Comparing electrical impedance spectroscopy to traditional clinical adjunctive tools in the detection of melanoma

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Background

- Early detection of melanoma leads to improved outcomes
- Despite adjuncts such as dermoscopy, clinical detection remains challenging
- Electrical impedance spectroscopy (EIS) (Nevisense, SciBase AB, Stockholm, Sweden) has been shown to have potential as a diagnostic aid for the detection of melanoma

Objectives

- To compare the results of EIS to clinical detection algorithms in biopsy-proven melanoma lesions
- To determine the correlation between EIS score and pathologic staging

Methods

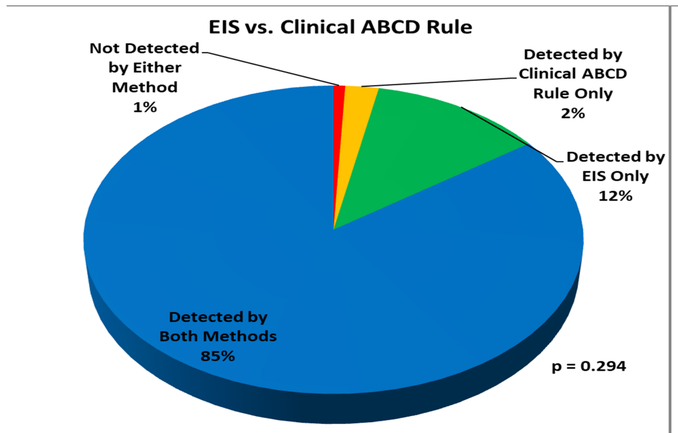
- A subset of 265 lesions from the EIS pivotal trial (2,416 total lesions from 22 sites in 7 countries) was analyzed, representing all biopsy-proven melanoma specimens in the sample
- Prior to biopsy, each lesion was characterized by:
  - Clinical ABCD rule
  - ABCD rule of dermoscopy (cutoff >4.75 for +ve score)
  - 7-point checklist (cutoff ≥3 for +ve score)
  - Weighted 7-point checklist (cutoff ≥3 for +ve score)
  - EIS (cutoff ≥4 for +ve score)

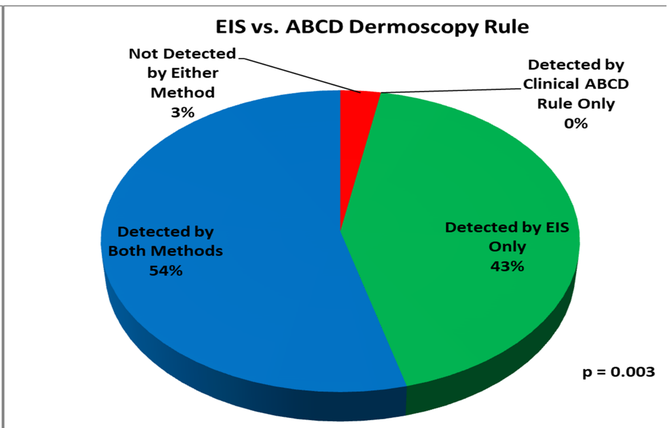
Distribution of Tumor Stage in a Sample of 265 Biopsy-Proven Melanoma Lesions

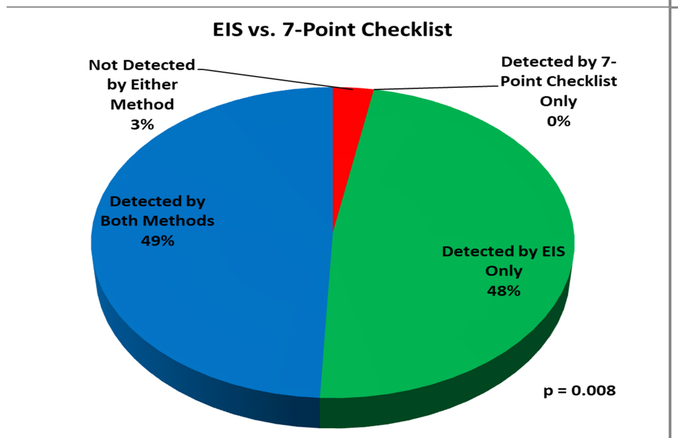
Tumor Stage	Number of Lesions	Percentage of Sample
In situ	112	42.3%
T1a	94	35.5%
T1b	19	7.2%
T2a	24	9.1%
T2b	11	4.2%
T3a	1	0.4%
T3b	3	1.1%
T4a	1	0.4%

