VOLUME 104 | SUPPLEMENT 1 | MARCH 2024

LABORATORY INVESTIGATION
THE SCIENCE THAT ADVANCES PATHOLOGY

ABSTRACTS (85-273)

BREAST PATHOLOGY

USCAP 113TH ANNUAL MEETING

BRINGING EDUCATION TO LIFE

MARCH 23-28, 2024 | BALTIMORE, MD

ELSEVIER

USCAP UNITED STATES AND CANADIAN ACADEMY OF PATHOLOGY

EDUCATION COMMITTEE

Rhonda K. Yantiss
Chair

Carlos Parra-Herran
Chair, Abstract Review Board and Assignment Committee

Laura C. Collins
Interactive Microscopy

Carla L. Ellis
Chair, DEI Subcommittee

Yuri Fedoriw
Short Course Coordinator

Kristin C. Jensen
Chair, CME Subcommittee

Ilan Weinreb
Chair, Subcommittee for Unique Live Course Offerings

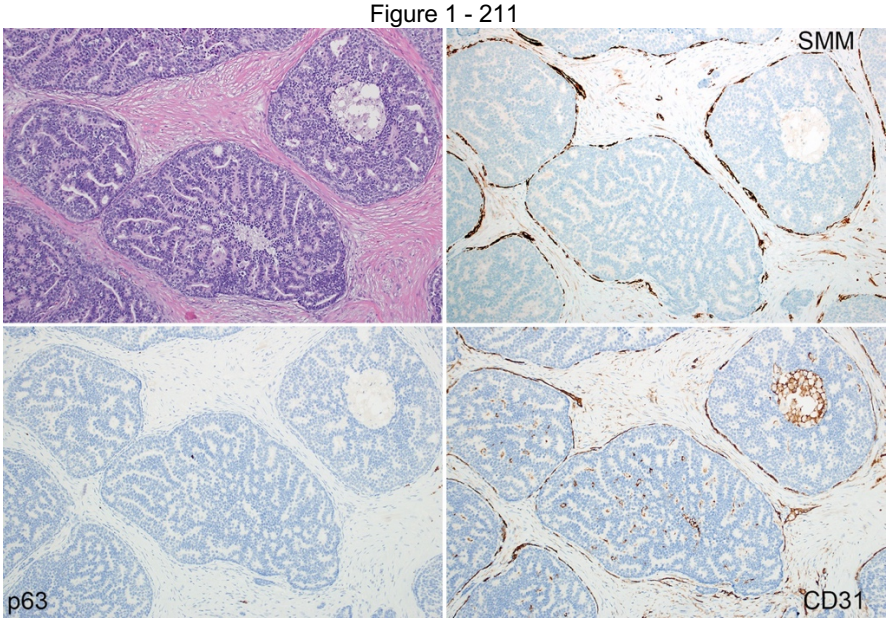
Adebowale J. Adeniran
Kimberly H. Allison
Phyu P. Aung
Justin A. Bishop
Marilyn M. Bui
Sarah E. Gibson
Jennifer B. Gordetsky
Melinda F. Lerwill
Chieh-Yu Lin
M. Beatriz S. Lopes
Tamara L. Lotan
Terri L. Mason, Pathologist-in-Training
Nicole C. Panarelli
Charles "Matt" Quick
David F. Schaeffer
Maria Westerhoff
Josh Alexander Zeitlin, Pathologist-in-Training

