

Incidence of Iatrogenic Radial Nerve Palsy Following Repair of Humeral Shaft Nonunion

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Purpose: The rate of iatrogenic radial nerve palsy following repair of acute humeral shaft fractures is approximately 6.5%. To our knowledge, no study has investigated the rate of occurrence of iatrogenic radial nerve palsy following surgical repair of established humeral shaft nonunion (HSNU). We hypothesize that the incidence of radial nerve palsy is higher following repair of an established HSNU when compared to historical rates reported for open reduction and internal fixation (ORIF) of acute humeral shaft fractures.

Methods: This study was conducted at an academic Level I trauma center following IRB approval. All patients who underwent operative treatment of an HSNU were identified from a fracture treatment database. Inclusion criteria were an HSNU confirmed both clinically and radiographically, absence of a preoperative radial nerve palsy, and postoperative clinical follow-up documenting radial nerve function. 63 surgically managed HSNUs were identified, of which 54 patients (86%) had adequate postoperative neurologic examination for inclusion in the study. The main outcome was diagnosis of postoperative iatrogenic radial nerve palsy.

Results: 54 patients were included in the cohort. Median age was 54.5 years (range, 21-93 years) with 24 males and 30 females. Ten patients (18.5%) developed iatrogenic radial nerve palsies: eight experienced complete resolution (mean, 2.5 months) and two experienced partial resolution. There were no statistically significant differences between patients who developed nerve palsy and those who did not in regards to age, gender, tobacco use, diabetic status, initial management (operative vs nonoperative), surgical approach, presence of infected nonunion, number of previous surgeries, or operative time ($P > 0.05$).

Conclusion: The incidence of iatrogenic radial nerve palsy for patients undergoing surgical repair of an HSNU was 18.5%. According to historical data, this rate is nearly three times higher than for those undergoing ORIF of acute humeral shaft fractures.