These images and additional data from the experiment focus on the measurement of muscle size in the thenar eminence using ultrasound imaging in individuals with thumb carpometacarpal joint osteoarthritis (OA) compared to healthy controls. The study included 14 controls (23-78 years of age) and 8 severe thumb CMC OA subjects (78-80 years of age) recruited from Stanford Hand Clinic. Real-time ultrasound imaging (Logic E9, GE Healthcare) was used to measure the anatomical cross-sectional area (CSA) of abductor pollicis brevis (APB), opponens pollicis (OP), and first dorsal interosseous (FDI) muscles, with the muscle size being scaled by hand size to generate a scaled CSA (sCSA). Ultrasound imaging was performed with the probe in the short axis of the thenar eminence to identify the flexor pollicis longus (FPL) tendon and first MC bone, which were used as anatomic landmarks.

**Results**
- sCSA for each muscle was lower in OA subjects compared with controls.
- sCSA for OP was statistically significantly lower in OA subjects compared with controls (Table 1).
- Comparisons between controls and OA subjects were stratified by sex.
- sCSA for distal FDI was statistically significantly lower in OA subjects compared with controls (Table 2).

**Methods**
- Participants: 14 controls (23-78 years of age) and 8 severe thumb CMC OA subjects (46-80 years of age) recruited from Stanford Hand Clinic.
- Real-time ultrasound imaging (Logic E9, GE Healthcare) measured anatomic cross-sectional area (CSA) of APB, OP, and FDI muscles and length of metacarpal (MC) bone in both hands.
- To scale muscle size by hand size: CSA was divided by MC bone length.
- This scaled CSA (sCSA) was used for all analyses.
- Because OA subjects had bilateral disease, 2 hands of each subject were averaged to generate 1 sCSA value.
- Unpaired t-test was used to compare means (two-tailed, alpha level = 0.05).

**Conclusions**
- Ultrasound is a fast, noninvasive, effective method to measure hand muscles.
- sCSA for each muscle (APB, OP, distal FDI) was lower in OA subjects relative to controls (significant for OP overall and distal FDI in females only).
- Future prospective studies may evaluate association between changes in muscle sCSA and CMC OA disease and validate this ultrasound method for identifying at-risk patients and evaluating interventions.

**Acknowledgements**
Funding provided by Stanford Medical Scholars Research Program.