ABSTRACT REVIEW BOARD

Benjamin Adam
Oyedele Adeyi
Kenneth D. Aldape
Mariam Priya Alexander
F Zahra Aly
Catalina Amador
Vijayalakshmi Ananthanarayanan
Barina Aqil
Manju Aron
Ibrahim Batal
Gregory R. Bean
Govind Bhagat
Amarpreet Bhalla
Michael Bonert
Tamar C. Brandler
Allen P. Burke
Kelly J. Butnor
Sarah M. Calkins
Weibiao Cao
Barbara Ann Centeno
Joanna SY Chan
Vishal S. Chandan
Guoli Chen
Hao Chen
Lin Cheng
Soo-Jin Cho
Shefali Chopra
John Chrisinger
Adela Cimic
Cecilia G. Clement
Jennifer A. Cotter
Luis E. De Las Casas
Elizabeth G. Demicco
Katie Dennis
Jasreman Dhillon
Anand S. Dighe
Bojana Djordjevic
Michelle R. Downes
Siraj M. El Jamal
Kim Adams Ely
Mark G. Ettel
Sara M. Falzarano
Fang Fan
Evan A. Farkash
Gelareh Farshid
Michael Feely
Samson W. Fine
Susan A. Fineberg
Danielle Fortuna
Monica T. Garcia-Buitrago
Zeina Ghorab
Alessio Giubellino
Carolyn Glass
Hamza N. Gokozan
Carmen Gomez-Fernandez
Shunyou Gong
Purva Gopal
Anne Grabenstetter
Ian S. Hagemann
Richard D. Hammer
Suntrea TG Hammer
Eyas M. Hattab
Juan C. Hernandez-Prera
Jonas J. Heymann
Carlo Vincent Hojilla
Jody E. Hooper
Tao Huang
Weei-Yuarn Huang
Wei Huang
Aaron R. Huber
Kenneth A. Iczkowski
Jabed Iqbal
Shabnam Jaffer
Shilpa Jain
Jose Jessurun
Ivy John
Ridas Juskevicius
Meghan E. Kapp
Seema Kaushal
Mahmoud A. Khalifa
Thaer Khoury
Benjamin Kipp
Christian A. Kunder
Stefano La Rosa
Brandon T. Larsen
Katsiaryna Laziuk
Goo Lee
Vasiliki Leventaki
Xiaoxian Li
Mikhail Lisovsky
Lesley C. Lomo
Abberly Lott Limbach
Scott B. Lovitch
Fang-I Lu
Changqing Ma
Deqin Ma
Cristina Magi-Galluzzi
Varsha Manucha
Rachel Angelica Mariani
L. Jeffrey Medeiros
Anne M. Mills
Kamran M. Mirza
Hiroshi Miyamoto
Kathleen T. Montone
Kristen E. Muller
Priya Nagarajan
Asghar H. Naqvi
Navneet Narula
Dianna L. Ng
Michiya Nishino
Maura O'Neil
Sanjay S. Patel
Burcin Pehlivanoglu
Deniz Peker Barclift
Raghavendra Pillappa
Andre Pinto
Susan Prendeville
Carlos N. Prieto Granada
Bibianna M. Purgina
Martha M. Quezado
Emilian V. Racila
Santiago Ramon Y Cajal
Rema A. Rao
Kaaren K. Reichard
Jordan P. Reynolds
Heesun J. Rogers
Lisa Rooper
Andrew Eric Rosenberg
Esther Diana Rossi
Evita T. Sadimin
Ozlen Saglam
Ankur R. Sangoi
Kurt B. Schaberg
Vicki J. Schnadig
Qiuying (Judy) Shi
Wonwoo Shon
Pratibha S. Shukla
Gabriel Sica
Anthony Sisk
Kalliopi P. Siziopikou
Stephanie Lynn Skala
Isaac H. Solomon
Wei Song
T. Rinda Soong
Simona Stolnicu
Paul E. Swanson
Ben Jack Swanson
Sara Szabo
Elizabeth D. Thompson
Gulisa Turashvili
Neha Varshney
Jaylou M. Velez Torres
Hanlin L. Wang
He Wang
Stephen C. Ward
Kevin M. Waters
Jaclyn C. Watkins
Shi Wei
Kwun Wah Wen
Deyin Xing
Bin Xu
Ya Xu
Shaofeng Yan
Zhaohai Yang
Feng Yin
Ji (Jane) Yuan
Huina Zhang
Xuchen Zhang
Bihong Zhao

To cite abstracts in this publication, please use the following format: **Author A, Author B, Author C, Author D, et al. Abstract title.** *Laboratory Investigation*. **2024;104 (suppl 1):page#. File Title abstract #.**

Figure 1 - 211



Conclusions: DCIS-like invasive carcinoma is difficult to correctly recognize as invasive disease. We identified frequent tumor encircling vessels and characterized TAMMM as a rare but important pitfall. Our study illustrates how some commonly used myoepithelial markers, namely SMM and calponin, can highlight the tumor-associated vessels in TAMMM, which may be misinterpreted as myoepithelial staining. Our study reiterates the need for employing a “panel approach” of myoepithelial stains in distinguishing DCIS-like invasive carcinoma from true DCIS. CD31 staining supports TAMMM as an explanation for "false positive” SMM staining.

212 Combined Manual Reading and Computer-Aided Quantitative Analysis for the Standardization of HER2 IHC Scoring

Alma Sanchez-Salazar[1], Ruben Alvarado[1], Rabiu Ibraheem[1], Cristina Steele[2], Dan Walker[3], Yael Glickman[5]
[1]CorePath Laboratories, San Antonio, TX, [2]Applied Spectral Imaging, Carlsbad, CA, [3]Motic Digital Pathology, Emeryville, CA, [4]Applied Spectral Imaging, Yokneam Illit, Israel

Disclosures: Alma Sanchez-Salazar: None; Ruben Alvarado: None; Rabiu Ibraheem: None; Cristina Steele: None; Dan Walker: None; Yael Glickman: None

Background: Computer-aided methods for IHC analysis are gaining growing adoption. These techniques appear particularly helpful in cases of limited inter-observer agreement. The aim of this evaluation was to assess the usefulness of computerized HER2 scoring in the standardization of pathological evaluation of breast cancer specimens. This can be especially useful in cases where the tumor has variable intensity of expression.

Design: Five slides prepared for each breast cancer core biopsy specimen were stained with H&E, ER, PR, Ki67 and HER2. All slides were scanned with MoticEasyScan Infinity at 40X (0.26 um/px) and examined by certified pathologists using both conventional microscopy and digital imaging. HER2 FISH was requested to complete the evaluation of equivocal cases. HER2 IHC images were further analyzed using HiPath Pro scanner-agnostic software (Applied Spectral Imaging). Regions of interest marked on the H&E images were automatically transferred to HER2 specimens following tissue matching. Cells automatically identified as tumor cells were segmented and classified using a color-coded overlay. Computerized results were compared to manual readings. In case of discrepancy, a second manual reading was performed.

