

The Congruency of Radius of Curvature in Type 1 and 2 Lunates in Cadaver Specimens

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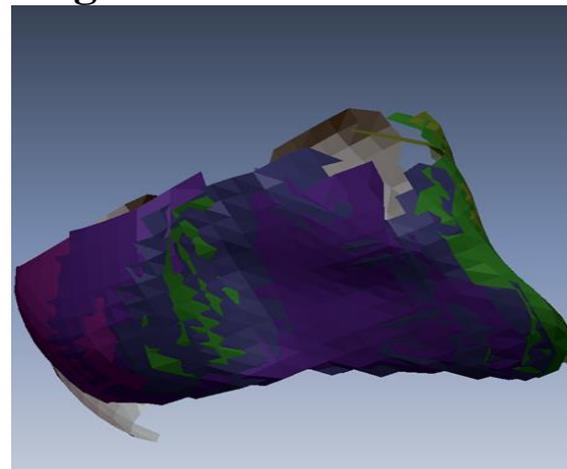
Introduction

- Proximal row carpectomy (PRC) is a treatment option for various wrist arthritides.
- When the lunate is excised, there is a possible mismatch with respect to the radius of curvature between the capitate and the lunate fossa of the distal radius.
- This mismatch is proposed to lead to failure of a PRC with subsequent progressive disease.
- Purpose of this study was to compare the articular morphology (radius of curvature) of the capitate in cadaveric wrists with type 1 and type 2 lunates.

Methods

- 12 specimens, 20 wrists total.
- 10 wrists with type 1 lunates and 10 wrists with type 2 lunates.
- NextEngine 3D scanner created three-dimensional images (Figure 1) of each lunate and corresponding capitate bone.
- Rapidform XOV program used to calculate radius of curvature.

Figure 1



Results

- 20 Wrists (15 M, 5 F)
 - ROC means (Table 1)
- Statistical Differences
- ROC all capitates to lunates, p=0.015.
 - ROC of type I lunates, 0.113 vs. type 2 lunates, 0.088, p=0.024.
 - Type 2 lunates vs. capitates, p=0.021

Conclusion

- Cadaveric anatomical study
- Wrists with a type 2 lunate showed a statistically different mean ROC between capitates and lunates.
- Further studies needed to investigate radius of curvature mismatch and effect on translational force, as well as progression of disease

Table 1. Mean radius of curvature for capitates and lunates in each wrist type

	Capitate means	Lunate means	P value between capitate and lunates
Overall	0.121+/-0.01	0.1+/-0.01	0.015
Type I	0.125+/-0.01	0.113+/-0.01	0.247
Type II	0.117+/-0.01	0.088+/-0.01	0.021
P value between each wrist type	0.48	0.024	