A dog's life.
Multiple trauma and potential abuse in a medieval dog from Guimps (Charente, France)

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Summary

- The animal presents numerous osteological lesions, including a medial patellar dislocation and an uncommon case of *radius-curvus*
- The lesions are shown to be all of traumatic origin and occurred in at least three independent events
- The chronology and the skeletal distribution of the trauma are typical of modern-day animal abuse

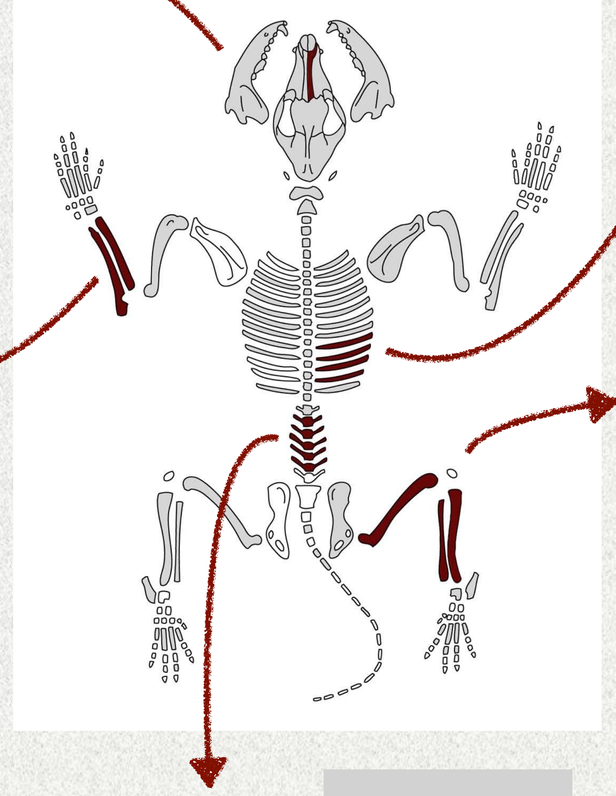
Archaeological context

- Preventive excavations led by ArcheoLoire in Guimps in 2011
- Medieval rural settlement, continuous occupation VIII-XVth centuries
- Isolated silo, containing little material apart from a single dog skeleton
- Dated by ceramic typology to the earliest phase of the site, VIII-Xth c., radiocarbon pending, perhaps contemporary with several sunken-floored buildings

The remains

- Sub-complete skeleton of domestic dog
- Young adult, 2-4 years old, probably female,
- Medium-sized, average conformation, sheepdog-like or common breed
- Excellent preservation, no anthropic traces and especially no cut-marks

Small, depressed **fracture** of the right nasale and right incisivum bones, in healing at time of death, **no older than 3-4 weeks *ante-mortem*.**

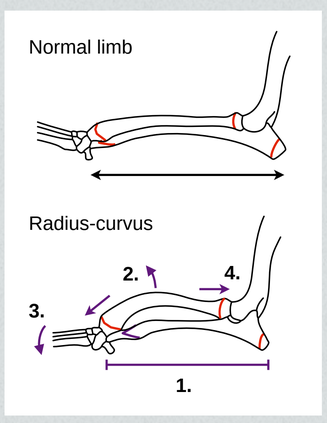


Right rib cage. Well-healed **fractures** of ribs 8 to 11, time of occurrence unknown.

Radius-curvus

Pathogenesis

- Antebrachial growth deformity
- Caused by premature closure of distal ulnar physis in actively growing dogs
- Consequence of direct or indirect trauma to distal ulna
- Before the age of 10 months



Lesions

Closure of the distal ulnar physis:

1. Ulna stop growing: shortened ulna

2. Radius continues to grow: bends away from ulna and acquires distinctive cranio-medial curvature

3. Radius twists at distal extremity and pushes on carpal joint: valgus and supination of the hand

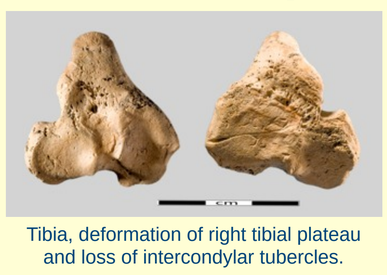
4. Radius pushes on elbow joint: elbow malarticulation

➡ **Traumatic origin**

➡ **Occurred before the age of 10 months**

4th lumbar vertebra. Deformed spinous process and healed **fracture**. L2 to L5 show similar lesions. Repeat trauma? Time of occurence unknown.

