Reviewer's report

Title: A geometric analysis of hallux valgus: correlation with clinical assessment of severity

Version: 1 Date: 2 March 2009

Reviewer: Simon Smith

Reviewer's report:

Major Compulsory Revisions

1. ABSTRACT: does not sufficiently summarise the nature of the study, including no Background information and vague Methods. Reporting on the Results need to be more succinct.

2. BACKGROUND: Authors needs to better represent or be more comprehensive in reporting the state of literature pertaining to the grading of hallux valgus (HAV) based on radiographic measures.

3. Authors don’t need to keep referring to the IP as: “…the intersection point of the perpendicular etc…”, just define it initially and then use IP consistently throughout the paper, as the former is clumsy in sentences.

4. METHODS: Authors don’t mention institutional ethics/ informed consent process and dates of study.

5. Angular Measurements: radiographic patient positioning/ capture is misleading(?) – does the patient only stand on one foot? What angle is the foot position to the sagittal plane.

6. There is inaccuracy regarding the referencing for the angular measurements:
   a. Hardy & Clapham1 – reported on HVA and IM using mid diaphyseal reference points, they did not measure DMAA or PPAA
   b. The AOFAS Ad Hoc Committee (Coughlin et al)2 – reported on HVA and IM, they did not measure DMAA or PPAA. They settled on the Hardy & Clapham method, but the description for measurement is not exactly the same as Hardy & Clapham (i.e. they suggest 1-2cm distant from respective joint for metatarsal and 1/2cm for phalanx – they don’t mention “mid-diaphyseal”).
   c. Coughlin & Freund3 – used the Hardy & Clapham method for HVA and IM (mid diaphyseal), they also looked at DMAA but did not reference the origin of this measure. They did not look at PPAA

   • The authors need to clearly define which angular measurement techniques they used for each measure – i.e. correctly reference and define. Can probably eliminate the AOFAS and Coughlin & Freund from reference for HVA and IM as they used the Hardy & Clapham method. Use Coughlin & Freund for DMAA.
   • The authors need to consider defining PPAA or the original definition/ reference for this.
• The authors might consider eliminating DMAA and PPAA given the questionable reliability of these measures and the fact that HVA and IM are the most commonly referred to measures for radiographic HAV assessment.

7. There was no mention of intraclass correlation statistic performed for the radiographic measures – this can impact the subsequent analysis

8. For those unfamiliar with the AutoCAD 2000 – is this validated for radiographic measurements? If so, this needs to be stipulated.

9. The authors should seriously reconsider the stratification of angular measurements and keep it to normal, mild, moderate and severe to avoid unnecessarily complex data presentation and in keeping with the generally accepted classification within the literature. Additionally, this should endeavours to include the same radiographic values/parameters per severity category that is commonly employed in the literature for greater generalisability. If not, they should state why.

10. Perpendicular Bisectors of the Longitudinal Axes of the First Metatarsal and Proximal Phalanx: the authors don’t mention how they arrived at which point along the 1st metatarsal and proximal phalanx bisection lines to begin the perpendicular bisectors which serve to form the IP… depending on where these lines are placed along each axis will serve to alter the position of the IP, which is the fundamental measure serving the statistical analyses and conclusions of this paper.

11. Clinical assessment of hallux valgus severity: what were the parameters for the clinical digital photo? i.e. x-distance from the foot at x-angle from the foot/ground. Were these standardised?

12. “Masked” should be “blinded”

13. STATISTICAL ANALYSIS: Language is awkward here and makes interpreting this section difficult. Will defer to a statistical expert for this section.

14. RESULTS AND DISCUSSION: Authors should separate these sections.

15. There is not a statement in the discussion on comparison with controls. The authors should discuss the differences in the text of the paper.

16. Again, the authors should consider collapsing the data into mild, moderate and severe for all radiographic measures and in regards to the IP, keep it to just “inside the foot” or “outside the foot” for the IP. This will make it easier to interpret for the readers and will not affect the conclusions.

Minor Essential Revisions

1. BACKGROUND: The authors make mention of visual inspection of foot for screening of hallux valgus in children and go on to note the VAS implementation for bunion severity based on clinical photographs (this also comes up in the discussion) – however the authors should make mention here of the existence of the Manchester Scale: a validated clinical tool for assessing severity of HAV from clinical photographs.

2. Perpendicular Bisectors of the Longitudinal Axes of the First Metatarsal and
Proximal Phalanx: The author concludes that the IP that serves to correlate well with the cut off point for severity of bunion deformity is at the border of the foot (i.e. HVA 42.5°). As such, the author should consider collapsing the data to represent the IP either inside the foot or outside the foot, rather than the categories of outside the foot but within a distance of a foot width and out of the foot but far away from a distance of a foot. These seem awkward and don’t necessarily make an important difference in the results/ discussion whether they are distinct categories or not.

3. In the discussion, the authors comment on the notion of VAS relating to clinical photos and suggest difficulty in comparing to the literature. While previous studies haven’t looked at VAS and clinical photos, the authors should again make mention of the Manchester scale – HAV assessment of clinical photos and the validation of this with radiographic measures HVA and IM performed in a separate study5.

Discretionary Revisions

1. BACKGROUND: Might be helpful to demonstrate a figure when the author discusses the “centre of the circle formed by the first metatarsophalangeal arc circumference” (paragraph 2).

2. METHODS: The authors might consider eliminating DMAA and PPAA given the questionable reliability of these measures and the fact that HVA and IM are the most commonly referred to measures for radiographic HAV assessment.

3. A representative image of a clinical photograph might be useful

4. I wonder if the authors considered reporting on the breakdown of VAS and correlating this with normal, mild, moderate and severe angles – this would be interesting data, especially on wether the VAS is statistically different between each group of severity for HAV.

Reviewers Comment:

This paper reads a little ad hoc and together with the language is confusing. While this is a somewhat novel alternative measure of HAV severity, many clinicians still use plain film radiographs on light boxes and will not effectively be able to draw an IP on a mild HAV case as they will run out of room on the film. There is also the consideration that this measure (IP) is “even more lines on an x-ray”, when conventional measures of severity of HAV are generally well accepted and integrated universally in clinical practice and surgical decision making.

Practically, it is unlikely that this measure will impact surgical decision making.


2. Coughlin MJ, Saltzman CL, Nunley II JA. Angular measurements in the evaluation of hallux valgus deformities: a report of the ad hoc committee of the American Orthopaedic Foot and Ankle Society on angular measurements. Foot


Level of interest: An article of limited interest

Quality of written English: Not suitable for publication unless extensively edited

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:

'I declare that I have no competing interests'