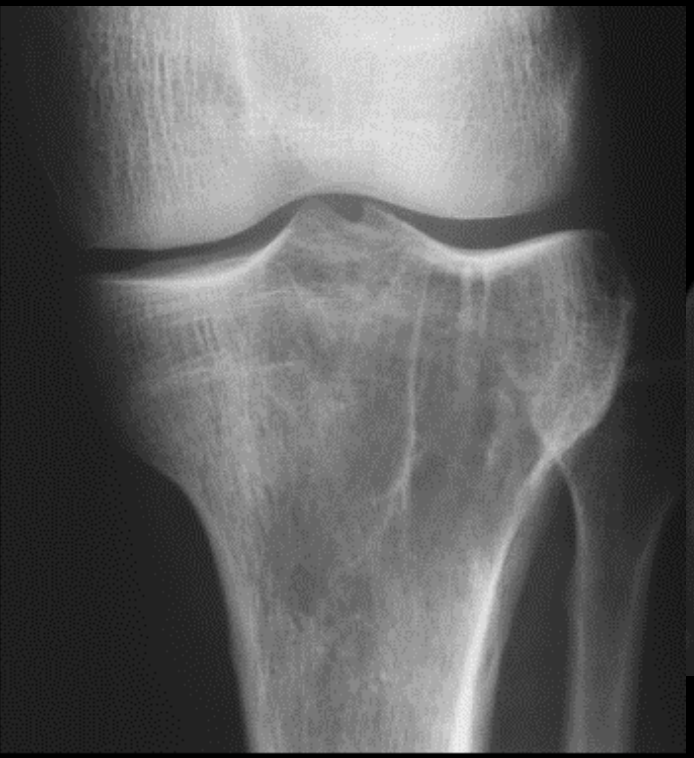
Lésion corticale et métaphysaire
Ostéolyse géographique avec liseré de sclérose

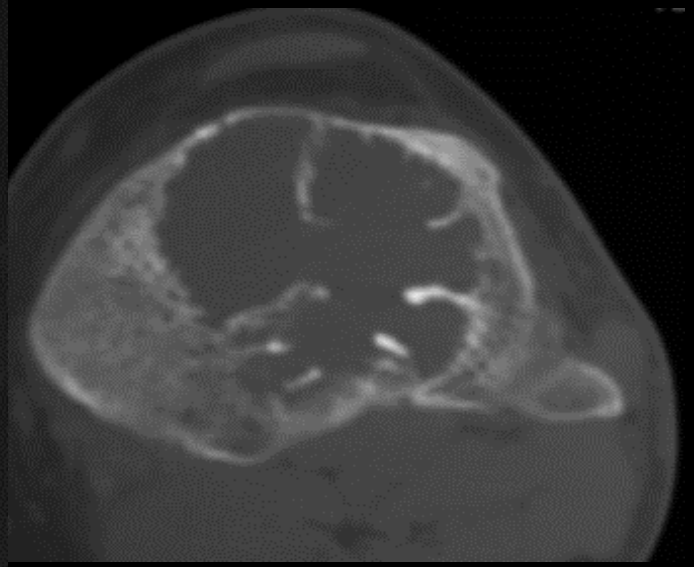


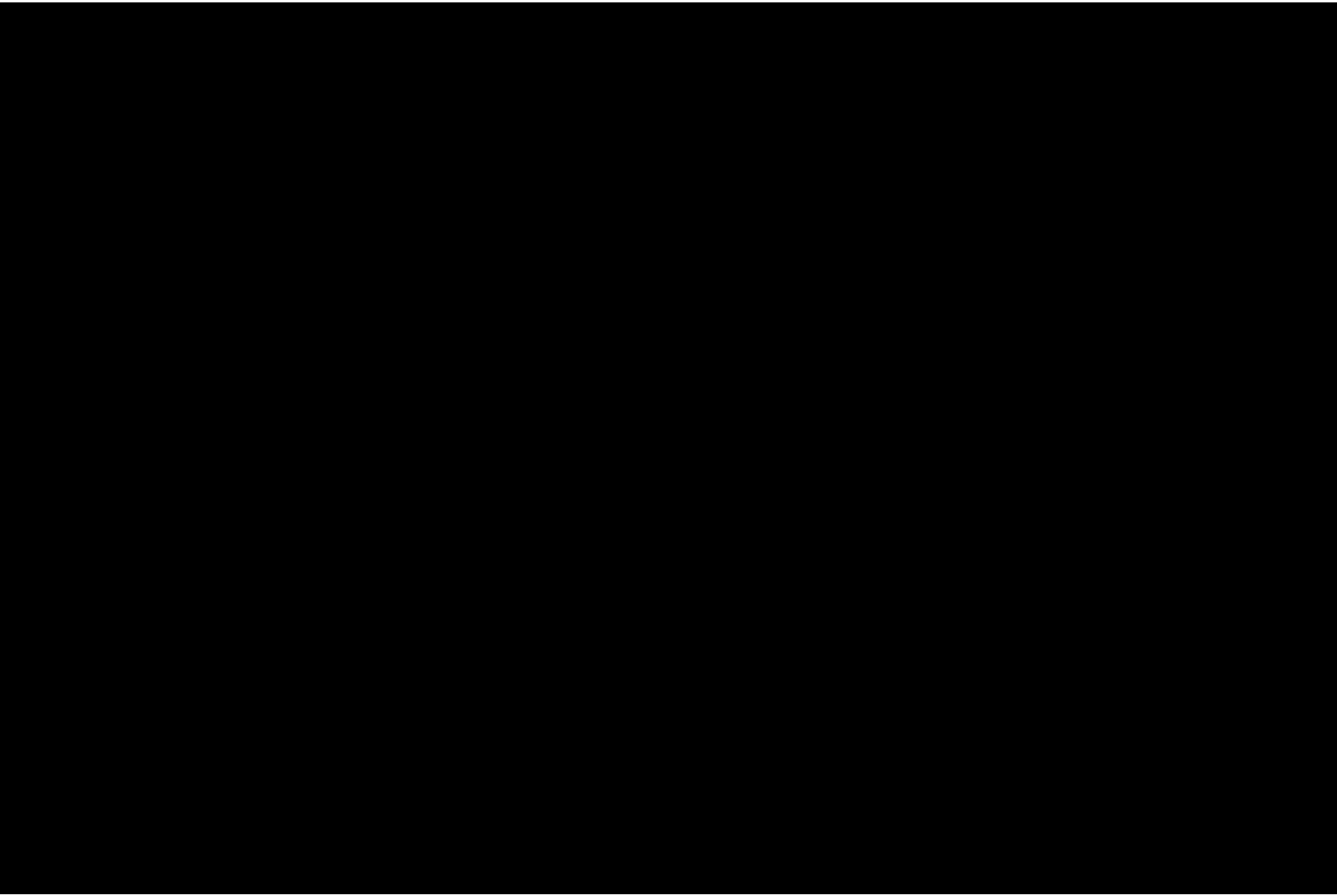
Sujet jeune, asymptomatique, unique
Fibrome non-ossifiant



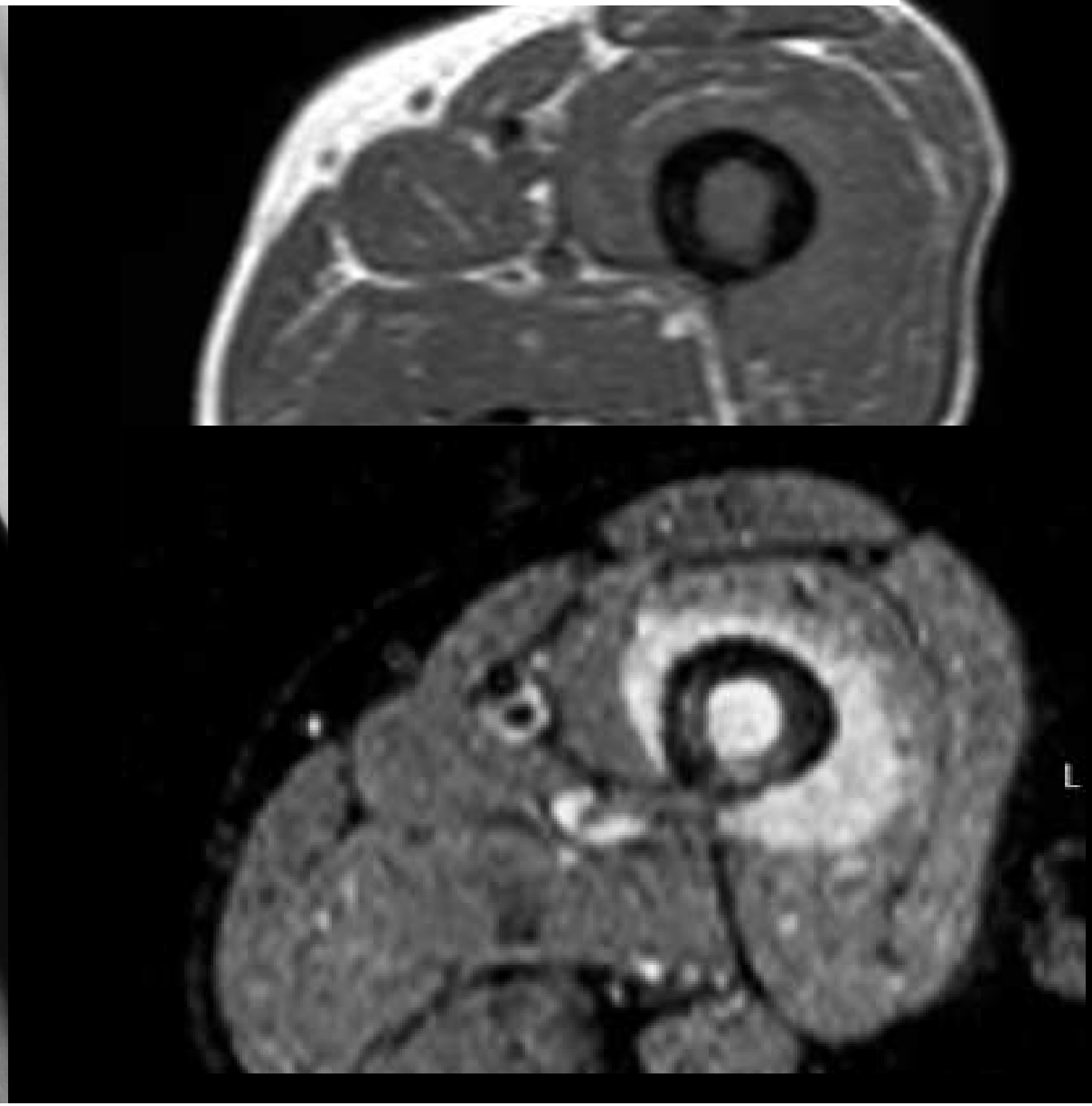
Lésion épiphyso-métaphysaire
Ostéolyse géographique sans liseré de sclérose
Homme âgé de 47 ans, douleurs, lésions multiples

