

3D TBP

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CONFLICTS

SPEAKER: Amirall, BMS, ISDIN, La Roche Posay, Leo, Novartis, Pierre Fabre, SunPharma, Roche, Sanofi

HONORARIA OR CONSULTATIONS FEES : Amirall, BMS, Biofrontera, GSK, ISDIN, La Roche Posay, Leo, Novartis, Polychem, SunPharma

GRANTS & RESEARCH SUPPORT: Amirall, Amgen, BMS, Biofrontera, Canfield, Cantabria, Fotofinder, GSK, ISDIN, La Roche Posay, Leo, Mavig, Nevisense, Novartis, Polychem, Roche, iTOBOs (EU Grant), Castle Biosciences, NelaCare, and SkylineDx, Amlo Bioscience

Spouse/partner: Amirall, Amgen, BMS, Biofrontera, Canfield, Cantabria, Fotofinder, GSK, ISDIN, La Roche Posay, Leo, Mavig, Nevisense, Novartis, Pierre Fabre, Polychem, Roche

Other support (please specify): Abbie (educational activities), Lilly (educational activities), Novartis

Co-founder of Diagnosis Dermatologica sl and Athena Care sl.

Medical Advisor for Dermavision





Research Team in AI. Dermatology Department. Hospital Clinic. Barcelona

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Josep Quintana
Konstantin Korotkov

Imaging technicians

Beatriz Alejo
Abel Caño



FOUNDING & COLLABORATIONS



M-Skip



RESEARCH AND INNOVATION GRANTS



AGENDA

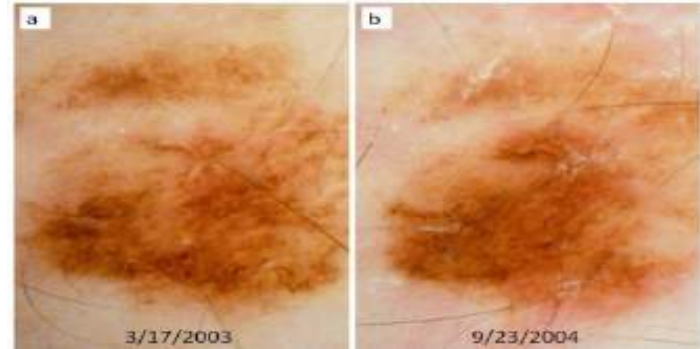
- Technology: hard and software and performance of the new devices
- 3D Total body dermatoscopy: evidence, advantages and limitations
- Software and AI using 3D TBP
- Future of melanoma detection

Total Body Photography



24 Photos per patient (15-56)

Digital Dermoscopy



18.44 lesions /patient (15-25)

“Two steps method of digital follow-up”

Digital follow-up (Dermoscopy)

The screenshot displays a digital dermoscopy software interface. At the top, there are three zoom level buttons: "25 x Macro", "0 x Detalles", and "36 x ELN". The main area is a 3x3 grid of images. The first column shows macro images of a patient's back with a yellow line indicating the location of a mole. The second column is empty. The third column shows dermoscopic images of the mole. Below each image is a date and ID number, and a label describing the location. The labels are: "espalda, cuello, brazo", "región escapular", "lumbal izquierdo", "paravertebral, lumbal", "espalda, cuello, brazo", and "paravertebral, torácica". To the right of the grid is a "Historial de imágenes" (Image History) panel, which is currently displaying a single dermoscopic image with a date and ID number. Below the history panel is a vertical toolbar with buttons for "3x3", "M+C", "D", "ALL", "LV", "PD", "R", "PE", and "T". At the bottom of the interface are buttons for "Imagen", "Comparar", "Imprimir", "Detalles", and "Salir".

25 x Macro 0 x Detalles 36 x ELN

19/5/2009 <96404,13> 19/5/2009 <123332,12> 19/5/2009 <123331,12>

espalda, cuello, brazo región escapular,

19/5/2009 <96402,12> 19/5/2009 <123331,6>

lumbal izquierdo paravertebral, lumbal

19/5/2009 <96404,13> 30/11/2007 <99673,3>

espalda, cuello, brazo paravertebral, torácica,

Historial de imágenes

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30/11/2007 <99674>

20/10/2008 <113098>

16/4/2007 <90311>

9/5/2008 <106630>

30/11/2006 <94904>

3x3 3x3

M+C M+C

D D

ALL ALL

LV LV

PD PD

R R

PE PE

T T

Imagen Comparar Imprimir Detalles Salir

Salir

Digital follow-up (Dermoscopy)



t



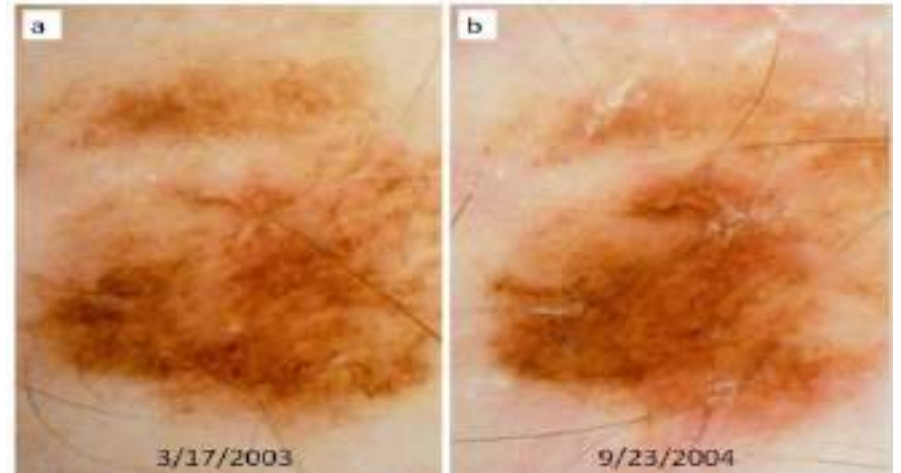
t



**30% of lesions were excised because
changes in Total Body Photography
40% of the new MMs**



**70% excised because changes in digital
dermoscopy /60% of the new MMs**



Salerni G, et al. Benefits of total body photography and digital dermatoscopy ("two-step method of digital follow-up") in the early diagnosis of melanoma in patients at high risk for melanoma. JAAD 2012

Nelson KC, Swetter SM, Saboda K et al. Evaluation of the number- needed-to-biopsy metric for the diagnosis of cutaneous melanoma: a systematic review and meta-analysis. JAMA Dermatol 2019; 155:1167–74.

Study (year)	Patients receiving TBP	Total number of biopsies	Mean biopsies per patient	True positives	False positives	Number needed to biopsy	Naevus : melanoma ratio	MIS : MM ratio
Drugge (2020) ¹²	218	225	2.0	67	158	3.36	2.36	1.91
Feit (2004) ⁵	567	77	6.4	27	50	2.85	1.85	3.50
Goodson (2010) ⁷	1076	548	0.6	28	520	19.57	18.57	1.15
Greenwald (2020) ²⁰	36832	1571	1.1	260	1311	6.04	5.04	2.81
Lallas (2020) ¹³	977	121	NS	52	69	2.33	1.33	2.06
Mintsoulis (2016) ²¹	114	267	2.3	14	253	19.10	18.07	NA
Moloney (2014) ²²	311	770	NS	82	688	9.39	8.39	NA
Risser (2007) ¹¹	64	53	1.9	0	53	NE	NA	NA
Salerni (2012) ¹⁹	618	1152	1.9	98	1054	11.76	10.76	1.18
Truong (2016) ⁸	926	1419	1.6	93	1326	15.26	14.26	0.98
Total	41703	6203	NA	721	5482	NA	NA	NA
Range			0.6–6.4			2.33–19.6	1.33–18.57	0.98–3.50
Weighted mean			1.6			8.6	7.6	1.68

MIS, melanoma in situ; MM, malignant melanoma; NA, not applicable; NE, not estimable. Values were calculated from source study data when not directly provided in the manuscript. Mean biopsies per patient = number of lesions biopsied/number of patients biopsied. True positives (MIS or MM on histopathology), false positives (neither MIS nor MM on histopathology), and number needed to biopsy (lesions biopsied for one MIS or MM) are shown for combined MIS and MM.

455 496 biopsies and 29 257 melanomas from 46 studies, assessed the accuracy of clinicians diagnosing melanoma. Mean 4–12% of lesions biopsied demonstrated melanoma; NNB of 14,8

DIAGNOSTIC ACCURACY

1. Based on previous studies, **the sensitivity of TBP+SDD** is low in the first visit (<25%) and increase to 100% in subsequent visits (1,2,3...) if we assume that every MM can be detected when the tumor evolves.
2. However **benign lesions can change** as well, and this fact determines a **specificity** in this population that is very low (i.e. NNT= 1:12-14).

Metanalyses of TBP-SDD (Salerni G, Terán T, Puig S, Malvehy J, Zalaudek I, Argenziano G, Kittler H. Meta-analysis of digital dermoscopy follow-up of melanocytic skin lesions: a study on behalf of the International Dermoscopy Society. J Eur Acad Dermatol Venereol. 2013 Jul;27(7):805-14)

THE NEW DEVICES



Automatic identification of lesions; detection of changes; lesion risk assessment; faster examination

Next Gen TBM: cross-polarised light and higher resolution



Non polarized image (EOS 700D)

RAW processed image (full frame DSLR)

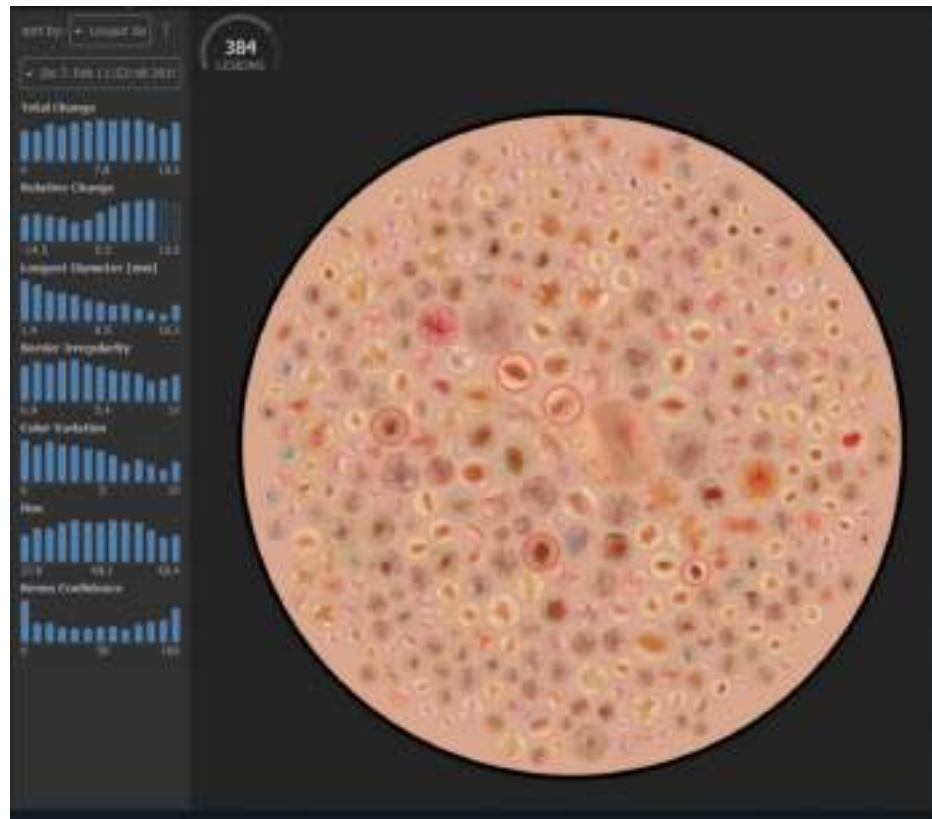


Non polarized image (EOS 700D)



RAW processed image (full frame DSLR)

3D TOTAL BODY PHOTOGRAPHY







3D TOTAL BODY PHOTOGRAPHY: ADVANTAGES AND LIMITATIONS

Pros

- Time of imaging (2 seconds)
- Avatars with better representation of complex body sites
- Patient's experience

Cons

- Cost
- Dedicated facilities

ADVANTAGES OF THE NEW DEVICES

- New TBM photographic devices **improved the quality and reduced the acquisition time**
- **Detection of changes of melanocytic lesions** in patients with atypical mole syndrome based on TBP is sufficient to detect early melanoma
- It is presumed that **fewer dermoscopic images are needed** to detect melanoma using new TBM devices.

