

# SEMINARI 4: LES CIÈNCIES FORENSES

*Professor: Xavier Jordana Comín*



## **Casos pràctics**

1. Determinació del sexe i edat a la mort en restes esquelètiques
- 2. Determinació de les causes i les circumstàncies de la mort**
3. Identificació genètica
4. Identificació dactiloscòpica

## Casos pràctics

### 2. Determinació de les causes i les circumstàncies de la mort

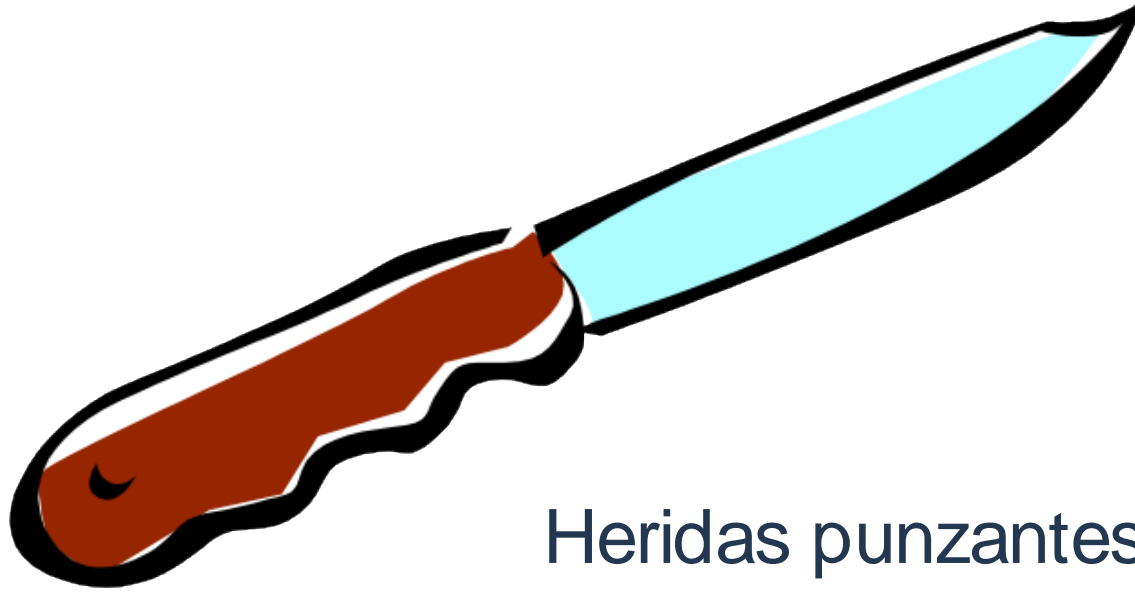
- *Quines causes de mort podem determinar?*
- *Què podem determinar sobre les circumstàncies de la mort?*

## **Causes de mort**

- *Cardiovascular*
- *Neurològica*
- *Infecçiosa*
- *Gastrointestinal*
- *Respiratòria*
- *Mort violenta*