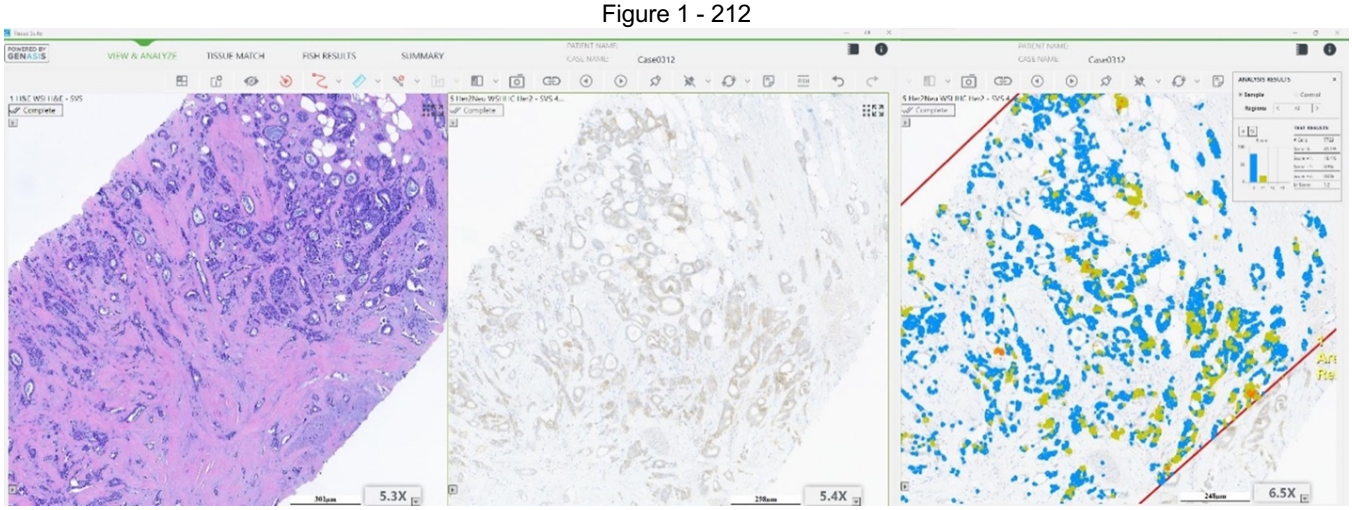
Results: Twenty biopsy specimens from 20 patients were included. 19 samples had a diagnosis of either IDC or ILC, and one of MCCD. Pathology reports indicated that 13 cases were ER+/PR+, 5 ER-/PR-, one ER+/PR-, one ER+/PR-. Ki67 was >20% in 14 cases, <10% in 3 and borderline in 3. Finally, HER2 was positive in 4 cases, equivocal in 7 cases and negative in 9. FISH was performed on all equivocal cases, confirming 3 cases as HER2+ and 4 as HER2- (Table 1). One image out of focus was removed from analysis. Computer-aided HER2 scoring was concordant with first manual reading in 13 cases. Two cases scored as HER2

(0) during the first reading were re-scored as HER2 (1+) low during the second reading, matching computerized assessment (Fig. 1). A third case diagnosed as equivocal (2+) and confirmed as FISH positive was re-scored as HER2 (3+) following the review of the software analysis. The diagnosis of the remaining 3 cases was unchanged after review of computerized results.

Table 1: Compared results of manual and computerized HER2 IHC scoring

Case #	IHC ER	IHC PR	IHC Ki67	IHC HER2 Reading 1	IHC HER2 Reading 2	HER2/CEN17 FISH Ratio	IHC HER2 AidedScore
1	POS	POS	Low	2+		1.1 NEG	2+
2	NEG	NEG	High	0			0
3	POS	POS	Low	0	1+		1+
4	POS	POS	High	2+		1.1 NEG	2+
5	POS	POS	High	2+		1.0 NEG	2+
6	POS	NEG	High	3+			3+
7	POS	POS	Borderline	0			0
8	POS	POS	High	2+	2+	1.3 NEG	1+
9	POS	POS	High	3+			N/A
10	POS	POS	High	2+	3+	4.9 POS	3+
11	NEG	NEG	High	0	1+		1+
12	POS	POS	High	1+			1+
13	POS	POS	Low	0			0
14	NEG	NEG	High	0			0
15	POS	POS	Borderline	1+	1+		0
16	POS	POS	High	3+	3+		2+
17	NEG	POS	High	2+		3.8 POS	2+
18	NEG	NEG	High	2+		3.5 POS	2+
19	POS	POS	Borderline	0			0
20	NEG	NEG	High	3+			3+

Figure 1 - 212



Conclusions: This evaluation exemplifies the potential usefulness of computer-aided scoring as a mean to standardize the assessment of HER2 IHC, particularly in cases of low HER2 expression. This further illustrates possible use of combined manual reading and computerized analysis when reporting HER2 IHC in breast cancer.