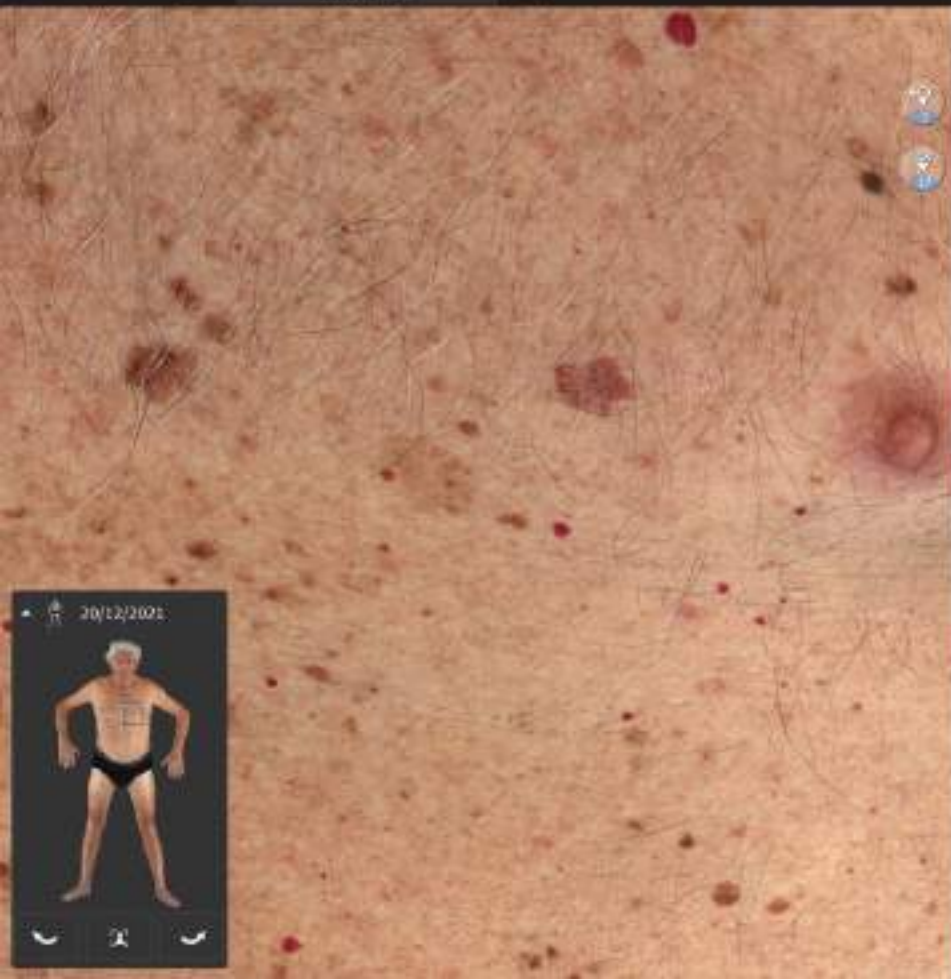
However there is no evidence of this assumption

Lista de lesiones: 0 / 17 imágenes

0 1 18 0 0 0 0

Mostrar por: Lesión

🔍 🔗

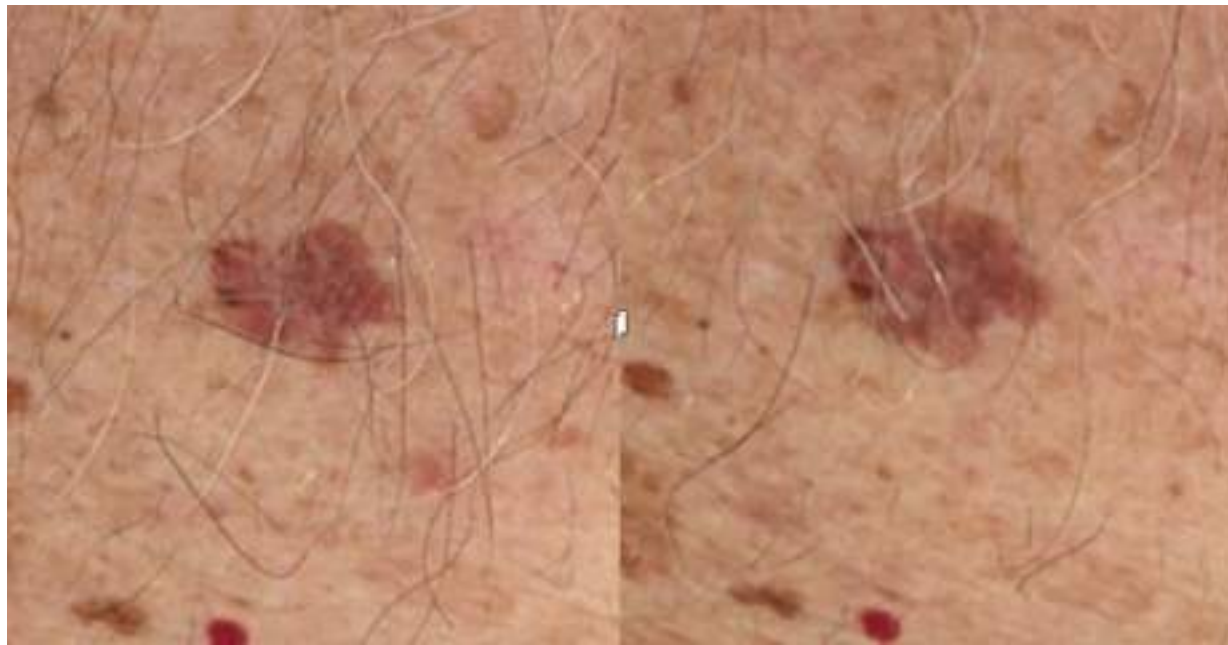


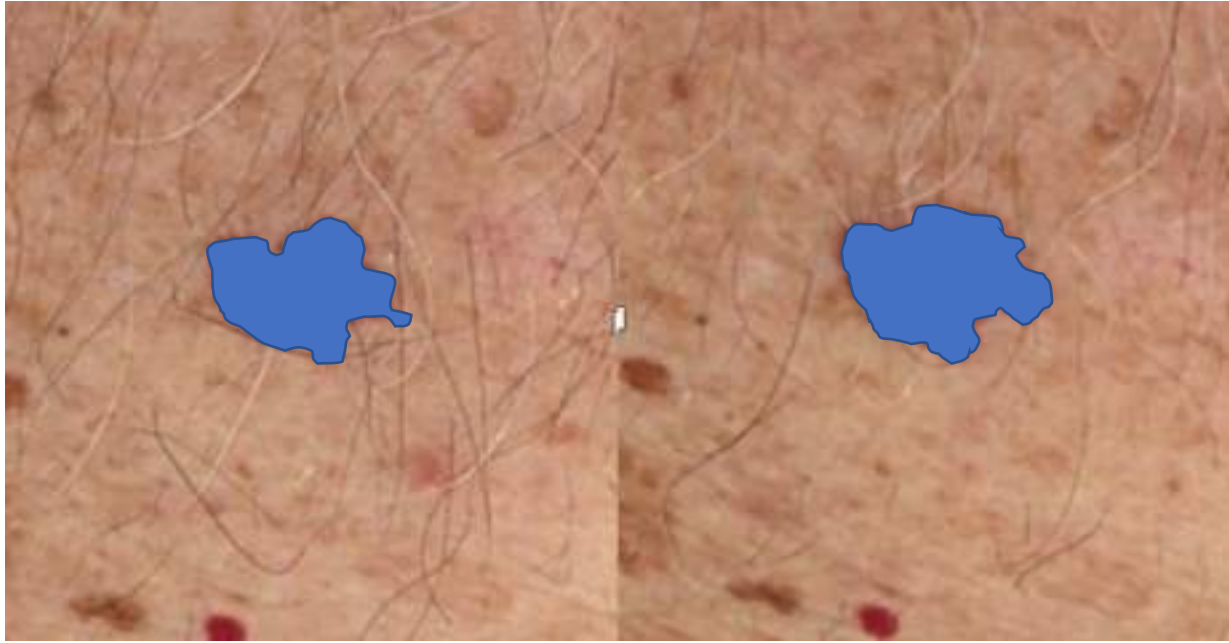
20/12/2021

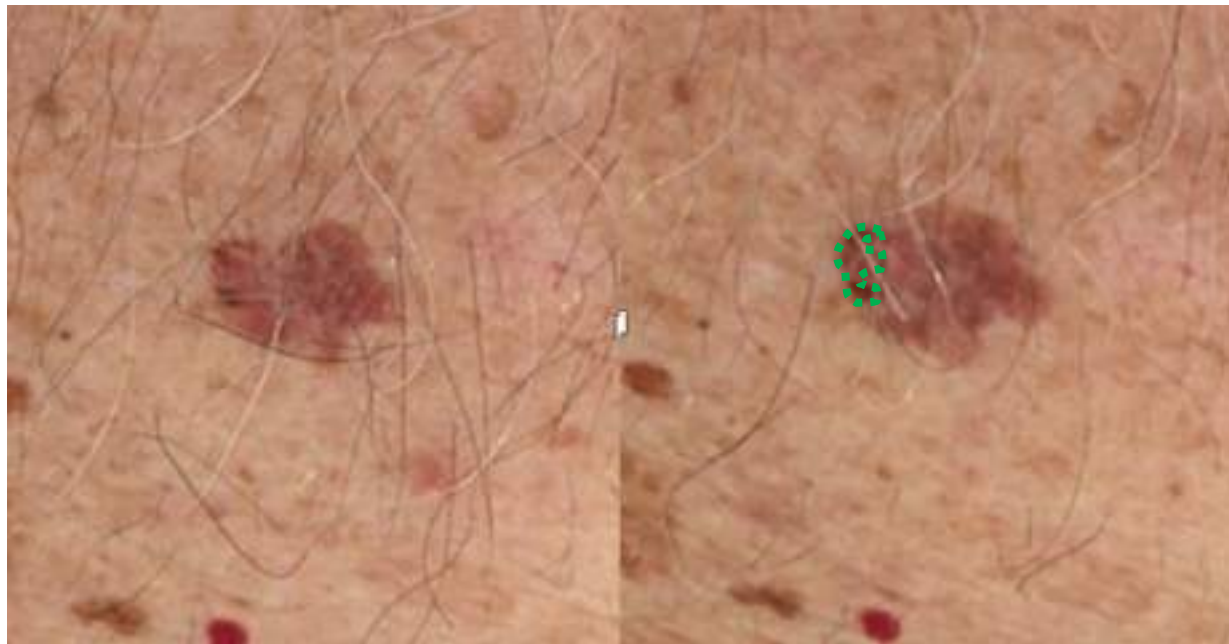
Body map showing the location of the lesion on the chest. The map is a silhouette of a human body with a grid overlay. The lesion is marked with a red dot on the upper chest area.

