

# Talar Head Uncovering: A New Measurement

Matthew B. Engelthaler, DPM<sup>1</sup>, Emily Curley, DPM<sup>1</sup>, Candace Masso, DPM<sup>2</sup>, Mark Rose, DPM<sup>3</sup>

<sup>1</sup> Second Year Podiatric Medicine Resident, MetroWest Medical Center, Framingham, MA

<sup>2</sup> Third Year Podiatric Medicine Resident, MetroWest Medical Center, Framingham, MA

<sup>3</sup> Podiatric Residency Attending, MetroWest Medical Center, Framingham, MA

## PURPOSE

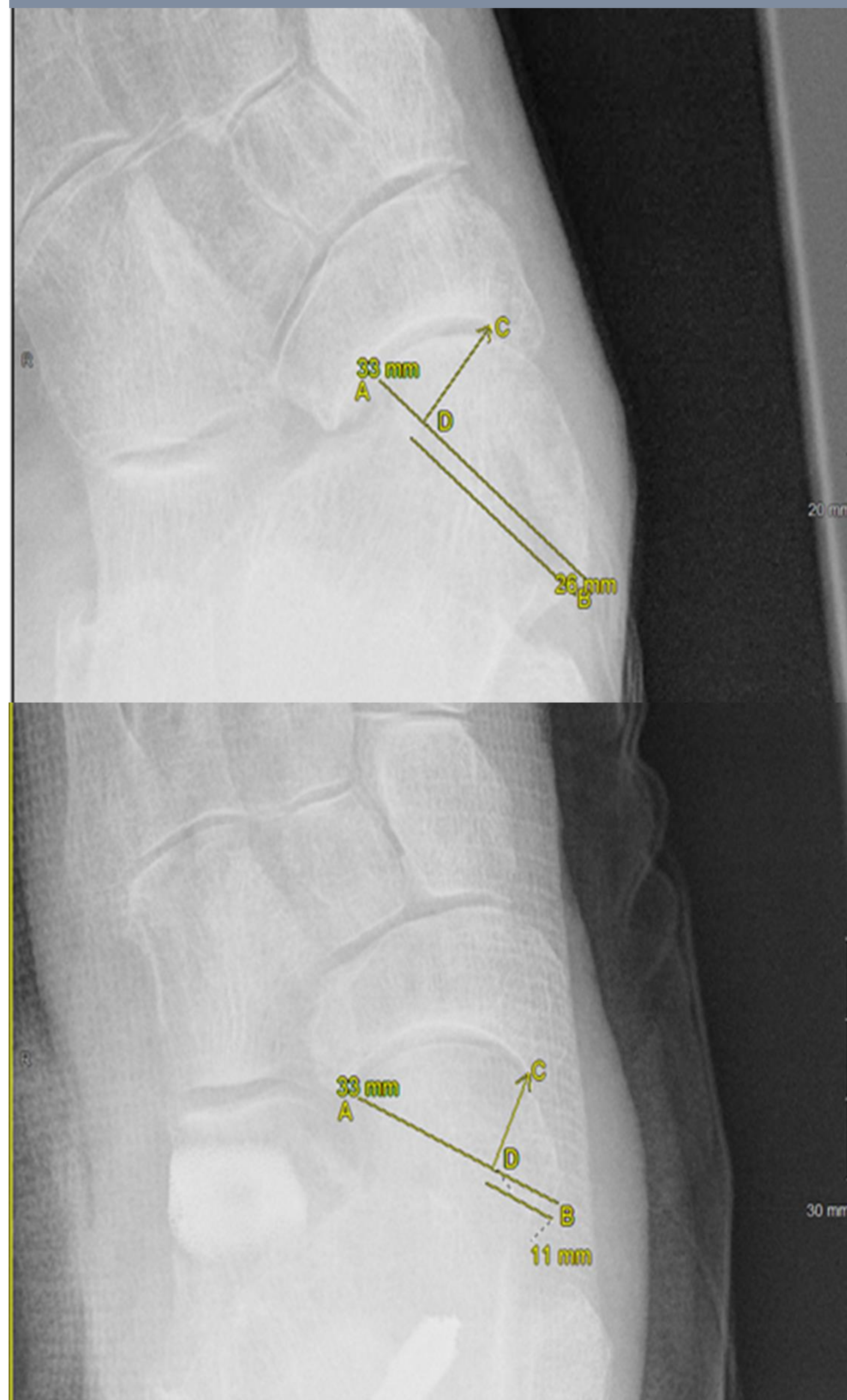
The condition of flatfoot is a common pathology seen by the foot and ankle surgeon. When assessing this condition it is important to keep in mind the 3 planes of the deformity. Typically the transverse plane is the dominant plane this condition resides in and there are many different measurements to quantify this. One of the measurements considered is the percentage of Talar Head Uncovering. An interesting find is that many papers which discuss correcting the flatfoot use this measurement however it is unclear of the actually process of measuring this. In addition, in clinical practice many times the percentage is estimated by a quick glance. Both of these leave room for very subjective data and in the case of those that determine the need for surgical reconstruction by this measurement, there is room for inconsistency. In 1993 Sangerozan et al described a method, which had been suggested before, of quantifying the Talonavicular articulation by the talonavicular coverage angle. They proposed that the angular measurements of x-rays should be used to limit the errors of magnification<sup>1</sup>. The main purpose of this poster is to provide an objective and relatively quick measurement that will be accurate and consistent for the talonavicular articulation. To the author's knowledge this method has not been described in the literature.

