

Madelung Deformity of the Wrist: A Classic Presentation

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A B S T R A C T

Introduction: Patients with Madelung deformity most often report deformity at the wrist caused by the prominence of a relatively long ulna. Most of the patients are females. Radial inclination is increased and a ‘Vickers’s ligament’ described later, is characteristic; being a helpful distinguishing factor between Madelung deformity and Madelung- like deformities.

Case Report: We report a case of classic modelling deformity in a thirteen-year old female who presented with gradually progressive deformity of the right wrist in the last two years. Plain radiographs of the wrist AP and lateral views were taken which demonstrated shortening of the ulnar portion of the distal radius with increased radial inclination and proximal migration of the proximal row of carpal bones suggestive of Madelung deformity.

Conclusion: Madelung deformity encompasses a wide spectrum of disease where deformities can be true Madelung (Vickers ligament will be present) or Madelung type. It can be congenital, post traumatic or associated with various bone dysplasias. Management may be conservative or surgical depending on symptoms and need for cosmetic correction

Keywords: Madelung Deformity, CT, Wrist Deformity, V Configuration, Vickers Ligament

INTRODUCTION

In 1878, Madelung described in detail an abnormality, which was reported many years back by Malgaigne. It subsequently came to be known by his name. Patients with Madelung deformity most often report deformity at the wrist caused by the prominence of a relatively long ulna. Most of the patients are females. Leri Weill dyschondrosteosis should be suspected in children with short stature and bilateral wrist deformity as it is often associated with this condition. Radial inclination is increased and a ‘Vickers’s ligament’ described later, is characteristic; being a helpful distinguishing factor between Madelung deformity and Madelung- like deformities.¹ It occurs mostly in adolescent females. Radiological deformity of the distal radius is due to arrest of growth in the medial portion of its epiphysis.² The abnormality can be picked up on routine antero-posterior and lateral wrist radiographs.

CASE REPORT

A thirteen-year old female presented with gradually progressive deformity of the right wrist in the last two years. It was associated with pain on movement since past few months. There was no history of trauma or surgery. She had no similar complaint in the left wrist or other joints. There was no history of fever and any redness or swelling over the right wrist on examination. There was fixed pronator deformity with no restriction of movements. Her height was 146 cm. General systemic examination was normal.

Plain radiographs of the wrist AP and lateral views were taken which demonstrated shortening of the ulnar portion of the distal radius with increased radial inclination and proximal migration of the proximal row of carpal bones. A V shape configuration was thus seen between the radius and ulna. There was mild dorsal shift of the ulnar head. (Figure 1). Plain CT and 3D volume rendered imaging displayed same findings. (Figure 2). There was no fracture. The patient was referred to a higher institute for surgical correction of the deformity.



Figure-1: AP (A) and lateral (B) radiograph of the wrist showing shortening of ulnar portion of radius (A - Black arrow) and proximal migration of proximal carpal row (A-White arrow) with dorsal displacement of ulnar head (B-Black arrow).