## **Etiologia de mort**

- *Natural*
- *Accident*
- *Suïcidi*
- *Homicidi*

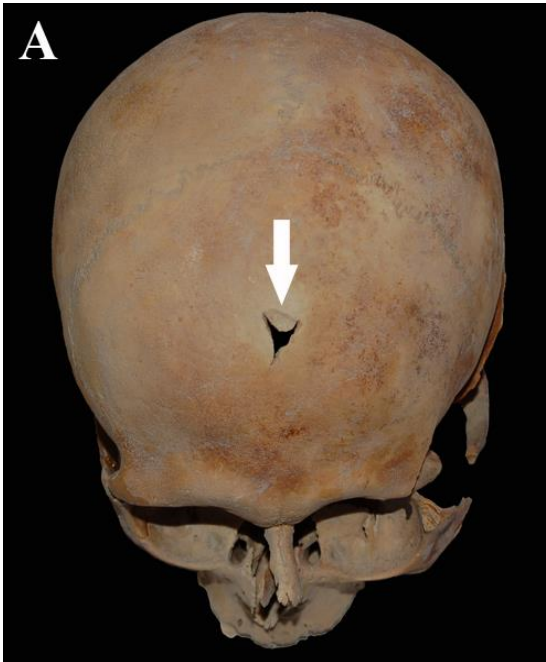


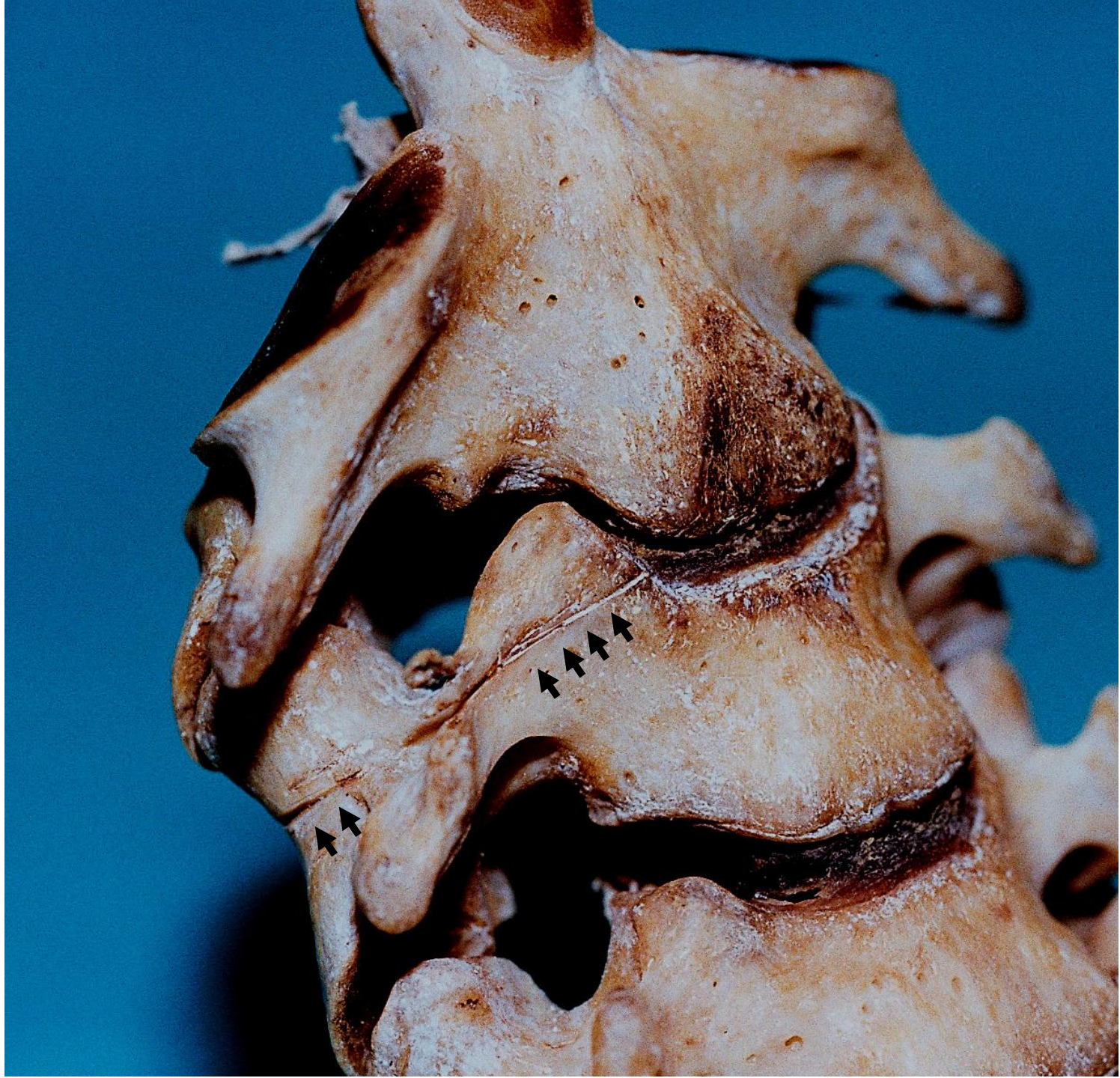
Heridas punzantes o penetrantes

Heridas incisas o cortantes

Heridas inciso-punzantes

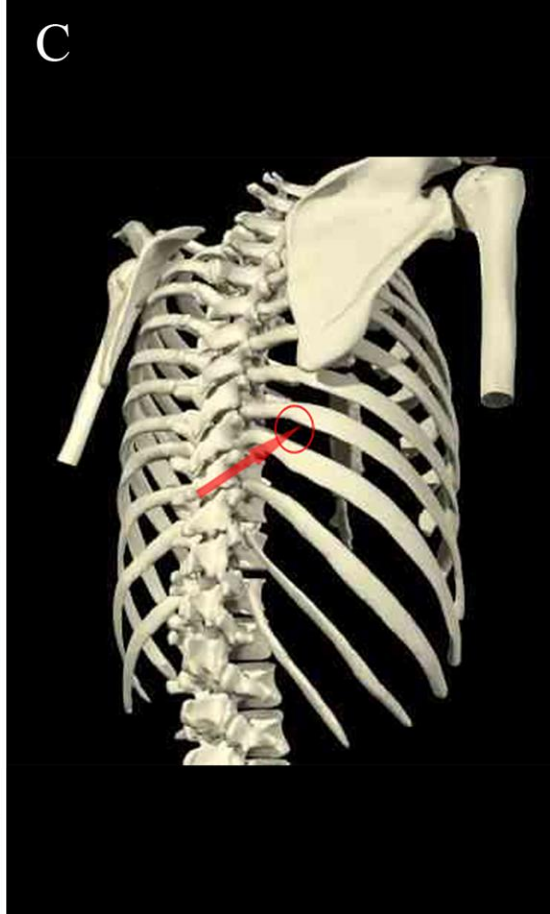
Heridas inciso-contusas

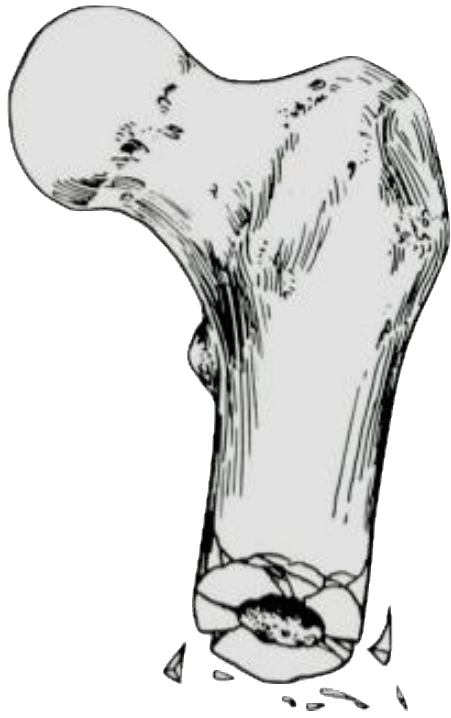










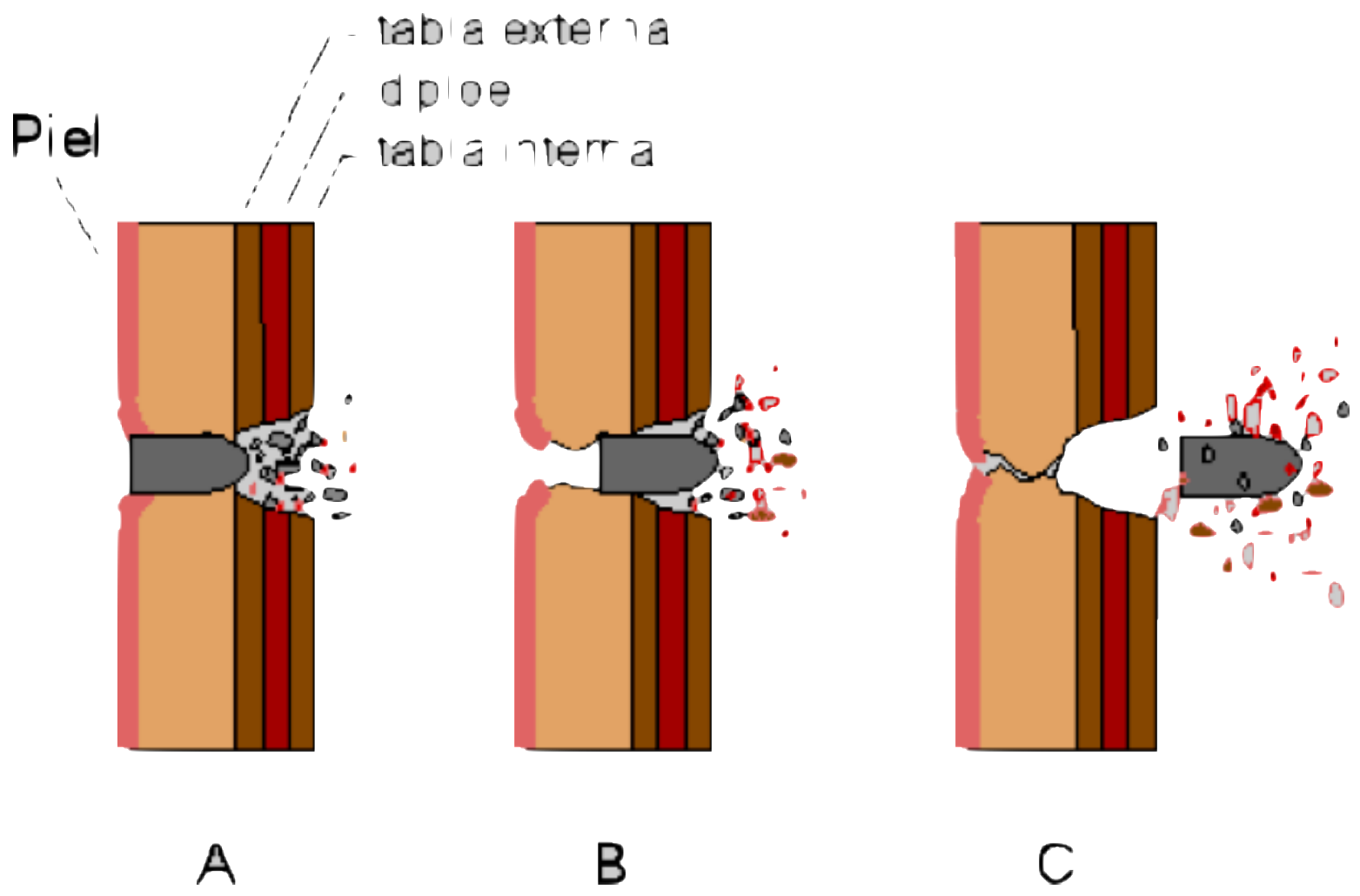




# Lesiones por arma de fuego



# Hueso:





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Baja velocidad

200 a 300 m/s

Pocas fracturas

Deformidad plástica

Alta velocidad

>700 m/s

Fracturas importantes

Poca deformidad

“Proyectiles oseos”

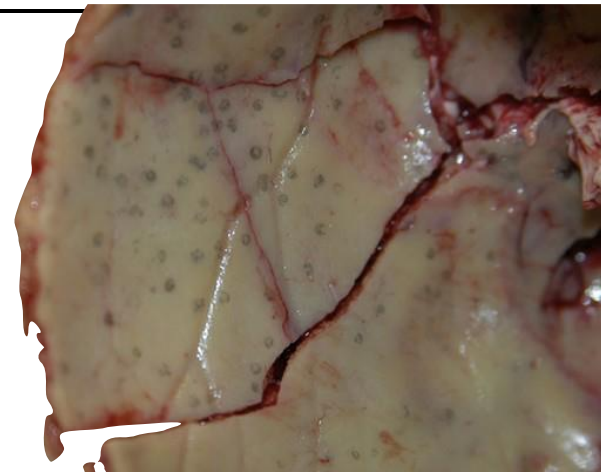
Proyectiles múltiples

Fracturas importantes

“Efecto billar”

Impactación balines

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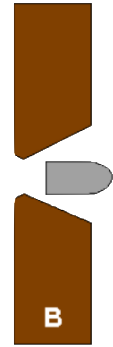
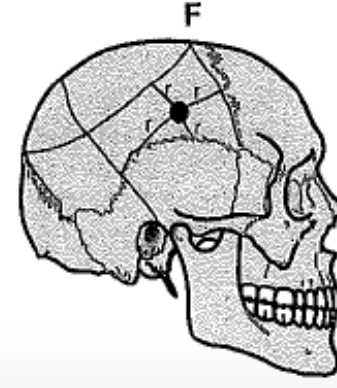
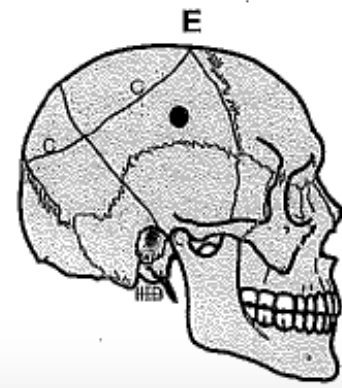
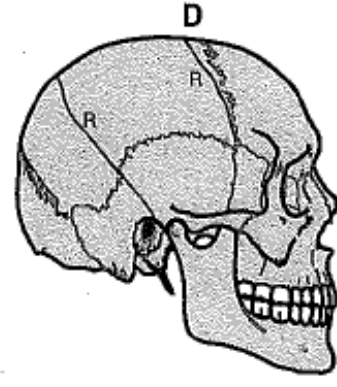
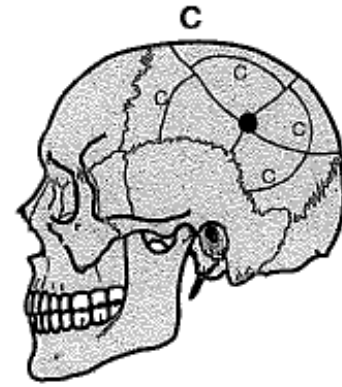
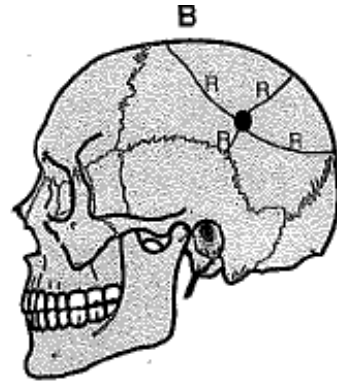
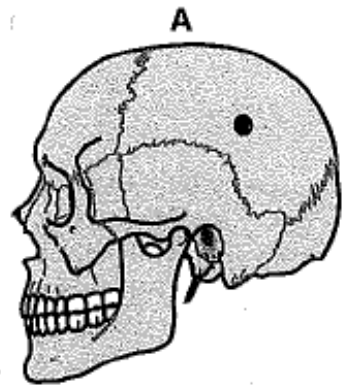




# Stress fractures

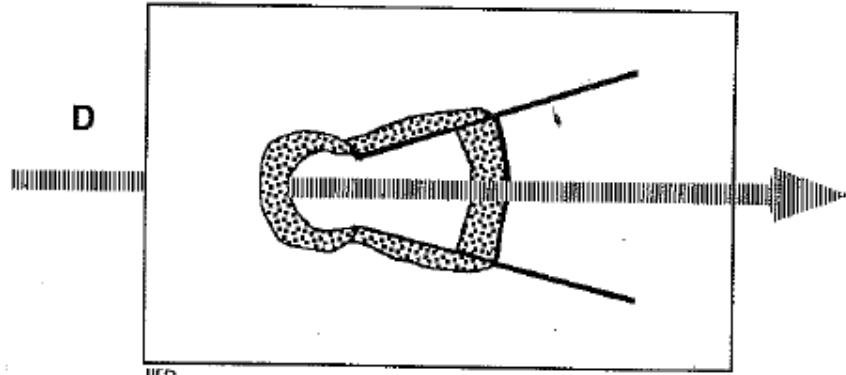
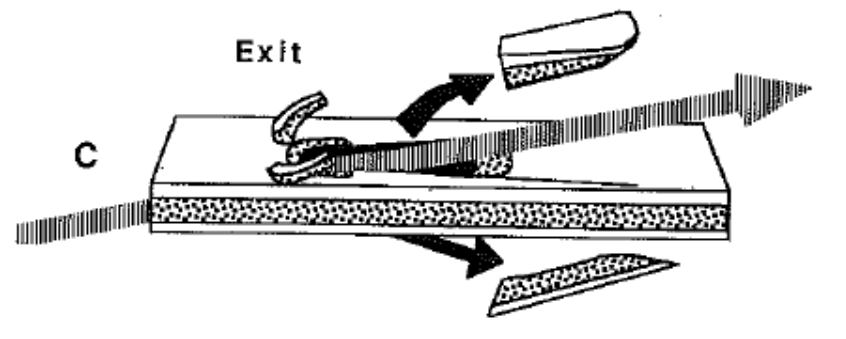
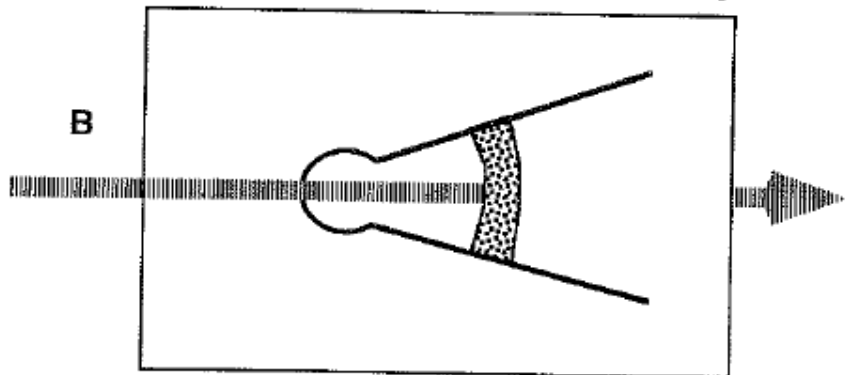
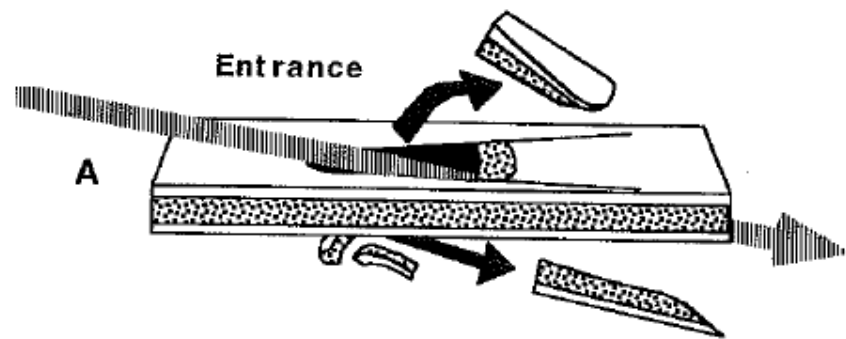
Spondylolysis of lumbar vertebra











