Validation of the Ankle-GO Composite Score

A Predictive Tool for Return to Sports After Achilles Tendon Repair

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Disclosure Information

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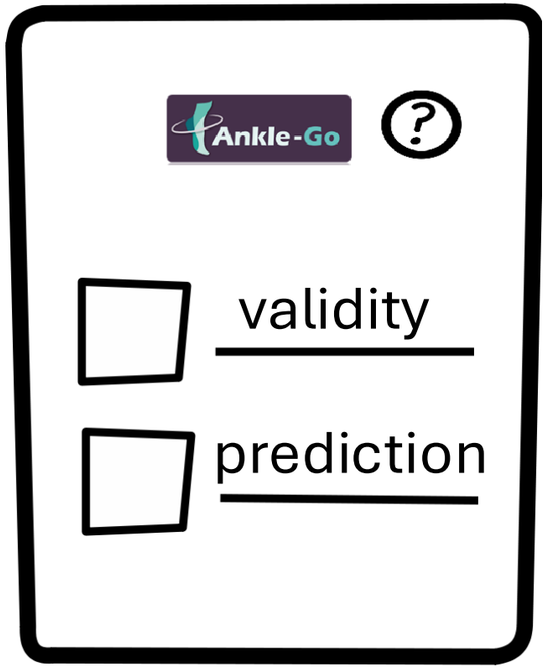
Background

- Achilles tendon ruptures are increasing in frequency, especially among active individuals aged 30–40.
- Return to sport (RTS) at the same level is a key outcome but remains difficult to predict.
- Ankle-GO is a composite score initially designed for lateral ankle sprains.
- This study aims to validate its use after Achilles tendon repair.

Study Objectives

Primary:
To assess the psychometric properties of the Ankle-GO score after Achilles tendon repair.

Secondary:
To evaluate the score's ability to predict RTS at the same level at 9 months post-op.



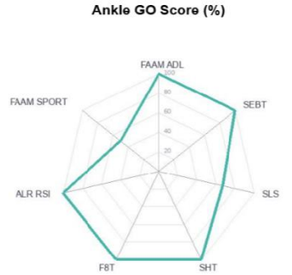
Methods: Design & Population

- Prospective multicenter study (3 centers, 2021–2022)
- 50 patients with acute Achilles tendon rupture surgically treated
- 30 healthy controls
- Inclusion: sports-active, <2 weeks from rupture
- Ankle-GO performed at 6 and 9 months post-surgery

Methods: The Ankle-GO Score

- Composite score: max **25 points**
- 4 **functional tests**: SLS, SEBT, SHT, F8T
- 2 **questionnaires**: FAAM (ADL & Sport), ALR-RSI

Score AnkleGo : 23 / 25



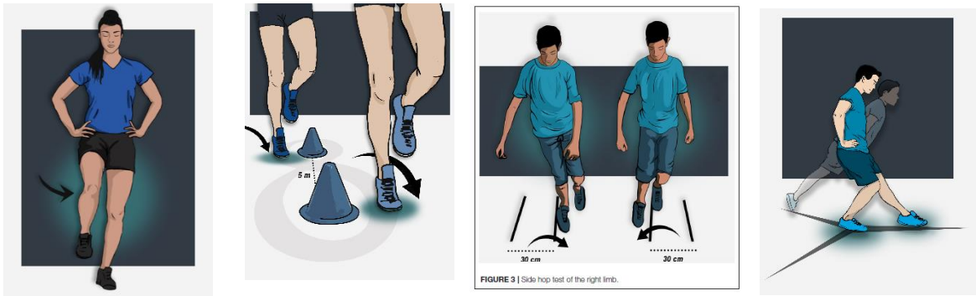


FIGURE 3 | Side hop test of the right limb.