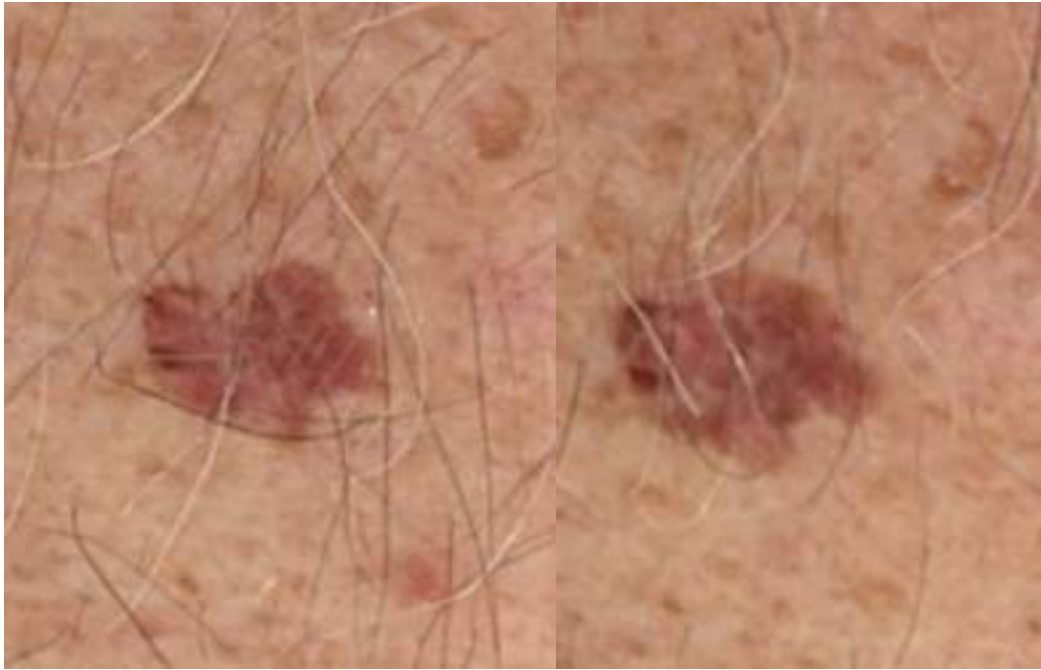
17/07/2022

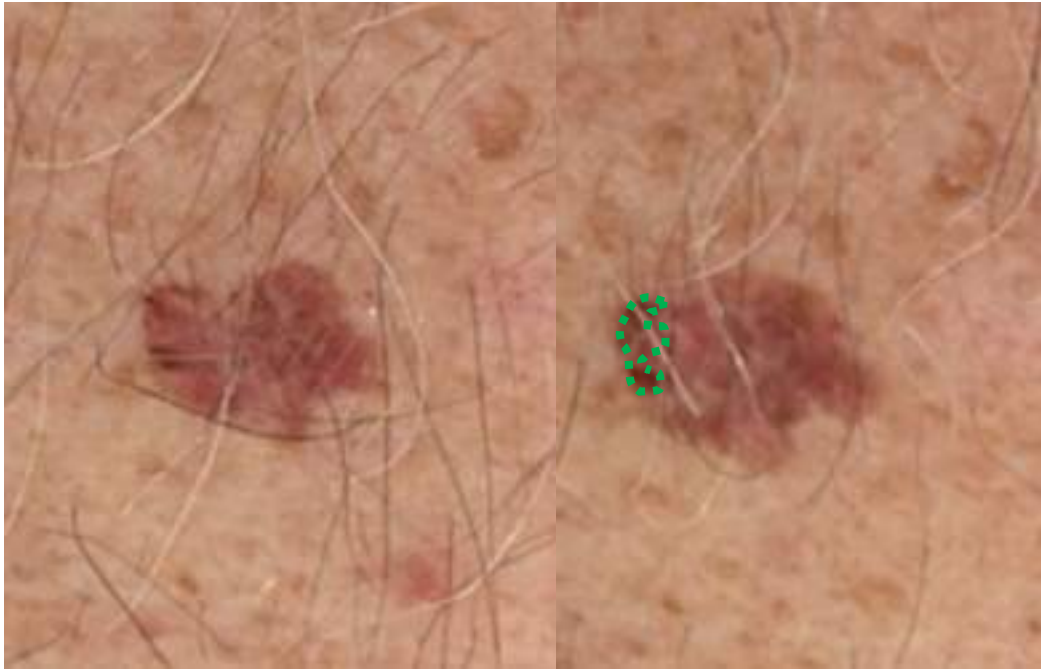
Body map showing the location of the lesion on the chest. The map is a silhouette of a human body with a grid overlay. The lesion is marked with a red dot on the upper chest area.













Historial de imágenes

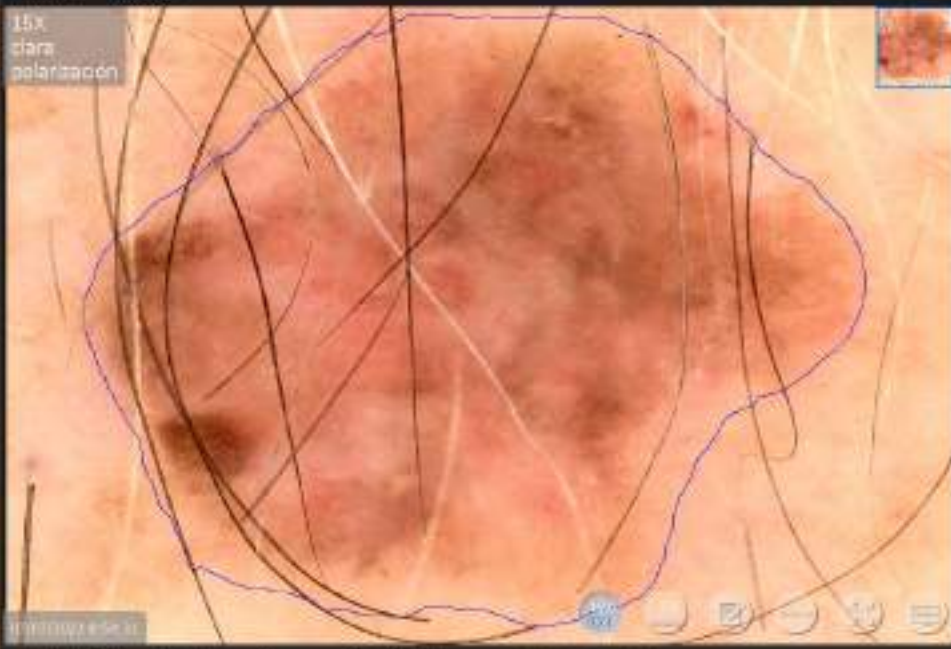
- 09/07/2021 - 09/07/2021 Configuración estado de lesión 15 a follow-up
- 09/07/2021 14:46 - 09/07/2021 Configuración estado de lesión 15 a fin remark. Configuración nombre de lesión como 15.

Vista en vivo

20/12/2021



Lesión 15 07/07/2022 follow-up



10.0

Knowledgebase

asymmetry	3.2
border	1.5
color	4.1
diameter	13.5mm

DEXI

- 07/07/2022 15:44:11 - 15/07/2022 - Configurar estado de lesión 15 a Follow-up.
 - 07/07/2022 15:46:11 - 15/07/2022 - Configurar estado de lesión 15 a No remark. Configurar nombre de lesión como 15.
- Vista en vivo

Description of 2-D and 3-D high resolution total body photography



Vectra 360. Canfield, USA



IntelliStudio. Canfield, USA

1. Optical resolution of TBP and hand held Dermoscopy
2. Dermoscopic structures in TBP



Dermlite Photo. Olympus Mark IV

Description of 2-D and 3-D high resolution total body photography



Number of Line Pairs / mm in USAF Resolving Power Test Target 1951

Element	Group Number											
	-2	-1	0	1	2	3	4	5	6	7	8	9
1	0.250	0.500	1.00	2.00	4.00	8.00	16.00	32.0	64.0	128.0	256.0	512.0
2	0.281	0.561	1.12	2.24	4.49	8.98	17.96	35.9	71.8	143.7	287.4	574.7
3	0.315	0.630	1.26	2.52	5.04	10.08	20.16	40.3	80.6	161.3	322.5	645.1
4	0.354	0.707	1.41	2.83	5.66	11.31	22.63	45.3	90.5	181.0	362.0	724.1
5	0.397	0.794	1.59	3.17	6.35	12.70	25.40	50.8	101.6	203.2	406.4	812.7
6	0.445	0.891	1.78	3.56	7.13	14.25	28.51	57.0	114.0	228.1	456.1	912.3

1951 USAF resolution test chart widely used in optical engineering laboratory work to analyze and validate imaging systems.

- [Koren 2003](#): Norman Koren's updated resolution chart better suited for computer analysis

Description of 2-D and 3-D high resolution total body photography

1-Evaluation of the optical resolution of TBP

138 stickers USAF 1951: face and neck, trunk, extremities, acral sites and legs.



