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The Radial Nerve Protection Plate Technique: Avoiding Radial Nerve Palsy in Case of Plate Removal

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Purpose: Iatrogenic radial nerve palsy (RNP) is a well-known complication when plating humeral shaft fractures with even an increased risk when plate removal is indicated. Bridging the nerve by a bended plate should allow plate removal in secondary surgery without RNP. Primary outcome is radial nerve palsy after removal of the radial nerve protection plate. Secondary outcome is the incidence of nonunion after primary surgery.

Methods: This was a retrospective, consecutive case series. The Radial Nerve Protection Plate (RNPP) technique was introduced in May 2013. Patients were included until June 2023, having at least 12 months of follow-up. In all patients the radial nerve was explored and subsequently bridged by the bended plate.

Result: In total 43 patients were included, 27 female and 18 male. Mean age was 62 years (range. 17-91). According to the OTA/AO classification there were 21 x 12A (15 x A1; 3 x A2; 3x A3), 14 x 12B (10 x B2; 1x B3), and 8 x 12C (2 x C2; 6 x C3). There were 5 preoperative RNPs. 23 patients received a lateral plate through a direct lateral approach, 20 patients received a posterior plate through a posterior approach. 8 patients (18%) experienced a temporary RNP after primary surgery. There were 4 nonunions, of which 1 was a pathologic fracture. In 10 patients the plate was removed after a mean of 14 months (range, 8-24) of which 7 were lateral and 3 posterior. Reasons for removal were 7 times hindrance, 2 nonunions and 1 peri-implant fracture. There were no RNPs after secondary surgery. One patient in whom we used cauterization to clear the plate at the level of the radial nerve experienced a 1-week weakness in finger extension.

Conclusion: The RNPP technique avoids radial nerve palsy in case of removal of the plate without impeding primary fracture healing. When clearing the plate, avoid cauterization of the plate near the radial nerve.