	TESTS		RAW VALUES	POINTS	MAXIMUM SCORE
FUNCTIONAL PERFORMANCE TESTING	Single leg stance test (SLS)		> 3 errors	0	3
			1 - 3 errors	1	
			0 error	2	
			No apprehension	+1	
	Star excursion balance test (SEBT)		< 90%	0	7
			90 - 95%	2	
			> 95%	4	
			Anterior (ANT) > 60 %	+1	
			Posteromedial (PM) > 90 %	+1	
			No apprehension	+1	
	Side hop Test (SHT)		> 13 s	0	5
			10 - 13 s	2	
			< 10 s	4	
			No apprehension	+1	
	Figure-of-8 hop Test (F8T)		> 18 s	0	3
			13 - 18 s	1	
			< 13 s	2	
			No apprehension	+1	
PATIENT REPORTED OUTCOME MEASURE	Foot and Ankle Ability Measure (FAAM)	Activities of Daily Living	< 90 %	0	2
			90 – 95 %	1	
			> 95 %	2	
		Sport	< 80 %	0	2
			80 – 95 %	1	
			> 95 %	2	
	Ankle ligament reconstruction-return to sport after injury (ALR-RSI)		< 55 %	0	3
			55-63 %	1	
			63 – 76 %	2	
			> 76 %	3	
Ankle-GO	25				

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Results: Demographics & Global Outcomes

Participant Characteristics

		Patients	Controls	P
Sex, n (Men/Women)		50 (26/30)	30 (22/8)	0.249
Laterality, n (right/left)		50 (25/25)	30 (15/15)	1
Age, y ± SD		38.3 ± 10.1	31,7 ± 13,5	**< 0.001**
BMI (kg/m2) ± SD		24.5 (2.6)	22.4	**<0.001**
Type of main sport, n (%)	Pivot contact	26 (52%)	9 (30)	0.414
	Pivot and no contact	13 (26%)	14 (46,7%)	
	No pivot and no contact	11 (22%)	7 (23,3%)	
Level of practice, n (%)	Professional	4 (8%)	1 (3,3%)	**< 0.001**
	Competitive	24 (48%)	3 (10%)	
	Recreational	18 (36%)	9 (30%)	
	Occasional	4 (8%)	17 (56,7%)	

Results at 6 and 9 Months[a]

	6 mo	9 mo	*P* Value
Ankle-GO	10.7 ± 4.8	15.5 ± 5.0	<.0001
FAAM, %			
Activities of Daily Living	88.5 ± 13.6	94.0 ± 12.0	<.0001
Sports	69.7 ± 19.6	84.3 ± 17.4	<.0001
ALR-RSI scale, %	60.1 ± 22.7	76.8 ± 21.1	<.0001
SLS test, errors	2.5 ± 2.2	1.7 ± 1.9	.0003
mSEBT, %			
Composite	81.1 ± 6.9	85.0 ± 7.7	<.0001
Anterior	59.3 ± 6.1	62.7 ± 6.6	<.0001
Posteromedial	93.5 ± 9.1	97.5 ± 9.9	.0005
Posterolateral	90.7 ± 9.9	94.9 ± 10.6	.0003
Side hop test, s	18.3 ± 10.6	14.1 ± 8.6	<.0001
Figure-of-8 hop test, s	17.6 ± 8.1	14.7 ± 6.6	<.0001

[a]Data are shown as mean ± SD. ALR-RSI, Ankle Ligament Reconstruction–Return to Sport after Injury; FAAM, Foot and Ankle Ability Measure; mSEBT, modified Star Excursion Balance Test; SLS, single-leg stance.

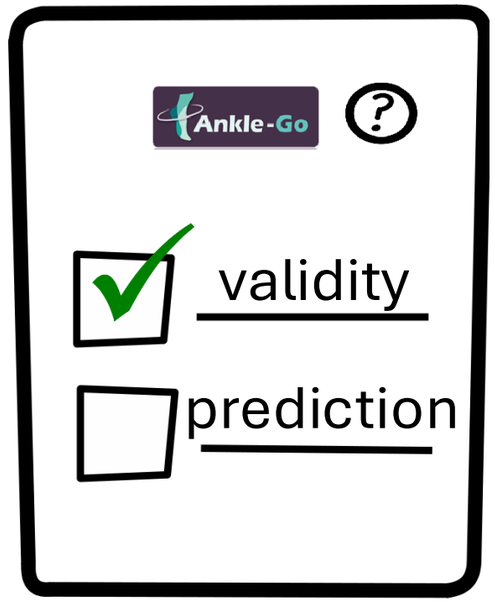
- Mean age: 38.3 ± 10.1 | 52% male
- At 6 months: Ankle-GO = 10.7 ± 4.8
- At 9 months: Ankle-GO = 15.5 ± 5.0
- 28% returned to sport at same/higher level

