

Intérêt du scanner 3D dans les fractures articulaires



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1/ Qu'est-ce qu'un scanner ?

2/ Qu'est-ce qu'un scanner 3D ?

3/ Qu'est-ce qu'un scanner 3D en cas de fracture articulaire ?

4/ Qu'est-ce qu'un bon scanner 3D en cas de fracture articulaire ?

Préambule

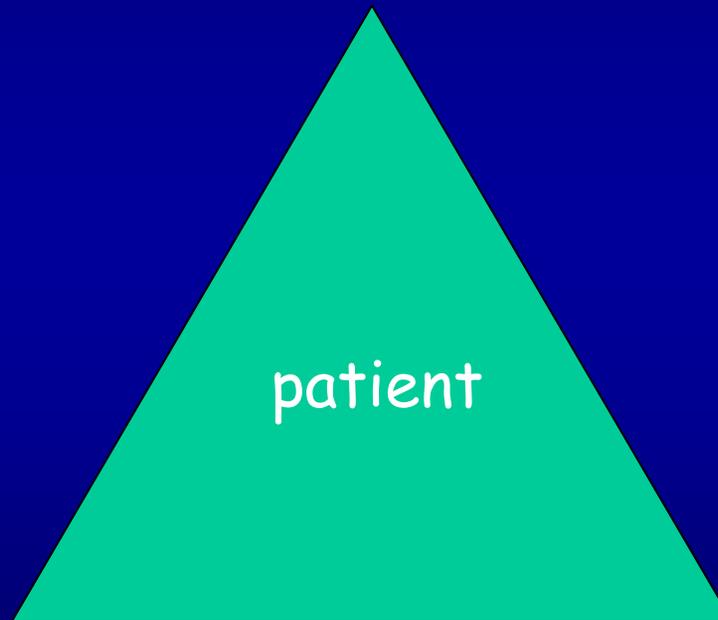
imagerie = production d'information

exhaustive

patient

intelligible

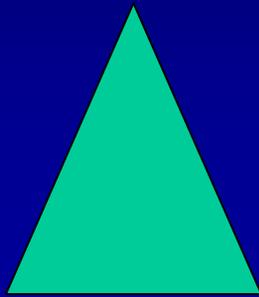
pertinente



Qu'est ce qu'un scanner ?

Absorption des rayons X au travers de la matière

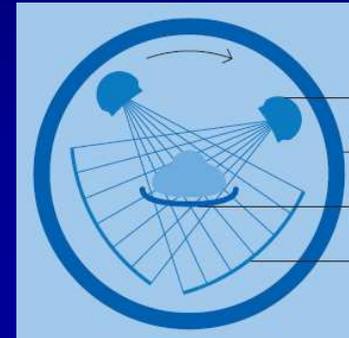
Radiographie



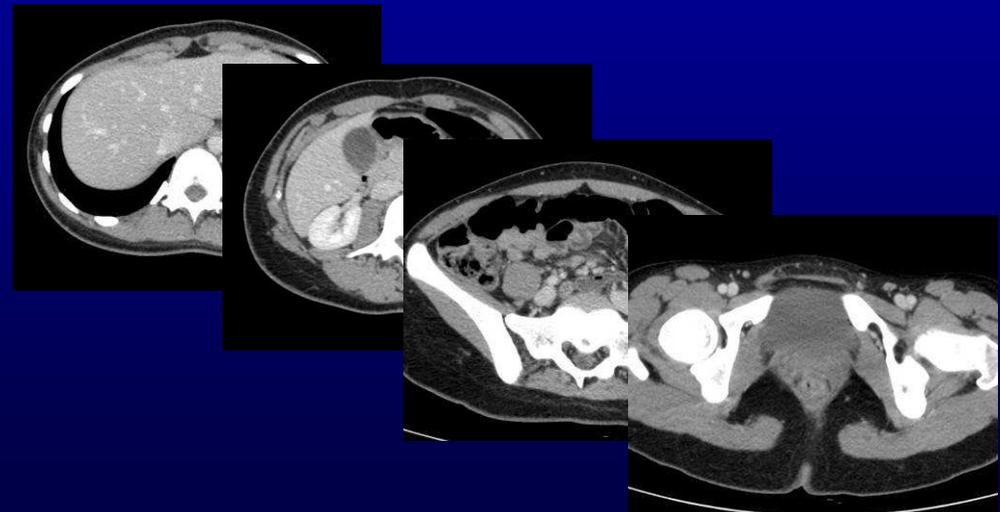
1 image
(projective)



Scanner



1 succession d'images
(tranches)



4 densités élémentaires

De façon générale

+++

+++

++

+

+++

os
air
graisse
tissus

+ contraste iodé

Ostéo-articulaire

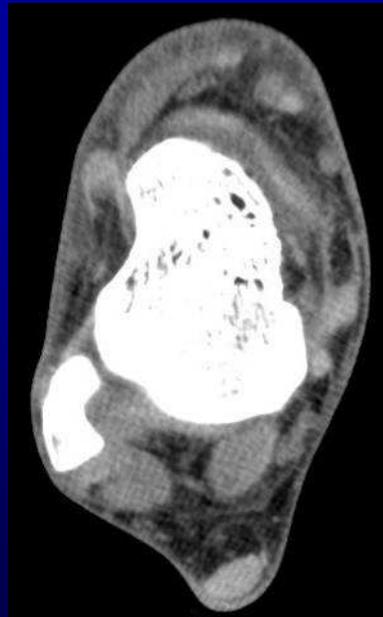
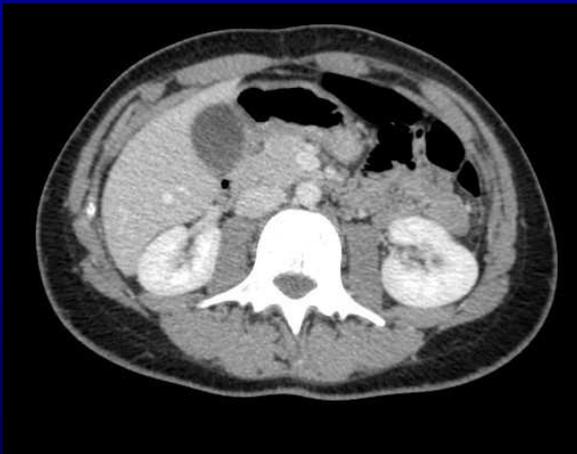
+++

