

Unilateral Madelung Deformity and its Treatment with Radial Dome Osteotomy and Ulnar Shortening - A Case Report

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Abstract: ***Introduction:** Madelung deformity is an abnormality of the palmar ulnar part of the distal radial physis in which progressive ulnar and volar tilt develops at the distal radial articular surface, with dorsal subluxation of the distal ulna. it may be unilateral or bilateral. **Case Presentation:** A 14 years old girl presented to BSMCH OPD with chief complain of pain over left wrist and bony prominence over the medial aspect of the wrist on dorsal side since 2 years. On examination all movements around the left wrist such as flexion and extension and pronation and supination was restricted. patient managed by surgical intervention with biplanar dome osteotomy of radius - metaphyseal region fixed with 2 k wires and ulnar shortening done for this case. **Result:** Patient results were assessed both clinically and radiologically. After surgery pain relieved, cosmetic discomfort gone and range of motion of wrist increased. **Conclusion:** Distal radius deformities associated with madelung deformity can be treated with surgery especially in the presence of pain and cosmetic discomfort. Radial volar dome osteotomy + ulnar shortening is considered as gold standard surgery for madelung deformity in patient with open physis and less growth potential.*

Keywords: Madelung deformity, Radius, ulna, surgery

1. Introduction

Madelung deformity is a rare congenital anomaly of the wrist caused by asymmetric growth at the distal radius physis secondary to a partial ulnar sided arrest. Its first described in 1855 by Malgaigne and 1878 by Madelung [1 - 4]. The deformity is more common in female and is often associated with Leri Weil dyschondrosteosis; a developmental skeletal dysplasia characterized by mesomelia (Short forearm) short stature and madelung deformity [5 - 8]. Patients usually present in late adolescence with characteristic wrist deformity, decreased wrist motion and wrist pain [9].

2. Case Presentation

A 14 years old girl presented to BSMCH OPD with chief complain of pain left wrist and bony prominence over the medial aspect of the wrist on dorsal side since 2 years.

- 1) Pain and deformity increased since last 4 months hindering daily activities.
- 2) No involvement of any other joint.
- 3) No history of trauma or infection.
- 4) No family history of deformity around wrist

Inspection

- Wrist broadened
- Ulnar head prominent

- Ulnar and dorsal bowing of forearm

Palpation

- Ulnar head pushed back volarly
- Tender

Movements

All movements around the left wrist such as flexion and extension and pronation and supination was restricted

Painful to elicit



Figure 1: Clinical picture before surgery



Figure 2: x ray before surgery

Management

Investigation

- X ray B/L wrist
- PA and Lat view
- Radiological assessment

PA view shows –

- Radius is curved
- Failure of ossification of lateral side of radial epiphysis
- Increased radial inclination
- Triangulation of carpels.

LAT view shows

- Dorsal subluxation of ulna
- Volar subluxated hand
- Increased radial tilt.

3. Surgical Technique

In our case - discrepancy in length of distal radius and ulna is due to cessation of growth of distal radius physis. The ulna is relatively lengthened and impinges on the carpus. The stability provided by the distal ulna should be preserved, especially in growing children, segment of ulnar shaft was resected and shortening of the ulna enough to allow its head to articulate with ulnar notch of the radius.

Surgical Procedure

- Tourniquet
- Incision over the distal ulna shaft
- Ulnar shortening
- Periosteal envelope was stitched.
- Biplanar dome osteotomy of radius - metaphyseal region fixed with 2 k wires...

Postoperative Care

Post operative antibiotics and analgesics were given, patients was discharged from hospital on third postoperative day. An immediate postoperative x ray of forearm and wrist done. Above elbow POP slab in neutral position. Pin removal done on 8 weeks.

4. Results

Patient result were assessed both clinically and radiologically. After surgery pain relieved, cosmetic discomfort gone and range of motion of wrist increased. On radiologically

- Triangulation of carpals corrected.

- Radial inclination improved
- Volar subluxation of hand and dorsal subluxation of ulna corrected.

Position of Hand after 8 Weeks of Surgery

After 8 weeks the slab was removed and pictures were taken just prior to removal of k wires.

The ulnar head prominence over the dorsal aspect of wrist has gone and there is no volar subluxation of hand.



Figure 3: Pre op x ray 1



Figure 4: After 12 weeks of surgery



Figure 5: After 22 weeks of surgery



Figure 6: Clinical picture after surgery

5. Conclusion

Madelung - believed to be a congenital disorder - manifests in late childhood or early adolescence.

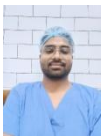
Surgery to be considered in cases of severe deformity causing functional disability and pain.

Radial volar dome osteotomy + ulnar shortening is considered as gold standard surgery for madelung deformity in patient with open physis and less growth potential.

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