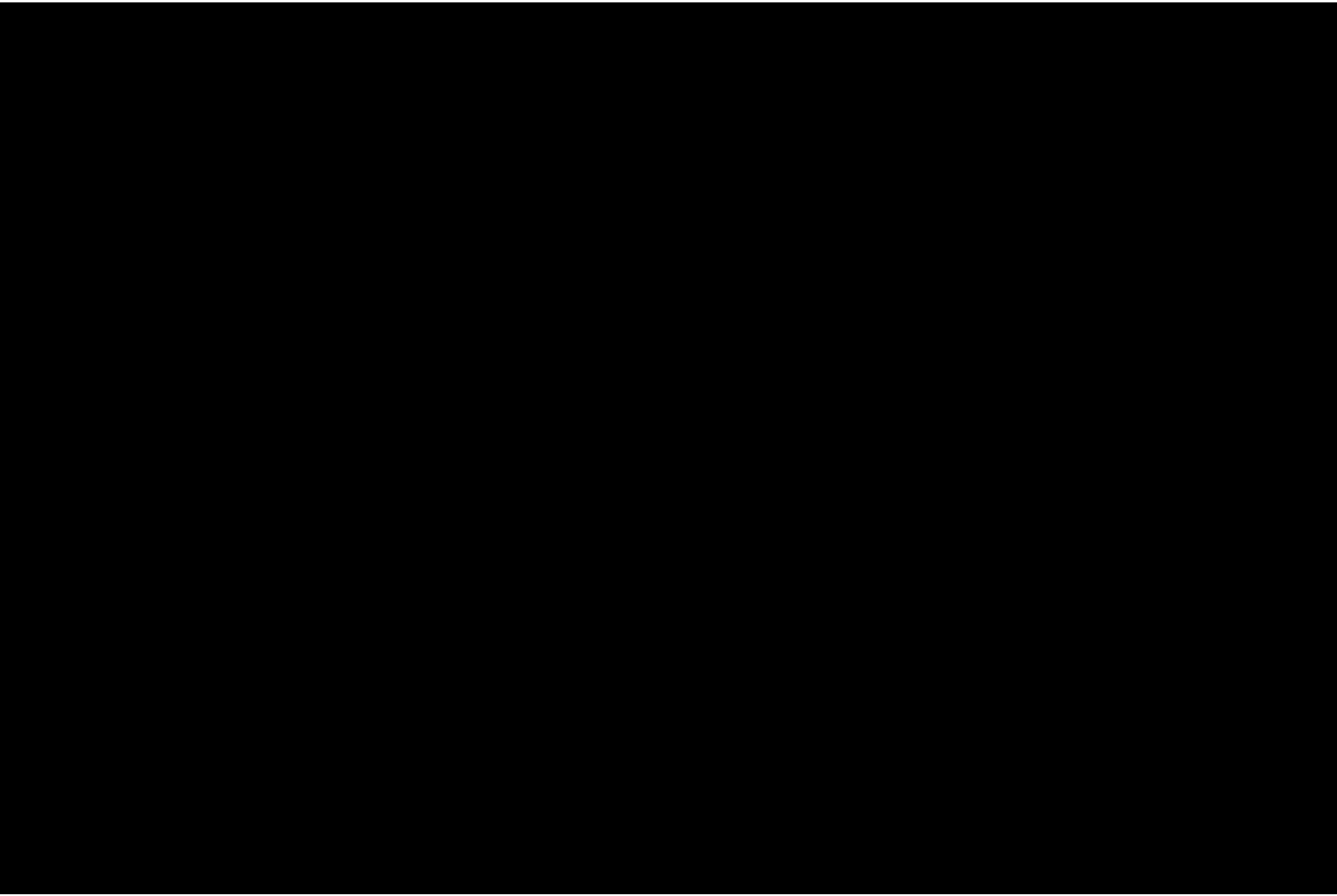






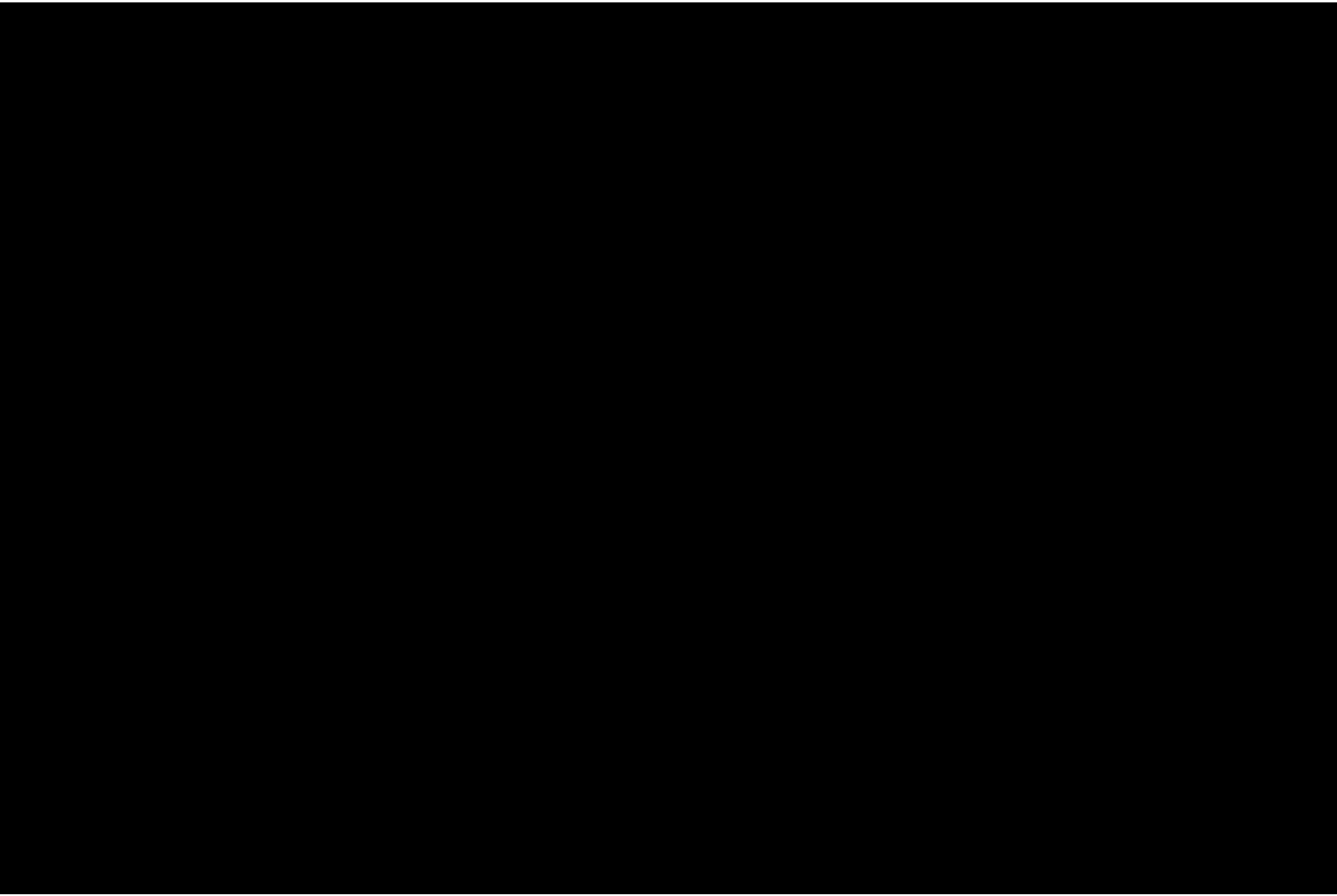
Lésion métaphyso-diaphysaire
Ostéolyse perméative (aspect vermoulu)
Homme âgé de 52 ans, douleurs, lésions multiples