0

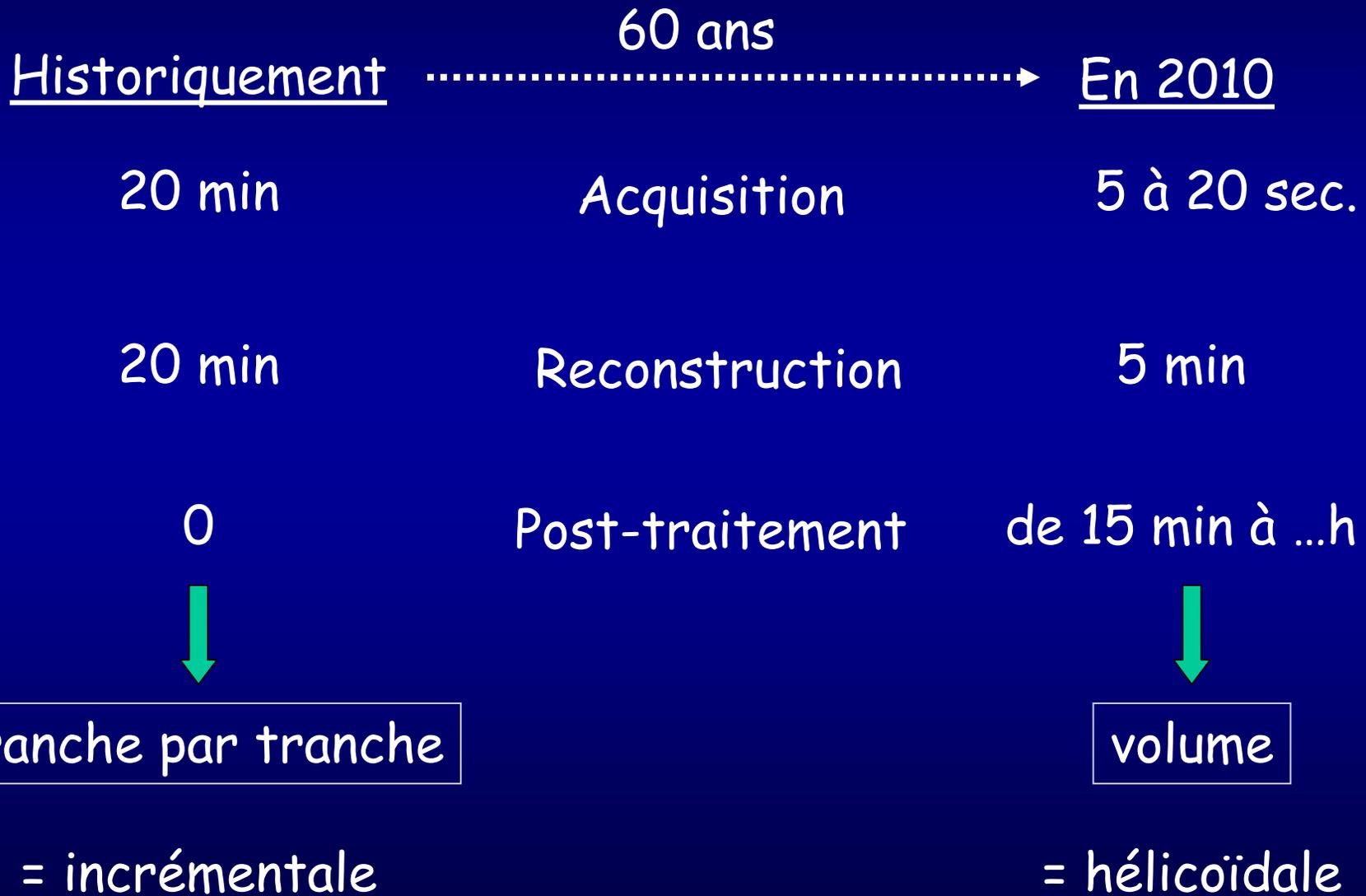
+/-

-

+/-

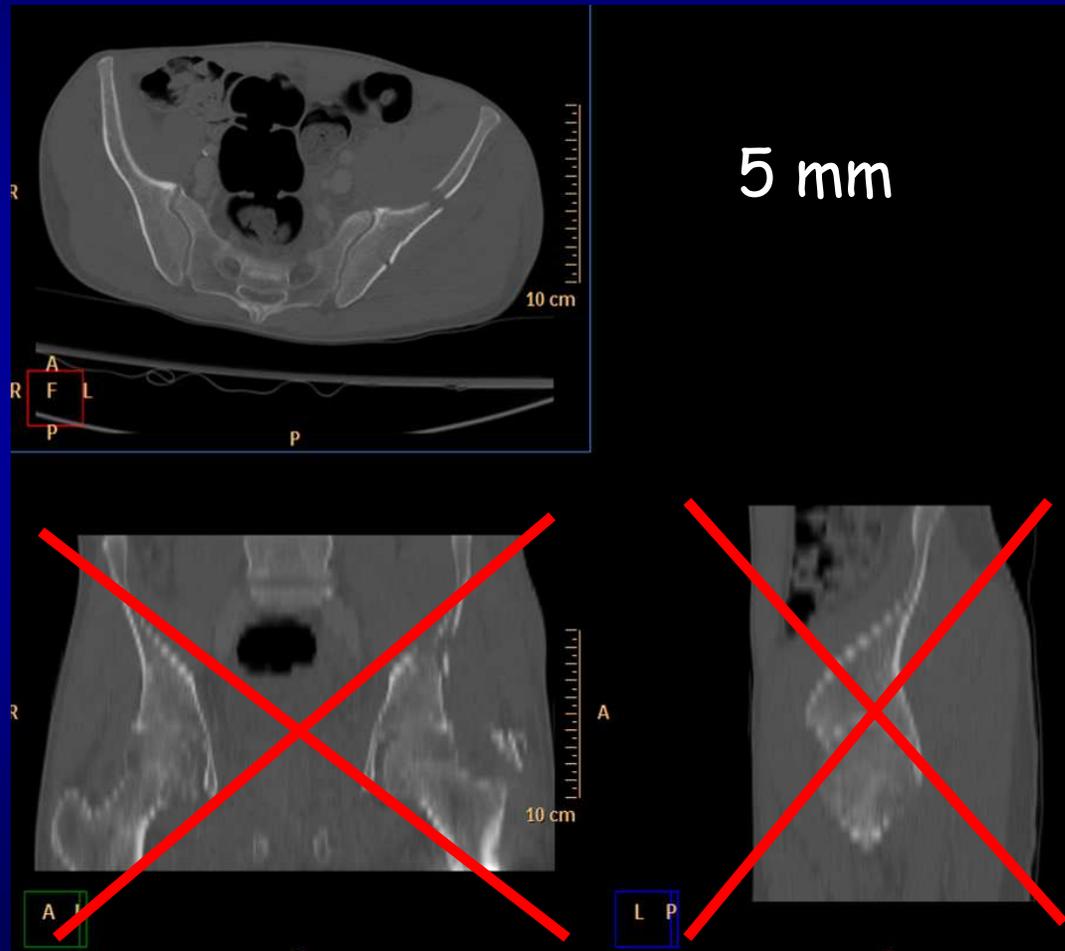


Déroulement d'un scanner



tranche par tranche

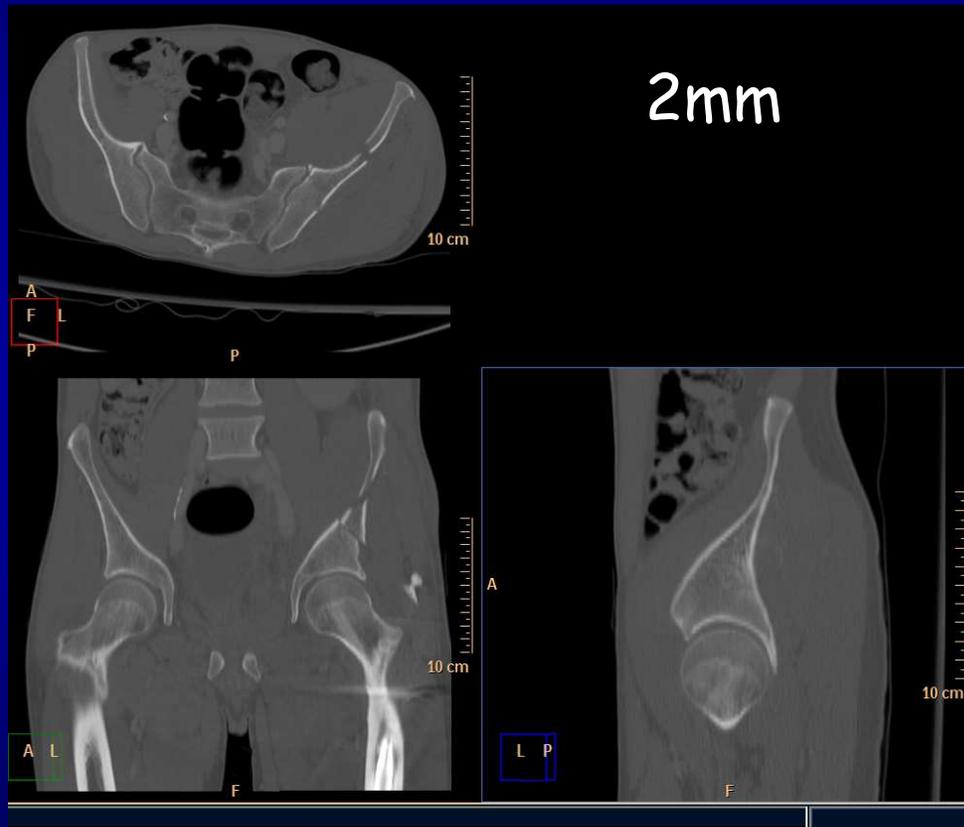
Pas de post-traitement !



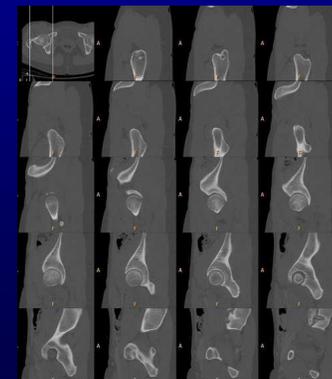
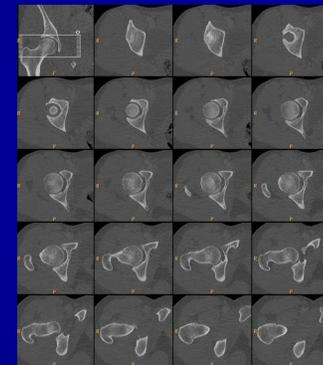
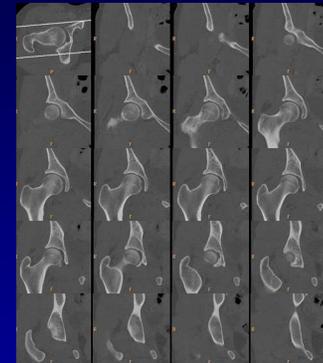
60 images

Volume

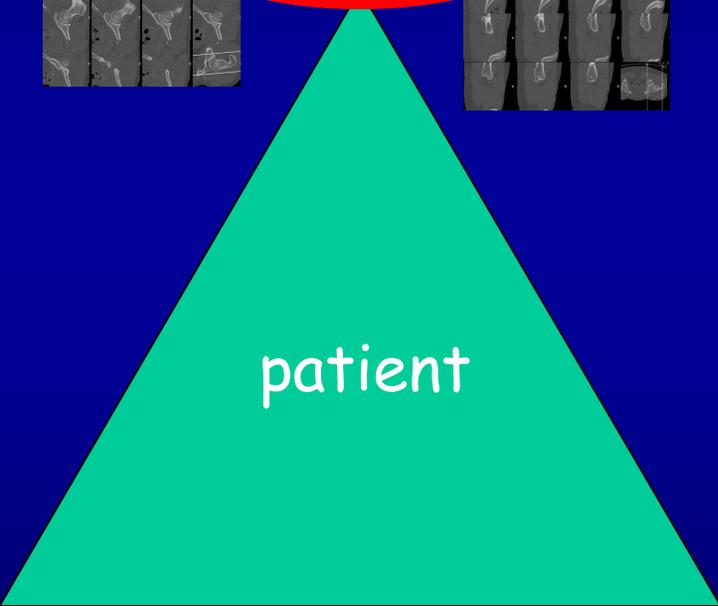
post-traitement systématique
= reformations multiplanaires = MPR = 2D