HEB

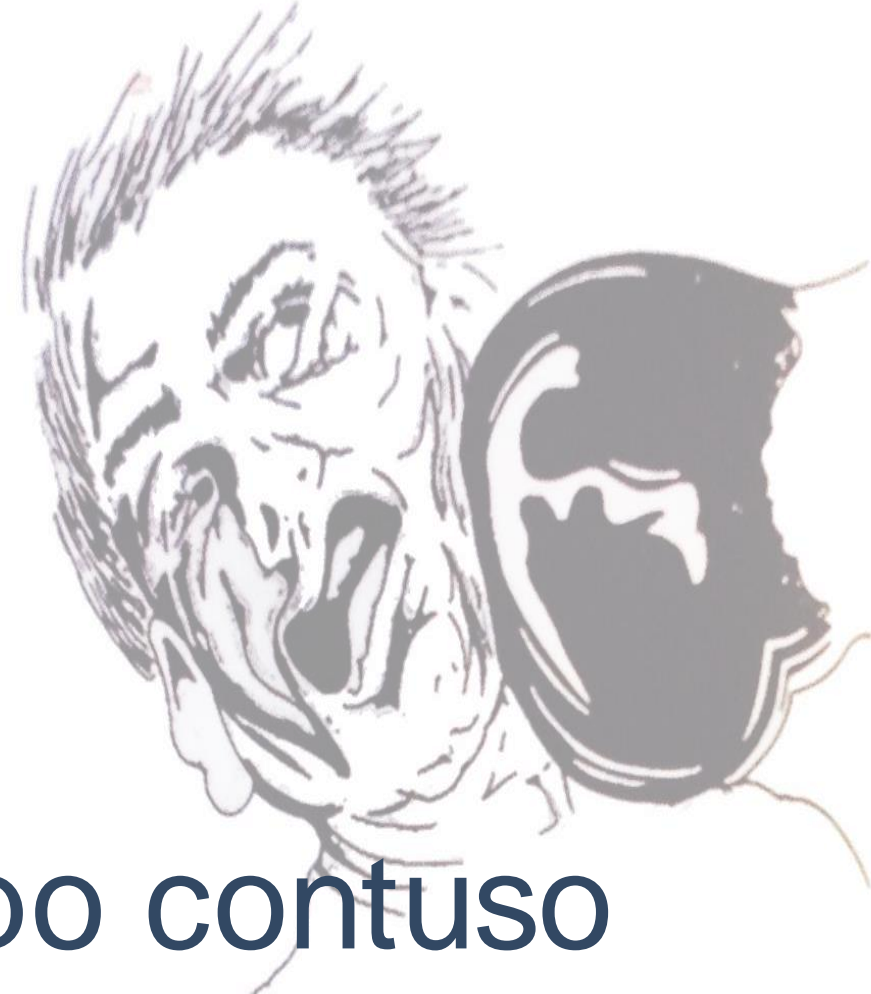


Sternal foramen

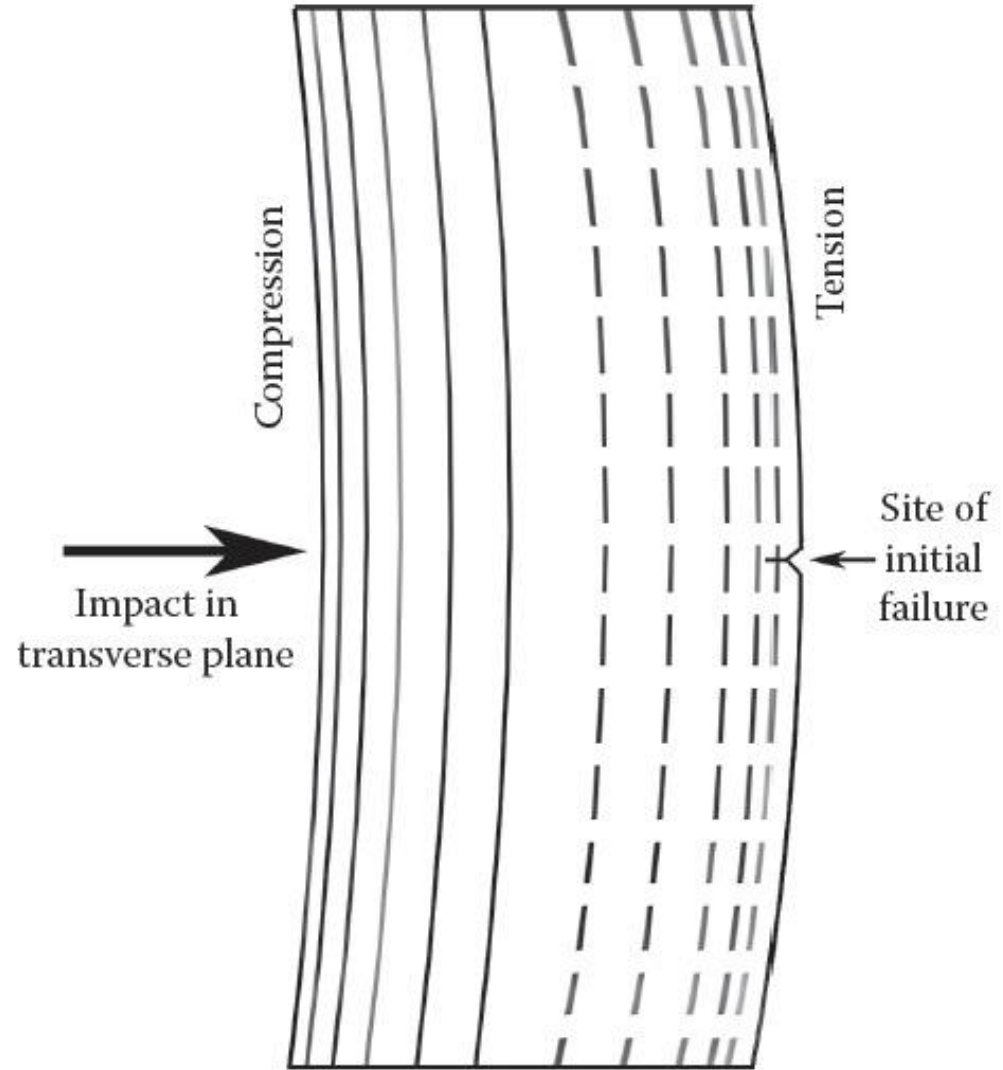
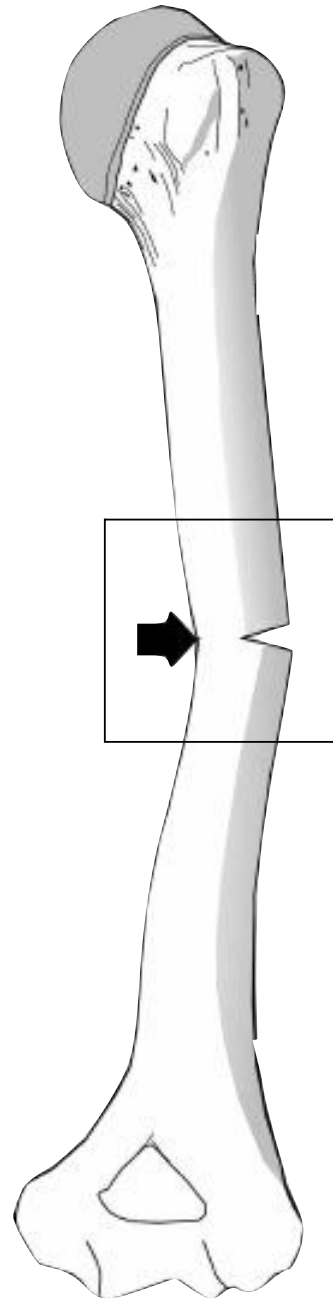


FIGURA 1.- Esternón.





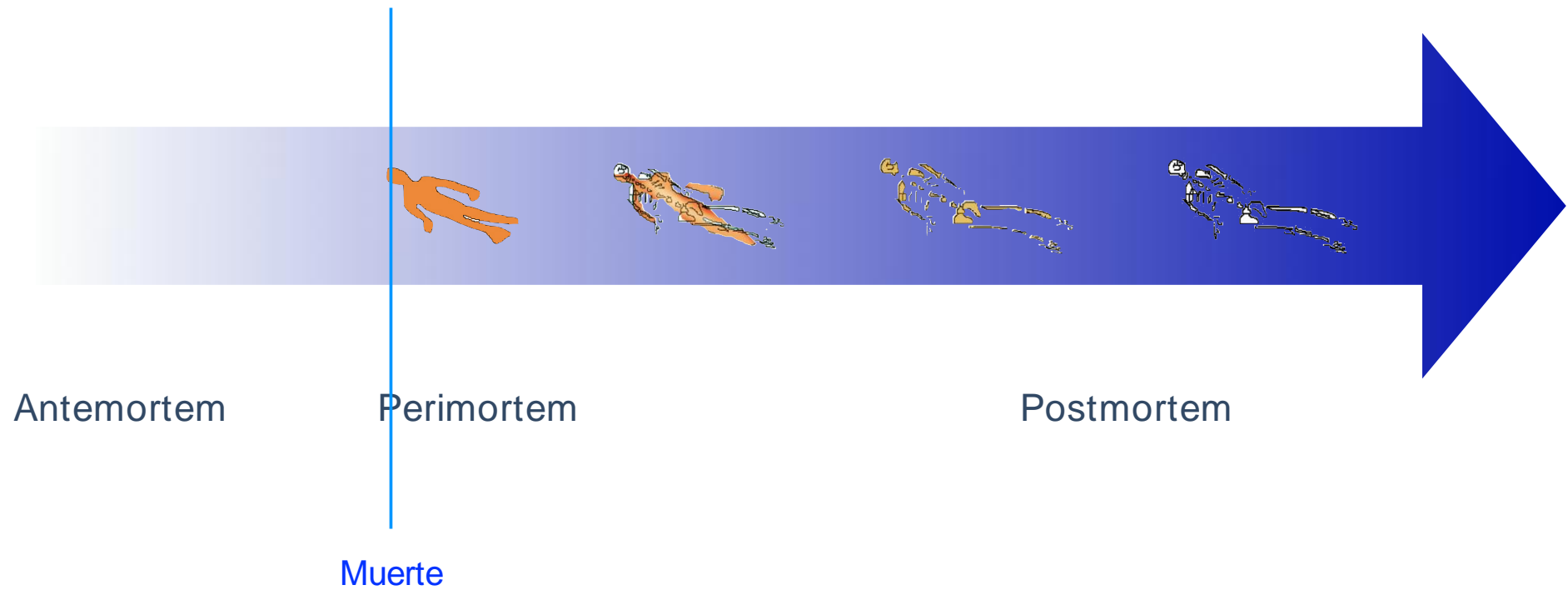
# Lesiones de tipo contuso



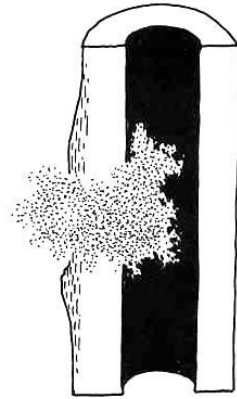
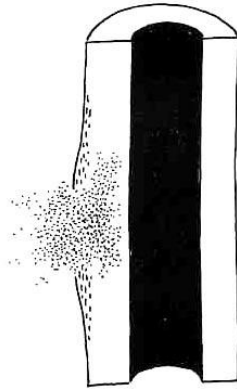
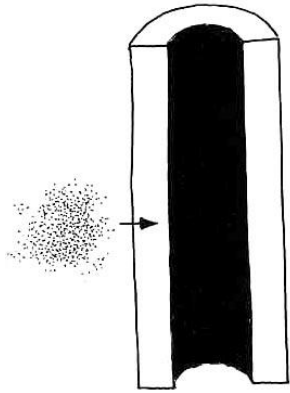
## Casos pràctics