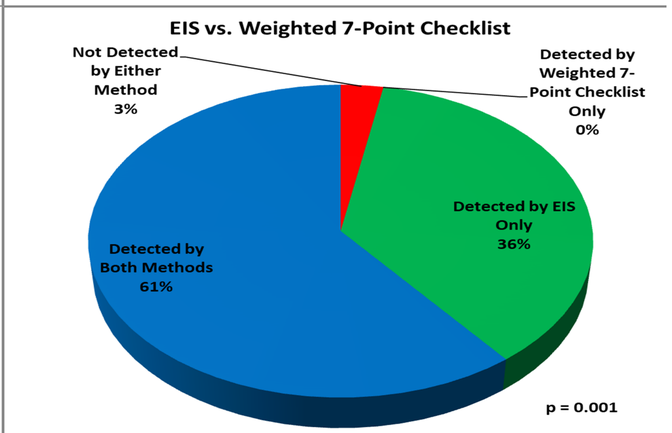
Results

Percentage of Biopsy-Proven Melanoma Lesions Detected by Various Clinical Diagnostic Algorithms vs. EIS

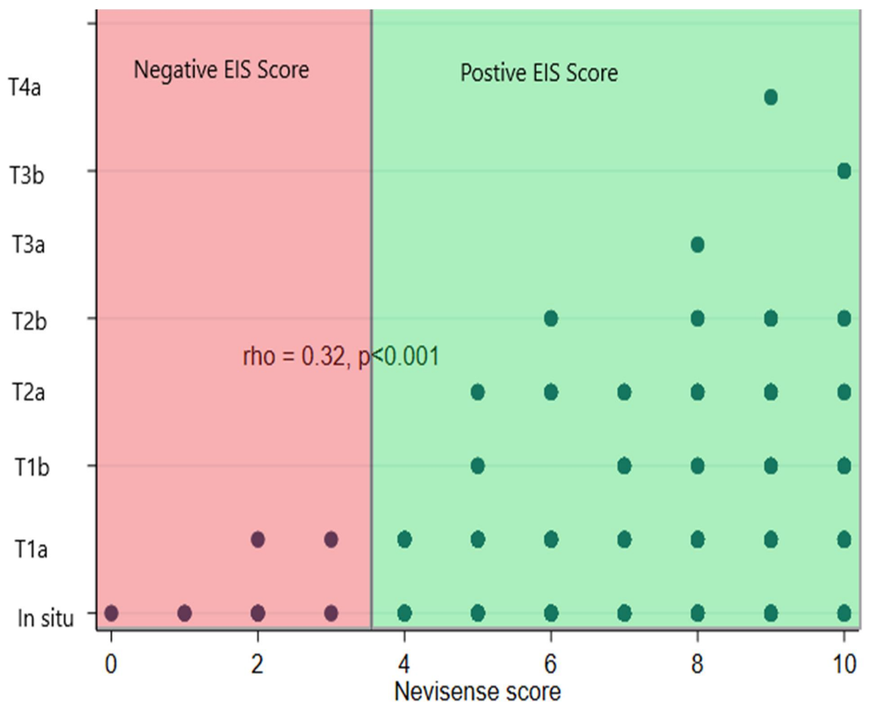








Correlation between pathologic staging and EIS score



Sensitivity of Clinical Tools for the Detection of Melanoma in a Sample of 265 Biopsy-Proven Melanoma Lesions

Technique	Percentage of False Negative Cases	Sensitivity for Detection of Melanoma	p-value*
Electrical Impedance Spectroscopy	3.4%	96.6%	-
Clinical ABCD Rule	12.8%	87.2%	0.294
ABCD Dermoscopy Rule	45.8%	54.2%	0.003
Seven-Point Checklist	50.8%	49.2%	0.008
Weighted Seven-Point Checklist	39.3%	60.7%	0.001

*Comparing sensitivity to that of EIS

Limitations

- Only biopsy-positive lesions were included in the data analysis
- There were few advanced lesions

Conclusions

- EIS potentially has a lower incidence of false negative results than other common diagnostic adjuncts in the detection of melanoma
- There appears to be a moderate positive correlation between increasing EIS score and advancing tumor stage

*Disclosures: The data for this study was supplied by SciBase, AB. No compensation was received by the authors.