Surgical Management of Madelung Deformity: A Systematic Review

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Background

Madelung deformity is a congenital wrist condition characterized by volar subluxation of the wrist caused by premature growth arrest of the distal radius. Progressive symptoms can necessitate surgical intervention, yet optimal treatment strategy remains unknown.

The aim of this study is to determine treatment options, surgical indications, and operative outcomes for Madelung deformity.

Methods

This study adhered to the Meta-Analyses of Observational Studies in Epidemiology (MOOSE) guidelines.

A comprehensive systematic review was performed to identify all studies describing surgical interventions for Madelung deformity. All studies were evaluated by level of evidence and a self-developed quality assessment tool.

Results

Twenty-five studies met inclusion criteria; all case series with type IV level of evidence. Studies assessed pain, range of motion, aesthetic deformity, and grip strength. The primary indication for surgery was the presence of wrist pain. Various surgical procedures exist and could be categorized as: radial lengthening, ulnar shortening or a combination of both. All studies report post-operative pain reduction and most studies report an improved ROM.

Conclusion

A variety of surgical procedures reportedly have satisfactory outcomes. However, outcomes are reported in an inconsistent manner, prohibiting pooling of studies and comparisons of surgical procedures and their outcomes.

We propose several methodological changes for implementation in future studies, increasing the quality of evidence to compensate for small patient numbers.