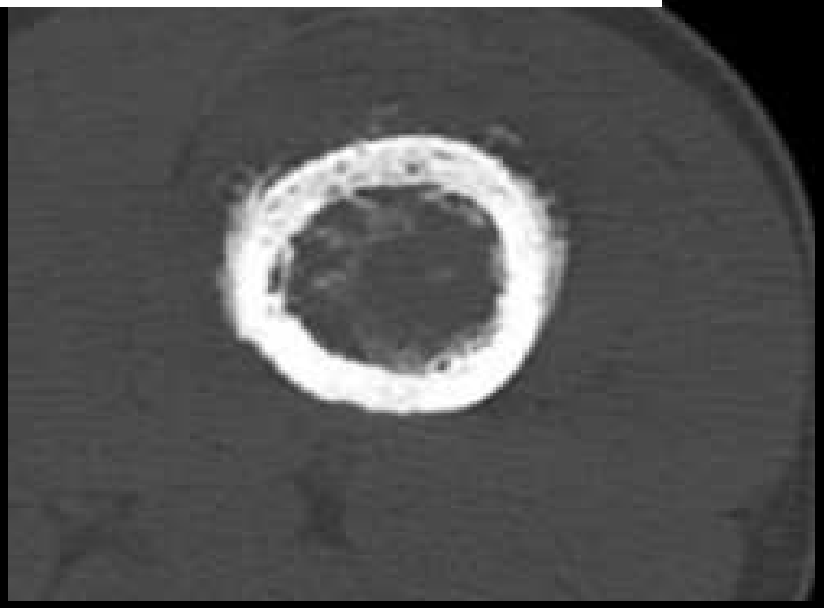


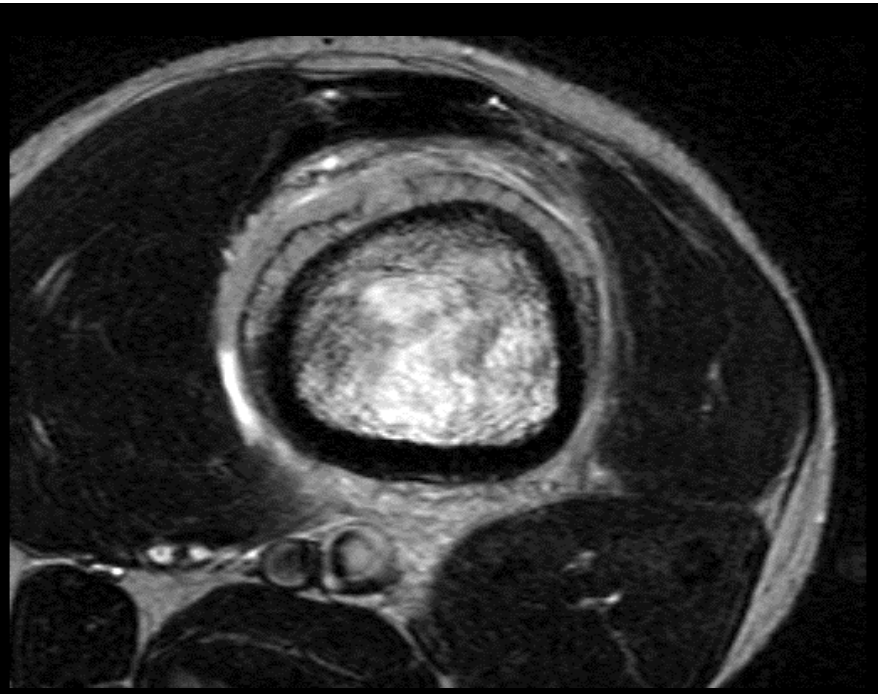
Types d' Ostéolyse – limites intra- et extra-osseuses