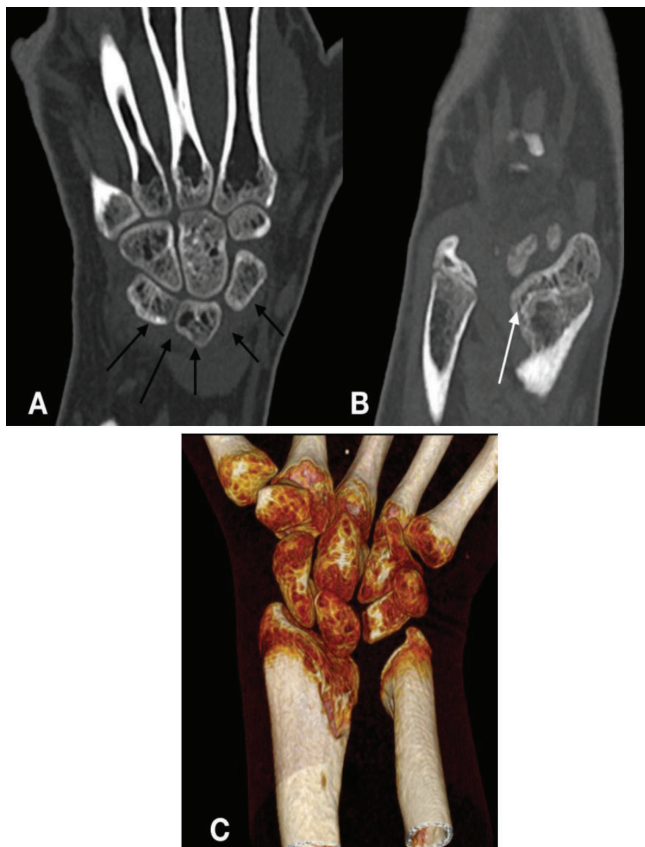


Figure-2: Coronal reformatted(A and B) CT images of wrist joint showing V shaped configuration of proximal carpal row(black arrows) and ulnar slanting of radial head(B- white arrow). 3D volume rendered CT image (C) showing classic Madelung deformity.

DISCUSSION

Madelung deformity may be the only presenting symptom of Leri-Weil and Turner syndrome.² It was initially believed to be a dyschondroplasia of the epiphysis of the distal ulna. Pain and reduced range of motion can be a presenting complaint. It may be unilateral or bilateral. Main radiological abnormalities which affect the radius include- a) Double curvature, b) decreased length, c) Triangularization of the epiphysis of distal radius, d) Premature fusion of medial half of epiphysis and e) Increased ulnar angulation of articular surface of distal radius. Predominant changes involving the ulna include- a) Dorsal subluxation of the ulna and b) Decreased ulnar length.³

In addition to the above findings, antero-posterior view of radiograph of the wrist can also demonstrate a radiolucent flame shaped notch at the medial radial metaphysis produced by the “Vickers” ligament. It is an abnormally short, volar, radioulnar ligament which restricts medial and volar growth of the radius. Magnetic Resonance Imaging can aid in identifying Vickers ligament and the extent & severity of the disease. Plain computed tomography (CT) can help in surgical planning and to exclude and other causes & any fracture. The newer advances in diagnosis include EOS Imaging (low dose 3-D digital radiography system) which would minimize radiation exposure. Three-dimensional printing also has a role.⁴ A few studies have mentioned that

there is insufficient evidence regarding a systematic approach to surgical measures of treatment.⁵ Treatment usually consists of surgical release of Vickers ligament from the distal radius to prevent progression of the disease.⁶ A dome osteotomy of the radius may be required.¹

CONCLUSION

Madelung deformity encompasses a wide spectrum of disease where deformities can be true Madelung (Vickers ligament will be present) or Madelung type. It can be congenital, post traumatic or associated with various bone dysplasias. Management may be conservative or surgical depending on symptoms and need for cosmetic correction.

REFERENCES

1. Kozin SH, Zlotolow DA. Madelung deformity. *The Journal of hand surgery.* 2015;40(10):2090-8.
2. Huguet S, Leheup B, Aslan M, Muller F, Dautel G, Journeau P, French Society of Pediatric Orthopaedics (SOPOP. Radiological and clinical analysis of Madelung's deformity in children. *Orthopaedics & Traumatology: Surgery & Research.* 2014;100(6):S349-52.
3. Felman AH, Kirkpatrick Jr JA. Madelung's deformity: observations in 17 patients. *Radiology.* 1969;93(5):1037-42.
4. Babu S, Turner J, Seewoonarain S, Chougule S. Madelung's Deformity of the Wrist—Current Concepts and Future Directions. *Journal of wrist surgery.* 2019;8(03):176-9.
5. Peymani A, Johnson AR, Dowlatshahi AS, Dobbe JG, Lin SJ, Upton J, Streekstra GJ, Strackee SD. Surgical management of Madelung deformity: a systematic review. *HAND.* 2019;14(6):725-34.
6. Hanson TJ, Murthy NS, Shin AY, Kakar S, Collins MS. MRI appearance of the anomalous volar radiotriquetral ligament in true Madelung deformity. *Skeletal radiology.* 2019;48(6):915-8.

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