### 2. Determinació de les causes i les circumstàncies de la mort

- *Podem distingir entre un traumatisme durant la vida de la persona (antemortem) d'un relacionat amb la causa de la mort (perimortem) o un dany tafonòmic (postmortem)?*







## Ossifications and periostitis



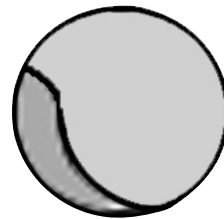
*Figura 7.- Miositis osificante a nivel de la bifurcación de la línea áspera del fémur izquierdo.*



*Figura 8.- Imagen radiológica de una osificación subperióstica a nivel de la cara interna de la diáfisis femoral.*

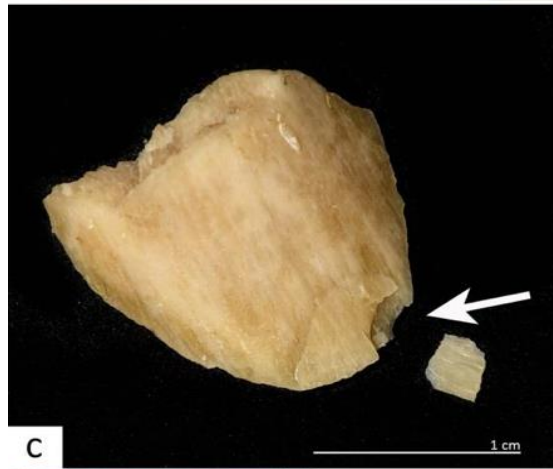
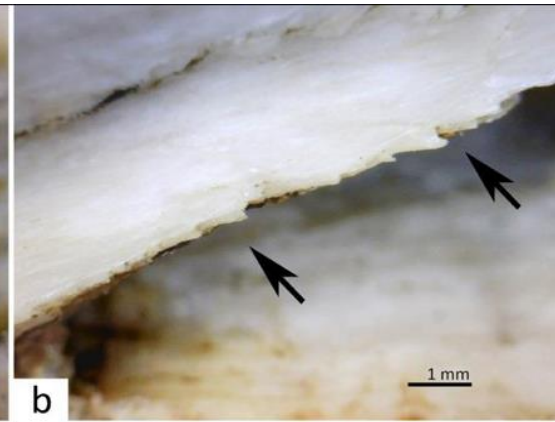
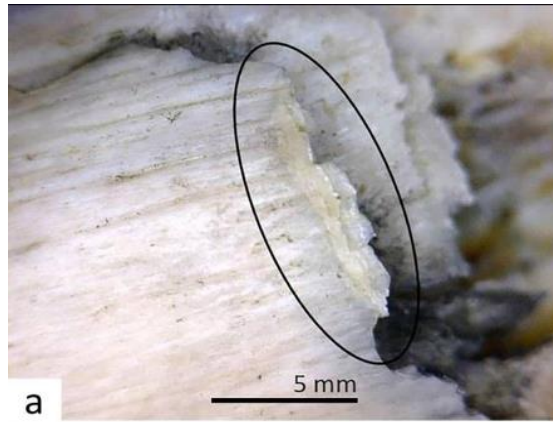
Perimortem	Postmortem (Tafonomía)
No signos de regeneración Deformidad de fragmentos Presencia de pátina Márgenes suaves, romos Márgenes en bisel Patrón de fractura (?) Presencia de “splinters”	Análisis del contexto Ausencia de pátina Fragmentación de márgenes





Etxeberria F (2003) Patología Traumática. In: Isidro Llorens A, Malgosa Morera A (eds) Paleopathologia: la enfermedad no escrita. Masson, Barcelona





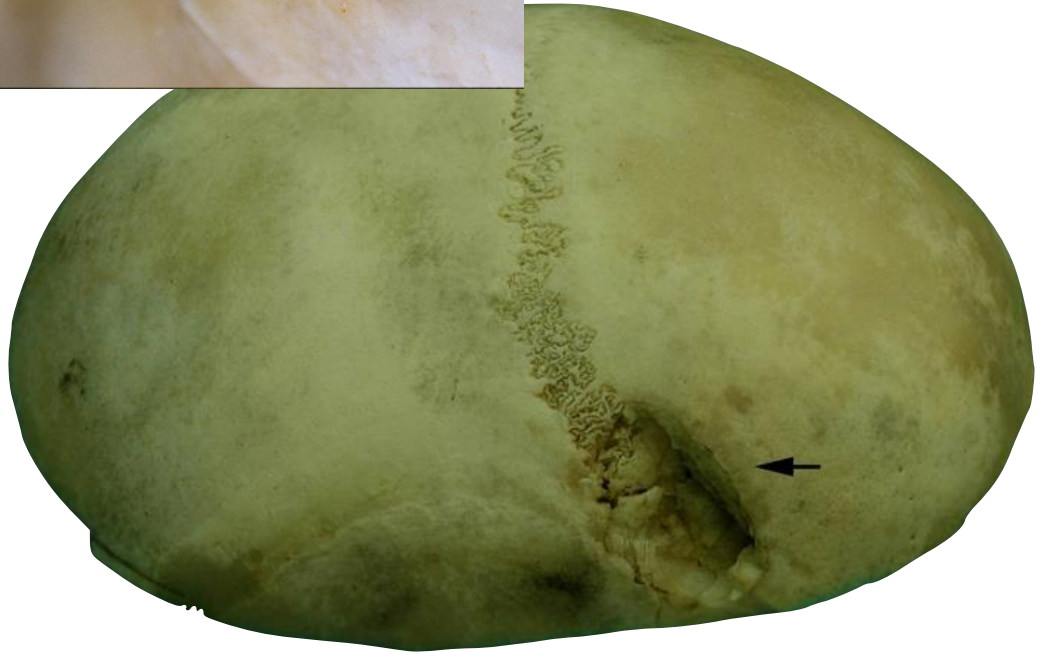


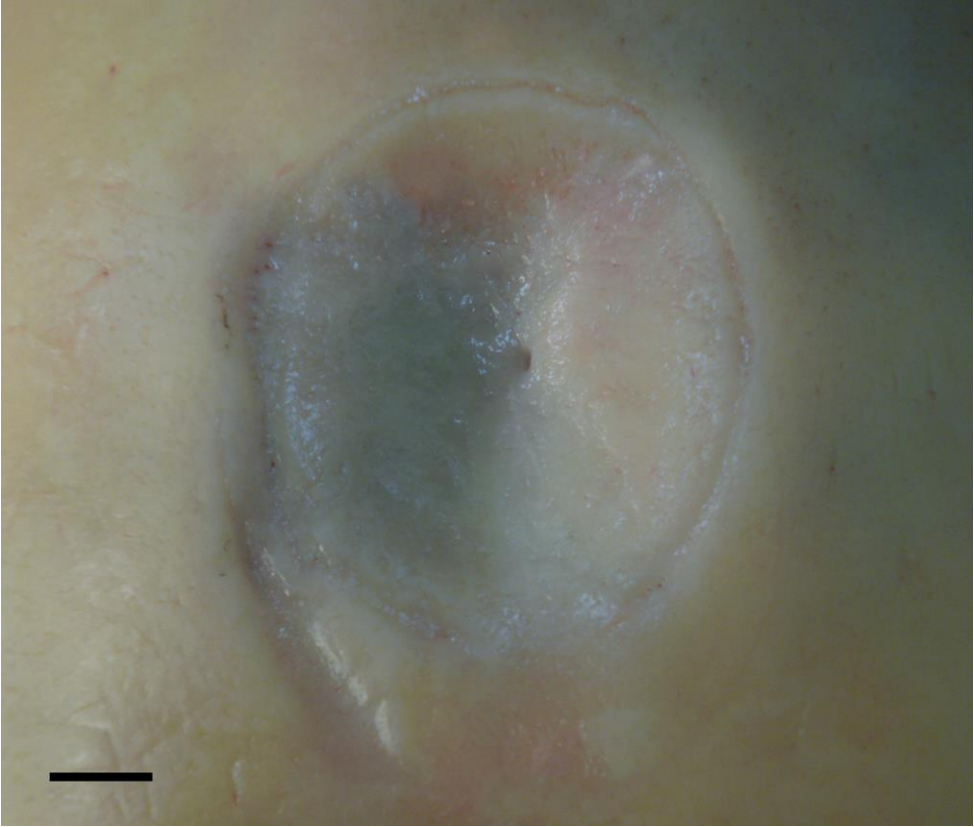
Pick TP (1885) Fractures and Dislocations. Lea Brothers & Company, Philadelphia