Ostéolyse perméative
Limites floues
Appositions spiculaires

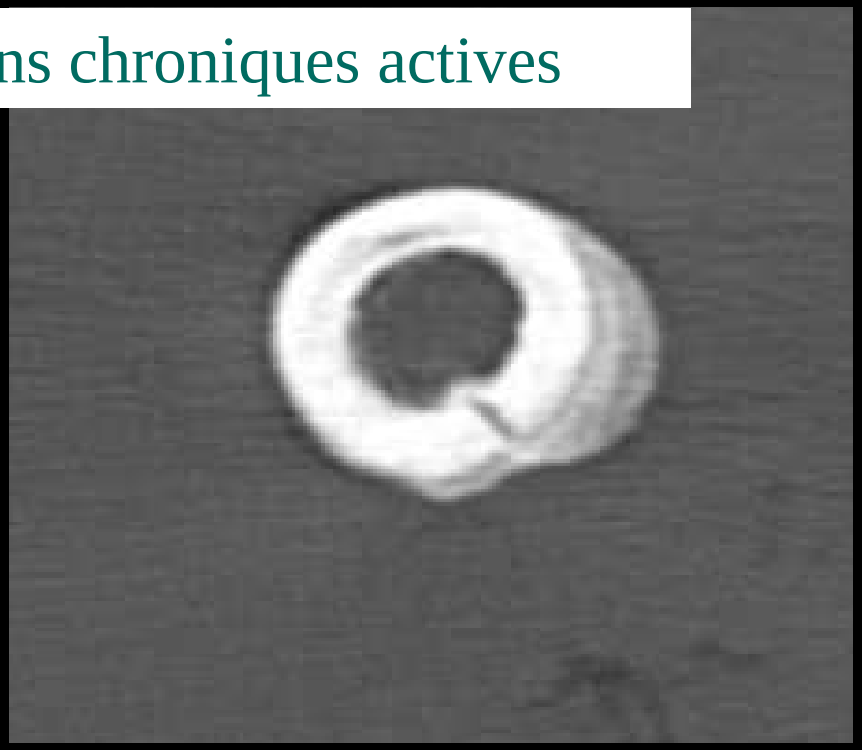


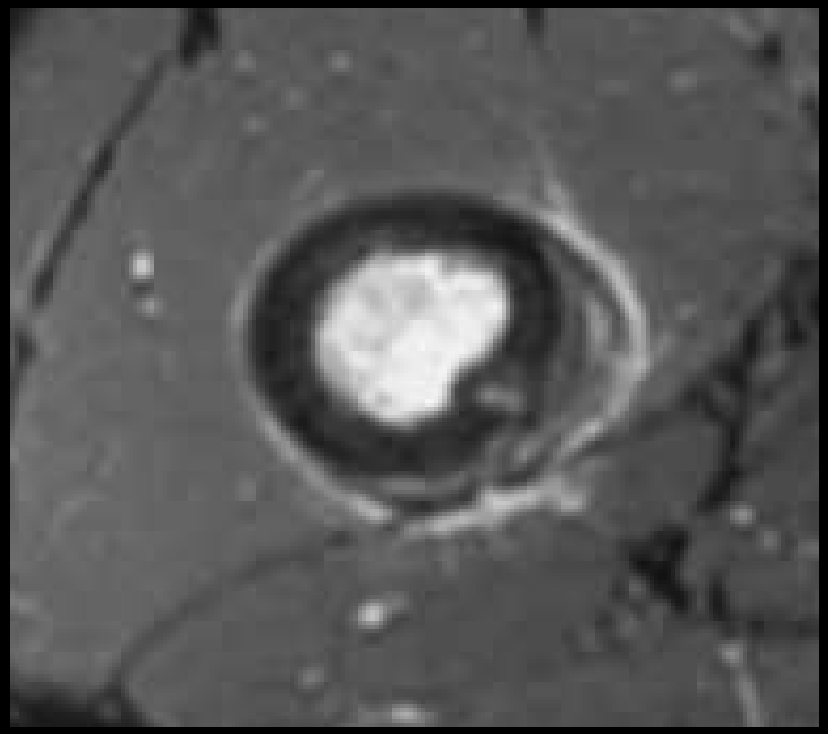
Appositions spiculaires actives





Appositions chroniques actives

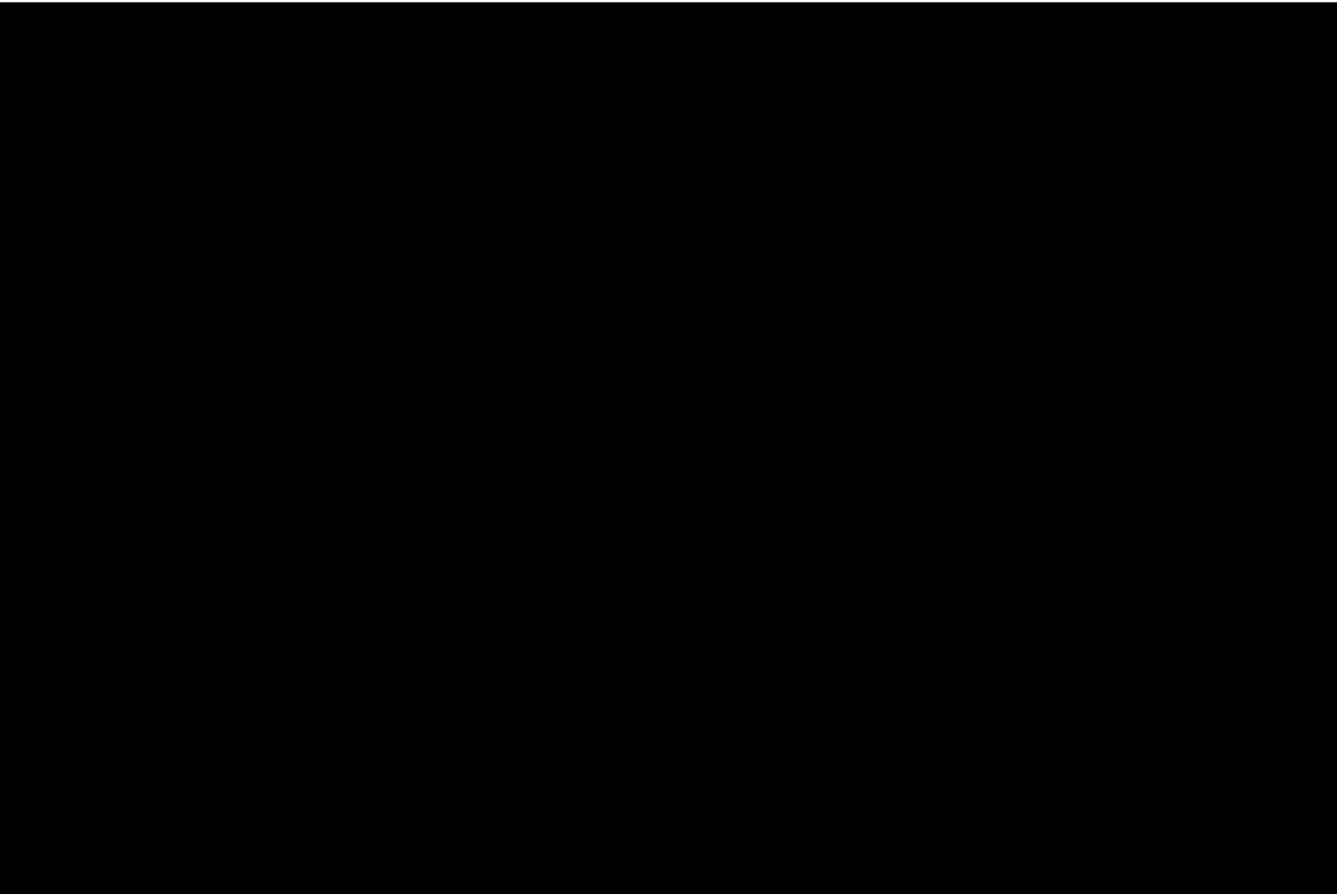




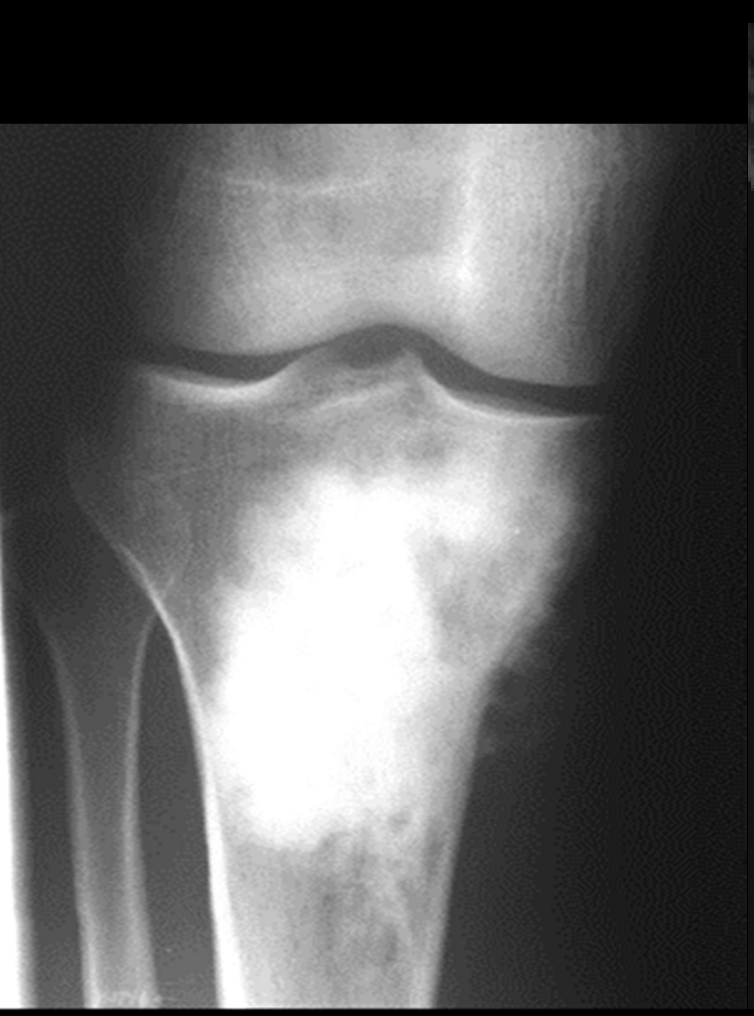
Principes d'analyse - lésion osseuse

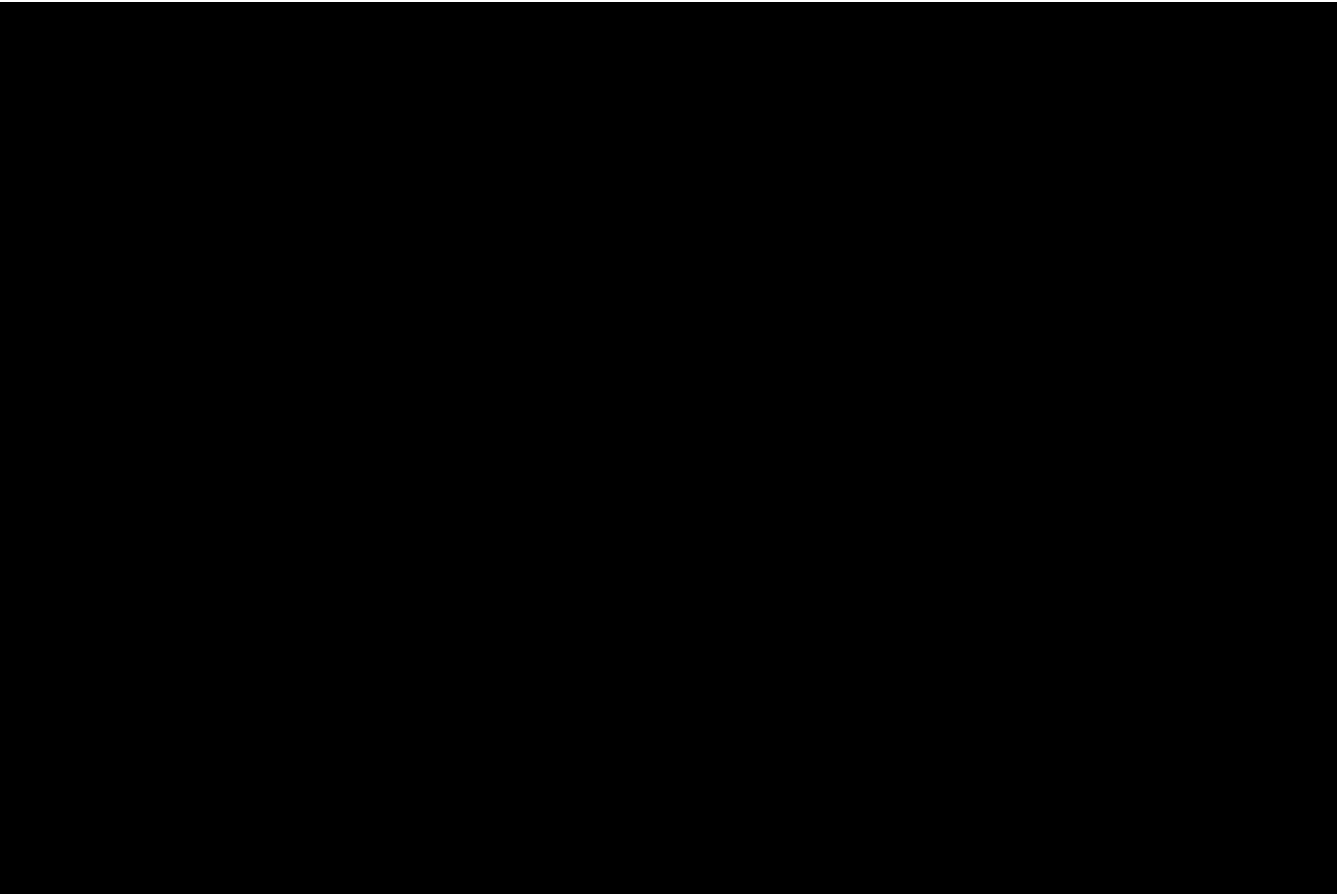
Paramètres intrinsèques

1. Topographie
2. Type de modifications structurale de l'os
3. Limites intra- et extraosseuses
4. Matrices tissulaires
   - osseuse – fibreuse (CT)
   - graisseuse – cartilagineuse (CT / IRM)
   - sang-liquide-remplacement-oedème (IRM)

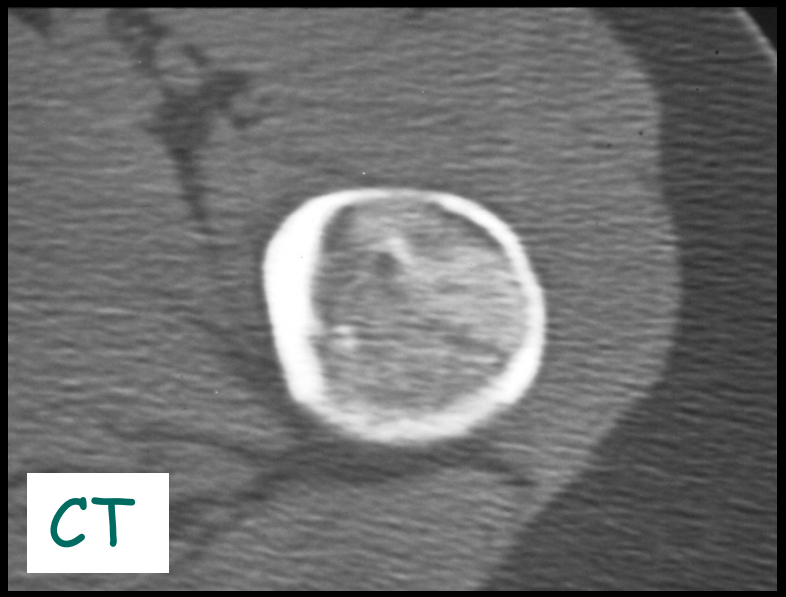


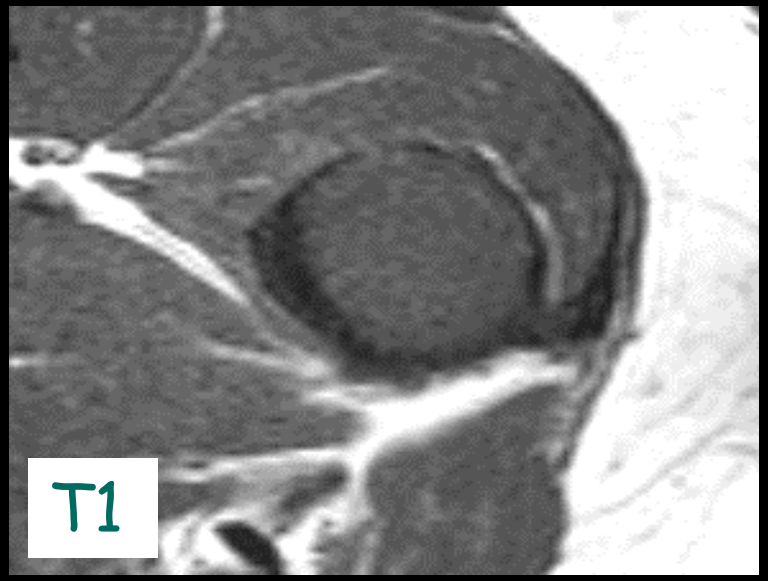
Matrice osseuse (CT)

