

## **<a>Risk Factor</a>s for Complications in Ulnar Shortening Osteotomies: A Multicenter Retrospective Review**

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### **INTRODUCTION:**

Ulnar shortening osteotomy (USO) is a common procedure to alleviate pathologies causing ulnar sided wrist pain. Surgical complications include nonunion and hardware removal with rates up to 18% and 45%, respectively. The primary objective of the study was to report the overall complication rate of ulnar shortening osteotomy through a multicenter retrospective review. The secondary objective was to identify risk factors predictive of complications and outcomes.

**METHODS:** A retrospective multicenter review was undertaken, including seven Canadian hand surgery centers over a six-year period (2013-2018). A detailed review of the medical record was undertaken to extract pertinent data. The medical records were reviewed to collect demographic data, details on surgical technique, implant used, and postoperative complications. Descriptive statistics of demographics and operative characteristics including plate positioning, type of osteotomy, plate type, and ulnar variance (mm) were analyzed with Chi-squared test. Stepwise regression selection was applied to determine the optimal regression model. All statistical tests were 2-tailed, and an effect was considered significant if  $p < 0.05$ .

### **RESULTS:**

A total of 361 USOs were performed. The mean patient age was  $46 \pm 16$  (60.7% male). Eleven percent of the patients had an active workers' compensation (WCB) claim. Active smokers and diabetics accounted for 21.6% and 7.2% of the population, respectively. The overall complication rate was 37.1%. The hardware removal and nonunion rate was 29.6% and 9.4%, respectively. WCB claims accounted for 21.6% of all complications. Neither smoking nor diabetes was associated with increased complication rates. Seventy percent of plates were placed volarly, 25.5% dorsally, and 3.9% were directly ulnar. Osteotomies were oblique in 83.7% of cases and transverse in 15.5%. A commercial USO system was used in 65.1% of cases, and a free-hand osteotomy with standard 3.5mm LCDCP in 34.1% of cases. Multivariate regression analysis revealed younger age (OR = 1.03) was a risk factor for hardware removal and male sex (OR = 1.57) was a risk factor for nonunion. WCB claim was a risk factor for both complications. Surgical factors associated with hardware removal and nonunion were direct ulnar plate placement (OR = 7.24) and oblique osteotomy, respectively.

**DISCUSSION AND CONCLUSION:** There are significant rates of complications with ulnar shortening osteotomies. Direct ulnar placement of the plate should be avoided and meticulous technique should be exercised, even when using a commercially available USO plate. Patients need to be thoroughly counselled on the risks of complications prior to proceeding with ulnar shortening osteotomy.