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Total elbow arthroplasty for the treatment of unstable chronic nonunions of the distal humerus: A case series

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Statement: 5% of distal humeral fractures go onto nonunions. 50-70% will eventually heal and have a satisfactory outcome following multiple repeat osteosynthesis surgery. Remaining patients are left with painful, unstable elbow with limited function. Reconstructive options are limited due to the remaining poor bony and soft tissue envelopes and the fibrous nonunion tissue. We assessed outcomes for total elbow arthroplasty (TEA) as a salvage procedure for this group of patients.

Methodology: Seven patients with mean nonunion time of 12 years (range 3-29 years) and mean of 4 previous failed surgeries prior to undergoing TEA as salvage procedure for distal humeral nonunion. Pre and postoperative Oxford Elbow Scores (OES) were used to assess functional outcome and all complications were reported at follow-up.

Findings: Mean preoperative OES was 11.9 (range 6-18), at a mean follow up of 24.3 months (range 6-54), the mean OES was 37.7 (range 17-47), a mean 25.9 score improvement postoperatively (t-test, $p=0.00038$). Preoperatively, all patients had painful unstable and restricted arcs of motion ranging from a flail elbow to at best 90 degrees of flexion. Postoperatively, all TEA had sagittal and coronal stability throughout an arc of motion of 20-140 degrees. 86% of our series had a good outcome (OES >38). One patient had metalwork removed for suspected infected nonunion and ulna nerve neuropathy prior to TEA. Despite eradication and normal histology and blood markers prior to TEA this patient has a poor outcome score (OES 17), with the majority of symptoms relating to the preexisting ulna neuropathy. This patient is satisfied with the stability and function the TEA has provided which is not reflected in the OES.

Conclusion: Our series shows that TEA is a good salvage option for chronic distal humeral nonunion, with good functional outcomes in patients who have never had an infected nonunion.

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