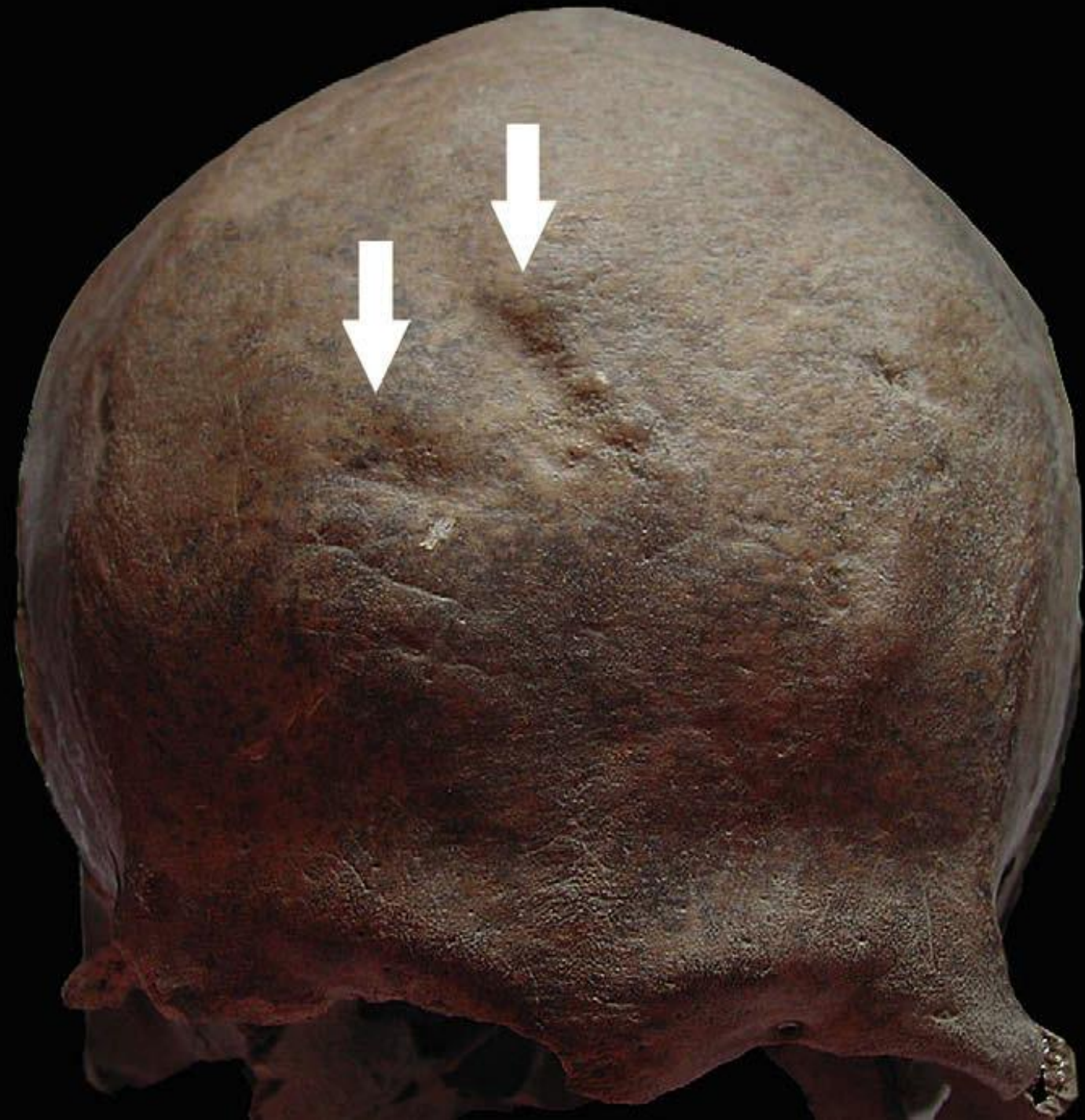
Etxeberria F (2003) Patología Traumática. In: Isidro Llorens A, Malgosa Morera A (eds) Paleopathología: la enfermedad no escrita. Masson, Barcelona

Sen S, Ando T, Kobayashi E, et al. (2014) Development of Femoral Bone Fracture Model Simulating Muscular Contraction Force by Pneumatic Rubber Actuator. Eng Med Biol Soc 6872–6875.



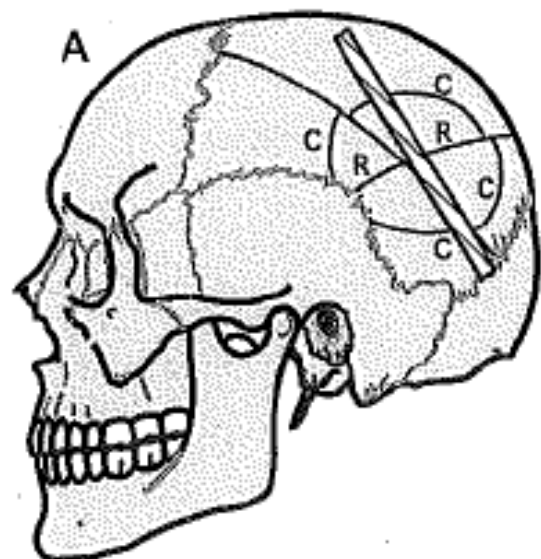




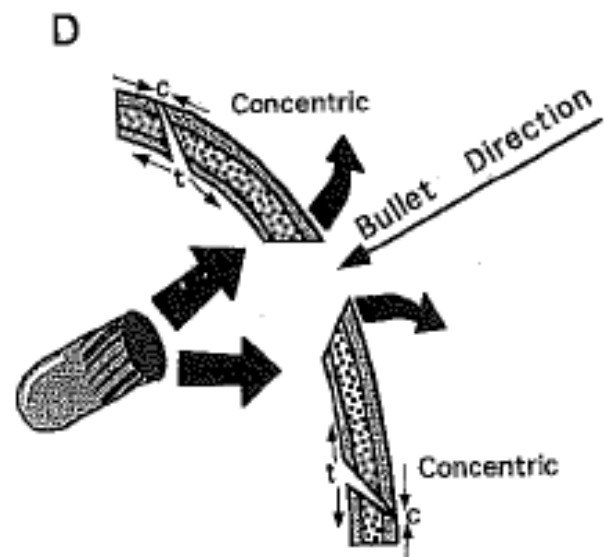
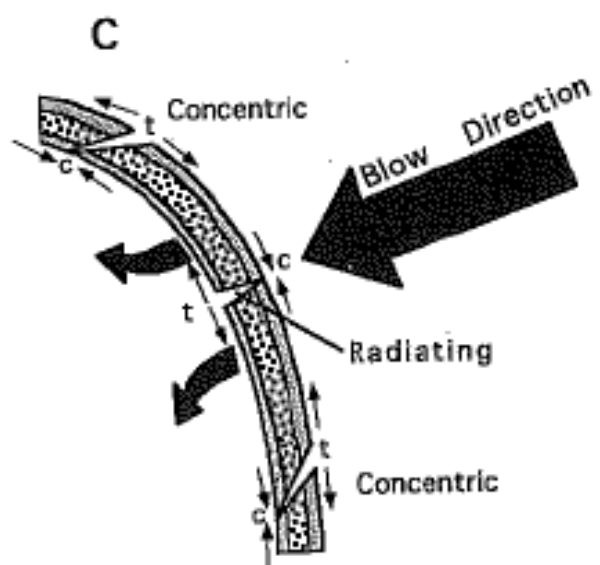
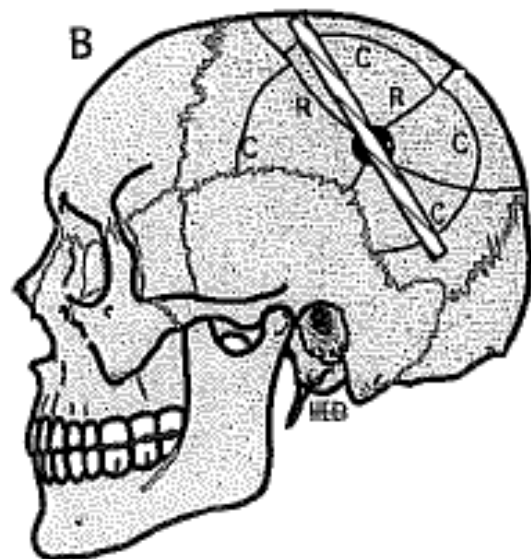