162 images *3



imagerie = production d'information

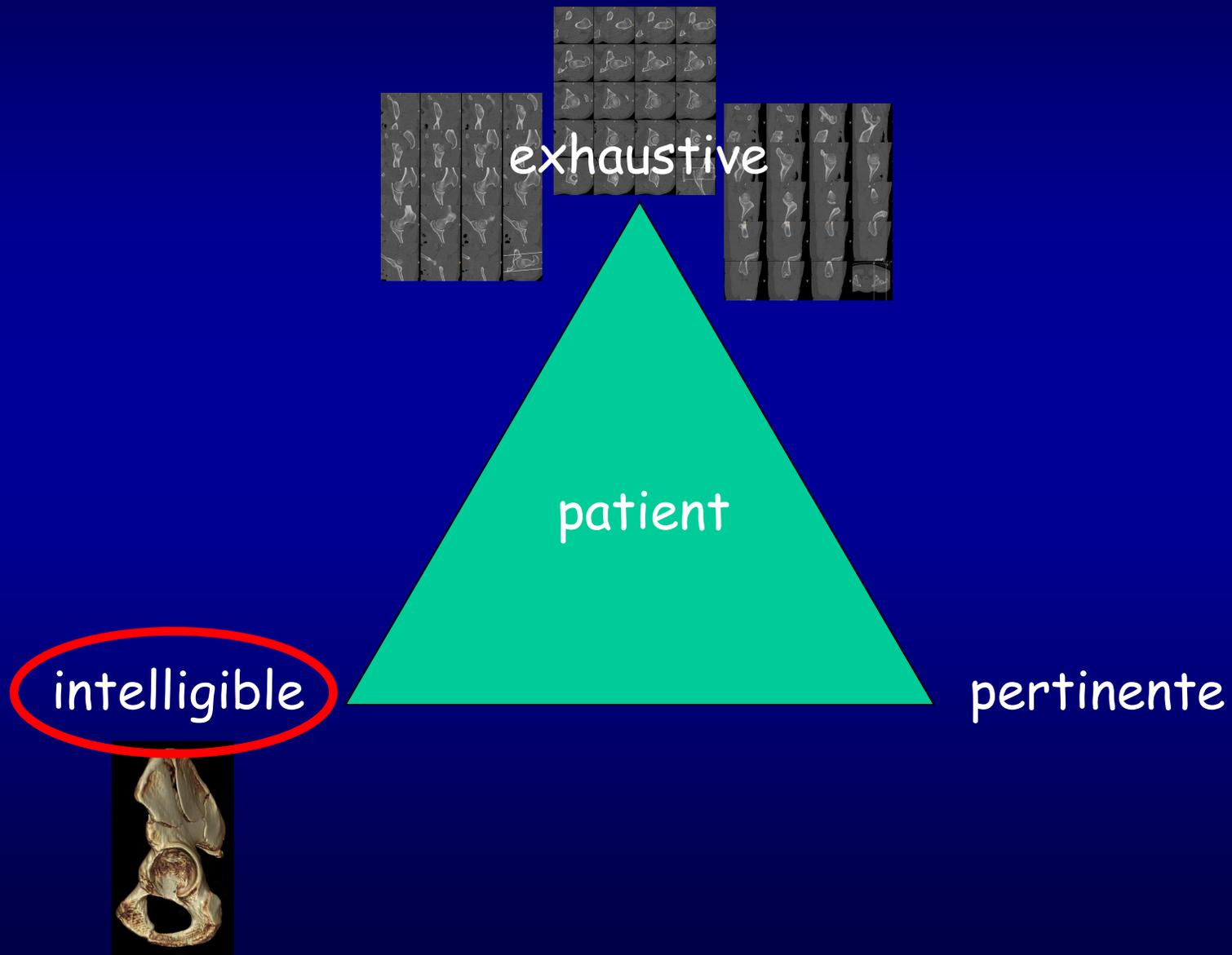


intelligible

pertinente

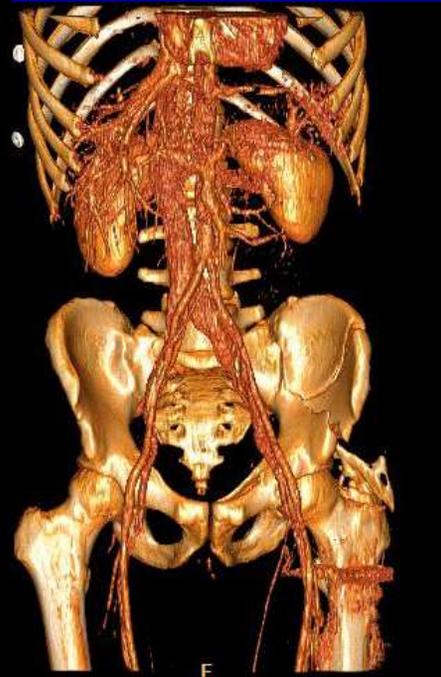
Qu'est ce qu'un scanner 3D ?

3D = manière de rendre intelligible l'information



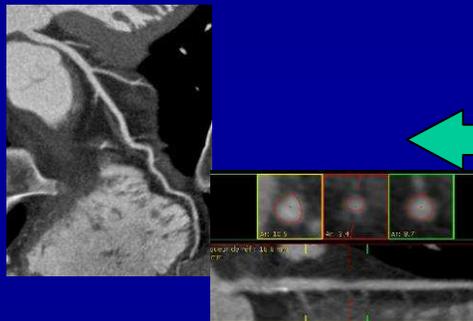
Volume

Tous les scanners sont volumiques
= ils sont tous « 3D » !

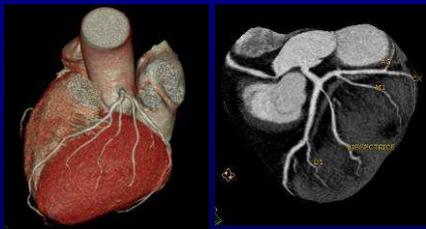




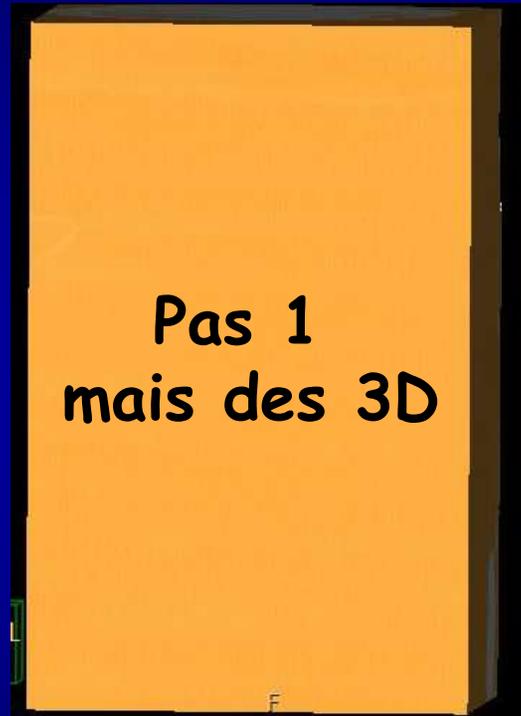
Coloscopie virtuelle



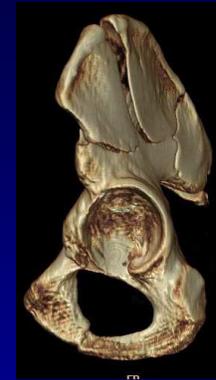
études vasculaires



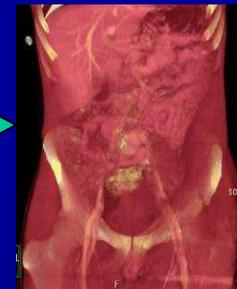
Coroscanner



Pas 1
mais des 3D



Volume rendering



VIP



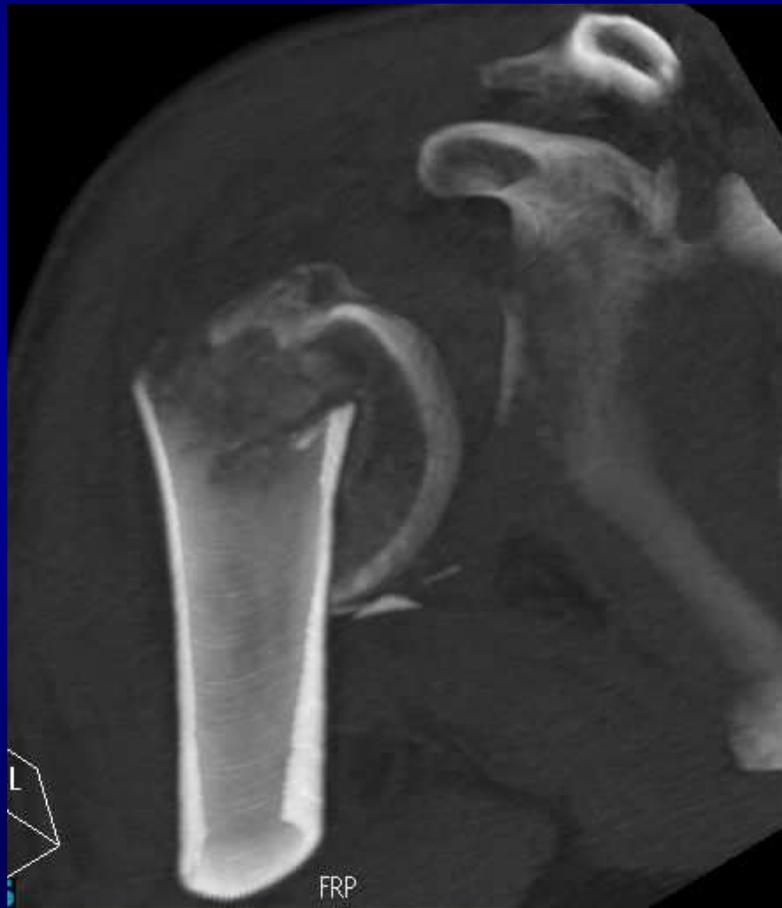
MIP

MIP (maximum intensity projection)

sélection de tous les pixels les plus denses
sur une tranche plus ou moins épaisse