## Method

A weight bearing dorsal-plantar radiograph is taken of the foot. A line is drawn from the lateral edge of the articular surface of the talar head to the medial which we will designate as AB. The medial edge of the articular surface of the navicular is found (point C) and a perpendicular is drawn to the line AB (whose point will be designated as D). At this time the length of AB is measured and the length of AD is measured. The final equation is as follows  $DB/AB \times 100\% = \% \text{ of talar head uncovering}$ .

Fig. 1 Pre-operative film on the top and post-operative film on the bottom s/p Evans and a medial calcaneal slide osteotomy clearly showing good correction and measurements of 78.8% to 33.3%

FIGURE 1a, 1b, – PRE/POST-OPERATIVE IMAGING



## DISCUSSION

The Talar uncovering percentage is a well-known tool to use while working up the surgical flat foot patient. However in the literature, it is unclear many times how this percentage was derived. Also, in clinical practice it can be arduous to some clinicians and therefore an approximation is made. There is also the option of using the arc length to come up with the measurements however since the talar head is not exactly circular or spherical and the movement of the talus on the calcaneus is not a purely circumferential motion at the talonavicular joint, this is likely to also lead to technically incorrect data. Sangeorzan et. al stated the importance of angular measurements which deletes the variable of magnification of the radiographs. Other's have also used this described method as well<sup>2,3,4</sup>. We have proposed a measurement that not only uses an angle (at 90°) in order to take the percentage into account which also removes the magnification variable therefore creating a measurement that can be used in succession and is more objective rather than subjective.

## REFERENCES

- 1) Effect of Calcaneal Lengthening on Relationships among the Hindfoot, Midfoot, and Forefoot  
Bruce J. Sangeorzan, M.D., Vincent Mosca, M.D., Sigvard T. Hansen, M.D. *Foot & Ankle*, vol. 14, 3: pp. 136-141. , First Published Mar 1, 1993.
- 2) Reconstruction of the Pediatric Flexible Planovalgus Foot by Using an Evans Calcaneal Osteotomy and Augmentative Medial Split Tibialis Anterior Tendon Transfer. Viegas G, DPM. *Journal of Foot and Ankle Surgery*, July/August 2003 Vol. 42, No. 4: pp. 199-207.
- 3) New Radiographic Parameters Assessing Forefoot Abduction in the Adult Acquired Flatfoot Deformity. Ellis S, MD; Yu J, BS; Williams B, BS; Lee C, MD; Chiu Y, MS; Deland J, MD. *Foot & Ankle International*. December 2009. Vol. 30, No. 12, pp: 1168-1176.
- 4) Radiographic Assessment of Adult Flatfoot. Younger A, M.B., C.H.B., F.R.C.S.C.1,2; Sawatzky B, Ph.D.2; Dryden P, M.D., F.R.C.S.C. *Foot & Ankle International*, October 2005. Vol. 26, No. 10, pp: 820-825.