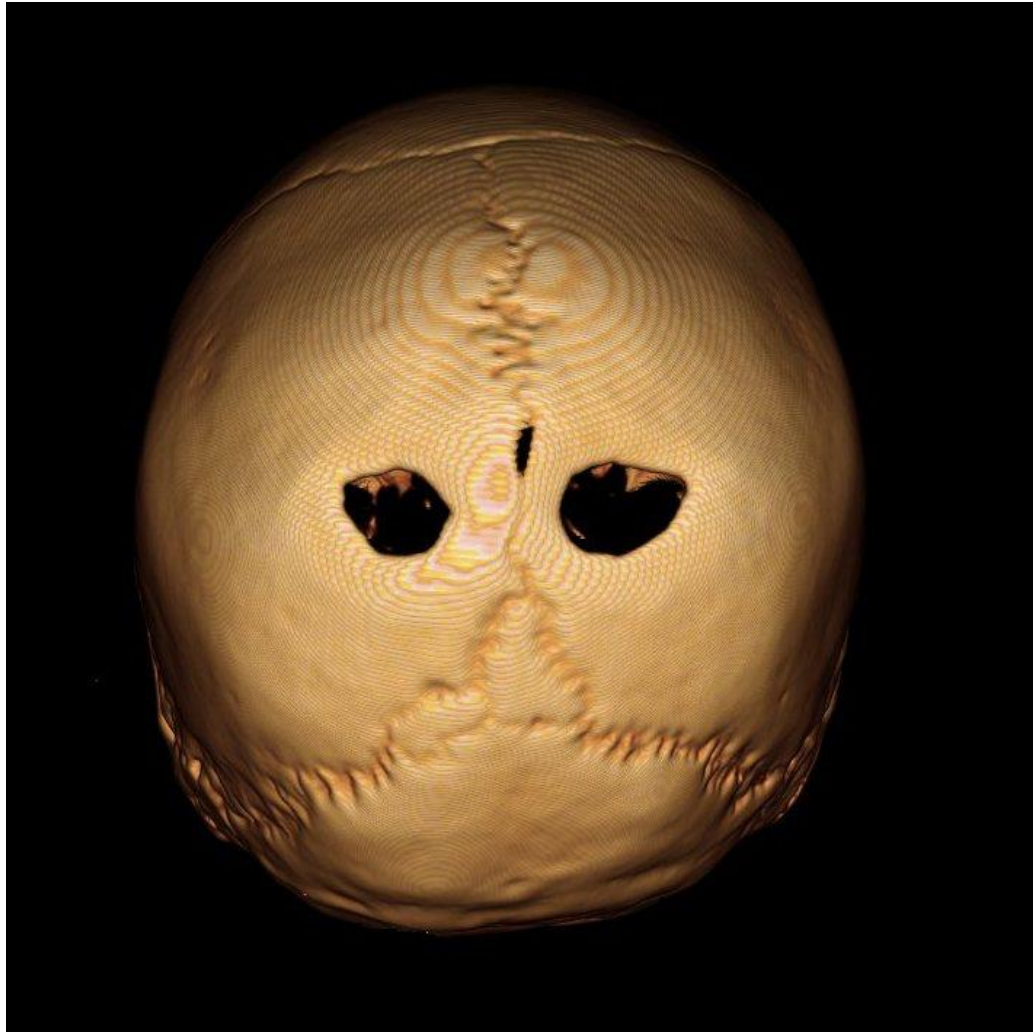


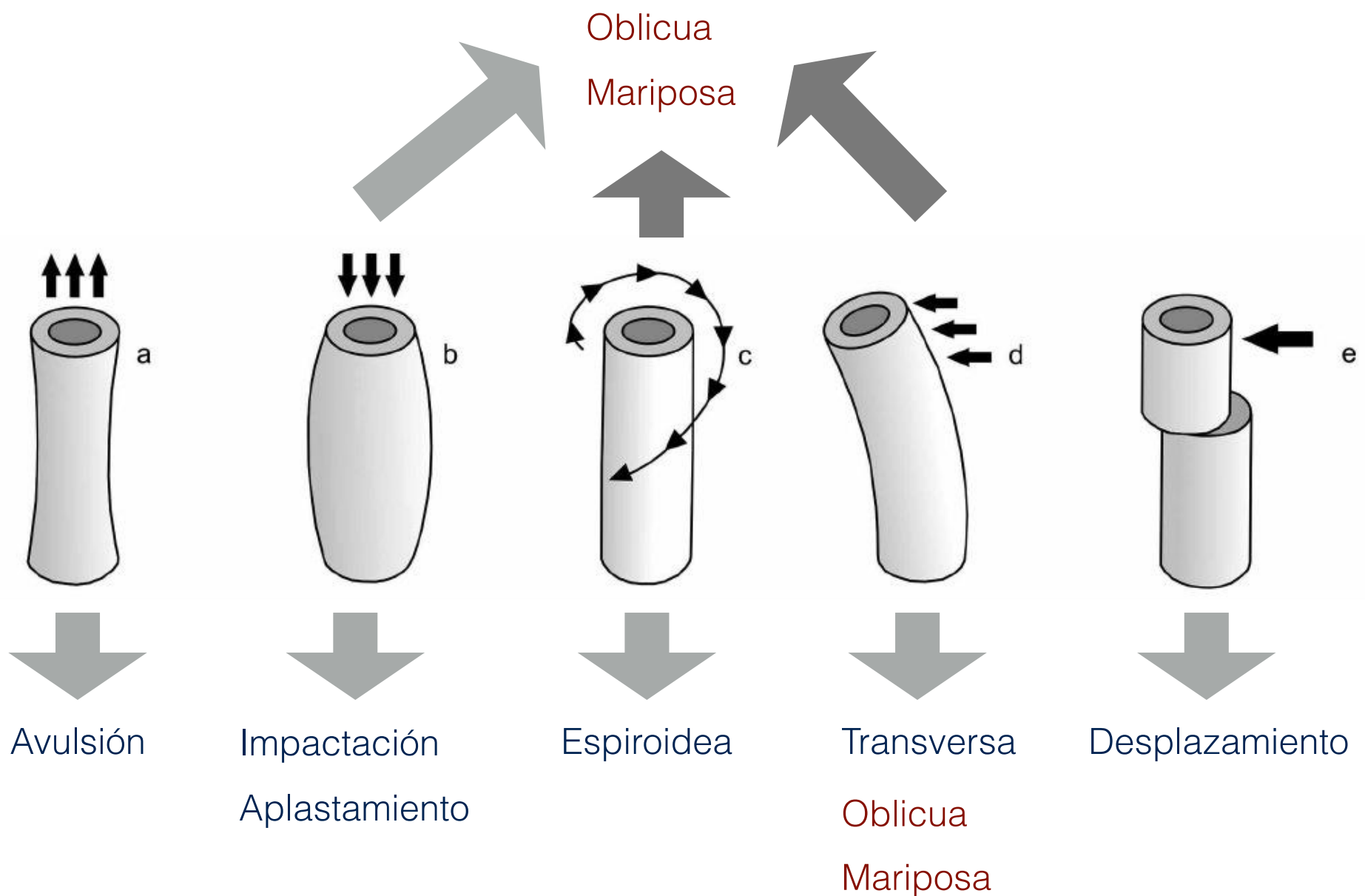
Blunt Trauma

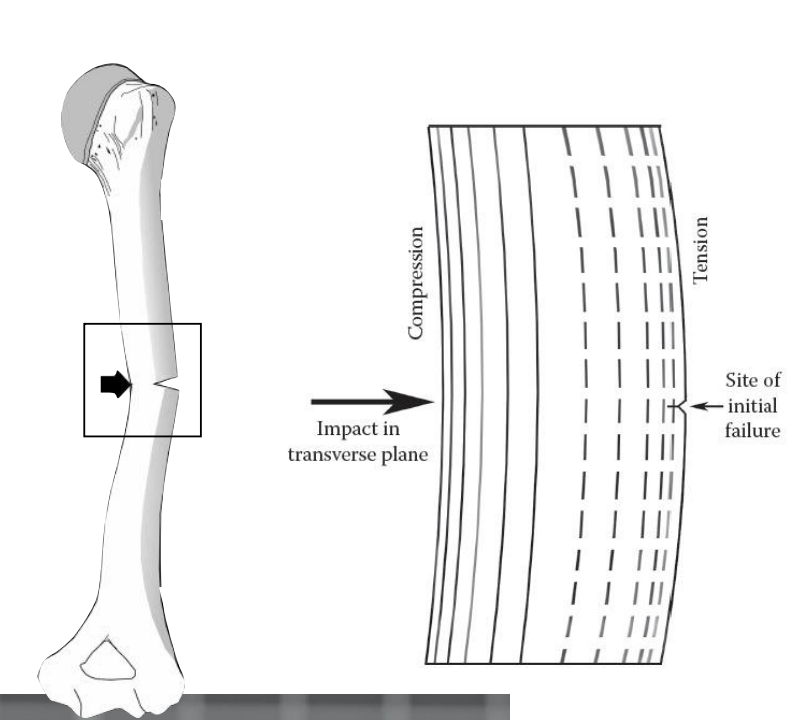


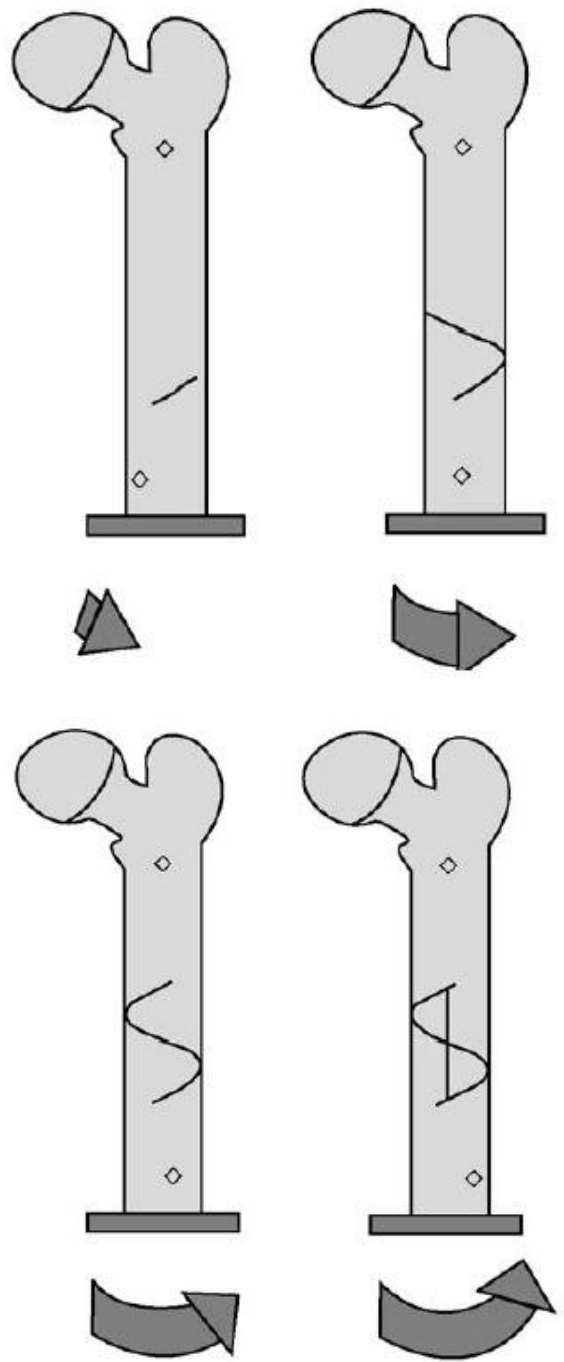
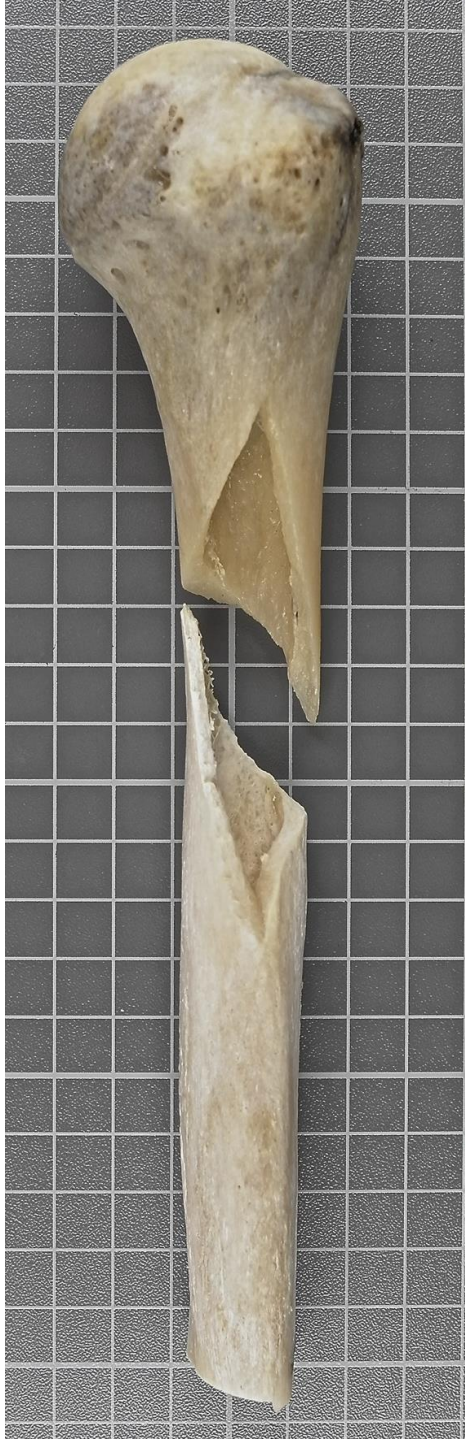
Gunshot Trauma