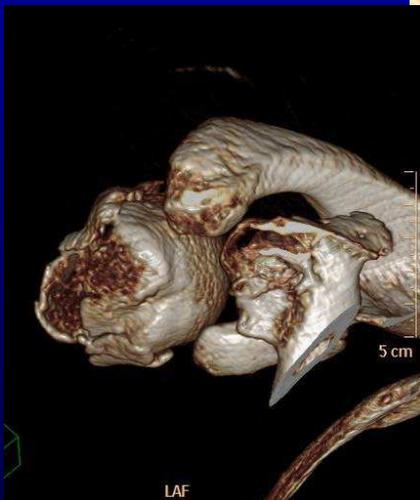
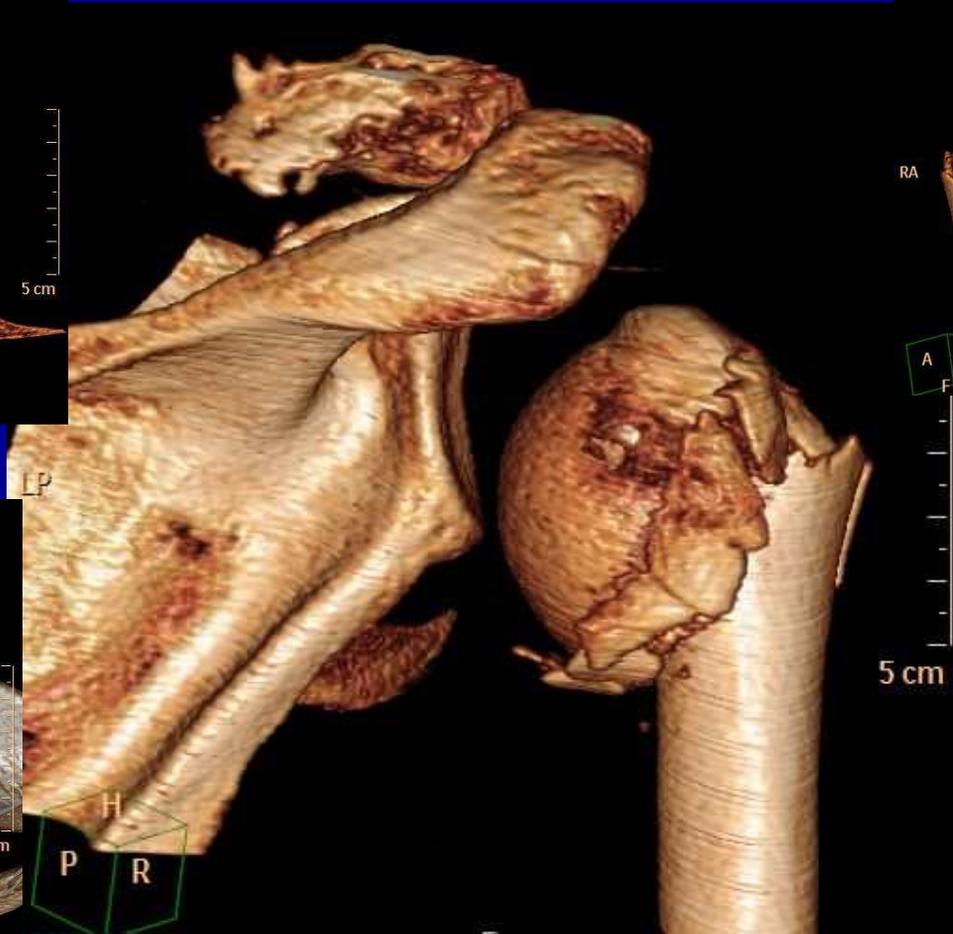
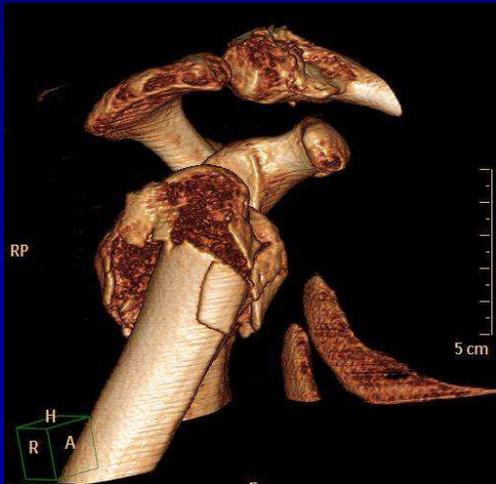


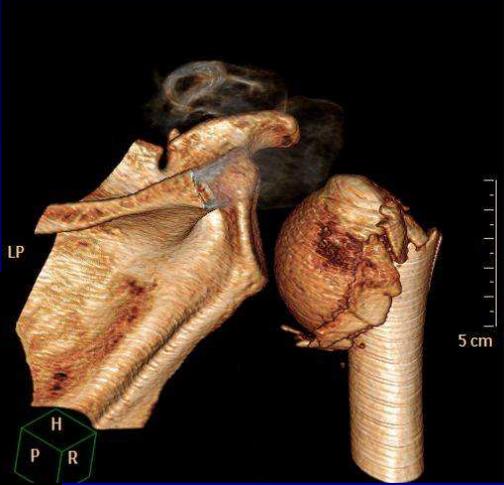
VIP (volume intensity projection)
= MIP sur tout le volume + intensité plus importante des pixels les plus proches (perspective)



VR (Volume rendering)

source lumineuse extérieure créant un effet de profondeur, appliquée au volume



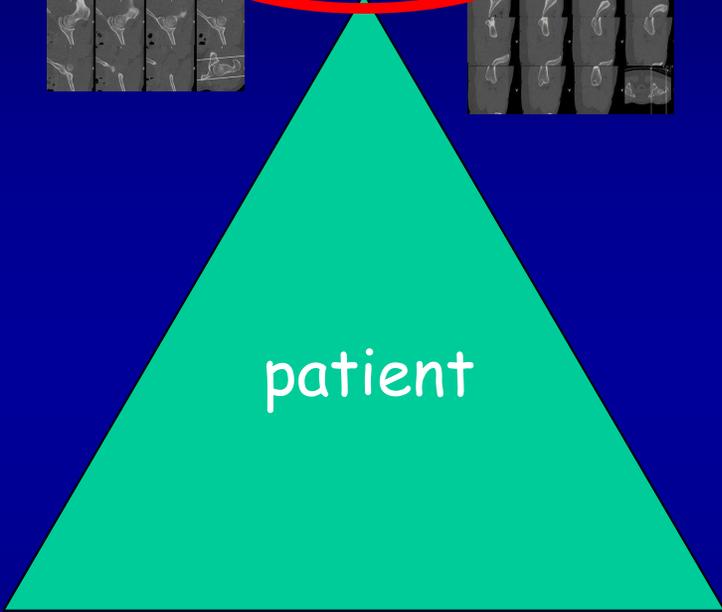




Qu'est ce qu'un scanner 3D
en cas de fracture articulaire ?



exhaustive



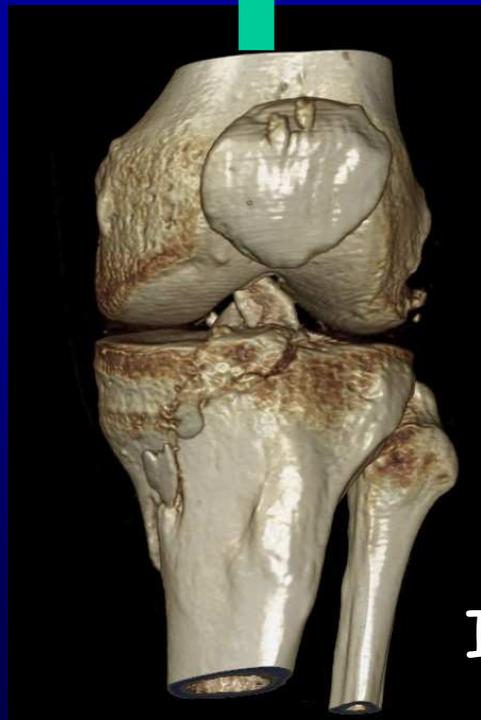
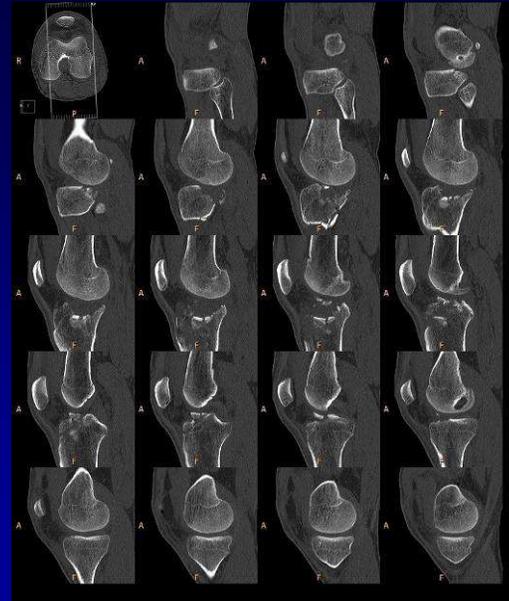
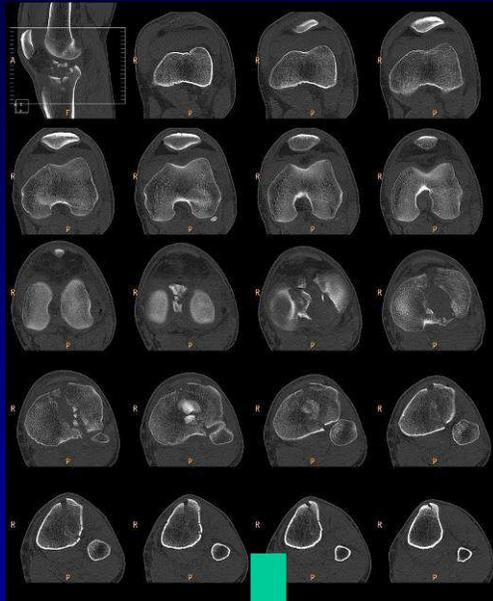
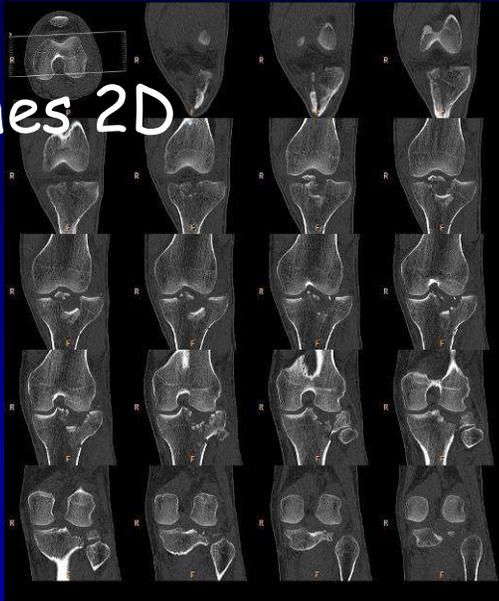
patient



