Clinical Effects of Ulnar Variance Which Lengthened Again after Ulnar Shortening Osteotomy

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Introduction

- Ulnar variances after ulnar shortening osteotomy often were lengthened again.
- However, less is known about the changes of ulnar variance after ulnar shortening osteotomy though it can affect on clinical outcome of ulnar shortening osteotomy.
- The purpose of this study was To assess change of ulnar variance & estimate its clinical effect and to identify predictors for the change of ulnar variance after ulnar shortening osteotomy.

Materials & Methods

- From June 2005 to March 2015, Retrospectively reviewed 124 patients (139 wrists, R t: 75, Lt : 64, Both : 15) who had undergone ulnar shortening osteotomy. Other musculoskeletal disease or trauma in upper extremity, any postoperative complication were excluded.
- To quantify the lengthened ulnar variance, immediate postoperative ulnar variances were compared with those at 1 and 2 years after surgery.
- Calculate % of changed ulnar variance during 2 years after surgery in contrast to shortening length
- To assess its clinical effect, divided into two groups group A; ≥50% of lengthened ulnar variance, group B; < 50% of lengthened ulnar variance
- the preoperative VAS & DASH score and those at 1 and 2 years after surgery were compared.
- Possible predictors included Length of ulnar shortening, Level of ulnar shortening osteotomy (Proximal or distal shortening to central band of interosseous membrane)
- Level of ulnar shortening osteotomy: Estimated with immediate postoperative radiography & preoperative MRI, divided into proximal or distal osteotomy to ulnar insertion of central band of interosseous membrane
- A logistic regression analysis was performed in order to detect predictors for the ulnar variance lengthening.

Hypothesis

- Proximal ulnar osteotomy to central band insertion can induces transient longitudinal instability of forearm

Level of osteotomy

- Distal margin of ulnar insertion of central band
  = Just proximal to extensor indicis proprius muscle origin (Tuberosity of distal ulna - proximal to pronator quadratus muscle)
- The Level of ulnar shortening osteotomy were estimated with immediate postoperative radiography & preoperative MRI

Results

- Between group A and B, there is no statistical difference sex, age, incidence of DRUJ OA, plate removal, amount of physical work exposure
- The relengthened ulnar variance were longer in Group A.

- Pain and functional score (VAS and DASH score) was better in group B (p<0.01)
- Length of ulnar shortening and level of ulnar shortening osteotomy influenced at ulnar variance lengthening (p<0.01)

Conclusion

- Ulnar shortening length and proximal osteotomy (from insertion of central band of interosseous membrane) were independent risk factors for postoperative ulnar variance change.
- The ulnar variances after ulnar shortening osteotomy were lengthened with time and effect the clinical result of ulnar shortening osteotomy.
- To prevent the lengthening of ulnar variance, osteotomy should be performed at distal to insertion of central band of interosseous membrane.