

ABSTRACT

Introduction

This study evaluates the effect of a 3D-planned corrective osteotomy using patient-specific drilling and cutting guides in patients with distal radioulnar joint (DRUJ) instability due to diaphyseal forearm malunion sustained in childhood.

Methods

Nine patients (mean age at trauma, 12 years) with malunion and preserved forearm rotation but symptomatic DRUJ instability underwent a corrective osteotomy of the radius and/or ulna. Function and pain were assessed using the Patient-Rated Wrist/Hand Evaluation (PRWHE) score, the Numeric Rating Scale (NRS), and the Patient-Specific Functional Scale (PSFS). Furthermore, baseline clinical assessments were compared with findings at twelve months of follow-up.

Results

At twelve months, all patients demonstrated significant and clinically relevant improvement in function and pain, as well as a stable DRUJ without additional soft-tissue repair. Median PRWHE scores improved from 44.5 to 5.5 ($p = 0.004$). NRS scores improved from 2 to 0 ($p = 0.063$) at rest and from 7 to 1 ($p = 0.016$) during activity. PSFS scores improved from 7 to 2 ($p = 0.01$). All outcomes showed clinically relevant improvements according to the minimal clinically important difference (MCID).

Conclusion

These findings indicate that precision 3D-guided osteotomy can restore DRU joint stability and improve symptoms in patients with a diaphyseal forearm malunion without the need for (additional) soft tissue reconstruction.