intelligible

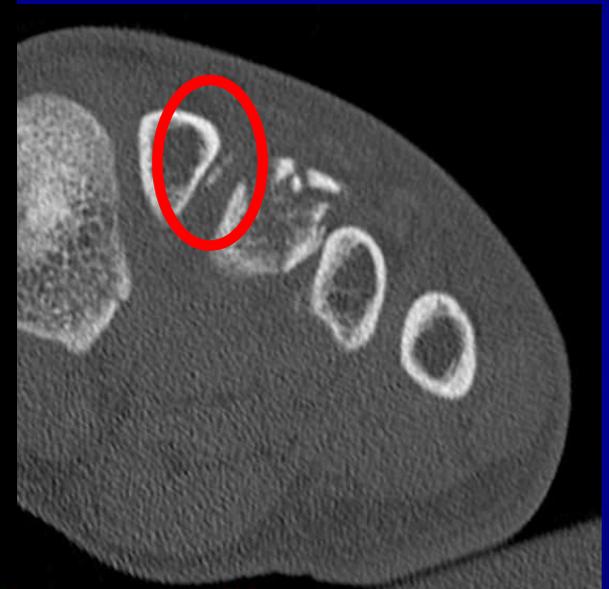
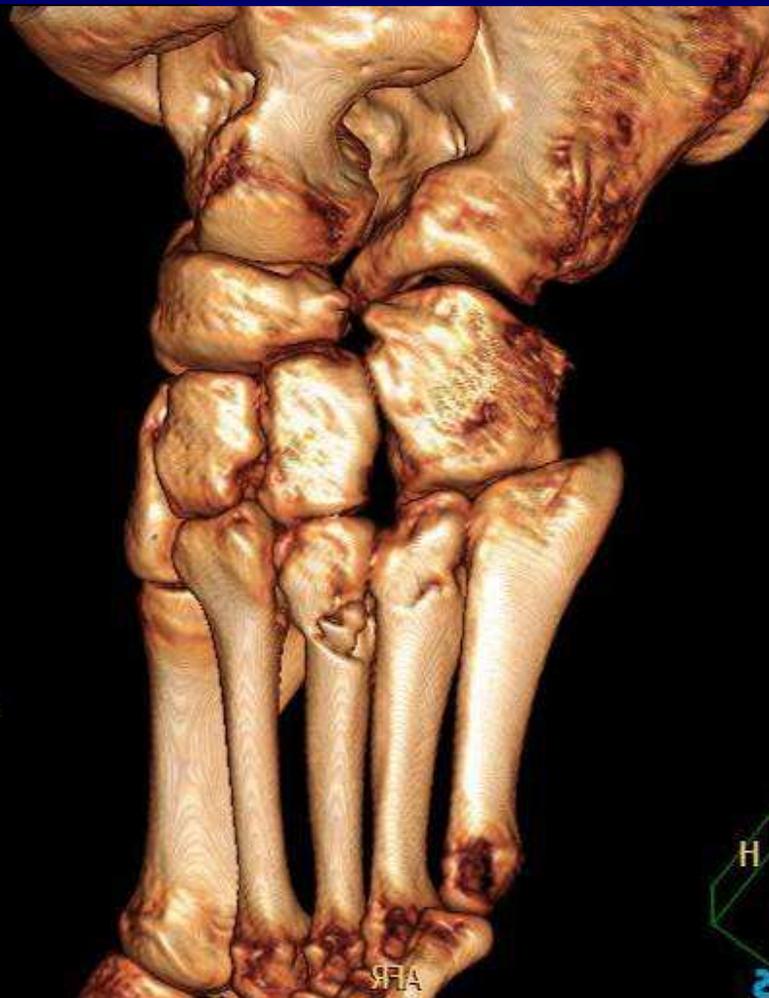
pertinente

Planches 2D

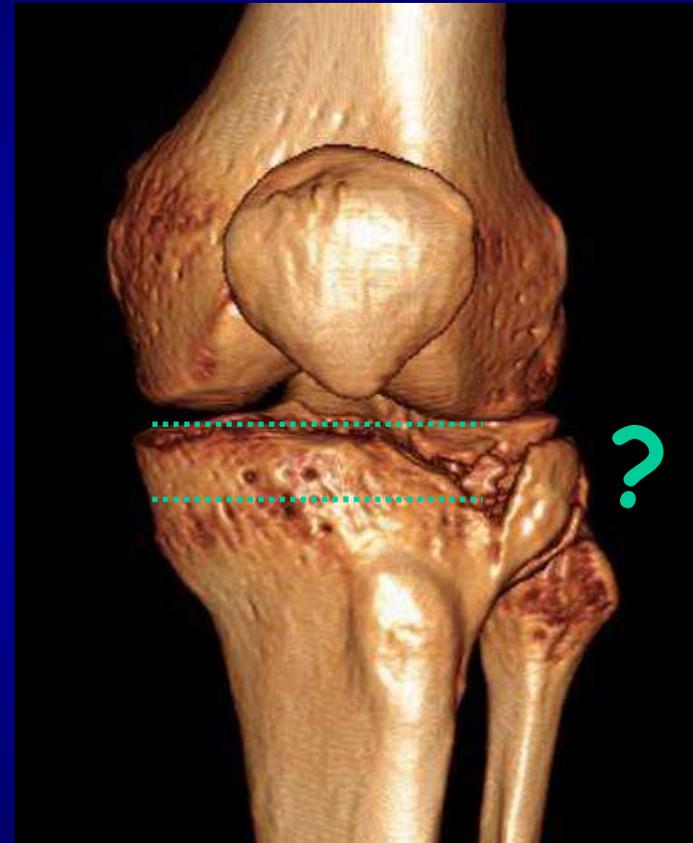


Images 3D

Problème de résolution spatiale

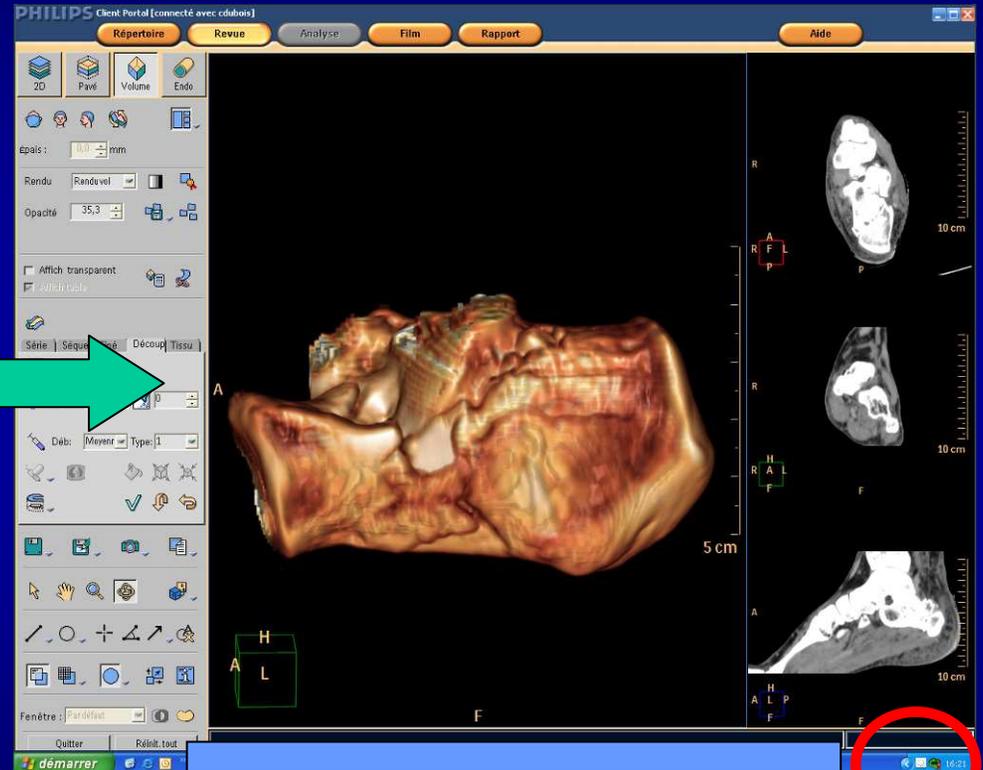


Problème de mesures



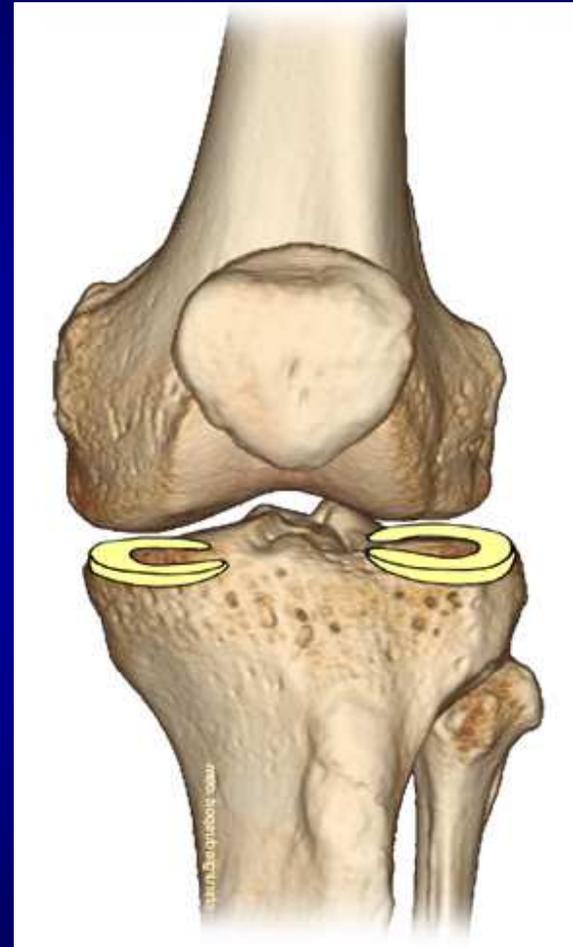
impossible sur les images 3D

Problème du temps



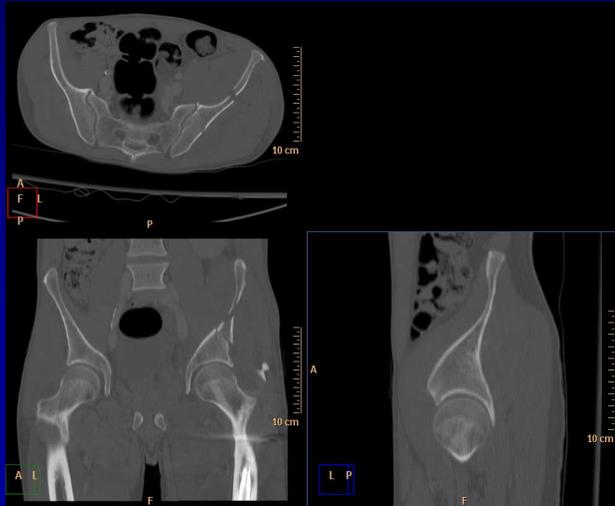
25 min !