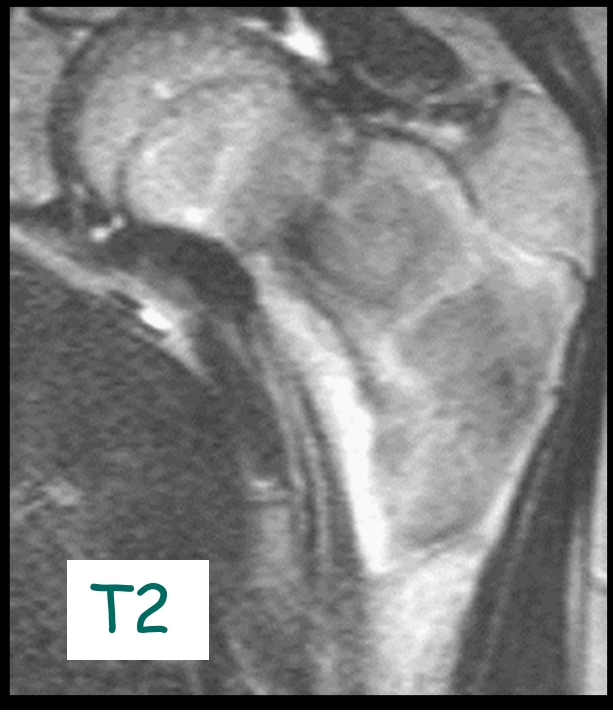


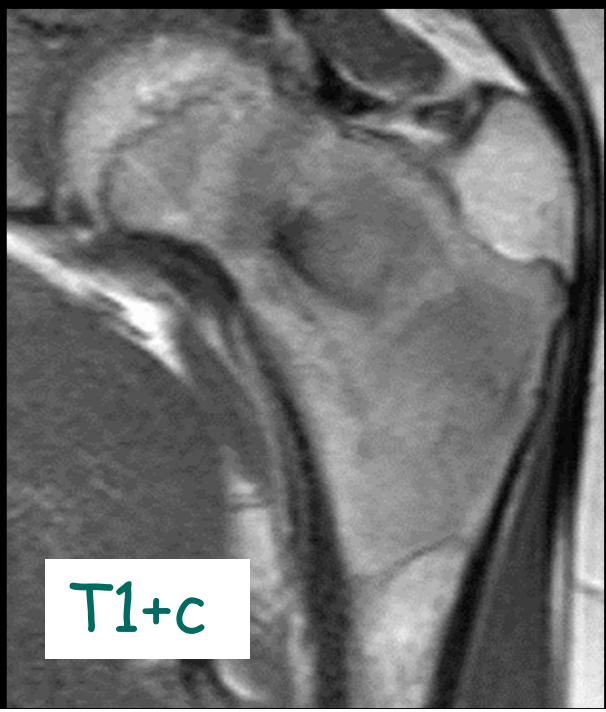


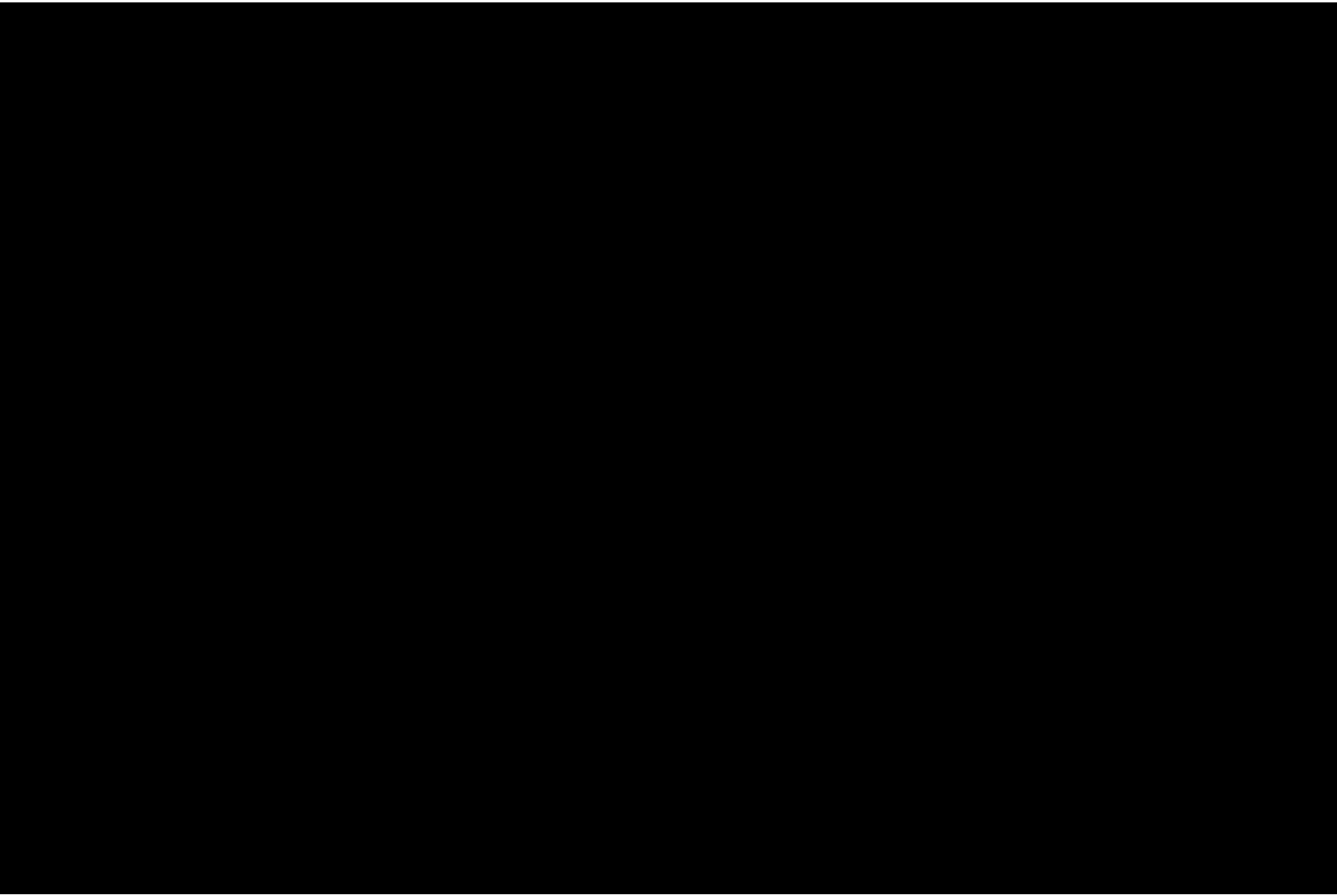
Matrice fibreuse (CT)



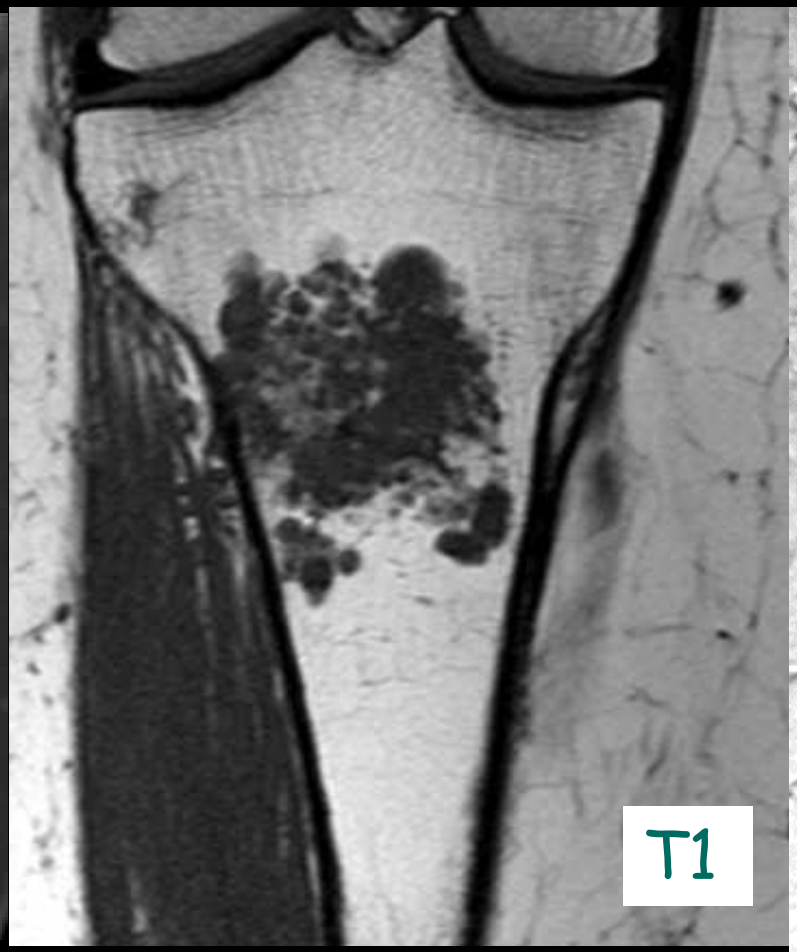








Matrice cartilagineuse (CT / IRM)