DESCRIPTION OF IMAGES OF TBP AND D- DERMOSCOPY

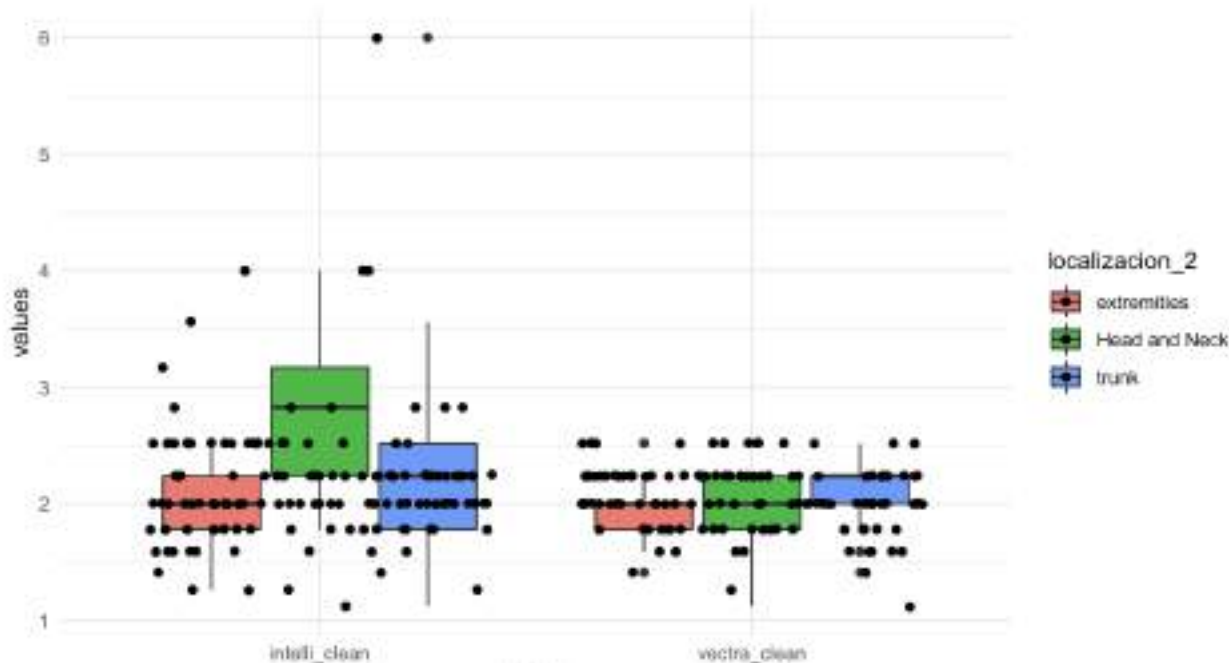


Figure 7 Graphic of 1951 USAF test mediums comparison according to body site

TBP

USAF mean value

2D TBM= 2,18 3D

TBP = 2,04 lp/mm

Head and neck (2D

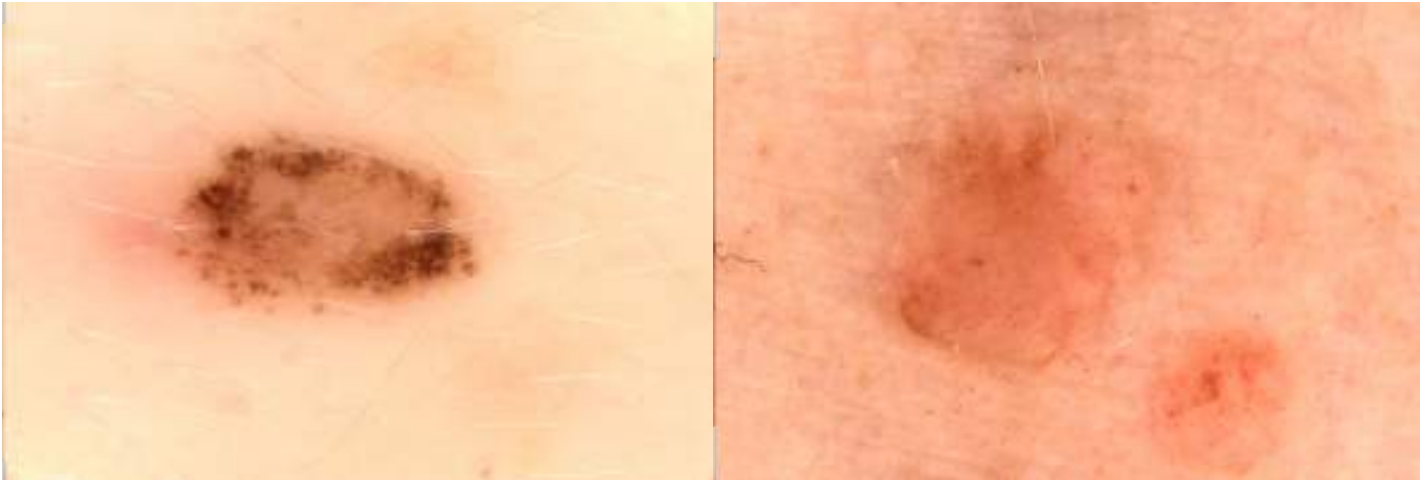
TBM)=2.85 lp/mm

**Cross-polarized
hand-held
dermatoscope**

USAF 1951 >14.3
lp/mm.

Dermatoscopic structures in 2D and 3D TBP (n=117 lesions)

- **Colors** (light brown, dark brown, black, blue, red, white)
- **Global pattern** (reticular, globular, homogeneous, starburst, multicomponent)
- **Dermoscopic structures** : globules, dots, pigment network, negative of the pigment network, pigment pseudonetwork, structureless areas, cobblestone, radial projections/pseudopods, blotches, regression structures, white-blue veil, vascular structures.



Dermatoscopic structures in 2D and 3D TBP and in the dermoscopic images

- **Colors** had a good correlation between Dermoscopy/TBP except for blue-grey
- **Dermoscopic global pattern** (reticular, globular, cobblestone, homogeneous) was not detected in TBP.
- The **dermoscopic structures**: dots (19,7%), globules (33,3%), structureless areas (50,4%) and vascular structures (14,5%), was **NOT detected in TBP techniques**.
- **Focal hyperpigmentation** (n=18; 15,4%) was detected by TBP



Pol D



Pol D



3D TBP



2D TBP



CLINICAL PROTOCOL HOSPITAL CLINIC OF BARCELONA

Inclusion criteria of patients

High-risk for melanoma due to multiple atypical melanocytic lesions +/- personal or familial melanoma +/- genetic syndromes

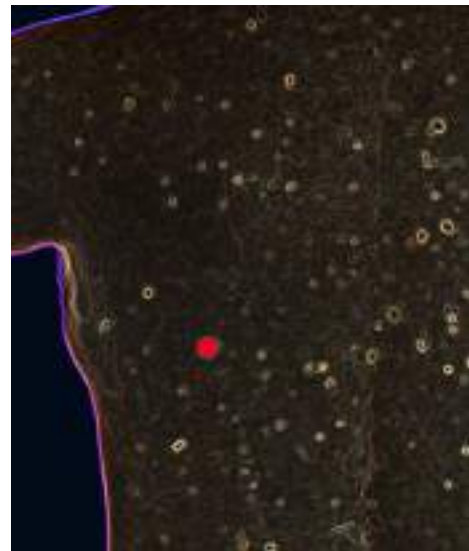
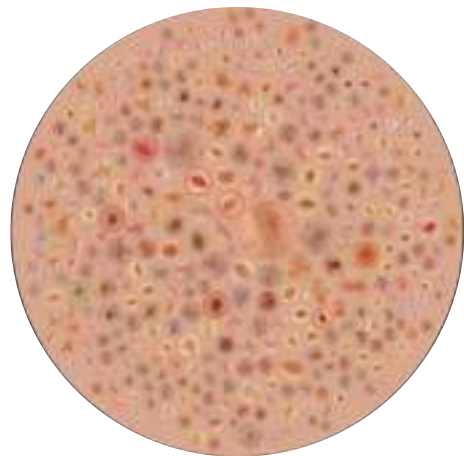
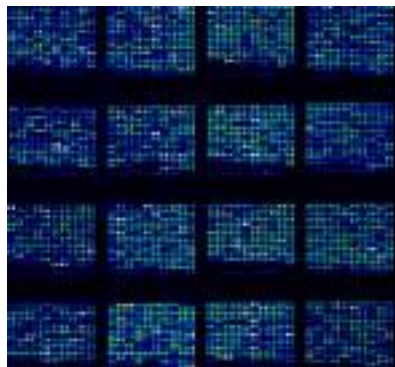
Schedule

1. Base line with full body exam +Dermoscopy-TBP+SDD
2. Follow-up: Imaging (detection of changes)- full body exam with Dermoscopy

Selection of lesions for Dermoscopy image

- Any lesion considered for excision;
- Lesions considered for follow-up with one or more of the following dermoscopic criteria: asymmetry, multicomponent pattern, negative of the pigmented network, regression structures, streaks, ring of globules or atypical vessels