Results: Score Validity & Consistency

Results in Patients at 9 Months and in Control Group[a]

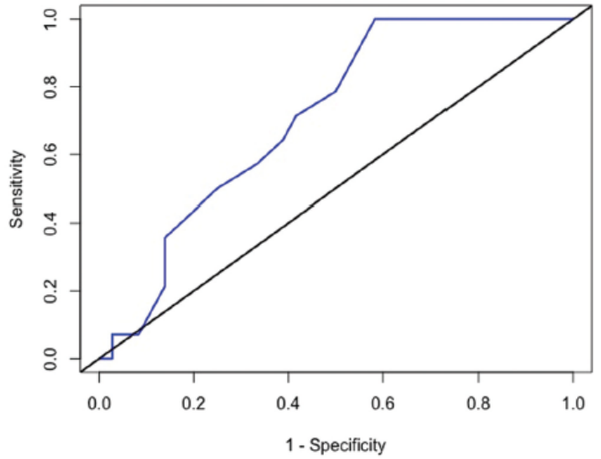
	Patients at 9 mo	Controls	*P* Value	Effect Size	95% CI
Ankle-GO	15.5 ± 5.0	19.6 ± 3.4	<.001	−0.926	−1.401 to −0.446
FAAM, %					
Activities of Daily Living	94.0 ± 12.0	99.8 ± 0.5	<.001	−0.603	−1.065 to −0.136
Sports	84.3 ± 17.4	98.9 ± 2.2	<.001	−1.061	−1.542 to −0.574
ALR-RSI scale, %	76.8 ± 21.1	96.1 ± 5.2	<.001	−1.136	−1.621 to −0.644
SLS test, errors	1.7 ± 1.9	1.2 ± 1.4	.174	0.318	−0.140 to 0.774
mSEBT, %					
Composite	85.0 ± 7.7	91.9 ± 6.7	.004	−0.695	−1.165 to −0.220
Anterior	62.7 ± 6.6	65.6 ± 5.0	.041	−0.487	−0.951 to −0.020
Posteromedial	97.5 ± 9.9	106.8 ± 11.2	<.001	−0.914	−1.392 to −0.429
Posterolateral	94.9 ± 10.6	91.9 ± 6.7	.162	0.331	−0.132 to 0.792
Side hop test, s	14.1 ± 8.6	11.6 ± 2.7	.125	0.359	−0.100 to 0.816
Figure-of-8 hop test, s	14.7 ± 6.6	11.7 ± 2.2	.022	0.543	0.079 to 1.004

[a]Data are shown as mean ± SD unless otherwise indicated. ALR-RSI, Ankle Ligament Reconstruction–Return to Sport after Injury; FAAM, Foot and Ankle Ability Measure; mSEBT, modified Star Excursion Balance Test; SLS, single-leg stance.

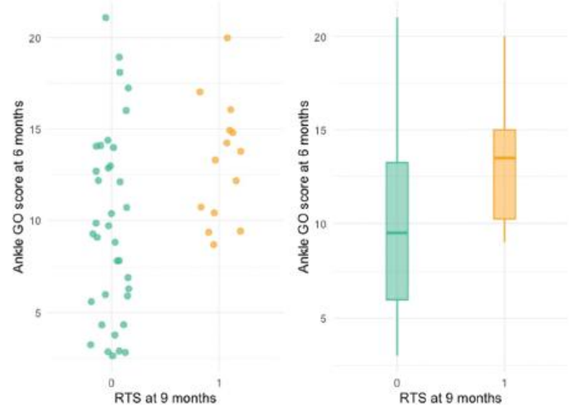


- No floor or ceiling effects
- Cronbach's α = 0.78 (good internal consistency)
- High inter-item correlation (mean r = 0.85)
- Strong discriminant validity vs. controls