3D : anatomique

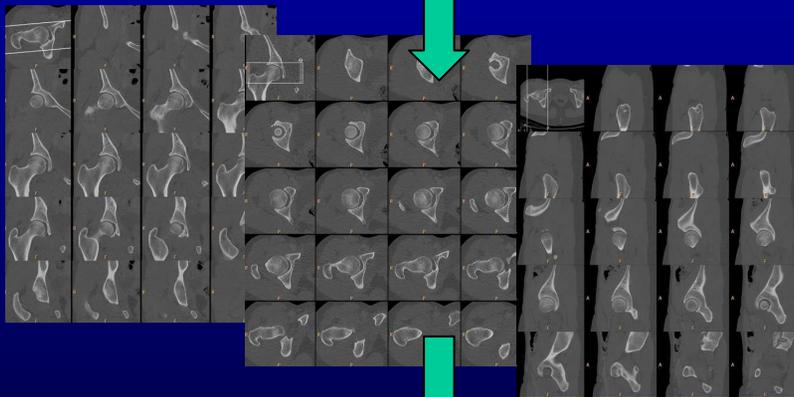


planification du geste

Problème du nombre d'image



162 images * 3



3 planches de 20



6 images

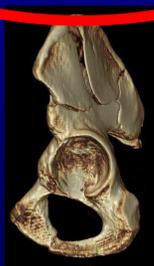
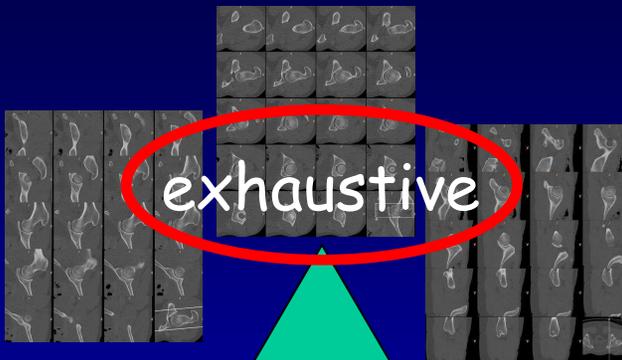
Qu'est ce qu'un BON scanner 3D
en cas de fracture articulaire ?

exhaustive

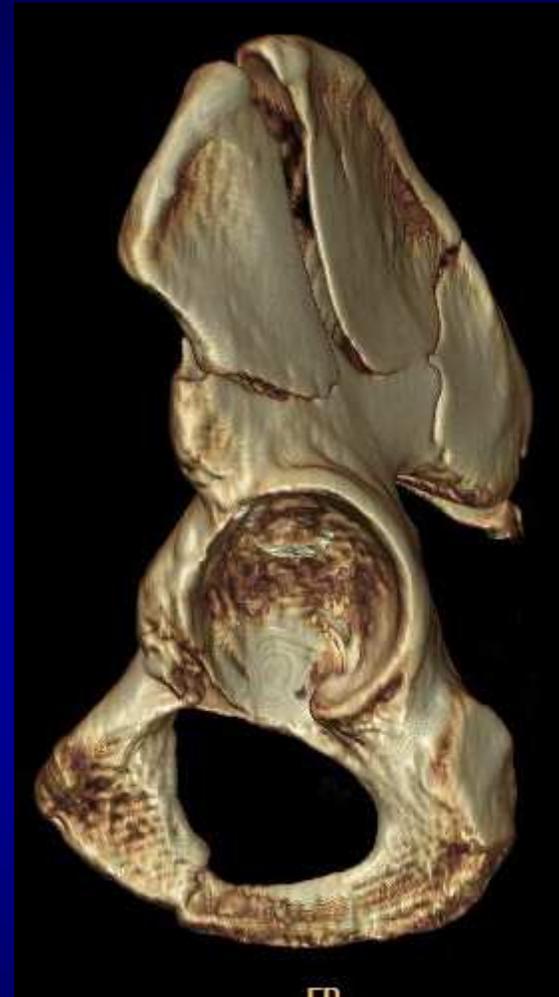
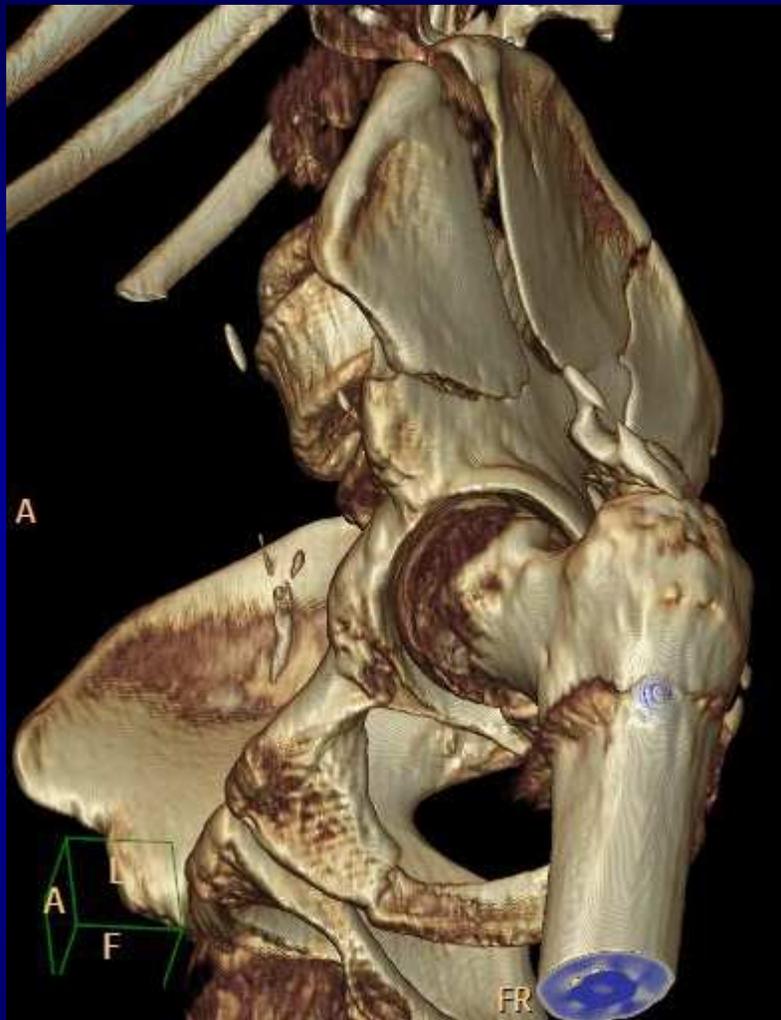
patient

