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Predictive Modeling for Post-Thrombotic Syndrome in DVT Patients

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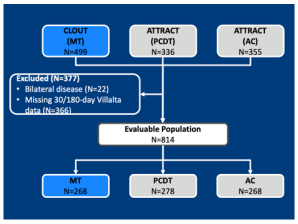
PERTINENT DISCLOSURES: INARI MEDICAL

Can Early Villalta Score Be Predictive of PTS?

- Post thrombotic syndrome (PTS) is a common and debilitating complication of deep vein thrombosis (DVT)
- Khan et al. 2008 observed that 30-day Villalta score category was a strong predictor of later disease severity in DVT patients treated with anticoagulation (AC)[1]
- There is no literature demonstrating the predictive ability of early Villalta scores in patients receiving interventional treatment

Objective: To determine if 30-day Villalta scores are associated with disease severity at later time points using patients from both CLOUT and ATTRACT.

Can Early Villalta Score Be Predictive of PTS?



Who
- Full unilateral CLOUT and ATTRACT populations with 30/180-day Villalta score data

What
- Logistic regression of 30-day Villalta scores to predict
  - PTS (5+)
  - Moderate/severe PTS (10+)
- At 6 and 12 months

How
- Measured with AUC and odds ratios

Patient Characteristics

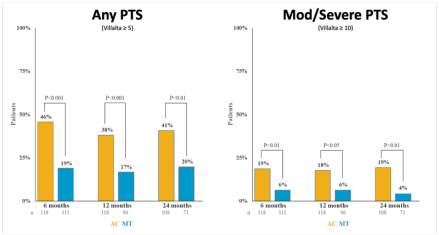
	MT N=268	PCDT N=278	AC N=268	Combined N=814
Symptom duration, n (%)	N=263	N=277	N=268	N=808
<7 days	129 (49.0%)	147 (53.1%)	130 (48.5%)	406 (50.2%)
7 to 14 days	64 (24.3%)	117 (42.2%)	121 (45.1%)	302 (37.4%)
>14 days	70 (26.6%)	13 (4.7%)	17 (6.3%)	100 (12.4%)
DVT location, n (%)	N=241	N=278	N=268	N=787
Iliofemoral[1]	198 (82.2%)	159 (57.2%)	141 (52.6%)	498 (63.3%)
Isolated femoral-popliteal	43 (17.8%)	119 (42.8%)	127 (47.4%)	289 (36.7%)
Villalta score	N=238	N=278	N=268	N=784
Mean (SD)	9.8 (5.8)	9.8 (5.1)	9.8 (5.7)	9.8 (5.5)
0–4 (%)	42 (17.6%)	43 (15.5%)	50 (18.7%)	135 (17.2%)
5–9 (%)	84 (35.3%)	100 (36.0%)	94 (35.1%)	278 (35.5%)	
10–14 (%)	57 (23.9%)	82 (29.5%)	77 (28.7%)	216 (27.6%)
≥ 15 (%)	55 (23.1%)	53 (19.1%)	47 (17.5%)	155 (19.8%)

Patient Characteristics

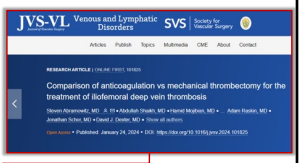
	Matched		
	AC N=164	MT N=164	P value
Age, mean (SD)	52.9 (12.4)	53.2 (15.9)	0.66
Male, n (%)	81 (49.4)	73 (44.5)	0.44
BMI, mean (SD)	31.5 (7.5)	31.2 (6.7)	0.88
Left leg, n (%)	109 (66.5)	112 (68.3)	0.81
Previous DVT/PE, n (%)	42 (25.6)	45 (27.4)	0.80
Race, n (%)			0.73
White	127 (77.4)	122 (74.4)	
Black	33 (20.1)	36 (22.0)	
Other	4 (2.4)	6 (3.7)	
Symptom duration, n (%)			0.82
<7 days	95 (57.9)	93 (56.7)	
7 to 14 days	58 (35.4)	57 (34.8)	
2–4 weeks	11 (6.7)	14 (8.5)	

	Matched		
	AC N=164	MT N=164	P value
Provoked, n (%)			0.57
Surgery	20 (12.2)	23 (14.0)	
Immobilization	3 (1.8)	7 (4.3)	
Childbirth / pregnancy	5 (3.0)	4 (2.4)	
Villalta score, mean (SD)[2]	10.0 (5.4)	9.8 (5.6)	0.58
0–4 (%)	30 (18.3)	28 (17.1)	
5–9 (%)	55 (33.5)	65 (39.6)	
10–14 (%)	44 (26.8)	37 (22.6)	
≥ 15 (%)	35 (21.3)	34 (20.7)	

