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

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- 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

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

Results



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 \geq 3 for +ve score)

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

Tumor Stage	Number of	Percentage of	Spectro	scopy						
ln situ	Lesions 112	42.3%	T2b • • • Clinical rho = 0.32, p<0.001 • Ru	ABCD 12.8% 87.2% 0.294 le						
T1a	94	35.5%	T2a ABO T1b ABO T1b ABO T1b ABO Dermo	CD 45.8% 54.2% 0.003 scopy						
T1b	19	7.2%	T1a Seven- Chec	Point 50.8% 49.2% 0.008 klist						
T2a	24	9.1%	In situ	nted 39.3% 60.7% 0.001 Point						
T2b	11	4.2%	Nevisense score Chec	*Comparing sensitivity to that of EIS						
T3a	1	0.4%	Limitations							
T3b	3	1.1%	 Only biopsy-positive EIS potentially has a lower incidence of fallesions were included in diagnostic adjuncts in the detection of media 	 EIS potentially has a lower incidence of false negative results than other common diagnostic adjuncts in the detection of melanoma 						
T4a	1	0.4%	 the data analysis There appears to be a moderate positive advancing tumor stage advanced lesions 	 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.						

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

 Weighted 7-point checklist (cutoff ≥3 for +ve score) EIS (cutoff ≥4 for +ve score) 		T4a	Negative EIS Score Postive EIS Score			Technique	Percentage of False Negative Cases	Sensitivity for Detection of Melanoma	p-value*		
Distribution of Tumor Stage in a Sample of 265 Biopsy-Proven Melanoma Lesions			T3b T				Electrical Impedance	3.4%	96.6%	_	
Tumor Stage	Number of	Percentage of	13a				Spectroscopy				
In situ	112	42.3%	T2b -	rho = 0.32, p	<0.001	• • •	Clinical ABCD Rule	12.8%	87.2%	0.294	
Τ1 -	0.4		T2a		• • •	• • •	ABCD	45.8%	54.2%	0.003	
IT9	94	35.5%	T1b -		•	• • •	Rule				
T1b	19	7.2%	T1a	• •	• • •	• • •	Seven-Point Checklist	50.8%	49.2%	0.008	
T2a	24	9.1%	In situ –		4 6	• • • • • 8 10	Weighted Seven-Point	39.3%	60.7%	0.001	
T2b	11	4.2%		~ ~ ~	Nevisense score Checklist *Comparing sensitivity to that of EIS						
T3a	1	0.4%		mitations	ions						
T3b	3	1.1%	• Only lesio	 Iy biopsy-positive EIS potentially has a lower incidence of false negative results than other common diagnostic adjuncts in the detection of melanoma 							
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p = 0.001