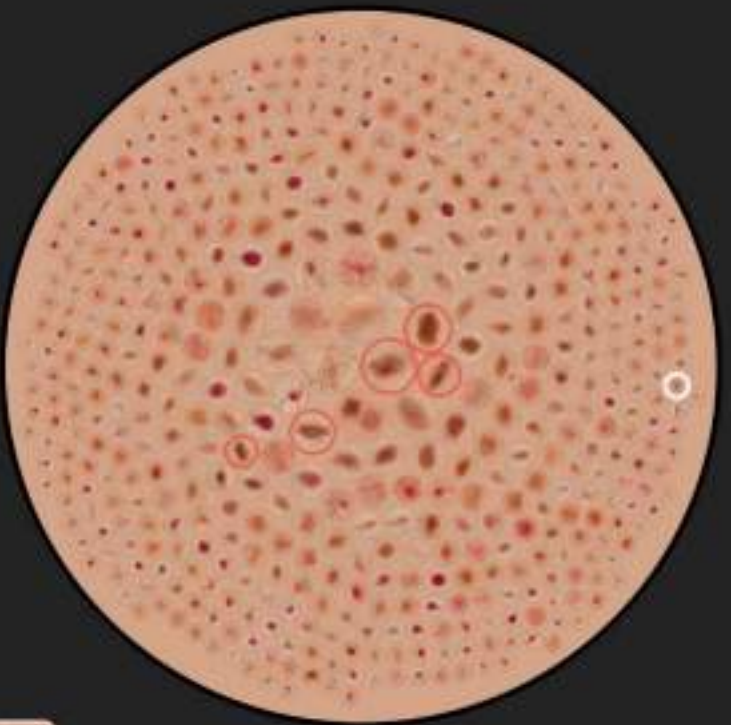
SOFTWARE AND AI



CLINIC
Dermatología
FUS 2138 30 000 000 01

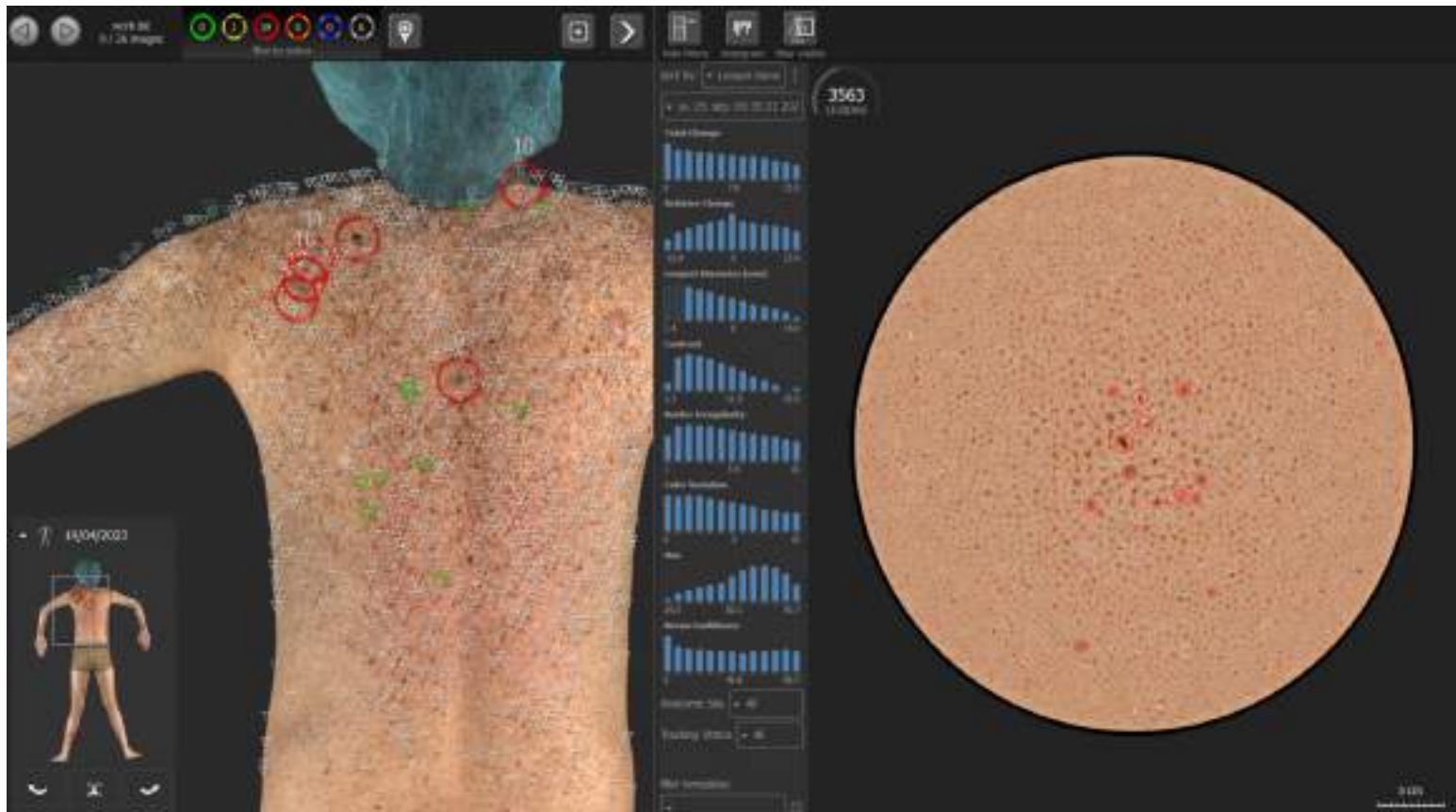


503 LESIONS

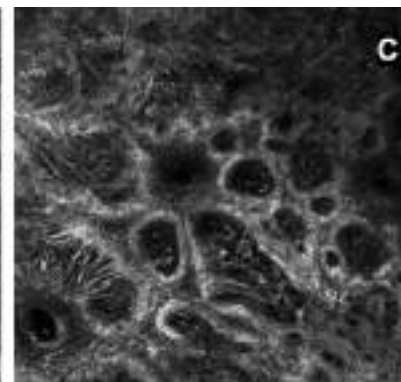
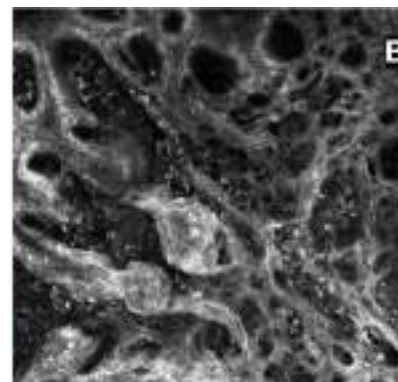
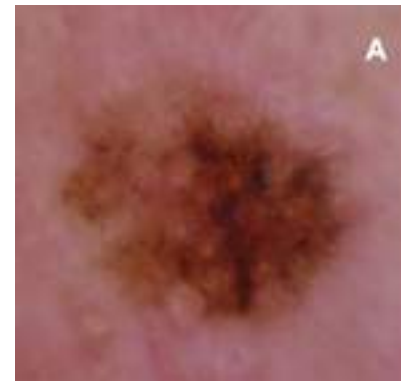
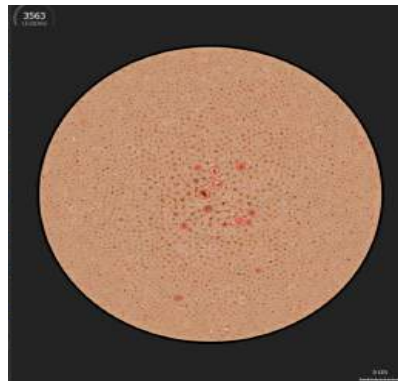
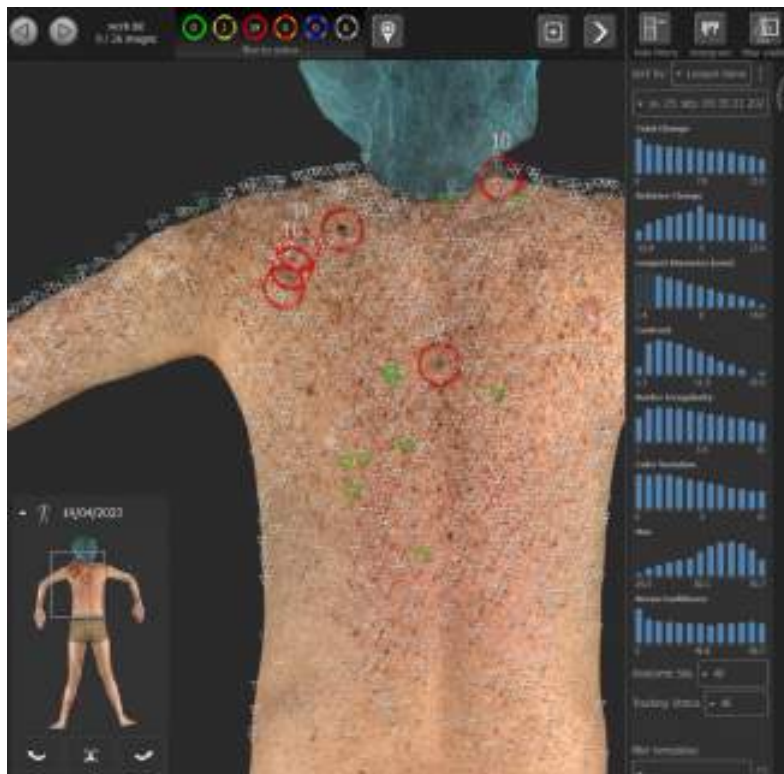


Property	Value
Lesion Diameter (mm)	4.06
Depth	12.97
Area (mm ²)	2.04
Color Variance	3.90
Peri	46.21
Area Complexity	29.18
ASUBNOI (%)	100% 0.00

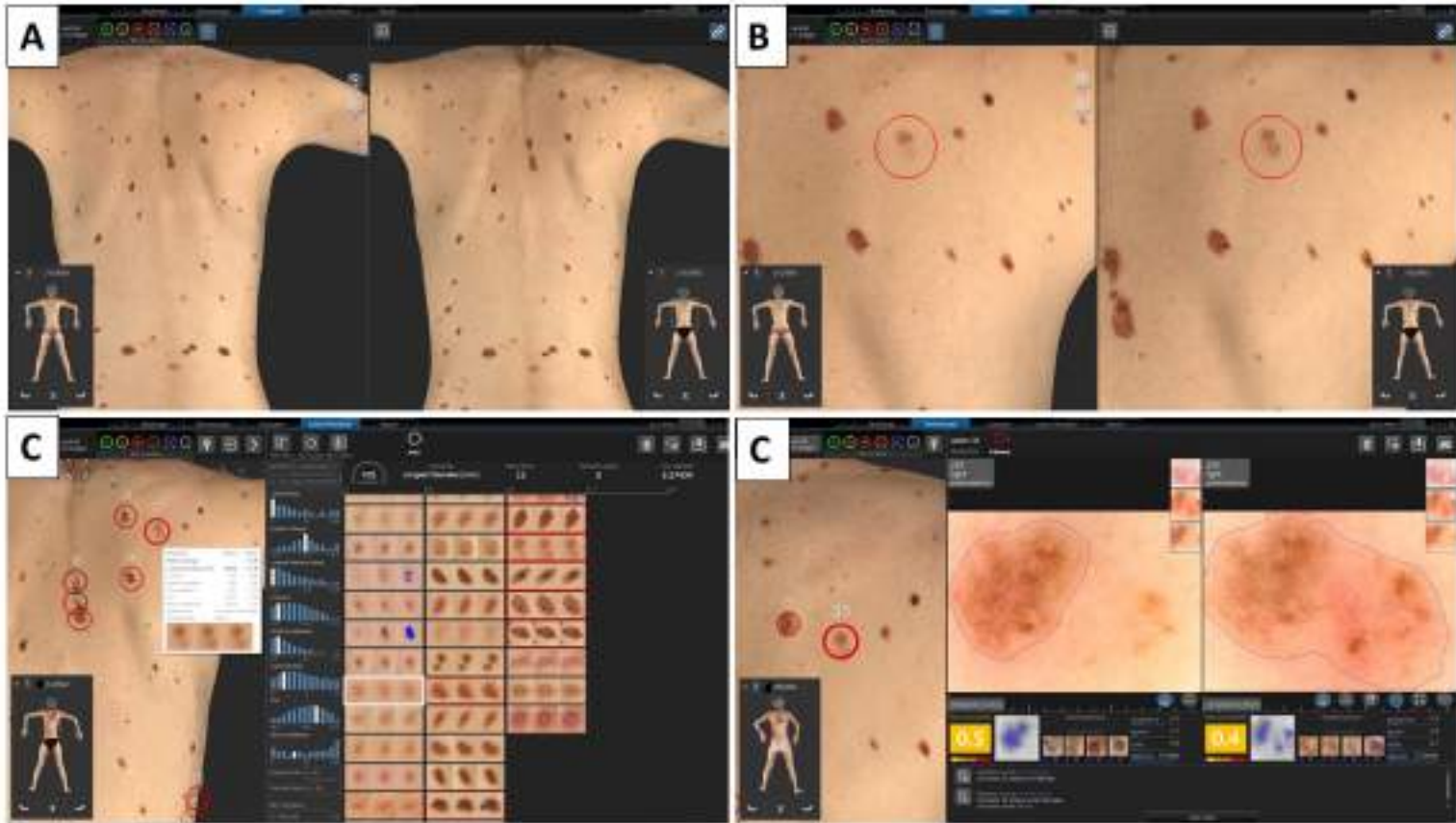




Rivas AC, Luna A, Serra E, Luque M, Caño A, Alejo B, Castrejón N, Rezze G, Alkhawaja A, Podlipnik S, Puig S, Malveyh J, Carrera C. Xeroderma pigmentosum: 12 years of experience combining multiple imaging techniques for follow-up. Hospital Clinic of Barcelona. Poster . World Congress of Confocal Microscopy. 1-3 June, 2023



