VIMATS – Vienna Morphological Achilles Tendon Score

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Target Audience

Musculoskeletal radiologists, orthopedic surgeons

Purpose

The Achilles tendon (AT) is the largest as well as the strongest tendon in the human body and also one of the most frequently injured tendons (1). In addition to ultrasound, MRI is a common imaging modality for the AT (2), however, no MRI Score exists for morphological quantification of AT injuries. Therefore, the purpose of this study is to introduce the newly created Vienna Morphological Achilles Tendon Score (VIMATS) and to evaluate the reproducibility of this score.

Methods

Institutional Review Board approval and written, informed consent was obtained.
In 38 consecutive patients (49,9 mean age ± StD 12,3 years; 10 female, 30 male) a total number of 40 painful ATs were examined on a 3T whole-body system, in prone position, using an 8-channel knee coil. MR-protocol consisted of a sagittal PD-w TSE sequence (TR 3970 ms, TE 26 ms, FoV 220x220 mm, TA 3:55 min), a sagittal T1-w SE sequence (TR 724 ms, TE 11 ms, FoV 220x220 mm, TA 3:22 min) and an axial T2-w TSE sequence (TR 6720 ms, TE 100 ms, FoV 170x170mm, TA 3:22 min). Two observers independently assessed the thickness, continuity, signal intensity and associated pathologies of the AT according to VIMATS (Table 1). Intra- and interobserver agreement was calculated by intraclass correlation coefficient (ICC) and kappa- values.

Results

The mean VIMAT-Score (maximum score: 100) was 50.2± StD points (range) for observer 1 and 49.3± StD 21.4 points (range) for observer 2. The analysis of ICC yielded excellent inter- (ICC 0.898) and intraobserver agreement (ICC 0.870) for the VIMAT-Score, respectively. (Figure 1)
Concerning the intraobserver agreement for individual variables kappa-values ranged from 0.389 for peritendinitis to 0.855 for calcaneal bone marrow edema.
Excellent interobserver agreement was found for the variable "thickness" (kappa-value: 0.843); worst, but still moderate agreement showed the variable "intratendon alterations" (0.453).

Discussion

The VIMAT-Score is the first MRI-Score for semi-quantitative morphological evaluation of AT injuries and will provide radiologists a powerful tool to longitudinally follow-up patients after surgery. This might help in future, e.g. to predict patients who are at risk of re-rupture.

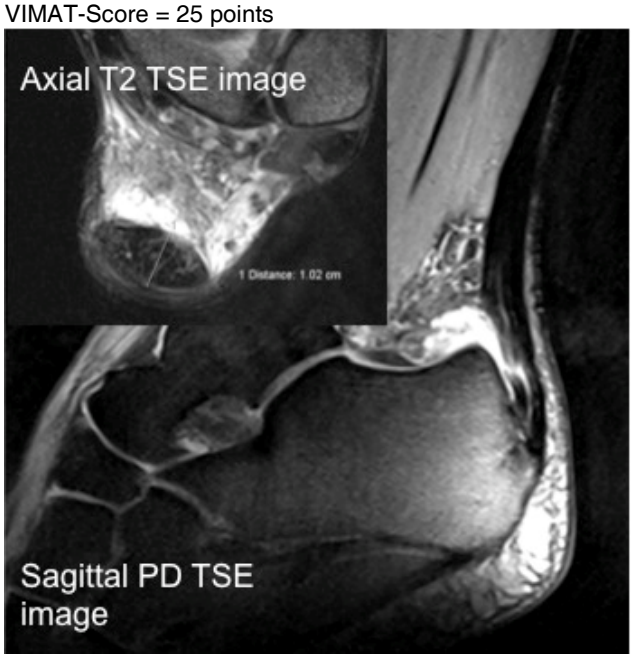
Conclusion

The newly developed VIMAT-Score is an easy, fast, reliable, reproducible and accurate tool for assessing injuries of the AT.

Table 1.: Vienna Morphological Achilles Tendon Score

Variable	Points
1. Thickness	
< 7mm	20
7,1- 10 mm	10
10,1- 13 mm	5
> 13 mm	0
2. Continuity	
Normal	30
Interstitial tear	20
Partial tear	10
Complete tear	0
3. Signal intensity	
Isotense	20
Hypertense	10
Fluid-like	0
4. Associated pathologies	
None	30
Haglund exostosis	-10
Intratendon alterations (enthesiophytes, ossifications)	-5
Peritendinitis	-5
Calcaneal bone marrow edema	-5
Bursitis	-5
MAX SCORE	**100**

Figure 1: 51 year old female patient: Thickness 10 mm, partial tear, fluid-like signal intensity, Haglund exostosis, enthesiophyte, calcaneal bone marrow edema, and bursitis. VIMAT-Score = 25 points



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