c

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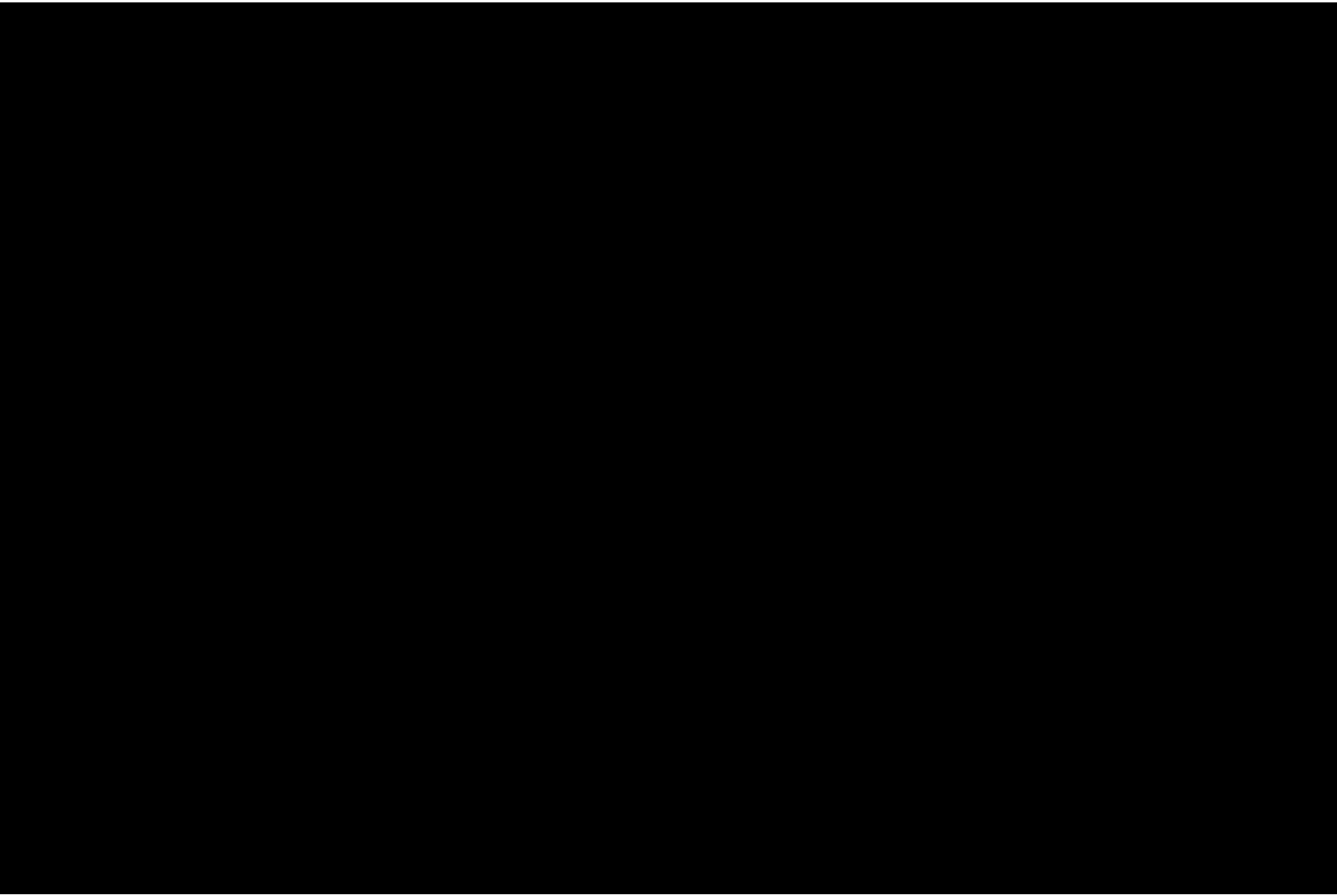
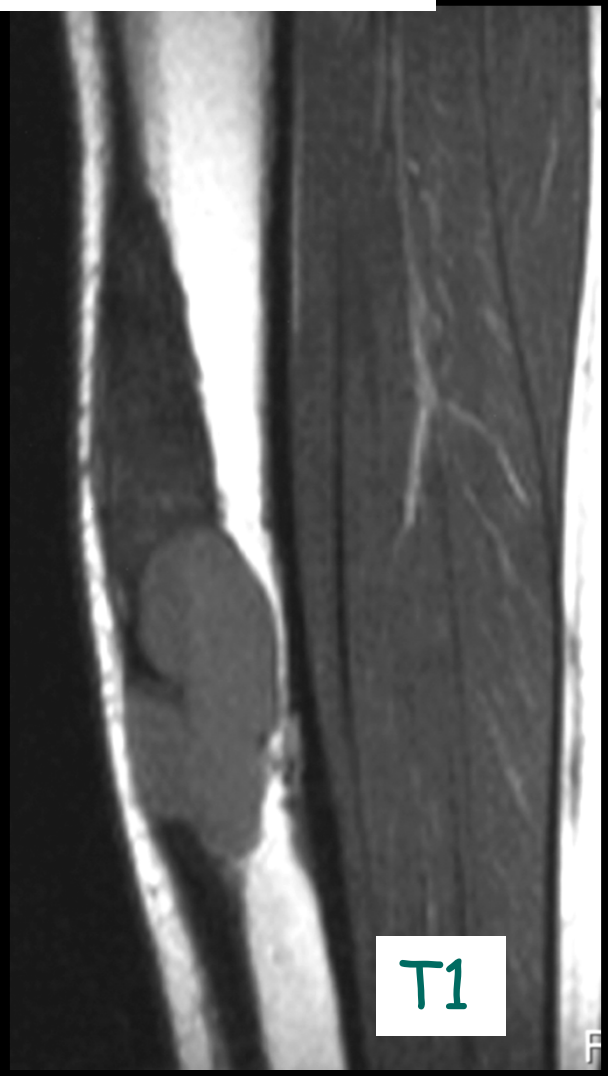
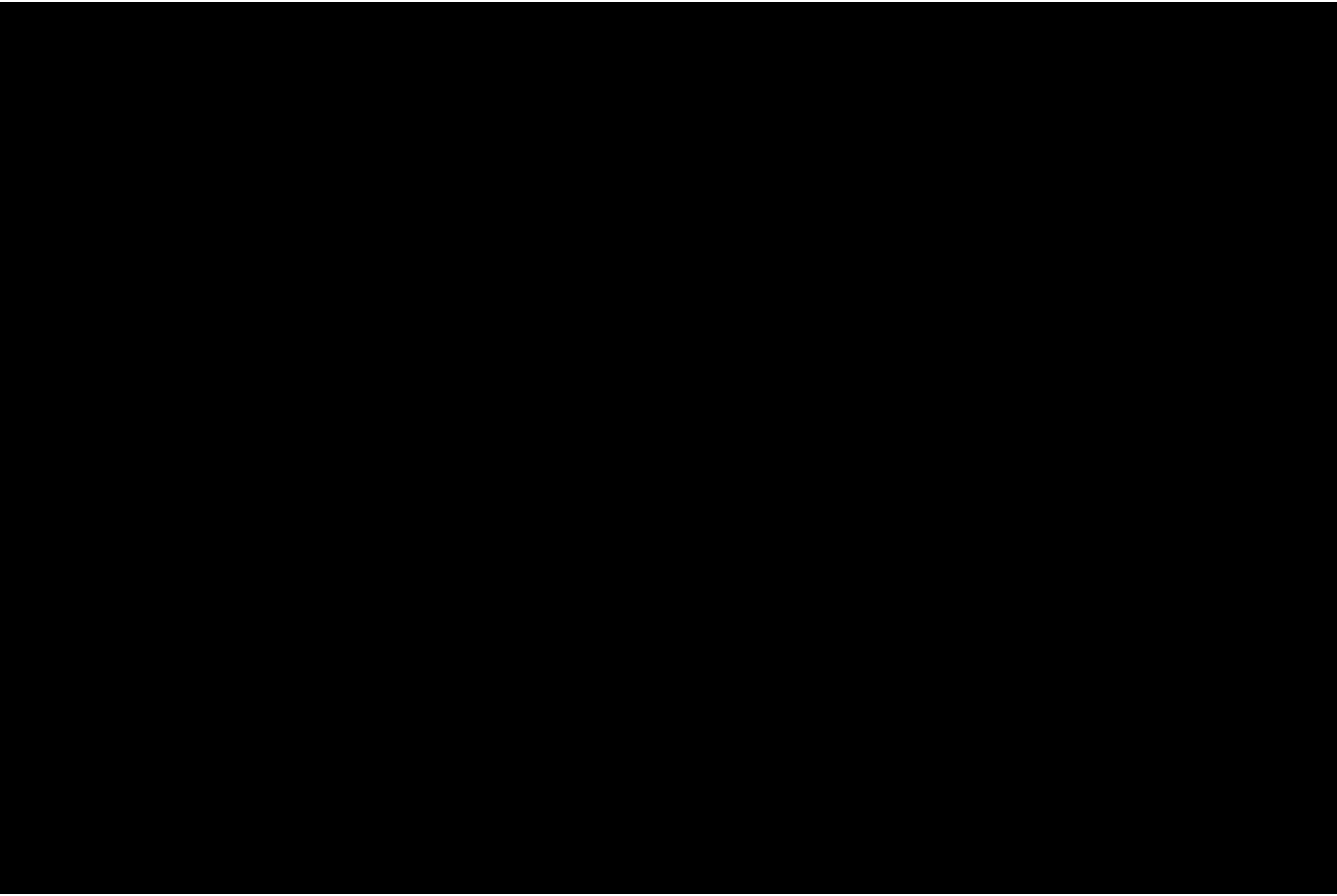
Matrice graisseuse (CT / IRM)