Medial patellar dislocation



Tibia, deformation of right tibial plateau and loss of intercondylar tubercles.

Femur, disappearance of the right trochlear groove.

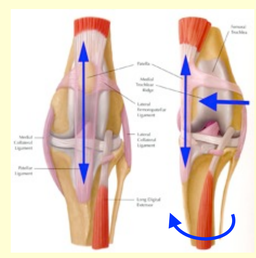
Right fibula, healed fracture.

Diagnosis

- Complete absence of trochlear groove ⇨ **Patellar luxation,** probably grade III or IV
- Tibial plateau remodelling demonstrating internal rotation of tibia ⇨ **Medial dislocation**

Etiology

- Mostly congenital BUT not in typical epidemiology
- Rarely traumatic BUT presence of fibular fracture consistent with lateral trauma



➡ Probably **traumatic**

➡ Probably **occurred in adulthood**

Discussion

Q. How can these injuries be explained?

- Five independent lesions of traumatic origin, at least three separate events. Interpretation should explain the lesions collectively and take into account their skeletal distribution.
- In present-day dogs:
  - Blunt force trauma (BFT) is the most common form of abuse
  - Pattern of injury in BFT-abuse includes multiple fractures at different stages of healing, particularly when located on the head, the ribs or the spine
  - Locations identified by clinical findings in abused dogs and supported by behavioral considerations:
    - Humans: most common forms of BFT-abuse are:
      - Kicking ⇨ Upwards movement, injures mostly belly, ribs and nose in medium-sized dogs
      - Hitting with a stick ⇨ Downwards movement, injures mostly head and spine
    - Dogs: three possible responses to aggression:
      - Return aggressiveness ⇨ presents head to aggressor
      - Flight ⇨ presents hind quarters and lower back
      - Protective curling up ⇨ presents sides, forelimbs and spine

    ⇨ second blow likely to end up in these locations.
- The animal presented nose, rib and spine injuries in different stages of healing, as well as injuries of a foreleg and of a hind-leg

➡ **Abuse appears extremely probable.**

Killing of a rabid dog, woodcut engraving, 1575, spanish edition of De materia medica by Dioscorides

Q. Were battered dogs common in medieval Europe?

- Historical and literary sources: different social representation of the status of animals; omnipresent threat of rabies
- Fracture prevalence studies in disarticulated bone assemblages: significantly higher rate of fractures in dogs than in other species; skeletal element distribution often shows predominance of fractures in ribs, head and spine

➡ **Abuse may have been frequent**

- BUT only one published case in medieval Europe, though complete dog skeletons are extremely frequent

➡ **Need for higher attention to traumatic injuries in complete animal skeletons**

Q. What impact did these injuries have?

- Fractures : well healed, no misalignment, no articular impact: minimal incidence on the dog's health at time of death.
- Radius-curvus : limp and pain during growth ; when adult, if no elbow malarticulation, causes usually only a very discrete limp or none at all, and no pain.
- Patellar dislocation : serious stifle joint instability and severe limp, though bone remodeling indicates some weight was still borne on the leg. **The limp was probably serious enough to impair the dog's usefulness as a work animal.**

Q. Was the dog cared for?

- Fractures of ribs, vertebral processes, nose and fibula require no splinting and heal well spontaneously ⇨ **Healing does not imply specific treatment**
- Present-day pariah dog populations show limping or three legged dogs can fare reasonably well on their own ⇨ **Survival does not imply care and feeding of the animal**
- No cut-marks and no sign of postmortem exploitation of the body; cadaver buried in natural position alone in a silo and not thrown in the waste also present on site ⇨ **Some care was given to the disposal of the carcass**

Q. What did the dog die of?

- We don't know. If mistreatment can well be responsible of the death, for instance by a heavy blow to the head or one causing internal injury, no traces of it were left on the available bones (mechanical excavations destroyed the cranial vault), and very many other causes can be considered.

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Bibliographical references on separate sheet, available on request.