Cortical Bone MicroCT MGP_MCB_001

Purpose

To assess the cortical thickness of a femur.

Experimental Design

- **Minimum number of animals :** 1M or 1F
- **Age at test:** Week 16

Equipment

- Scanco Medical µ50
- µCT Tomography V6.3-1 software
- Forceps
- Plastic femur holders for up to 6 femurs
- 19mm Cylindrical Acrylic Tube
- 70% Ethanol
- Circular foam pad

Procedure

1. Set up the microCT equipment.
2. Ensure femurs are separated from the tibias.
3. Place up to 6 femurs in their individual slots in a plastic holder. They should be positioned distal end first so that the femoral head is not damaged. Place the holder into a 19mm microCT tube and fill it with 70 % ethanol ensuring all the femurs are aligned vertically and in parallel.
4. Enter sample information on the machine and insert tubes into the microCT equipment. Preview samples to ensure they are aligned.
5. Set scan area for each sample and start the scan.

a. The distal head of the femur needs to be pointing down in the resulting images and the femur should be within 12.5° of vertical. If the positioning is incorrect, the femur needs to be rescanned.

Notes

Data analysis

1. Reformat the orientation of the scan so that it shows transverse slices of the femur.
2. Identify the slice located 56% of the distance from the femoral head to the distal end.

Analysis should be performed on a 1.5 mm section centered on this reference point.
3. Define the cortical region by drawing a circle / oval around the outside of the cortical bone area for both the top and bottom slice and then contour automatically for these slices, correcting manually if needed.
4. Starting from the bottom slice run automatic contouring for all the other slices. Check contouring and correct manually if needed.
5. Measure the cortical properties based on the contouring.

Parameters and Metadata

Cortical Thickness MGP_MCB_001_001 | v1.0

simpleParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: mm

Description: cortical_thickness

Internal Diameter MGP_MCB_002_001 | v1.0

simpleParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: mm

Description: internal_diameter

Cortical Bone Mineral Density MGP_MCB_003_001 | v1.0

simpleParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: mgHA/cm^3

Description: cortical_bone_mineral_density

Equipment manufacturer MGP_MCB_004_001 | v1.0

procedureMetadata

Req. Analysis: true **Req. Upload:** false **Is Annotated:** false

Description: equipment_manufacturer

Equipment model MGP_MCB_005_001 | v1.0

procedureMetadata

Req. Analysis: true **Req. Upload:** false **Is Annotated:** false

Description: equipment_model