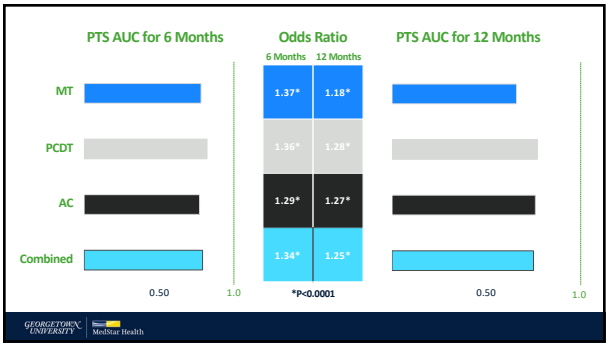
2-Year PTS Results

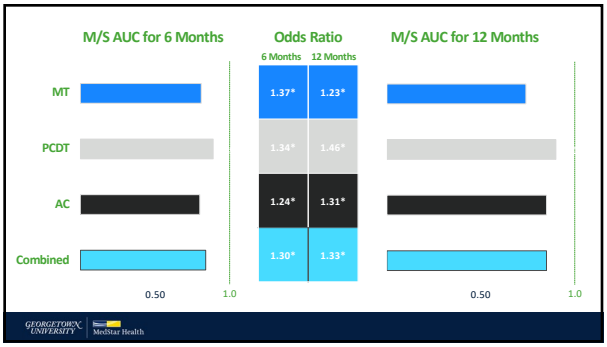


Association at 2 Years

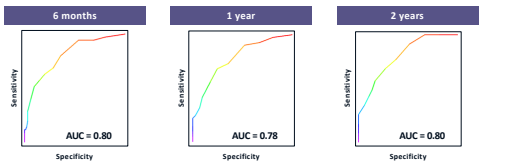


The current published analysis extends the 1-year manuscript findings comparing anticoagulation and ClotTriever in IFDVT – unpublished 2-year CLOUT data





2-Year PTS Association Data



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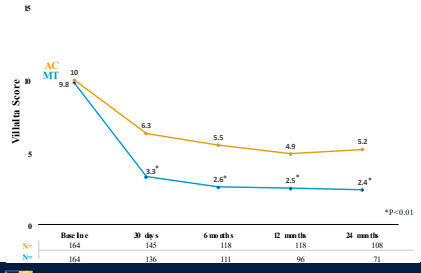
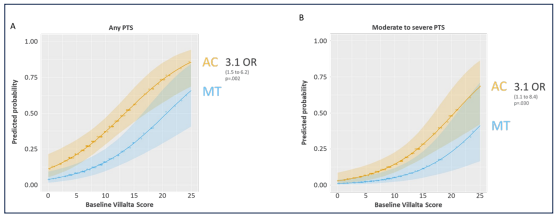
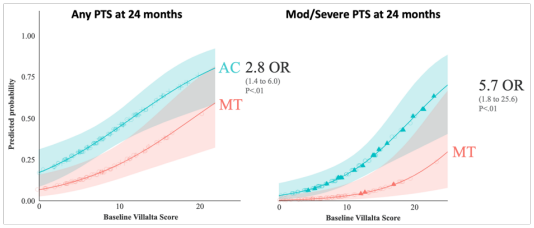


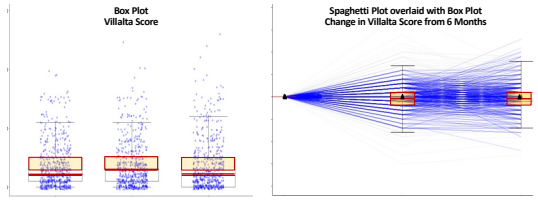
PTS Prediction at 1-Year



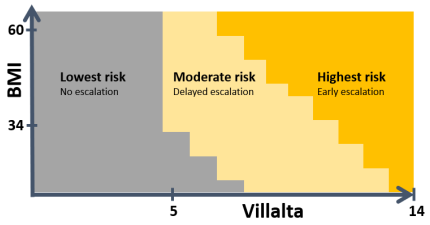
PTS Prediction at 2-Years



PTS Prediction at 2-Years



PTS Prediction at 2-Years



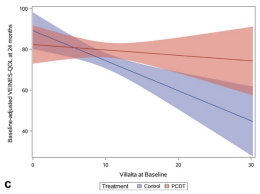
PTS Prediction at 2-Years

BMI	V0	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14
64															
60-63															
58-59															
54-57															
52-53															
46-51															
42-45															
40-41															
37-39															
34-36															
31-33															
28-30															
25-27															
23-24															
<23															

DVT and Quality of Life

Assessment:

- Limb Swelling
- Limb Pain
- VEINES-QOL
- Ulcer Healing/Recurrence
- Villalta
  - Correlates with venous pressure
  - Stronger VEINES-QOL correlation
- VCSS
  - Focus on skin for CVI correlation



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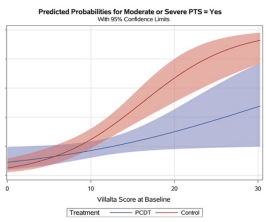

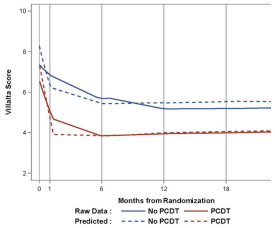

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Conclusions

30-day Villalta scores can predict the likely trajectory of PTS across a variety of patients and treatments

Predictions are especially accurate for moderate/severe disease

This may guide risk stratification as high early Villalta score or QOL impairment may warrant early intervention

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