Rivas AC, Luna A, Serra E, Luque M, Caño A, Alejo B, Castrejón N, Rezze G, Alkhawaja A, Podlipnik S, Puig S, Malveyh J, Carrera C. Xeroderma pigmentosum: 12 years of experience combining multiple imaging techniques for follow-up. Hospital Clinic of Barcelona. Poster . World Congress of Confocal Microscopy. 1-3 June, 2023



Primiero CA, Rezze GR, LJ, Carrera, Podlipnik S, Espinosa N, Puig S, Janda M, Soyer HP, Malveyh . Opportunities and Challenges in AI skin image analyses using Total Body Photography. JID 2023 (accepted)

Lista de trabajos
0 / 25 trabajos

0 0 0 0 0 0 0 0 0 0

Mapa del cuerpo

📍 📷 ➡

Lesion 6
28/04/2022

823 LESIONES

Sorted By Hue

New Lesions 20

Harmed Lesions 0

Avg. Diameter 1.23229



Indice por: Hue

28/04/2022 11:48:57 2022

Field Change

Redness Change

Complex Structure (mm)

Contrast

Border Irregularity

Color Variance

Hue

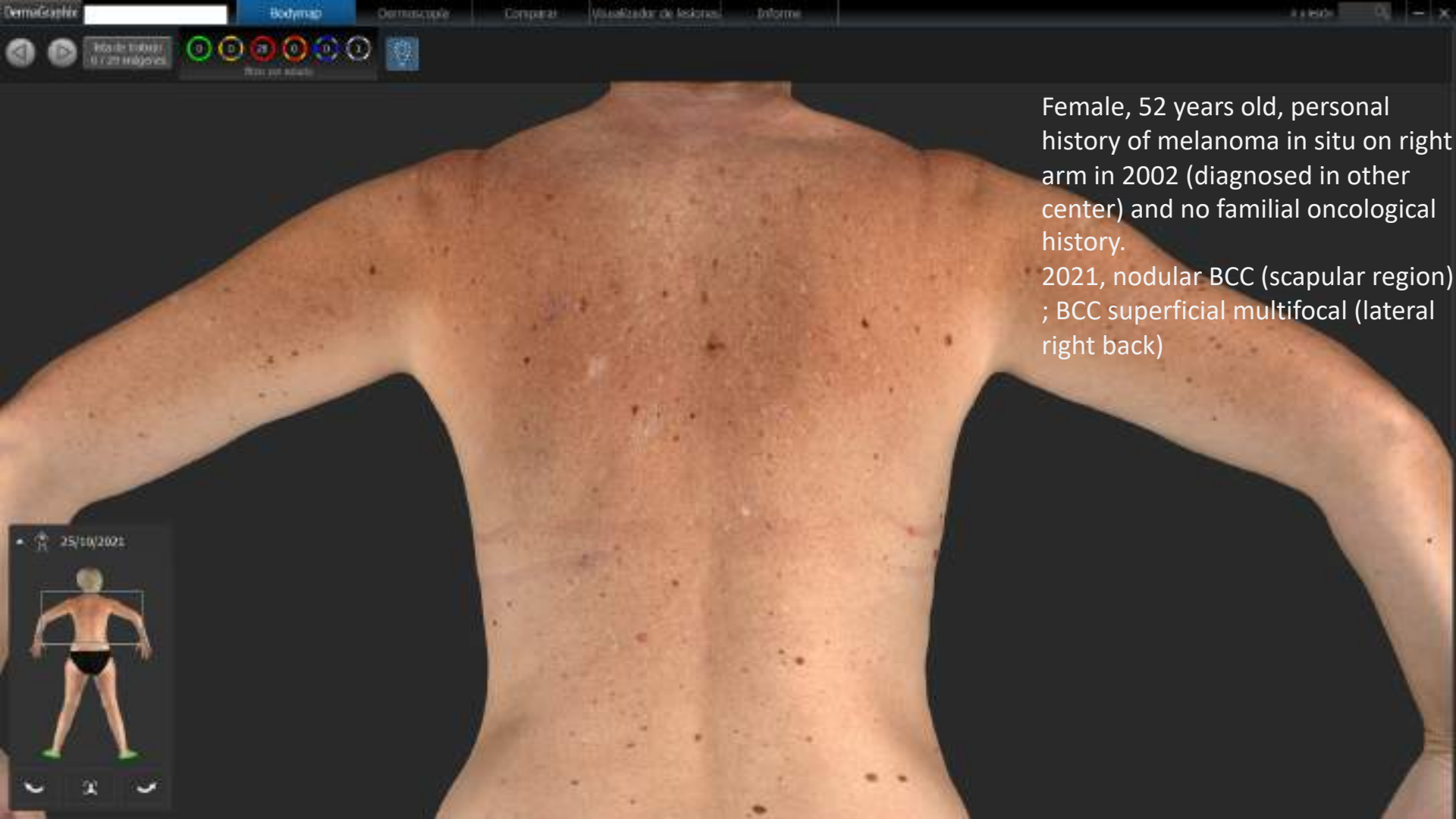
Shape Confidence

Analysis Size: 1x1

Tracking Status: 1x1

Harmed to Blue

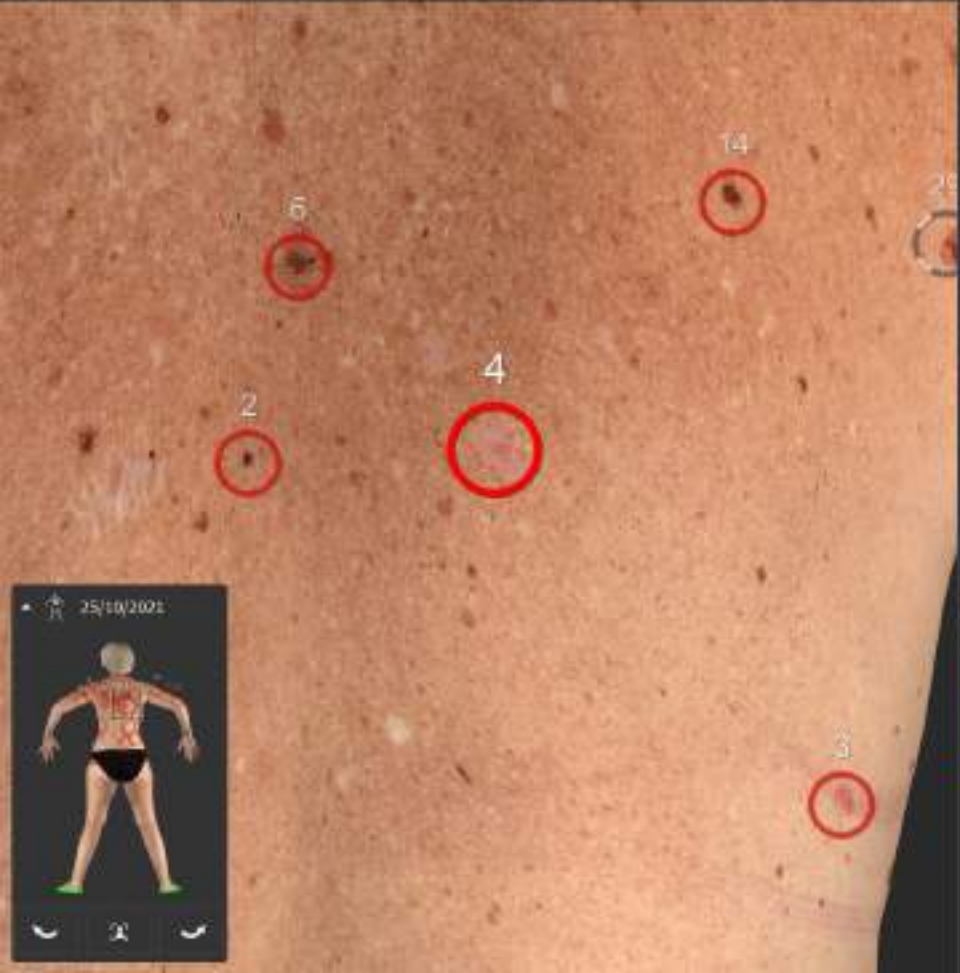
Color	Hue	New Lesions	Harmed Lesions	Avg. Diameter
0.0	0.0	0	0	0.0
0.1	0.1	0	0	0.0
0.2	0.2	0	0	0.0
0.3	0.3	0	0	0.0
0.4	0.4	0	0	0.0
0.5	0.5	0	0	0.0
0.6	0.6	0	0	0.0
0.7	0.7	0	0	0.0
0.8	0.8	0	0	0.0
0.9	0.9	0	0	0.0
1.0	1.0	0	0	0.0
1.1	1.1	0	0	0.0
1.2	1.2	0	0	0.0
1.3	1.3	0	0	0.0
1.4	1.4	0	0	0.0
1.5	1.5	0	0	0.0
1.6	1.6	0	0	0.0
1.7	1.7	0	0	0.0
1.8	1.8	0	0	0.0
1.9	1.9	0	0	0.0
2.0	2.0	0	0	0.0
2.1	2.1	0	0	0.0
2.2	2.2	0	0	0.0
2.3	2.3	0	0	0.0
2.4	2.4	0	0	0.0
2.5	2.5	0	0	0.0
2.6	2.6	0	0	0.0
2.7	2.7	0	0	0.0
2.8	2.8	0	0	0.0
2.9	2.9	0	0	0.0
3.0	3.0	0	0	0.0
3.1	3.1	0	0	0.0
3.2	3.2	0	0	0.0
3.3	3.3	0	0	0.0
3.4	3.4	0	0	0.0
3.5	3.5	0	0	0.0
3.6	3.6	0	0	0.0
3.7	3.7	0	0	0.0
3.8	3.8	0	0	0.0
3.9	3.9	0	0	0.0
4.0	4.0	0	0	0.0
4.1	4.1	0	0	0.0
4.2	4.2	0	0	0.0
4.3	4.3	0	0	0.0
4.4	4.4	0	0	0.0
4.5	4.5	0	0	0.0
4.6	4.6	0	0	0.0
4.7	4.7	0	0	0.0
4.8	4.8	0	0	0.0
4.9	4.9	0	0	0.0
5.0	5.0	0	0	0.0
5.1	5.1	0	0	0.0
5.2	5.2	0	0	0.0
5.3	5.3	0	0	0.0
5.4	5.4	0	0	0.0
5.5	5.5	0	0	0.0
5.6	5.6	0	0	0.0
5.7	5.7	0	0	0.0
5.8	5.8	0	0	0.0
5.9	5.9	0	0	0.0
6.0	6.0	0	0	0.0
6.1	6.1	0	0	0.0
6.2	6.2	0	0	0.0
6.3	6.3	0	0	0.0
6.4	6.4	0	0	0.0
6.5	6.5	0	0	0.0
6.6	6.6	0	0	0.0
6.7	6.7	0	0	0.0
6.8	6.8	0	0	0.0
6.9	6.9	0	0	0.0
7.0	7.0	0	0	0.0
7.1	7.1	0	0	0.0
7.2	7.2	0	0	0.0
7.3	7.3	0	0	0.0
7.4	7.4	0	0	0.0
7.5	7.5	0	0	0.0
7.6	7.6	0	0	0.0
7.7	7.7	0	0	0.0
7.8	7.8	0	0	0.0
7.9	7.9	0	0	0.0
8.0	8.0	0	0	0.0
8.1	8.1	0	0	0.0
8.2	8.2	0	0	0.0
8.3	8.3	0	0	0.0
8.4	8.4	0	0	0.0
8.5	8.5	0	0	0.0
8.6	8.6	0	0	0.0
8.7	8.7	0	0	0.0
8.8	8.8	0	0	0.0
8.9	8.9	0	0	0.0
9.0	9.0	0	0	0.0
9.1	9.1	0	0	0.0
9.2	9.2	0	0	0.0
9.3	9.3	0	0	0.0
9.4	9.4	0	0	0.0
9.5	9.5	0	0	0.0
9.6	9.6	0	0	0.0
9.7	9.7	0	0	0.0
9.8	9.8	0	0	0.0
9.9	9.9	0	0	0.0
10.0	10.0	0	0	0.0
10.1	10.1	0	0	0.0
10.2	10.2	0	0	0.0
10.3	10.3	0	0	0.0
10.4	10.4	0	0	0.0
10.5	10.5	0	0	0.0
10.6	10.6	0	0	0.0
10.7	10.7	0	0	0.0
10.8	10.8	0	0	0.0
10.9	10.9	0	0	0.0
11.0	11.0	0	0	0.0
11.1	11.1	0	0	0.0
11.2	11.2	0	0	0.0
11.3	11.3	0	0	0.0
11.4	11.4	0	0	0.0
11.5	11.5	0	0	0.0
11.6	11.6	0	0	0.0
11.7	11.7	0	0	0.0
11.8	11.8	0	0	0.0
11.9	11.9	0	0	0.0
12.0	12.0	0	0	0.0
12.1	12.1	0	0	0.0
12.2	12.2	0	0	0.0
12.3	12.3	0	0	0.0
12.4	12.4	0	0	0.0
12.5	12.5	0	0	0.0
12.6	12.6	0	0	0.0
12.7	12.7	0	0	0.0
12.8	12.8	0	0	0.0
12.9	12.9	0	0	0.0
13.0	13.0	0	0	0.0
13.1	13.1	0	0	0.0
13.2	13.2	0	0	0.0
13.3	13.3	0	0	0.0
13.4	13.4	0	0	0.0
13.5	13.5	0	0	0.0
13.6	13.6	0	0	0.0
13.7	13.7	0	0	0.0
13.8	13.8	0	0	0.0
13.9	13.9	0	0	0.0
14.0	14.0	0	0	0.0
14.1	14.1	0	0	0.0
14.2	14.2	0	0	0.0
14.3	14.3	0	0	0.0
14.4	14.4	0	0	0.0
14.5	14.5	0	0	0.0
14.6	14.6	0	0	0.0
14.7	14.7	0	0	0.0
14.8	14.8	0	0	0.0
14.9	14.9	0	0	0.0
15.0	15.0	0	0	0.0
15.1	15.1	0	0	0.0
15.2	15.2	0	0	0.0
15.3	15.3	0	0	0.0
15.4	15.4	0	0	0.0
15.5	15.5	0	0	0.0
15.6	15.6	0	0	0.0
15.7	15.7	0	0	0.0
15.8	15.8	0	0	0.0
15.9	15.9	0	0	0.0
16.0	16.0	0	0	0.0
16.1	16.1	0	0	0.0
16.2	16.2	0	0	0.0
16.3	16.3	0	0	0.0
16.4	16.4	0	0	0.0
16.5	16.5	0	0	0.0
16.6	16.6	0	0	0.0
16.7	16.7	0	0	0.0
16.8	16.8	0	0	0.0
16.9	16.9	0	0	0.0
17.0	17.0	0	0	0.0
17.1	17.1	0	0	0.0
17.2	17.2	0	0	0.0
17.3	17.3	0	0	0.0
17.4	17.4	0	0	0.0
17.5	17.5	0	0	0.0
17.6	17.6	0	0	0.0
17.7	17.7	0	0	0.0
17.8	17.8	0	0	0.0
17.9	17.9	0	0	0.0
18.0	18.0	0	0	0.0
18.1	18.1	0	0	0.0
18.2	18.2	0	0	0.0
18.3	18.3	0	0	0.0
18.4	18.4	0	0	0.0
18.5	18.5	0	0	0.0
18.6	18.6	0	0	0.0
18.7	18.7	0	0	0.0
18.8	18.8	0	0	0.0
18.9	18.9	0	0	0.0
19.0	19.0	0	0	0.0
19.1	19.1	0	0	0.0
19.2	19.2	0	0	0.0
19.3	19.3	0	0	0.0
19.4	19.4	0	0	0.0
19.5	19.5	0	0	0.0
19.6	19.6	0	0	0.0
19.7	19.7	0	0	0.0
19.8	19.8	0	0	0.0
19.9	19.9	0	0	0.0
20.0	20.0	0	0	0.0