Matrice liquidienne (IRM)





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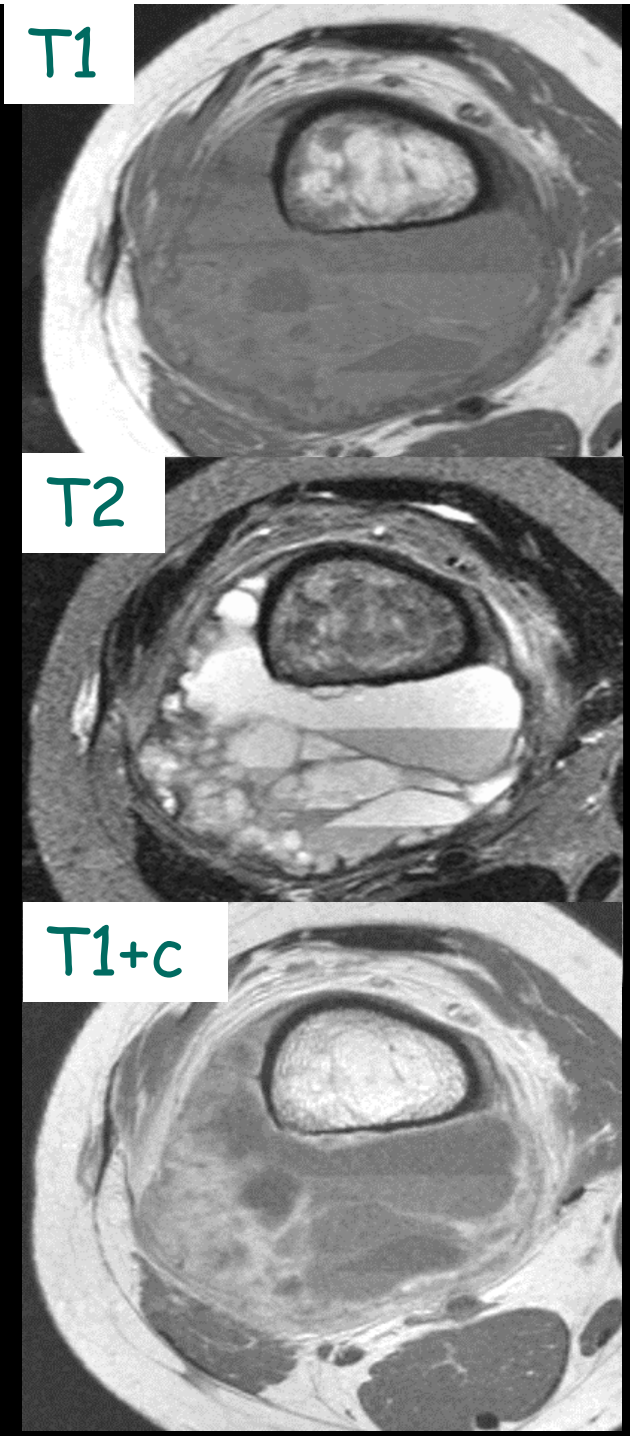