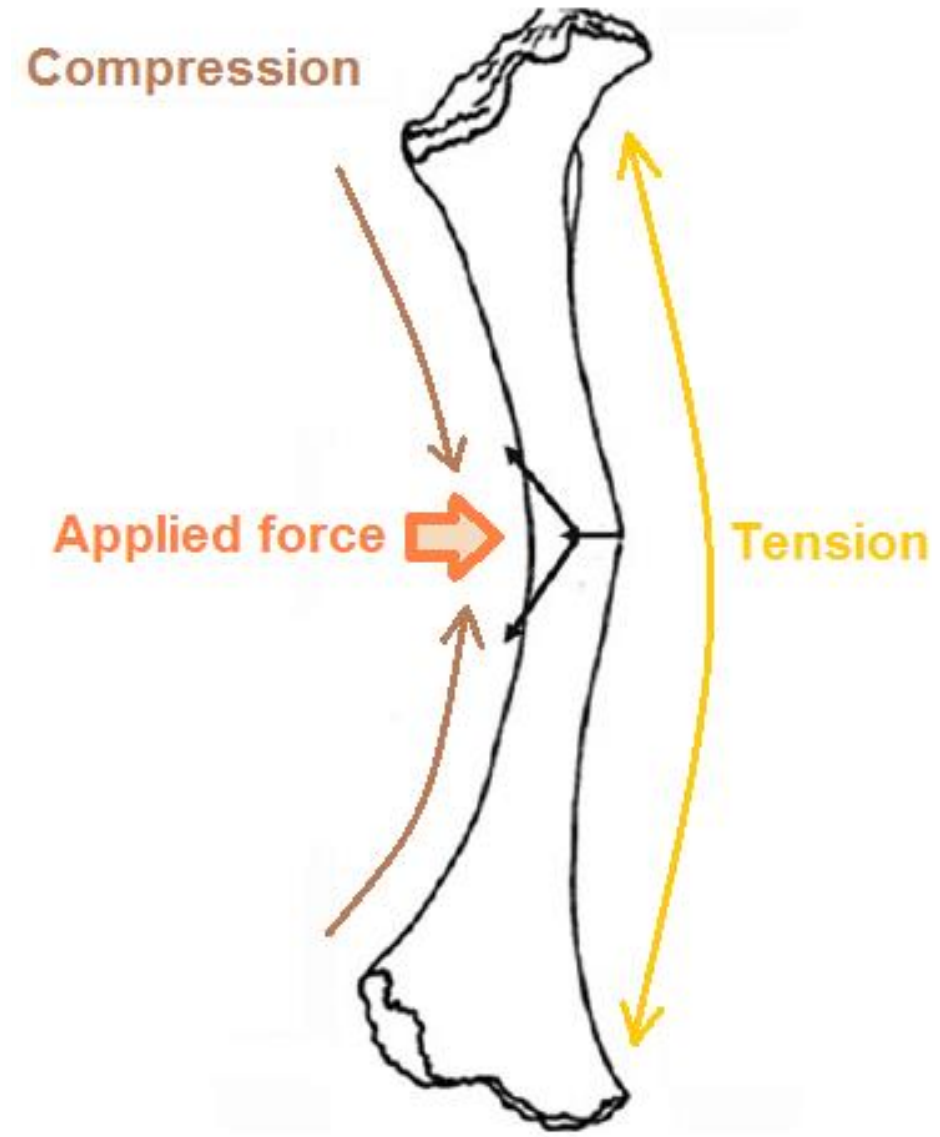


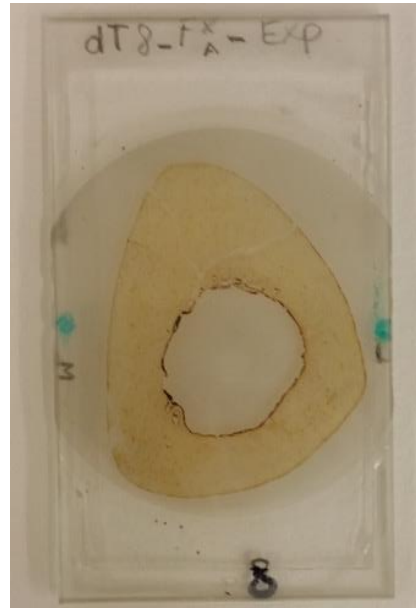




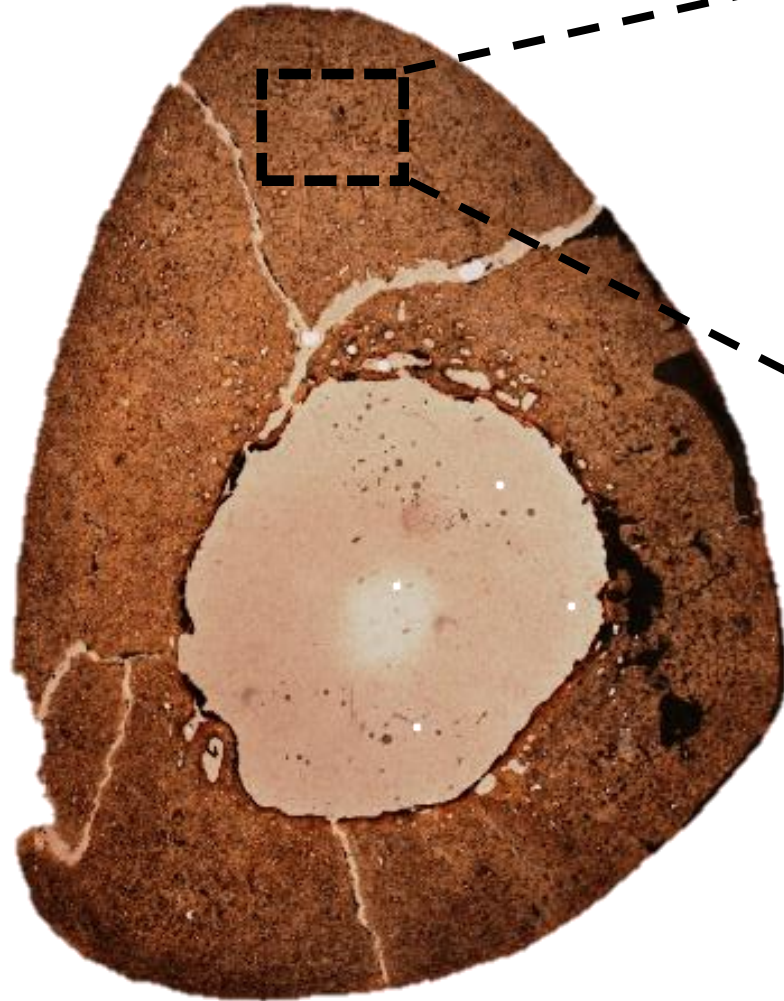


# Postmortem Trauma Simulator





ANTERIOR: COMPRESSION AREA



POSTERIOR: TENSION AREA



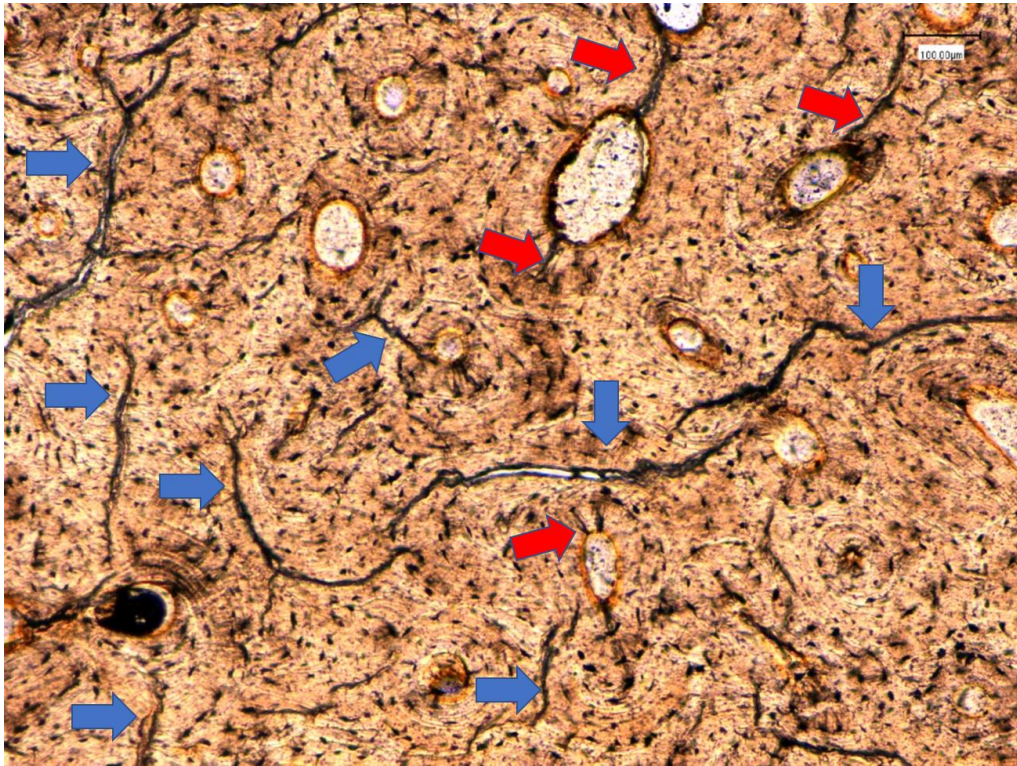
MICROCRACKING PATTERN

- MCK LOCATION
- MCK LENGTH
- MCK DENSITY

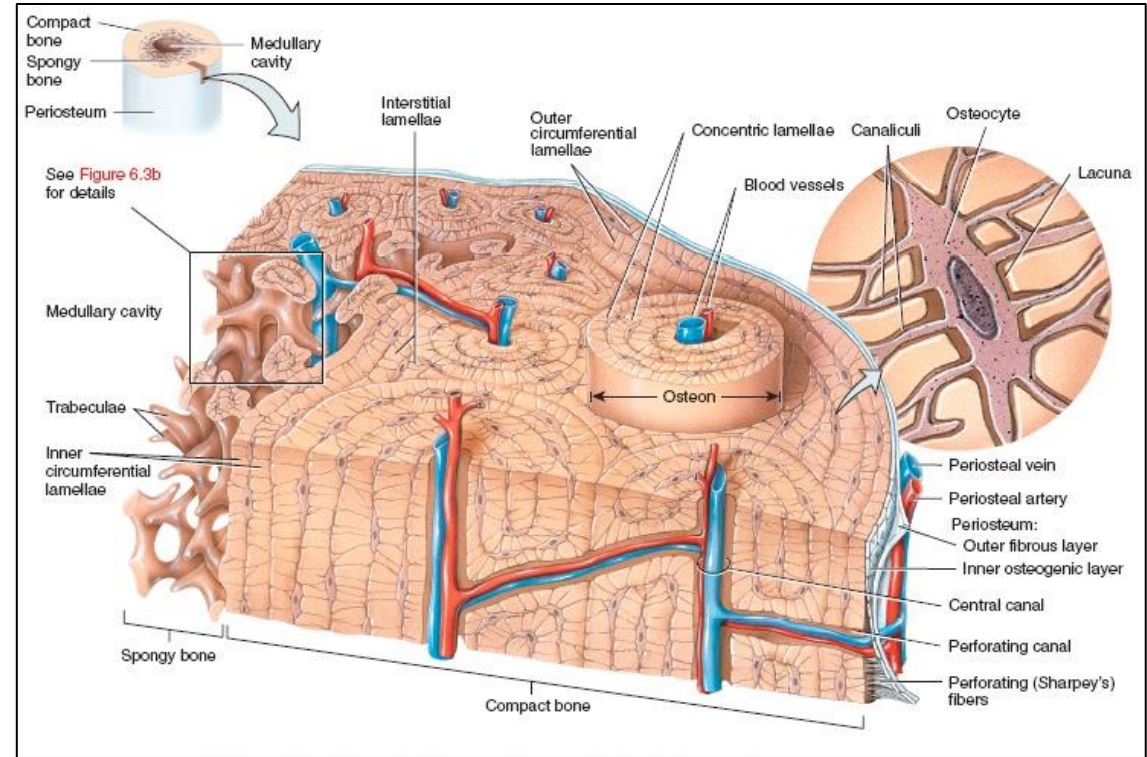


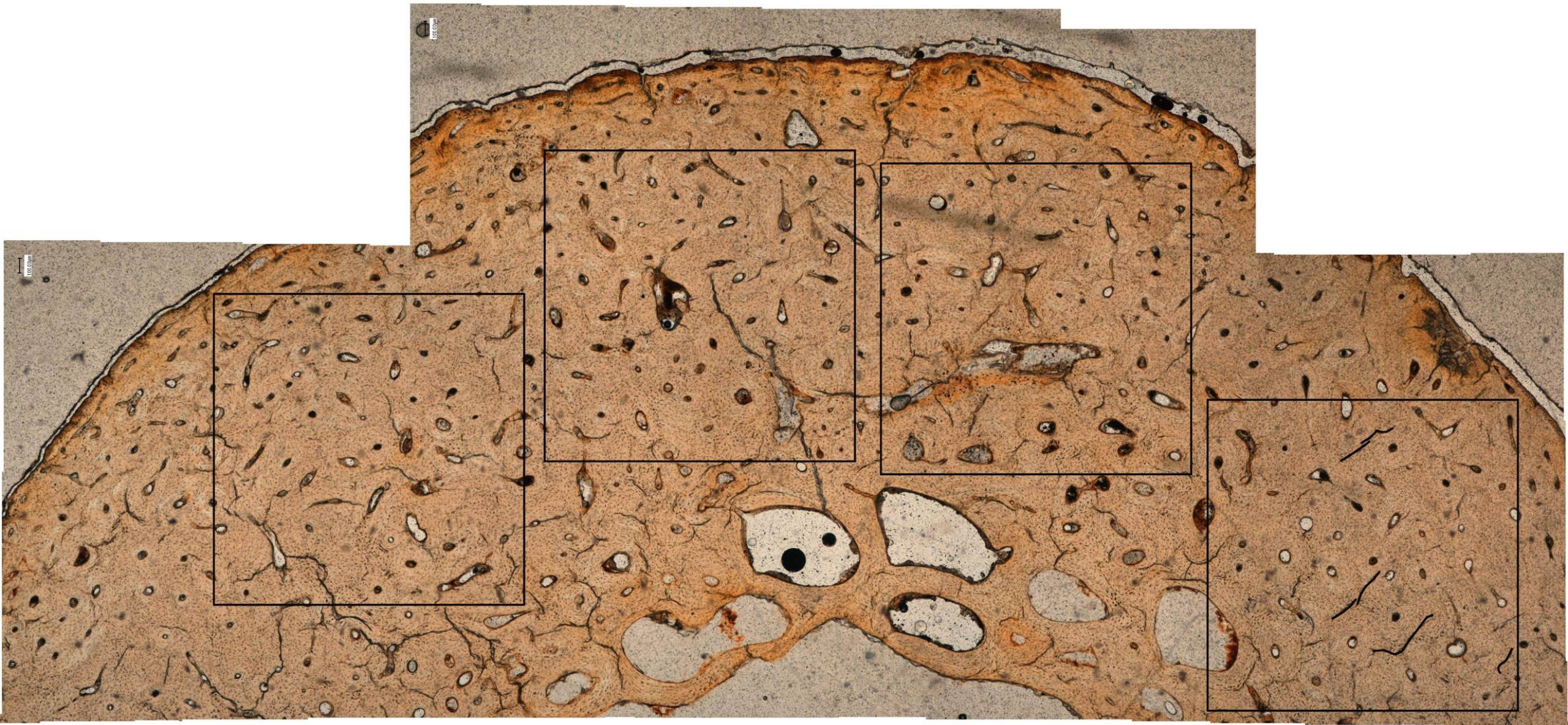
➡ INTERSTITIAL MCK

➡ OSTEONAL MCK

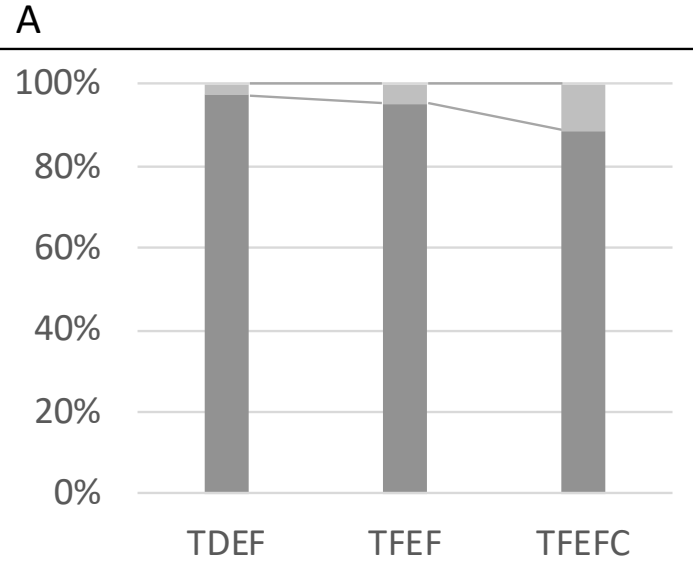


100 microns



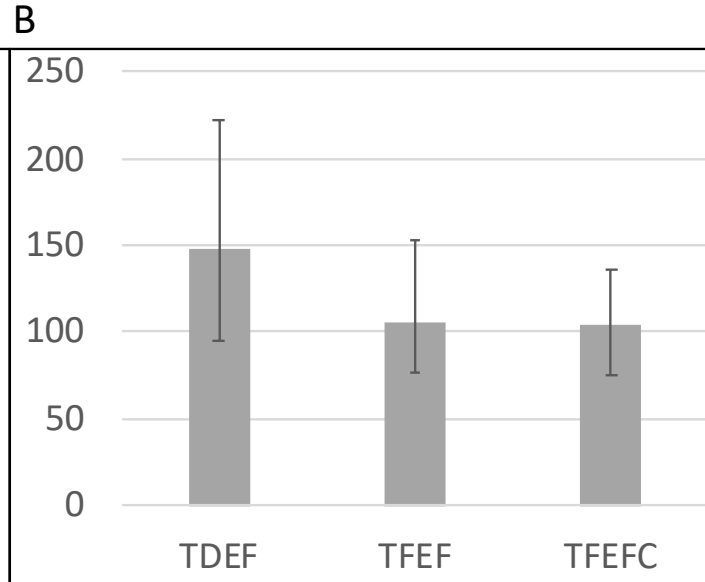


