Significant Osteolysis Following Press-Fit Radial Head Prosthesis: Comparison Between Two Different Implants

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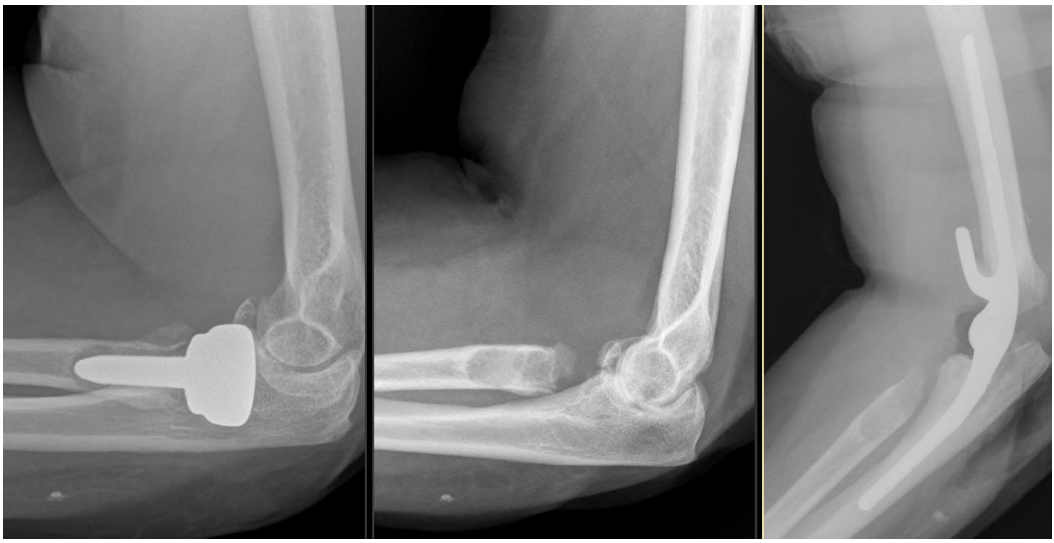
Background/Purpose: Radial head arthroplasty is a common treatment for comminuted radial head and radial neck fractures that are not amenable to reduction and fixation. Reported outcomes have been satisfactory with a common complication being loosening of the prosthesis. However, the clinical significance of this finding has not been delineated. The objective of this study was to review the radiographic outcomes of all radial head prostheses placed at one Level I trauma center and to compare the rate of periprosthetic lucency, osteolysis, periosteal reaction, and the need for reoperation between two implants.

Methods: This is a retrospective radiographic review of all patients who received a radial head arthroplasty for fracture of the radial head or radial neck from January 2010 to December 2015. Intraoperative radiographs and final follow-up radiographs were evaluated by two fellowship-trained orthopaedic trauma surgeons. The number of periprosthetic lucent zones as described by Popovic and the incidence of osteolysis and periosteal reaction were recorded. The results were further analyzed to compare the incidence of these findings in two different implants. Furthermore, the electronic medical record was utilized to determine the need for reoperation including removal of the prosthesis.

Results: From January 2010 to December 2015, 40 press-fit radial head prostheses were implanted into 39 patients. 14 elbows in 14 patients received the Synthes Radial Head Prosthesis, and 26 elbows in 25 patients received the Biomet ExploR Prosthesis. The average number of lucent zones was 2.88 in the Biomet implant and 4.64 in the Synthes implant ($P = 0.32$). The rate of osteolysis was 8% in the Biomet implant and 64% in the Synthes implant. This met statistical significance ($P = 0.0004$). The rate of periosteal reaction was similar in both implants, Biomet with 20% and Synthes with 36% ($P = 0.45$). There were 4 reoperations in the patients who received the Synthes and 3 operations in patients who received the Biomet implant. Two of the reoperations involving the Biomet implant were unrelated to implant stability, and the implant was retained. All other reoperations involved removal of the prosthesis. The incidence of reoperation involving removal of the prosthesis met statistical significance (P value: 0.10). One patient with the Synthes implant went on to total elbow arthroplasty.

Conclusion: Radial head arthroplasty remains a viable treatment option in the setting of irreparable radial head and radial neck fractures. However, complications including osteolysis, periosteal reaction, and need for reoperation can occur. Specifically, the Synthes press-fit modular radial head implant should be used with caution.



See pages 49 - 106 for financial disclosure information.