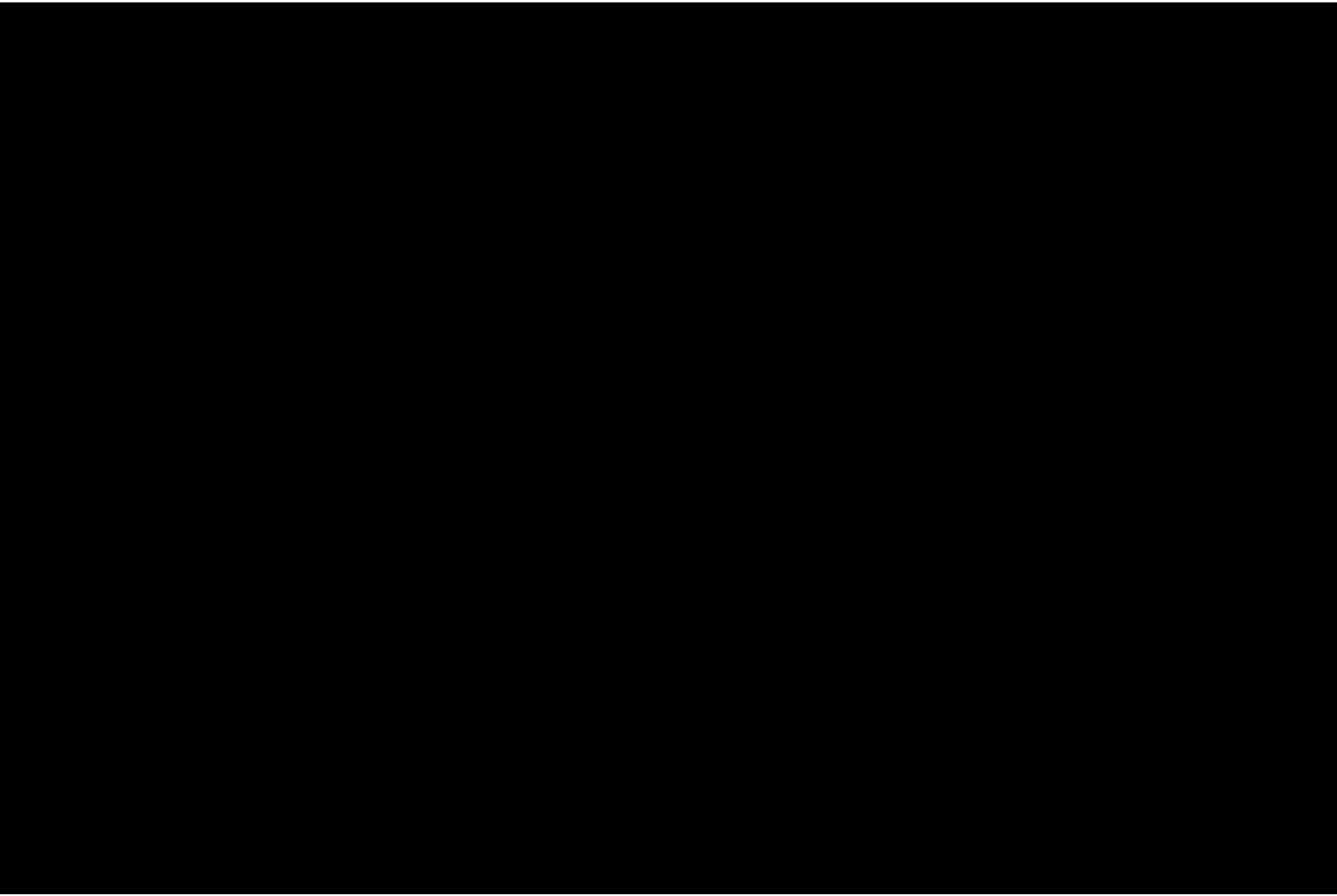

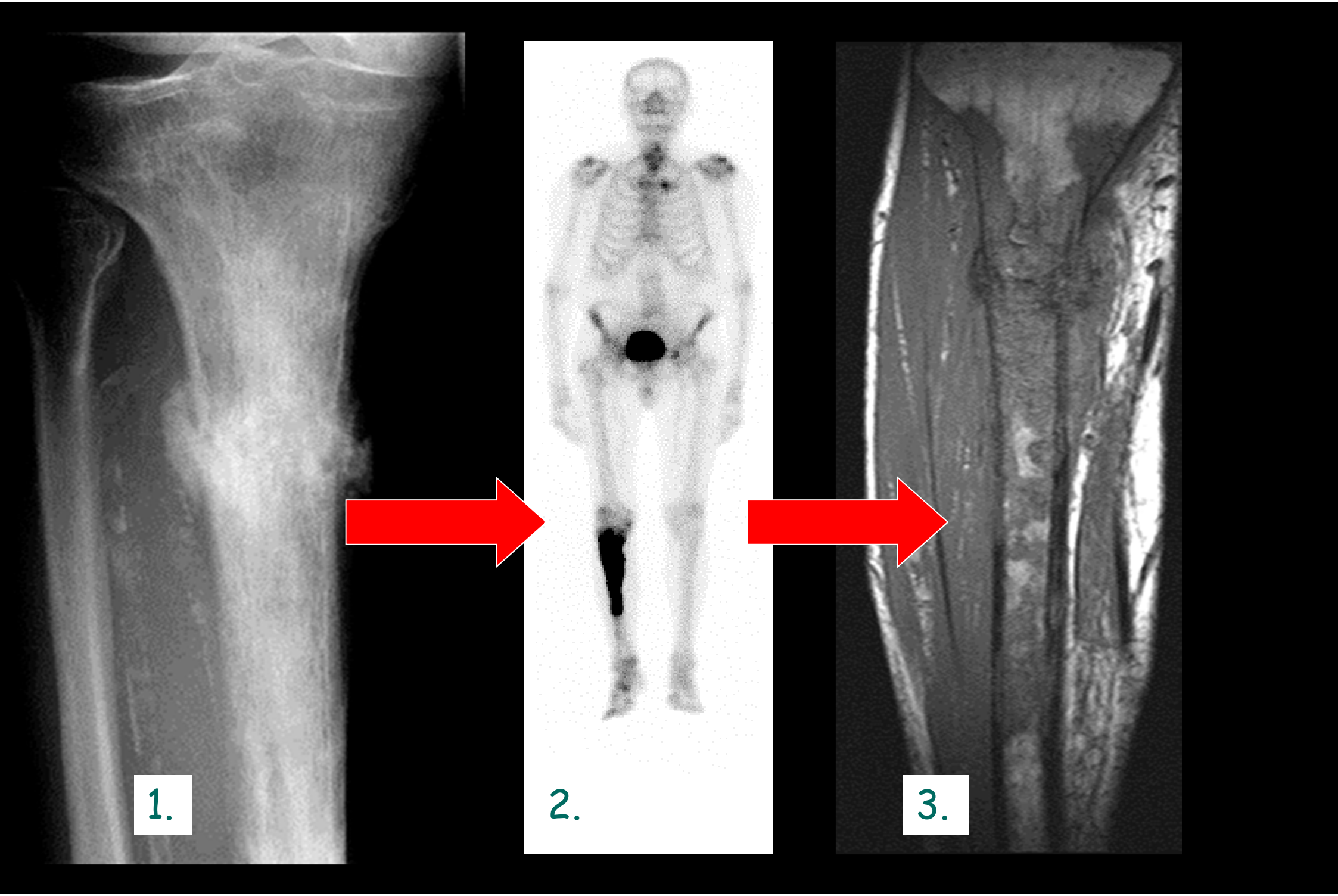
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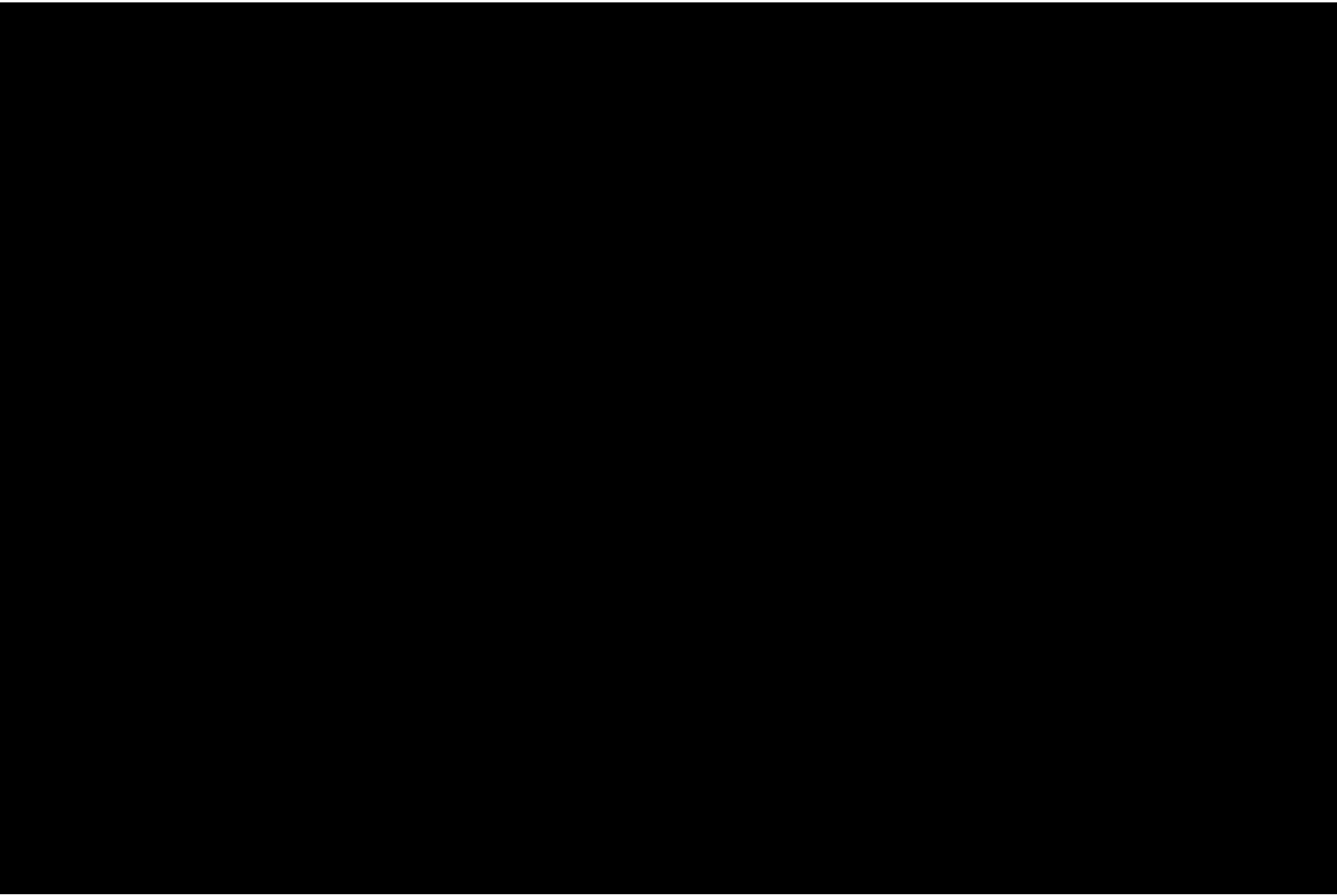


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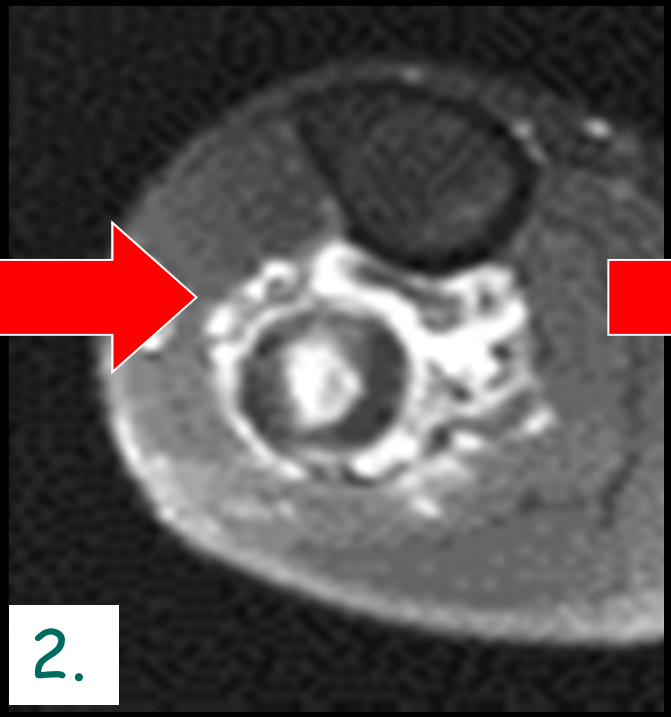
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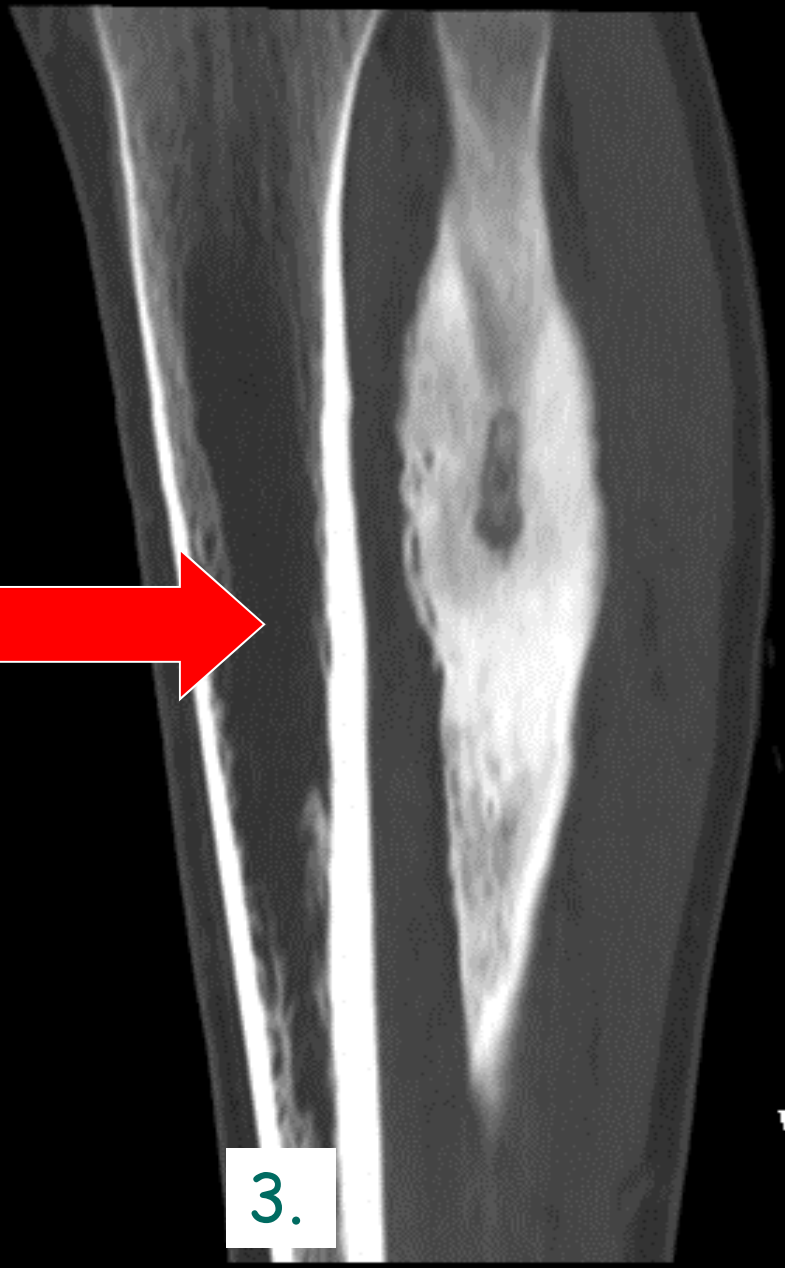
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