CP-GEP Identifies T1a Melanoma Patients At Risk of Sentinel Lymph Node Metastasis

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Introduction

- In melanoma, accurate identification of T1a patients who should consider sentinel lymph node biopsy (SLNB) is important.
- NCCN guidelines recommended consideration of SLNB for T1a melanoma patients with adverse features such as age <40 years, lymphovascular invasion, and/or ≥2 mitoses/mm².
- This study evaluates the clinical utility of the Merlin Assay (CP-GEP model that uses clinicopathologic and gene expression variables) in stratifying T1a melanoma patients for SLNB referral, including those without adverse features.

Methods

- This is a retrospective analysis of a cohort of 153 T1a melanoma patients from 11 centers diagnosed between 2007 and 2021 who underwent SLNB at the discretion of the treating surgeon.
- CP-GEP performance was assessed by comparing the SLN positivity rate (pre-test SLN+ rate) in the entire cohort to the post-test SLN+ rates for CP-GEP Low Risk and High Risk patients.

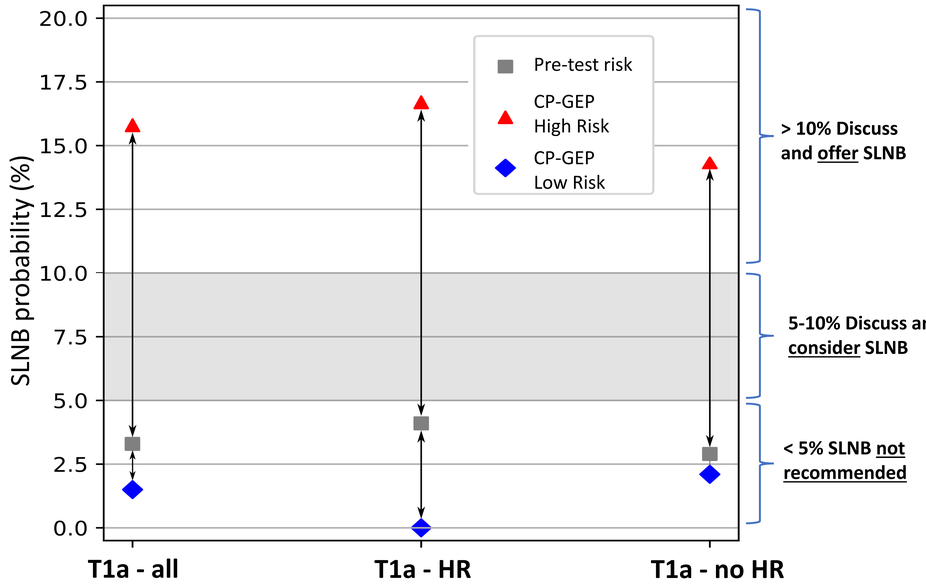
Results

- For 153 T1a melanoma patients, the overall SLN positivity rate was 3.3%.
- CP-GEP identified 134 patients as Low Risk (88%) with a post-test SLN+ rate of 1.5%. In contrast, CP-GEP identified 19 patients as High Risk (12%) with a post-test SLN+ rate of 15.8%.
- In T1a melanoma patients, CP-GEP achieved an SLNB reduction rate of 87.6% at a NPV of 98.5%.
- In 49 patients with a least one adverse feature, CP-GEP identifies 37 Low Risk patients with a post-test SLN+ rate of 0% (Figure 1).
- In 104 patients without any adverse feature, CP-GEP identifies 7 High Risk patients with a post-test SLN+ rate of 14.3% (Figure 1).

Table 1. Patient Characteristics

Variable	Level	Cohort N=153
Gender	Female	70 (45.8%)
	Male	83 (54.2%)
Age (years)	Median [1QR, 3QR]	54 (41, 65)
	<40	33 (21.6%)
	≥40	120 (78.4%)
Breslow thickness (mm)	Median [1QR-3QR]	0.6 (05, 0.7)
Ulceration	Absent	153 (100.0%)
	Present	0 (0.0%)
	Unknown	0 (0.0%)
SLNB outcome	Negative	148 (96.7%)
	Positive	5 (3.3%)
Clark level	1	0 (0.0%)
	2	15 (9.8%)
	3	33 (21.6%)
	4	18 (11.8%)
	5	0 (0.0%)
	Unknown	87 (56.9%)
Mitotic rate	Absent	47 (23.5%)
	Present	106 (69.3%)
Tumor Location	Head neck	14 (9.2%)
	Trunk	38 (24.8%)
	Upper extremities	19 (12.4%)
	Lower extremities	10 (6.5%)
	Acral head	8 (5.3%)
	Other	0 (0.0%)
	Unknown	64 (41.8%)
Histologic type	Superficial spreading	61 (39.9%)
	Nodular	2 (1.3%)
	Lentigo maligna	9 (5.9%)
	Acral lentiginous	2 (1.3%)
	Nevoid	2 (1.3%)
	Unclassifiable	3 (2.0%)
	Other	2 (1.3%)
	Mixed	1 (0.7%)
	Unknown	71 (46.4%)
Angiolymphatic invasion	Absent	150 (25.5%)
	Present	3 (2.0%)

Pre- and post-test probabilities for SLNB positivity with CP-GEP



	N	SLNB pos rate	N	SLNB pos rate	N	SLNB pos rate
Pre-test	153	3.3%	49	4.1%	104	2.9%
CP-GEP Low Risk	134	1.5%	37	0%	97	2.1%
CP-GEP High Risk	19	15.8%	12	16.7%	7	14.3%

Figure 1. Pre- and post-test probabilities for SLNB positivity with CP-GEP in T1a cutaneous melanoma patients. Adverse features such as age <40 years, lymphovascular invasion, and/or ≥2 mitoses/mm². Pre-test risk is the prevalence of having nodal metastases. High risk post-test is the probability of nodal metastases with a High-risk CP-GEP result (red). Low-risk post-test is the probability of nodal metastases with a Low Risk CP-GEP result (blue.)

Conclusions & Take-home messages

- Merlin Assay may support in risk stratifying cutaneous melanoma patients with T1a tumors.
- CP-GEP can support referral of T1a for SLNB surgery independent of traditional adverse features.
- CP-GEP can identify patients with T1a melanoma who are at high risk of SLN metastases who otherwise would not be offered an SLNB based on lack of adverse features. On the other hand, CP-GEP may deselect thin melanoma patients with adverse features who are at low risk for nodal metastases.