Female, 52 years old, personal history of melanoma in situ on right arm in 2002 (diagnosed in other center) and no familial oncological history.

2021, nodular BCC (scapular region) ; BCC superficial multifocal (lateral right back)





Sección Lesión 4

Visualizador de rangos	Índice de conocimiento	área	2,9
8.1	Composición de color de	borde	2,5
		color	3,9
		diámetro	14,9mm

- 25/10/2021 09:01 - 10:00 (1 min) Configurar estado de lesión 4 a Follow-up.
- 25/10/2021 09:01 - 10:00 (1 min) Configurar estado de lesión 4 a No recheck. Configurar nombre de lesión como 4.

Vista en vivo



- 25/10/2021 14:56:31
- 25/10/2021 14:56:31 Configuración estado de lesión 3 a Follow-up
- 25/10/2021 14:56:31 Configuración estado de lesión 3 a No renovar
- 25/10/2021 14:56:31 Configuración nombre de lesión como 3

25/10/2021

Body map showing a human figure with a red dot on the back indicating the location of the lesion. Below the figure are navigation arrows.

100 de fotos de 11 x 20 máximas

0 0 0 0 0 0 0 0 0 0 0 0

Mapa del cuerpo

Lesión 3

25/10/2021 follow-up

15x clara polarización



25/10/2021

25/10/2021 12:50:31

Visualizador de rangos

6.1

Índice de conocimiento

Asimetría 2.1

borde 1.5

color 3.0

diámetro 10.5mm

DEXI

25/10/2021 12:50:31 - 25/10/2021 12:50:31
Configurar estado de lesión 3 a Follow-up.

25/10/2021 12:50:31 - 25/10/2021 12:50:31
Configurar estado de lesión 3 a No remark.

25/10/2021 12:50:31 - 25/10/2021 12:50:31
Preferencias de configuración de la lesión 3.

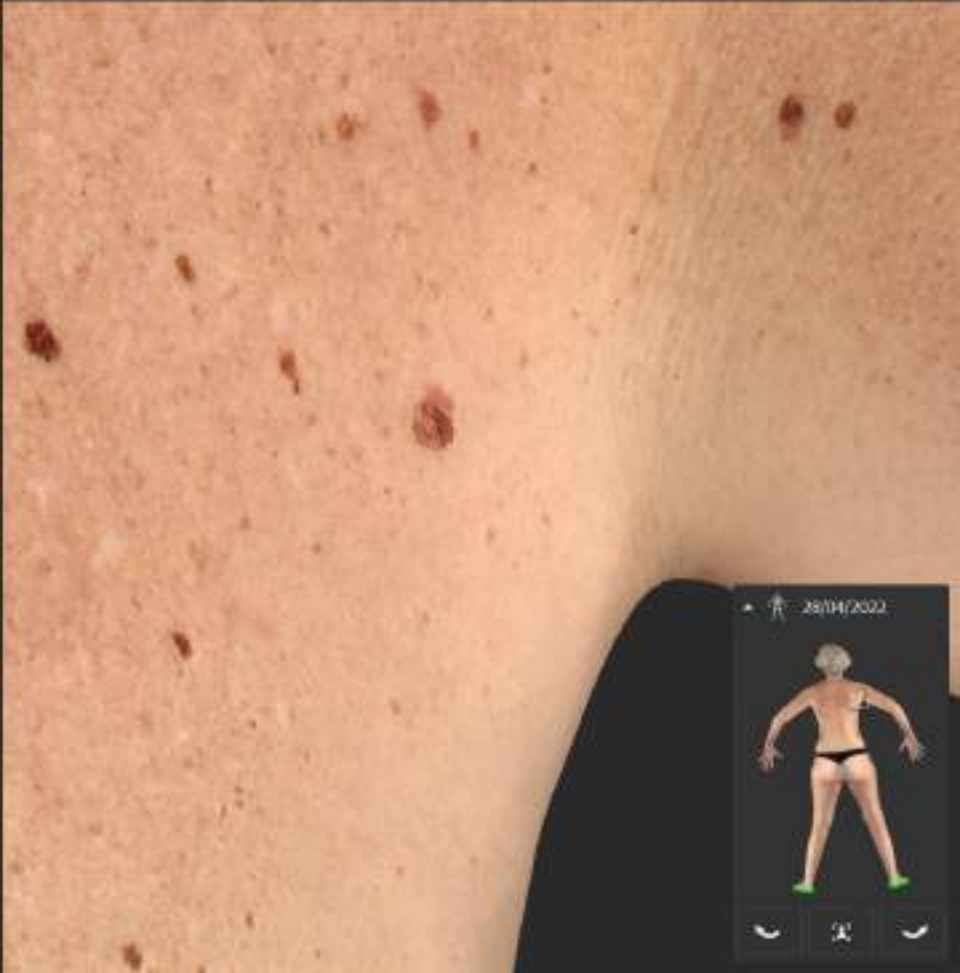
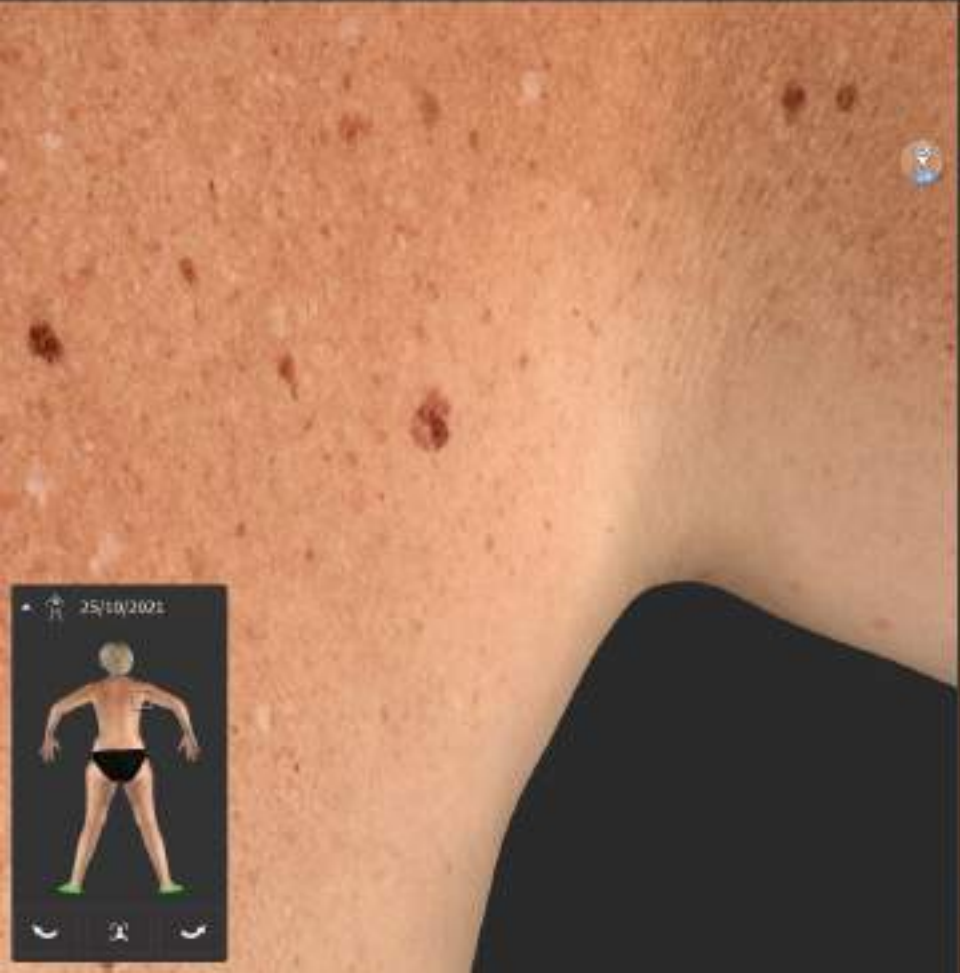
Vista en vivo