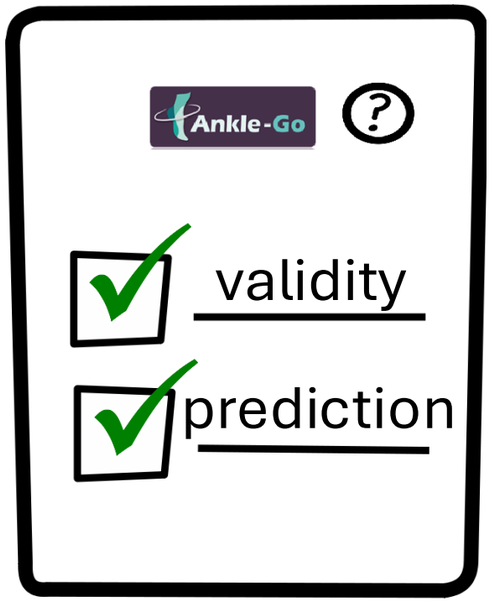
Results: Predictive Ability



Receiver operating characteristic curve for the Ankle-GO score at 6 months for predicting return to preinjury level of sport or higher at 9 months.



Scatter and box plots illustrating the relationship between the Ankle-GO score at 6 months and return to sports at 9 months (green: returned to the same level; yellow: did not return to the same level).



- Ankle-GO at 6 months predicts RTS at 9 months
- AUC = 0.71 | Cut-off = 9 pts
- Sensitivity = 100% | Specificity = 42%
- Strong predictive value for high-level RTS

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Results: Subgroup Analysis

Results in Relation to RTS at 6 and 9 Months[a]

	6 mo				9 mo			
	Same or Higher Level (n = 1)	Lower Level (n = 9)	No Sport (n = 40)	*P* Value	Same or Higher Level (n = 14)	Lower Level (n = 19)	No Sport (n = 17)	*P* Value
Ankle-GO FAAM, %								
Activities of Daily Living	100.0 ± NA	94.0 ± 5.7	87.0 ± 14.6	.0412	97.7 ± 3.7	95.9 ± 5.6	88.9 ± 18.8	.0842
Sports	93.8 ± NA	82.3 ± 11.2	66.3 ± 19.8	.0170	94.2 ± 5.9	84.9 ± 13.6	75.6 ± 22.9	.0098
ALR-RSI scale, %	65.0 ± NA	73.7 ± 19.8	56.8 ± 22.6	.1004	87.9 ± 14.6	76.3 ± 17.9	68.1 ± 25.3	.0246
SLS test, errors	7.0 ± NA	2.8 ± 3.0	2.4 ± 2.0	.3002	2.1 ± 2.1	1.6 ± 1.6	1.5 ± 1.9	.7643
mSEBT, %								
Composite	68.8 ± NA	84.3 ± 4.0	80.7 ± 7.1	.0820	86.9 ± 6.7	86.8 ± 6.9	81.6 ± 8.5	.0686
Anterior	58.9 ± NA	60.4 ± 6.0	59.1 ± 6.3	.9975	62.6 ± 5.3	64.6 ± 6.0	60.7 ± 7.9	.4235
Posteromedial	78.9 ± NA	95.8 ± 6.0	93.3 ± 9.5	.1963	100.5 ± 8.7	99.3 ± 8.8	93.0 ± 10.8	.0387
Posterolateral	68.4 ± NA	96.6 ± 6.2	89.9 ± 9.8	.0281	97.4 ± 11.4	96.6 ± 10.1	91.0 ± 9.9	.0588
Side hop test, s	35.0 ± NA	15.2 ± 8.0	18.6 ± 10.8	.2266	13.6 ± 6.5	12.4 ± 4.2	16.4 ± 12.8	.8994
Figure-of-8 hop test, s	23.0 ± NA	14.1 ± 1.9	18.3 ± 8.8	.3642	13.3 ± 4.6	13.1 ± 3.5	17.6 ± 9.5	.0576

[a]Data are shown as mean ± SD. ALR-RSI, Ankle Ligament Reconstruction–Return to Sport after Injury; FAAM, Foot and Ankle Ability Measure; mSEBT, modified Star Excursion Balance Test; NA, not applicable; RTS, return to sports; SLS, single-leg stance.

