

## Special Feature:

### Archibald's metacarpal sign

G. Rajagopal,<sup>1</sup> Arun Mukka,<sup>1</sup> B. Vijayalakshmi,<sup>2</sup> A.Y. Lakshmi<sup>2</sup>

Departments of <sup>1</sup>Endocrinology, <sup>2</sup>Radiodiagnosis  
Sri Venkateswara Institute of Medical Sciences, Tirupati

Rajagopal G, Mukka A, Vijayalakshmi B, Lakshmi AY. Archibald's metacarpal sign. J Clin Sci Res 2013;2:114-5.

A 14-year-old girl presented to the Endocrinology out-patient service for evaluation of delayed puberty. Salient physical examination findings included short-stature, hypoplastic mandible, multiple pigmented naevi, short 4<sup>th</sup> and 5<sup>th</sup> metacarpals and hypoplastic, wide-spaced nipples, and dimpling over the knuckles of both clenched fist (Figure 1). Radiograph of both hands (antero-posterior view) (Figure 2A) revealed that a tangential line drawn from the distal-end of head of 4<sup>th</sup> and 5<sup>th</sup> metacarpals passed through the distal end of 3<sup>rd</sup> metacarpal (*positive Archibald's metacarpal sign*). Peripheral blood lymphocyte karyotype was suggestive of 46, XX and she was diagnosed to have mosaic Turner's syndrome.

Archibald et al<sup>1</sup> labelled the term 'the metacarpal sign' and a positive sign is characterized by short ening of the fourth and fifth digits, presenting as dimpling over the knuckles of a clenched fist (Figure 1). This sign describes the difference in the relative lengths of the lateral



**Figure 1:** Clinical photograph of the patient's hands displaying dimpling over the knuckles of a clenched fist (arrows)



**Figure 2A:** Radiograph of both hands (antero-posterior view) showing tangential line drawn from the distal end of head of the 4<sup>th</sup> and 5<sup>th</sup> metacarpals passing through the distal end of 3<sup>rd</sup> metacarpal (*positive metacarpal sign*)

three metacarpals. It was described as a diagnostic marker of gonadal dysgenesis<sup>1,2</sup> and is seen in 33.8% patients with Turner's syndrome.<sup>3</sup> A positive metacarpal sign is also seen in Albright's hereditary osteodystrophy, brachydactyly with pseudohypoparathyroidism, acrodysostosis, rarely with homocystinuria<sup>4</sup> and as a normal variant in about 2%-4% of the subjects.<sup>1</sup>

Metacarpal sign is determined in the radiograph of the hand by a line, drawn tangentially to the circumference of the distal ends of the 4<sup>th</sup> and 5<sup>th</sup> metacarpals. Normally, the extension of this line passes distal to the head of the 3<sup>rd</sup> metacarpal and does not intersect (*negative metacarpal finding*) (Figure 2B).

Sometimes, such a line is tangential also to the circumference of the head of the 3<sup>rd</sup> metacarpal (*borderline metacarpal finding*). When the

Received: 01 October, 2012.

**Corresponding Author:** Dr G. Rajagopal, Assistant Professor, Department of Endocrinology, Sri Venkateswara Institute of Medical Sciences, Tirupati. **e-mail:** drraj.77@gmail.com



**Figure 2B:** Radiograph of normal hand (*negative metacarpal sign*)

line runs through the distal end of the third metacarpal it has been termed as a *positive metacarpal finding*.<sup>1</sup>

#### REFERENCES

1. Archibald RM, Finby N, De Vito F. Endocrine significance of short metacarpals. *J Clin Endocrinol Metab* 1959;19:1312-22.
2. Bloom RA. The metacarpal sign. *Br J Radiol* 1970;43:133-5.
3. Park E. Radiological anthropometry of the hand in Turner's syndrome. *Am J Phys Anthropol* 1977;46:463-70.
4. Tamburrini O, Bartolomeo-De Iuri A, Andria G, Strisciuglio P, Del Giudice E. Short fourth metacarpal in homocystinuria. *Pediatr Radiol* 1985;15:209-10.