

Functional outcomes for three different reconstruction techniques after proximal humerus resections

Running title: Proximal Humerus reconstruction

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Background

Proximal humerus reconstructions following wide resections or severe bone lost defects represent challenging procedures. Different reconstruction techniques had been described including endoprosthesis replacement (EPR), biological reconstructions or a combination of both. Benefits and disadvantages were described for all them.

Questions: We propose to analyze 3 groups of patients treated with EPR – OAA – APC for massive bone defects of the proximal humerus and compared it's results in terms of: 1) limb reconstruction survival (LSRS), 2) reconstructions failures 3) functional scores and 4) reconstruction stability

Methods: A retrospective review from our oncologic prospective collect data base searching for all proximal humerus reconstruction was done between 1990-2012 and all the patients who underwent a proximal humerus endoprosthesis replacement (EPR), osteoarticular allograft (OAA) or alloprostheses composite (APC) reconstruction were reviewed. A minimum of 18 months follow-up was demanded for those patients who did not present the failure event previously. All patients were treated by the same oncologic orthopaedic team at the same institution and the deltopectoral approach was used in the entire series. Complication rates and functional results (MSTS) were compared. A reconstruction failure was defined following Henderson's classification.

Results: A total of 52 proximal humerus reconstructions were included in the study (OAA: 18 - APC:17 - EPR:17). No significance differences were found between the three groups in terms of 5 year LSRS (OAA: 70% - APC: 69% - EPR: 72%) ($p=0.92$). Mean MSTs for the entire series was 24 (17-28).with no statistical differences between the groups (OAA:25 vs APC:24 vs EPR:22) ($p=0.23$). Biological reconstruction presented a high incidence of complications compared to EPR (42% vs 23%). Joint stability was significantly better in patients with OAA and APC compared to EPR.

Conclusion: The three different reconstruction techniques for proximal humerus resections achieved similar functional results. Biological reconstruction presented a high incidence of complications and failures.