



Microarchitecture of the Distal Radius: evaluation using pQCT and MicroCT

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Objective

To understand the boney microarchitecture of distal radius using 2 imaging modalities:

1. pQCT (peripheral quantitative computed tomography)
2. Micro CT

Methods (1)

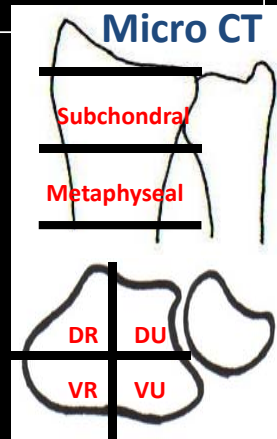
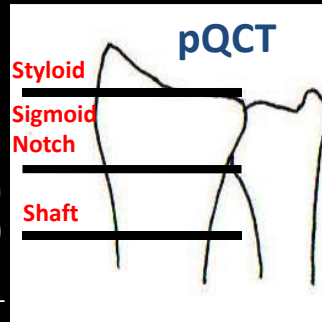
pQCT

- 10 cadaveric specimens
- 70kV, 2 mm axial sections
- 3 regions, 1 cm each
- n=50 per region
- Parameters:
 - Total bone density (mm/cm³)
 - Trabecular density (mm/cm³)
- ANOVA

Methods (2)

Micro CT

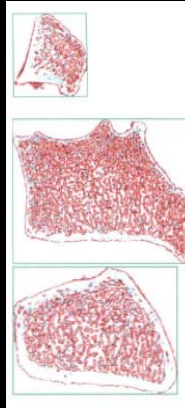
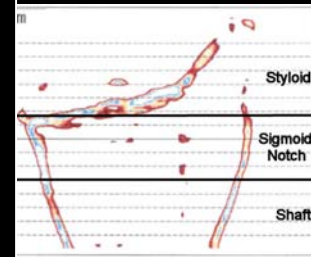
- 5 cadaveric specimens
- 29µm slices, 25 slices per region
- Parameters:
 - Trabecular number, thickness and spacing
- Radius studied in 2 regions:
 - Subchondral, metaphyseal
- Subchondral region further divided into 4 quadrants



Results (1)

pQCT

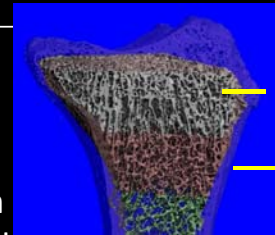
- Sigmoid notch - least total bone density*
- Shaft - significantly more bone*
- Styloid - highest trabecular density* *p<0.05



Results (2)

Micro CT

- No significant difference in trabecular thickness between subchondral and metaphyseal
- Higher trabecular number and trabeculae closer together in the subchondral region*
- No difference in the 4 quadrants* *p<0.05



Subchondral
Metaphyseal

Conclusions

- Styloid good trabecular bone volume – anchor for implants
- Subchondral stronger than metaphyseal – good fixation
- No difference in the 4 quadrants of subchondral