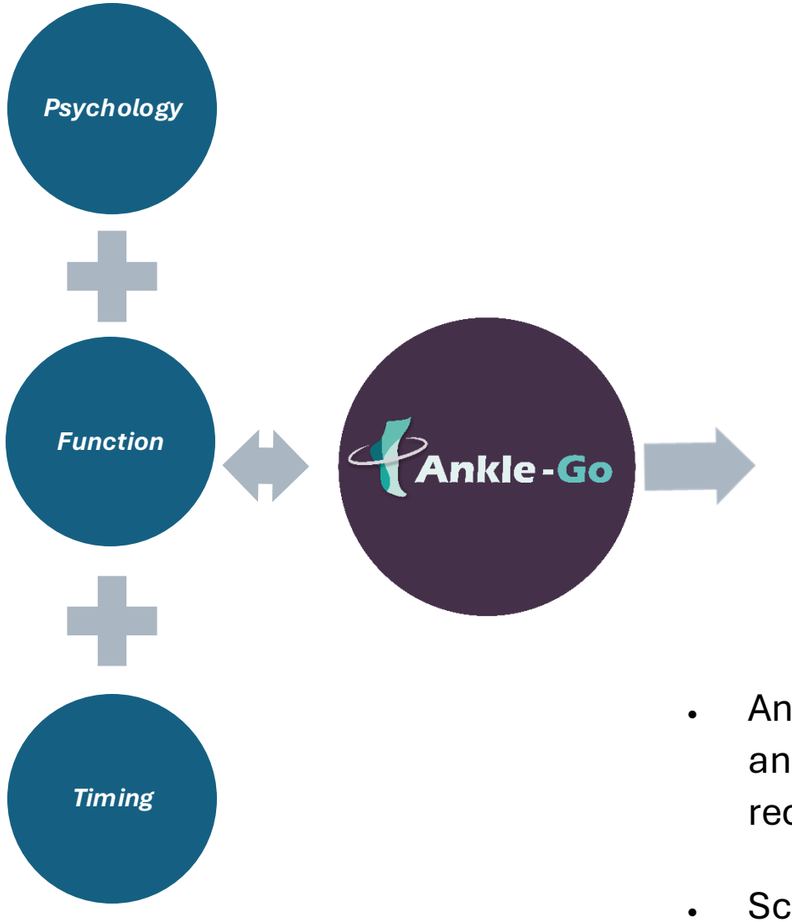
Ankle-GO Score in Professional/Competitive Athletes and Recreational/Occasional Athletes[a]

	6 mo				9 mo			
	Same or Higher Level	Lower Level	No Sport	*P* Value	Same or Higher Level	Lower Level	No Sport	*P* Value
Professional and competitive	(n = 24) 11.9 ± 5.1	(n = 4) 12.5 ± 2.6	(n = 0) NA ± NA	.9474	(n = 6) 16.0 ± 5.9	(n = 14) 17.3 ± 4.5	(n = 8) 19.1 ± 2.5	.4736
Recreational and occasional	(n = 16) 7.9 ± 4.0	(n = 5) 13.0 ± 4.5	(n = 1) 9.0 ± NA	.0505	(n = 11) 11.4 ± 4.3	(n = 5) 12.6 ± 4.7	(n = 6) 15.7 ± 3.6	.1665

[a]Data are shown as mean ± SD. NA, not applicable because no patient returned to sports at the same level at 6 months.

- Professional/competitive athletes: higher Ankle-GO scores
- Recreational/occasional: slower recovery
- Lower RTS rates for older patients and those with higher BMI

Discussion



- Ankle-GO is valid, reliable, and predictive in ATR recovery
- Score tracks recovery between 6–9 months: a critical phase
- Enables personalized rehab and RTS decisions
- Psychological readiness must be considered

Conclusion & Perspective

- ✓ Ankle-GO is a valuable composite score for clinical use
- ✓ Predicts RTS at same level 9 months post-ATR surgery
- ✓ Guides rehabilitation in the critical mid-recovery phase
- ✓ Further validation warranted for broader application

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