intelligible

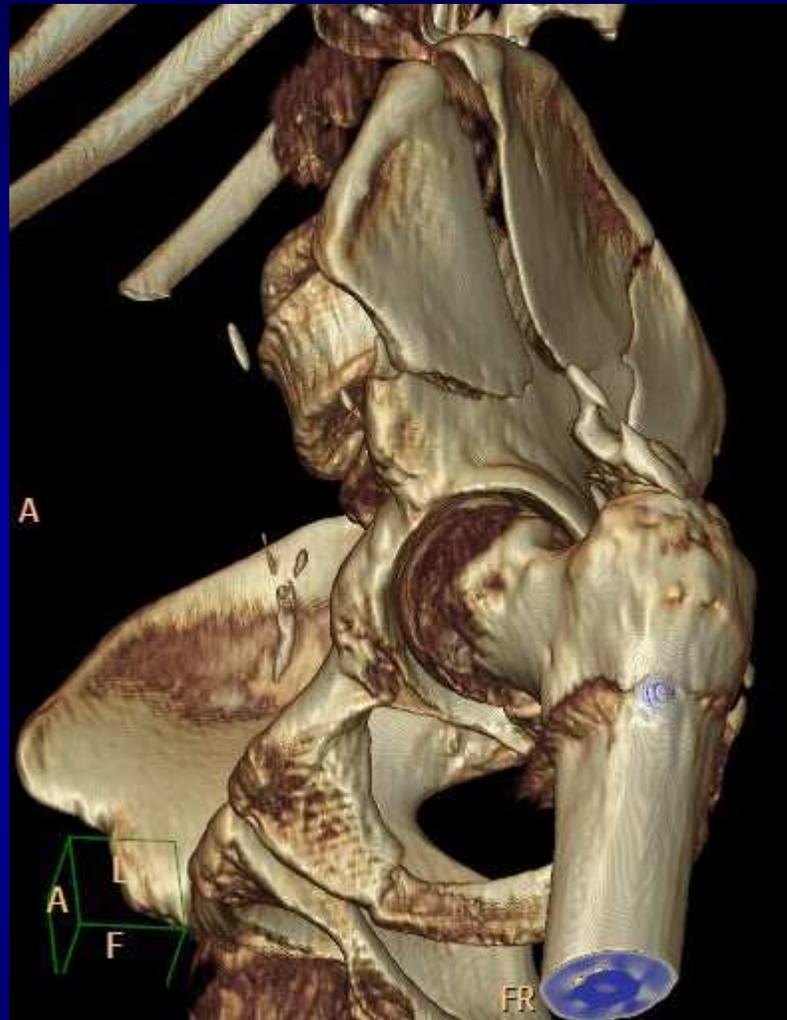
pertinente

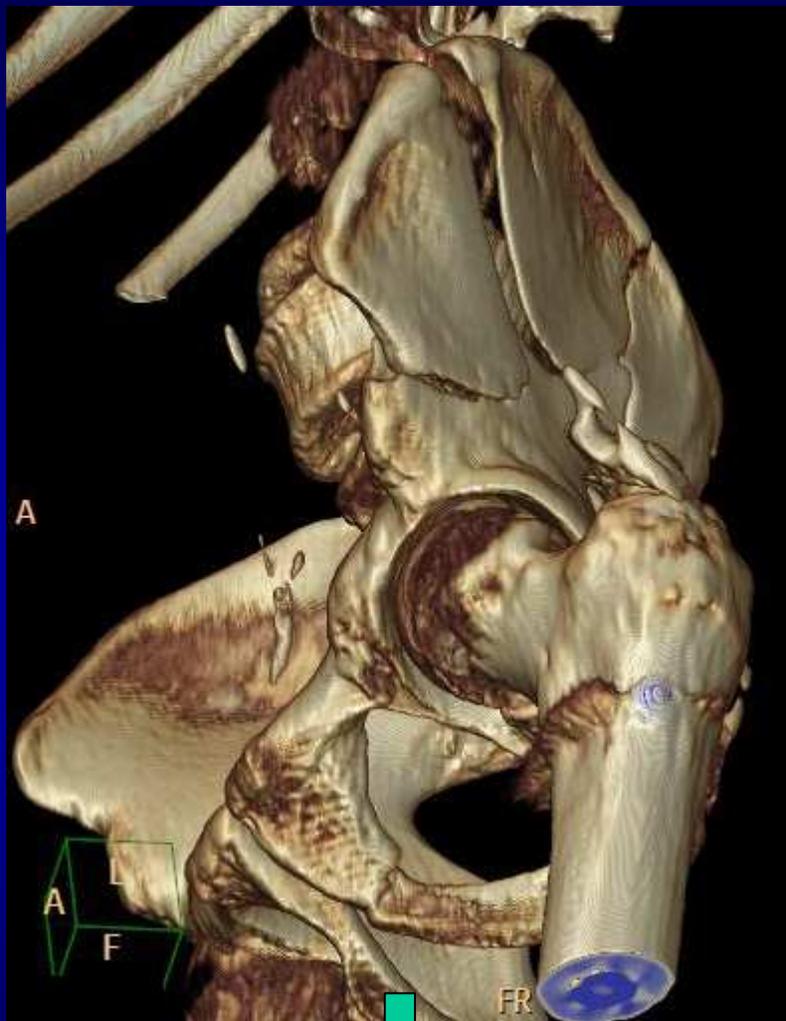


Problème de la pertinence des images fournies

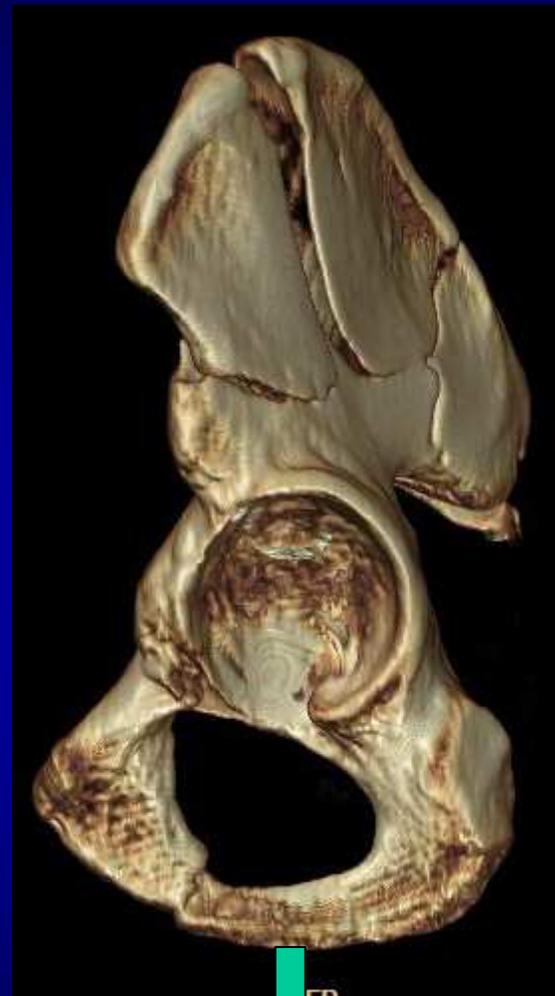


Même image !



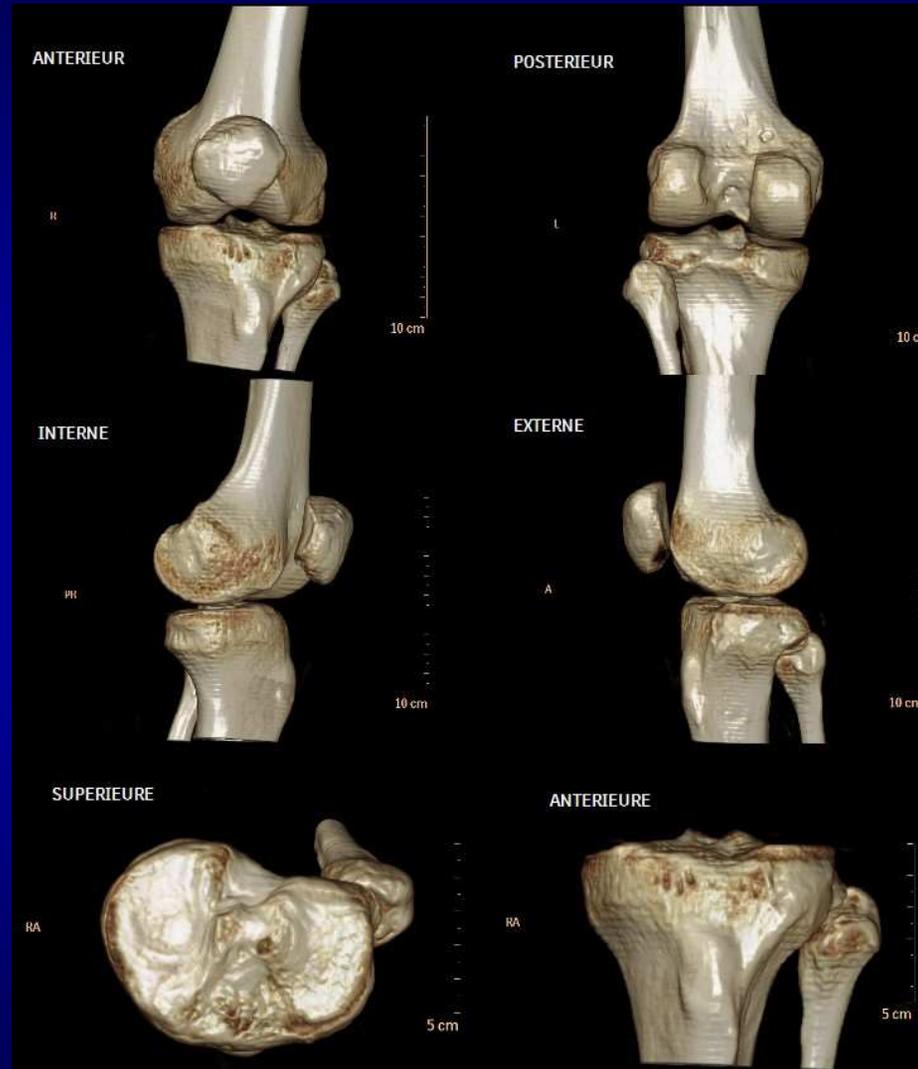


Aucun intérêt



Vue endo coxale :
atteinte du fond du
cotyle ?

Choix d'images informatives +++



Région non explorée de façon systématique en per-opératoire

Fracture de la tête de la fibula

Vue per-opératoire : planification du geste chirurgical

Vue arthroscopique

Planche résumé type

Problème de la pertinence des CR

Il est pas frais
mon compte rendu ??



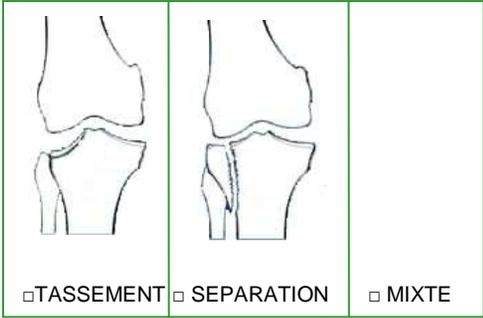
Pour sûr,
je l'ai même pas lu...