Proportion of microcrack



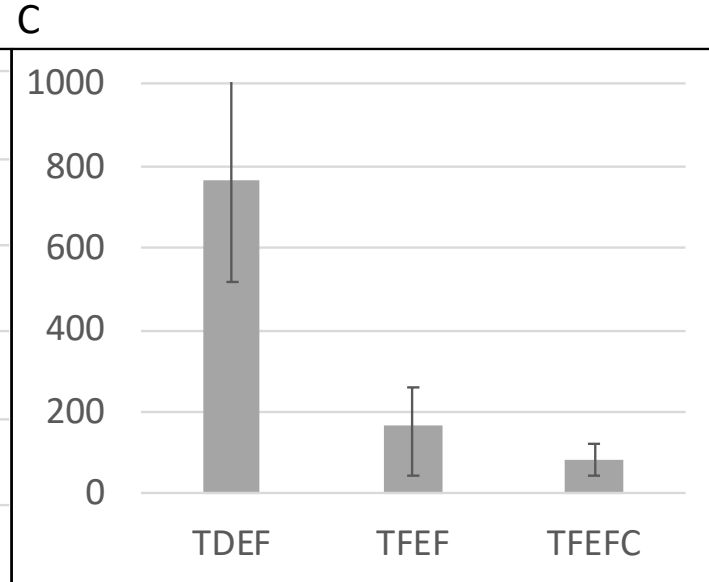
dry      fresh      fresh with  
compression

Microcrack length ( $\mu\text{m}$ )



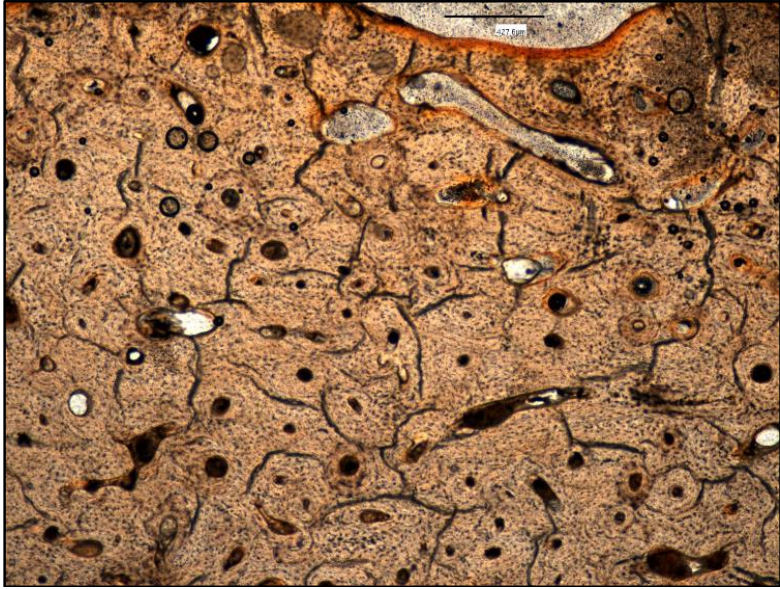
dry      fresh      fresh with  
compression

Microcrack density ( $\text{cm}^2$ )



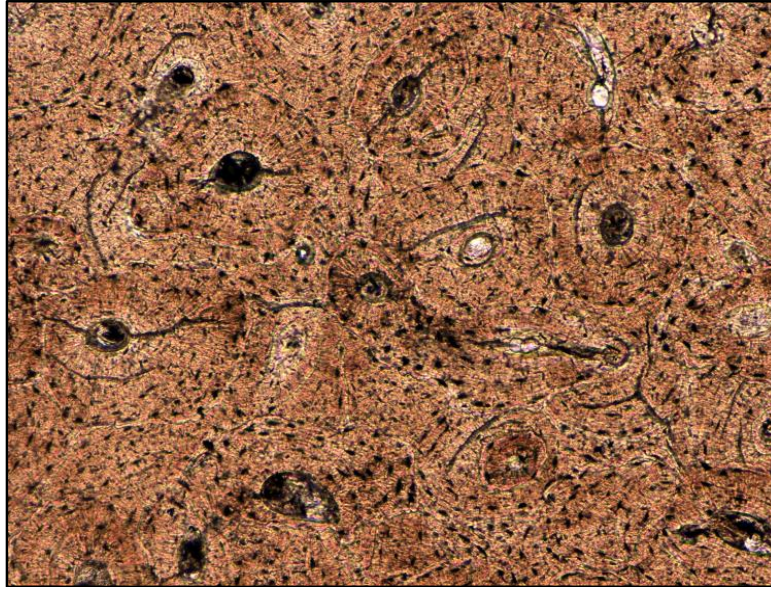
dry      fresh      fresh with  
compression

A



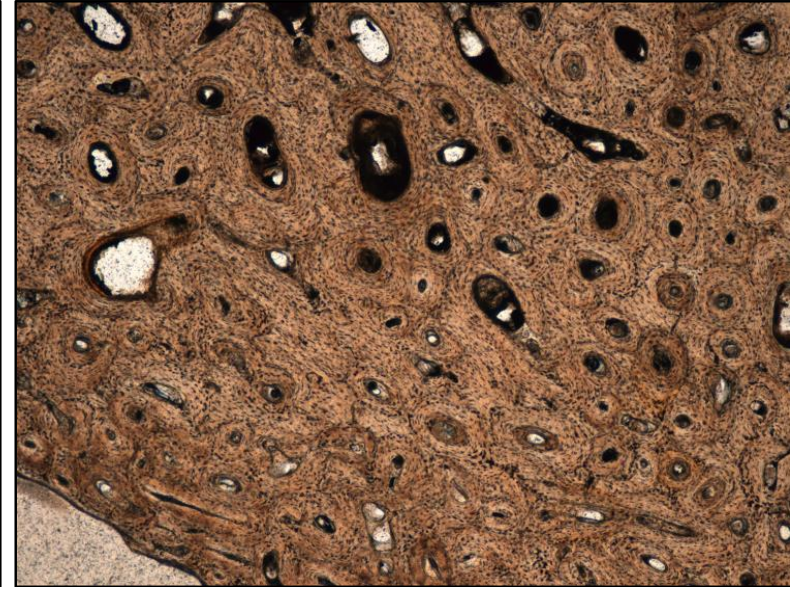
Dry tibia

B



Fresh tibia without axial  
compression

C



Fresh tibia with axial  
compression