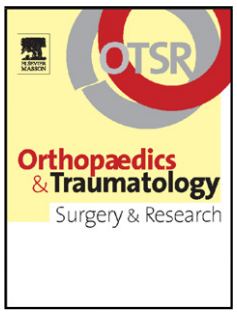

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Original article

Capitellar Erosion after Radial Head Arthroplasty: A Comparative Biomechanical Study of Operated Radial Head Fractures on Cadaveric Specimens

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Abstract

Background: We asked whether either open reduction and internal fixation (ORIF) or radial head arthroplasty (RHA), common techniques used for the confrontation of displaced or comminuted radial head fractures, are correlated with cartilage wear of the capitulum.

Hypothesis: We hypothesized that neither ORIF nor RHA are correlated with capitellar cartilage wear.

Material and Methods: On 5 cadaveric elbow specimens, osteotomies were employed to simulate radial head comminuted fractures followed with ORIF by Herbert screws. Radial heads were also excised from other 5 cadaveric elbow specimens and were replaced by metallic monopolar implants. Finally 2 elbows were not operated and used as a control group. Custom-made rotary machines, working unstoppably, generated 700.000 pronation and supination forearm movements at an 110º arc of motion. The elbow joints were examined with pre- and postoperative Magnetic Resonance Imaging (MRI) scans and the articular surfaces of the capitula were resected and sent for histopathology study.

Results: In the 2 cadaveric elbows of the control group and the 4 elbows treated with ORIF no cartilage damage was found. The fifth one displayed cartilage fissures which were classified according to International Cartilage Repair Society (ICRS) grading system as grade I cartilage damage. On the contrary, all 5 elbows treated with RHA sustained complete