Demographic Analysis of Acute Achilles Tendon Ruptures

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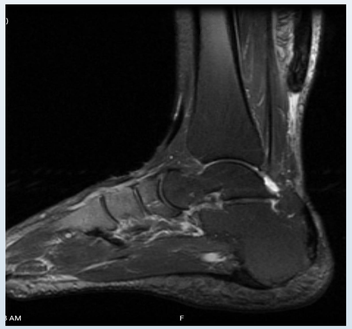

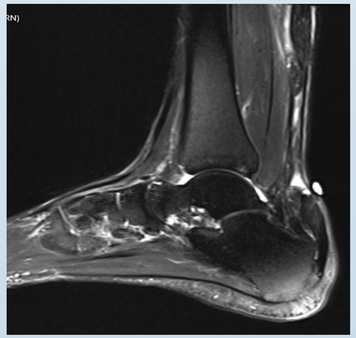

Statement of Purpose and Literature Review

Achilles tendon ruptures are a common lower extremity traumatic soft tissue injury of interest within the contemporary foot and ankle surgical literature. However, most of the accepted assumed knowledge with respect to the descriptive epidemiologic data of the presentation of this injury is based on historical and indirect data analyses.

Kuwada originally presented his widely accepted descriptive classification system of Achilles tendon ruptures in 1990 based on the repair of 28 ruptures [1]. This was later expanded to some degree in 1993 with longer term follow-up results and reporting of an "alarming" high rate of complications [2].

Most of the subsequent literature is similarly biased toward those patients whom undergo surgical repair [2-9]. These have demonstrated a bimodal age distribution pattern of rupture, most commonly affecting middle aged and elderly populations, with a strong sex predilection affecting more males than females.

Our group recently similarly evaluated descriptive statistics of patients undergoing surgical repair of Achilles tendon ruptures at an urban Level 1 trauma center by means of CPT codes (27650, 27653, 27654)[]. They found respective incidence rates of 42.5%, 20.0%, 32.5% and 5.0% for Type I, II, III and IV injuries as classified by Kuwada.

The objective of this study was to perform a similar investigation from the same base patient population, but with a slightly different hypothesis. Instead of querying CPT codes for patients undergoing surgical repair, we interrogated a large MRI imaging database for those patients who sustained the injury regardless of subsequent surgical repair.

Methodology

A MRI imaging database was queried for the diagnosis of Achilles tendon injury. Only complete ruptures were included in the subsequent analysis with evaluation of size of defect as classified by Kuwada, the distance of the rupture from the calcaneal insertion, subject age, subject gender, and laterality. Data collection and measurements were performed by two investigators (HWS and SA) including a musculoskeletal radiologist.

Results

Ruptures were common in males vs. females (77.6% vs. 22.4%; $p<0.0001$) and somewhat more common in left legs vs. right legs (53.4% vs. 46.6%; $p=0.6171$). Defects averaged 2.7 ± 1.7cm (0.5-9.0) in size with a distance from the calcaneal insertion of 5.46 ± 2.0cm (0.0-12.0). 62.1% of injuries occurred within the so-called watershed zone of the Achilles. 58.6% were classified as a Kuwada II, 37.9% as a Kuwada III and 3.4% as a Kuwada IV.

Modest and likely non-clinically significant correlations were observed between age/size of defect (-0.128), age/calcaneal distance (0.117), and size of defect/calcaneal distance (-0.202).

Discussion

As with any scientific investigation, critical readers are encouraged to review the study design and specific results and reach their own independent conclusions, while the following represents our conclusions based on the specific results. As scientists, we also never consider data to be definitive, but do think that these results are worthy of some attention and future investigation.

These results might provide foot and ankle surgeons with information related to the presentation of and surgical decision making for acute Achilles tendon ruptures.

-We observed rates of rupture according to the Kuwada classification in this diagnostic cohort similar to those previously described in surgical cohorts. Most ruptures occurred in the watershed area with a mean of 5.46cm of distal tendon attached to the calcaneus. We did not observe any substantial correlation of defect size or calcaneal distance associated with age.

-It is our hope that this investigation adds to the body of knowledge with respect to Achilles tendon injuries and leads to further investigations clarifying the demographic presentation and surgical decision making for these injuries.

References

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