

Prospective Randomized Study on the Effectiveness of the Reduction of Extra-Articular Distal Radius Fractures With Dorsal Displacement Under Hematoma Block Versus Conscious Sedation

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Purpose: Initial reduction of distal radius fractures is achieved commonly under conscious sedation (CS). Instead, the reduction can be done under a hematoma block (HB) as it imposes less risk on patients while adding the benefit of immediate post-reduction analgesia. Furthermore, in resource-poor settings and in a busy emergency department (ED) with lack of experienced staff to give CS can cause long delays in fracture reduction. These delays can be avoided if the fracture is reduced under HB, which can be administered by the person doing the reduction. Yet, unlike under CS, under HB since the patient is fully alert and awake, it can be difficult to achieve a successful reduction, immobilization, and maintain the reduction. This can have an adverse effect on the final functional outcome. Hence our objective was to design a 2-arm, parallel-group, prospective randomized study to determine whether a successful reduction can be achieved and maintained leading to a similar functional outcome, of reduction performed under HB compared to CS.

Methods: Based on predetermined inclusion and exclusion criteria, 62 eligible patients with AO/OTA 2R3A2.2 fractures were randomized to 2 treatment groups for reduction under CS and HB, using a web-based simple randomization with an allocation ratio of 1:1. All cases were immobilized with short cast following reduction. Reduction was done by one of the investigators and radiological measurements for each patient were determined by a different investigator. Measurements, namely radial inclination (RI), radial height (RH), ulnar variance (UV), and palmar tilt (PT), were compared for both groups at immediate post-reduction (PR) and in 3 subsequent follow-up visits at 7-10 days (FU1), 4-5 weeks (FU2), and 12 weeks (FU3). Functional outcome determined by comparing the Mayo wrist scores at FU2 and FU3 in both groups. Depending on the nature of variable, the t test, Fisher's exact test, or Pearson χ^2 test was applied. To compare the difference between groups, t tests (continuous variables) and nonparametric Wilcoxon rank-sum tests (non-normally distributed variables) were applied.

Results: 62 patients underwent fracture reduction. Thus, the CS group (n = 31) and HB group (n = 31) completed the radiological assessments and clinical follow-ups as described above. Demographic features were not statistically significant between groups in either sex (P = 0.99), age (P = 0.43), or fracture side (P = 0.80). No statistically significant differences were found according to the 2-sample Kolmogorov-Smirnov test, among the 2 groups in terms of RI, RH, UV, and PT values, measured at either PR, FU1, FU2, or FU3. We did not identify a statistically significant differences between the 2 groups in Mayo wrist scores at FU2 and FU3 (P = 0.99; P = 0.83).

Conclusion: Reduction of AO/OTA 2R3A2.2 fracture of the radius under HB is as effective as reduction under CS in terms of fracture reduction, maintenance, and functional outcome.