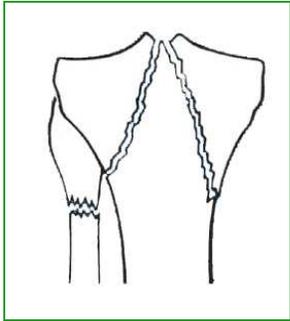
FRACTURE UNI-TUBEROSITAIRE

INTERNE

EXTERNE

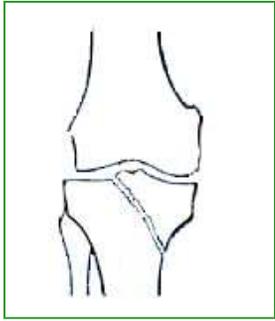


BI-TUBEROSITAIRE

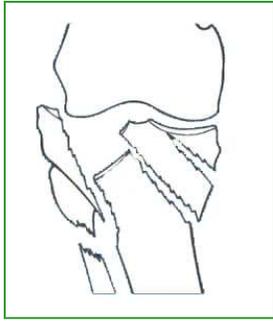


SPINO-

TUBEROSITAIRE

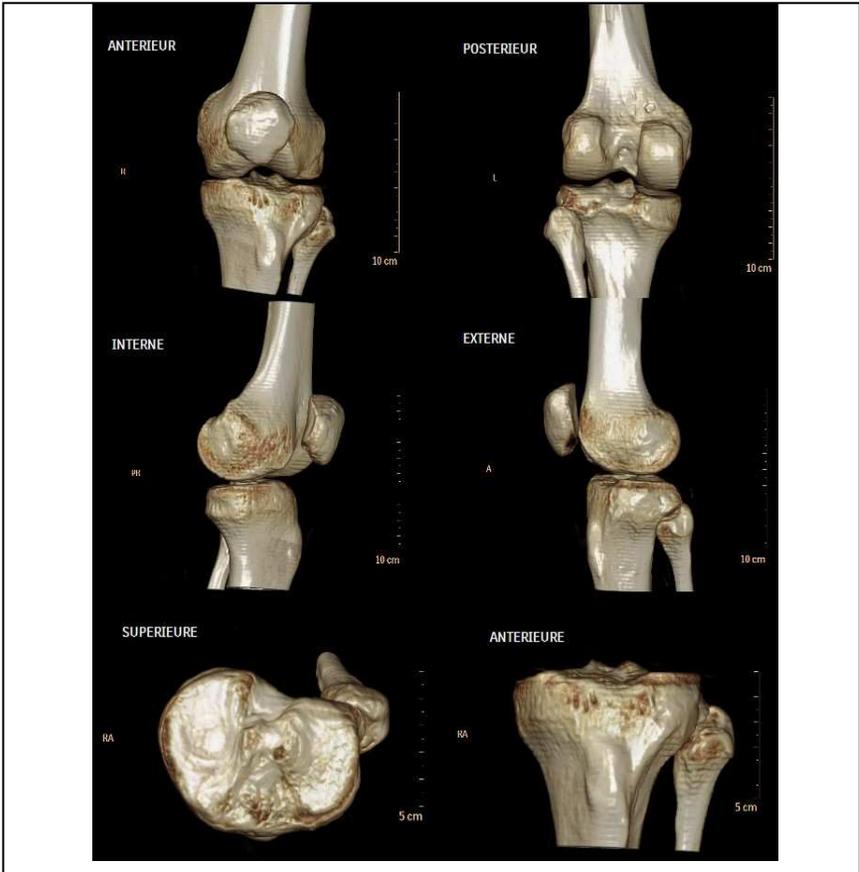


COMMINUTIVE



- DEPLACEMENT DU FRAGMENT : OUI NON <2mm >2mm
- ENFONCEMENT PLATEAU TIBIAL : OUI NON <4mm >4mm
- FRACTURE MASSIF EPINEUX : OUI NON
- CORPS ETRANGER INTRA ARTICULAIRE : OUI NON
- OS SOUS JACENT : DEMINERALISATION ARTHROSE
- FRACTURE ASSOCIEE : ROTULE TETE FIBULA DIAPHYSE TIBIALE
 CONDYLE FEMORAL INTERNE CONDYLE FEMORAL EXTERNE

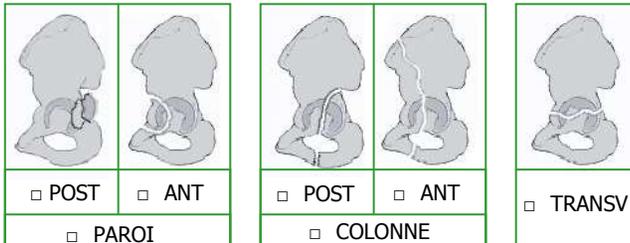
PLANCHE RESUMEE:



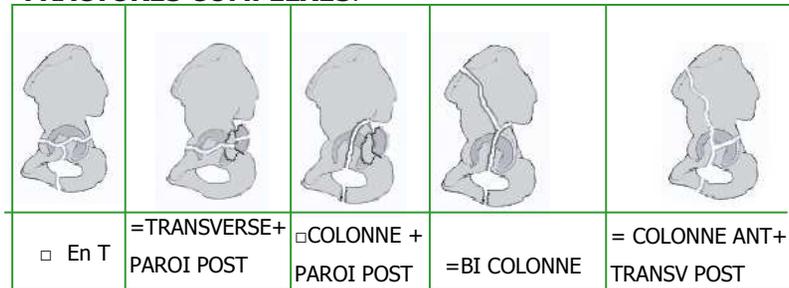
COMMENTAIRES ET CONCLUSION:



FRACTURES SIMPLES



FRACTURES COMPLEXES:



FRACTURES PARCELLAIRES:



- CONGRUENCE ARTICULAIRE COXO FEMORALE (INTERLIGNE ARTICULAIRE) :

NORMAL PERTE DE PARALLELISME PERTE DE CONTACT

- **PROTRUSION FEMORALE** OUI NON

- **IMPACTION OSTEOCHONDRALE** NON COTYLE TETE FEMORALE

- **RUPTURE DE L'ANNEAU PELVIEN** OUI NON

- **CORPS ETRANGER INTRA ARTICULAIRE** OUI NON

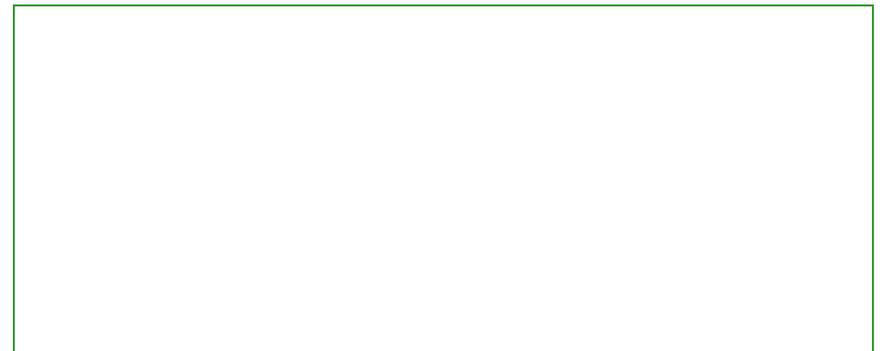
- **OS SOUS JACENT** DEMINERALISATION ARTHROSE

- **FRACTURE ASSOCIEE:** FEMUR SACRUM AUTRE

PLANCHE RESUMEE:



COMMENTAIRES ET CONCLUSION:



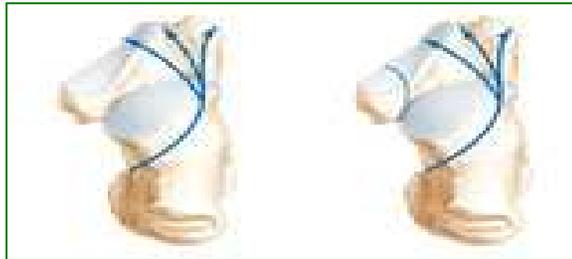
FRACTURE VERTICALE



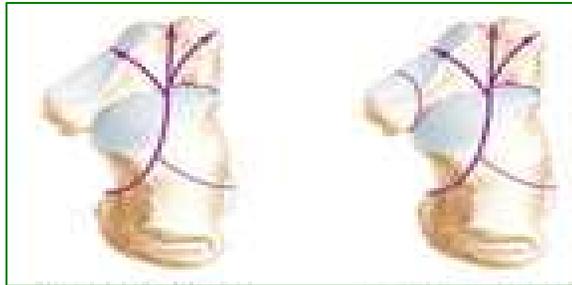
A UN TRAIT

A DEUX TRAIT

FRACTURE HORIZONTALE



FRACTURE MIXTE



- TRAITS ACCESSOIRES :

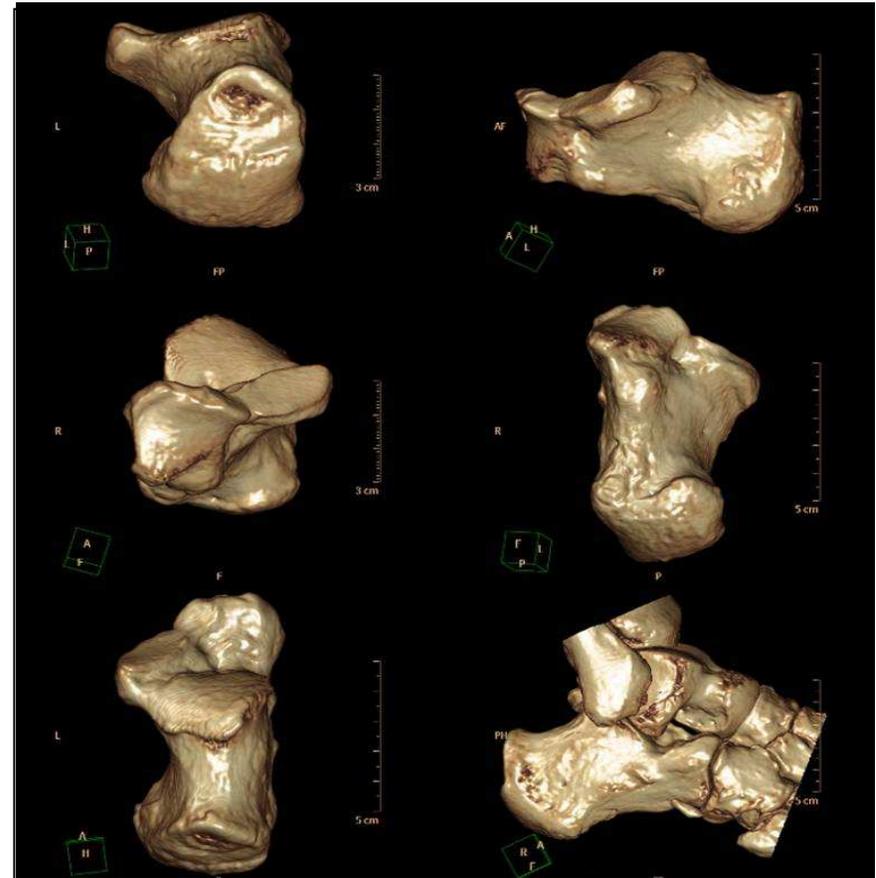
- REFEND CALCANEO CUBOIDIEN : OUI NON COMMUNUTIO N
- PROPAGATION TUBEROSITAIRE: OUI NON
- ECLAT DE LA CORTICALE LATÉRALE: OUI NON
- REFEND PLANTAIRE: OUI NON

- FRACTURE ASSOCIEE :

- TALUS NAVICULAIRE MALLEOLE LATÉRALE PILON TIBIAL CUBOÏDE

- CORPS ETRANGER INTRA ARTICULAIRE :** OUI NON

PLANCHE RESUMEE:



COMMENTAIRES ET CONCLUSION:



Conclusion

Plusieurs types d'imagerie 3D

Les images 3D seules ne sont pas suffisantes

Importance du choix des images 3D pertinentes

VOUTCH
UN WEEK-END SUR DEUX



- Pas mal, pas mal. Mais fondamentalement, tout ça, pour moi, ça reste de la 2D.

Merci !