0 0 28 0 0 1

Inicio de trabajo 0 / 25 imágenes

Inicio del trabajo

Inicio del trabajo



25/10/2021

A body map showing the back of a person with a small red dot indicating the location of the skin lesions. The person is wearing black underwear. The map is dated 25/10/2021.

28/10/2022

A body map showing the back of a person with a small red dot indicating the location of the skin lesions. The person is wearing black underwear. The map is dated 28/10/2022.



Localización: Strong Africa en español lista actual

Indicador de: + lista
28/04/2022 11:48:57 2002

823 LESIONES

Sorted By: Hun
New Lesions: 20
Recorded Lesions: 0
Avg. Diameter: 4.23229

Field Change:



Reddish Change:



Complex Structure (mm):



Ulcerated:



Border Irregularity:



Color Variance:



Blue:



White Cast/Brown:



Anatomic Site: + lista

Tracking Status: + lista

Marked as Photo:





Lesión 29 25/10/2021

15x clara polarización

25/10/2021

Visualizador de tiempo

8.1

Índice de conocimiento

asimetría	4.3
borde	3.8
color	5.4
diámetro	9.9mm

DEXI

25/10/2021 10:00:00 Configurar estado de lesión 29 a Fresh.

25/10/2021 10:00:00 Configurar estado de lesión 29 a Follow-up.

25/10/2021 10:00:00

Vista en vivo

SSMM Breslow 0,2mm

Foto de toma
0 / 20 imágenes

Recorrido automático



Lesión 6

25/04/2021

Polvo-up



25/04/2021 12:44:31
25/04/2021 12:44:31 - 10/05/2021 12:44:31
Configurar estado de lesión 6 a Polvo-up.

25/04/2021 12:44:31 - 10/05/2021 12:44:31
Configurar estado de lesión 6 a No remark.

25/04/2021 12:44:31 - 10/05/2021 12:44:31
Configurar nombre de lesión como 6.



Vista en vivo



Female, 54 years old, MM multiple and breast cancer in 2020, Familial history of melanoma (brother).
CDKN2A mutation

Pathological Dx:

























- 2003 -MM Superficial spreading B 0.5mm right thigh
- 2011 -MM in situ buttocks
- 2020 -Infiltrative breast carcinoma

collapse

image: [Dropdown] 00000000 [Dropdown]

zoom



colleges					
009	010	011	012	013	014
 12/13/2022	 12/13/2022	 12/13/2022	 12/13/2022	 12/13/2022	 12/13/2022
 7/3/2022	 7/3/2022	 7/3/2022	 7/3/2022	 7/3/2022	 7/3/2022
 12/13/2022	 12/13/2022	 12/13/2022	 12/13/2022	 12/13/2022	 12/13/2022
 7/3/2022	 7/3/2022	 7/3/2022	 7/3/2022	 7/3/2022	 7/3/2022

⏪ ⏩ week 01 0 / 10 images
0 0 11 0 0 0 0
📍
Bodymap

Lesion 2 12/13/2022 Followup
🗑️ 🗨️ ⬇️ 📷



12/13/2022

🌙 🔄 🌙

📄 12/13/2022 11:45:27 AM - 12/13/2022 11:45:27 AM
 Set lesion 2 status to Followup.

📄 12/13/2022 12:04:58 AM - 12/13/2022 12:04:58 AM
 Set lesion 2 status to No Remark.
 Set lesion name as 2.

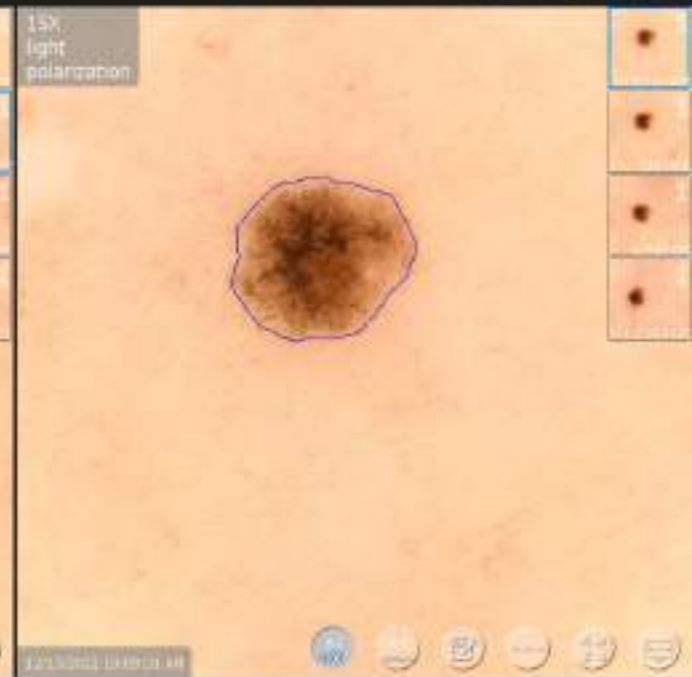
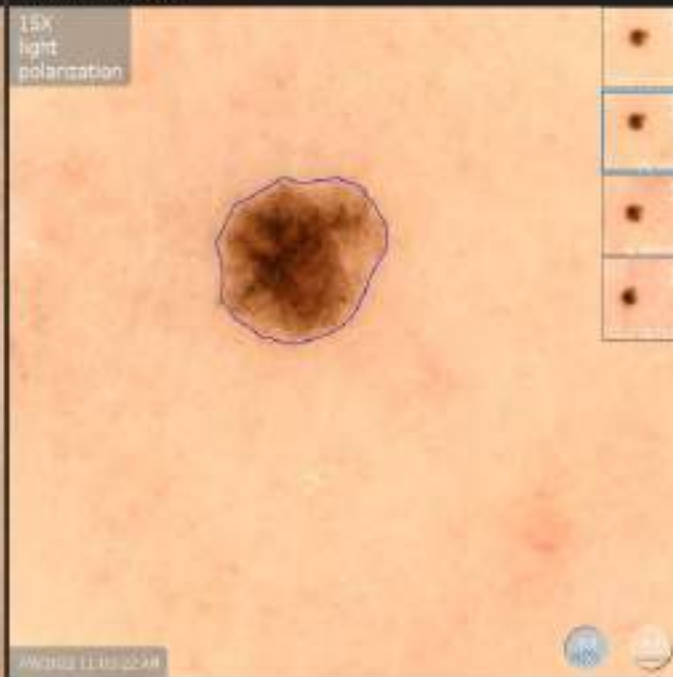
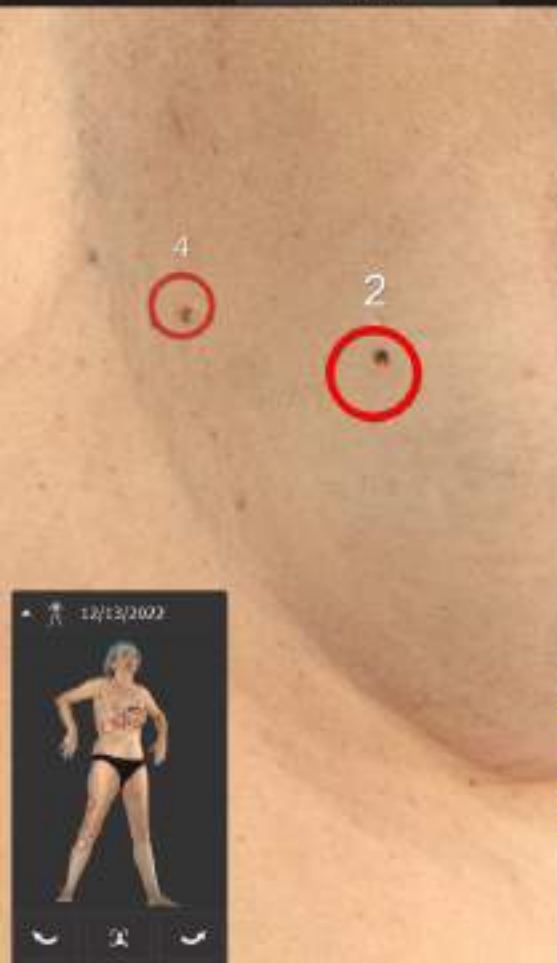
Live View

⏪ ⏩ ⏴ ⏵ ⏶ ⏷ ⏸ ⏹ ⏺ ⏻ ⏼ ⏽ ⏾ ⏿ 📍

week 01
 11/13/2022
 0 0 18 0 0 0 0
 Run by: ANA M. RIVERA ZUBIZARRETA

Lesion 2
 12/13/2022
 Followup

🗑️ 📄 ⬇️ 📷



12/13/2022 11:10:22 AM

Risk assessment: **0.5**
 Asymmetry: 3.6
 Border: 1.2
 Color: 6.1
 Diameter: 2.9mm

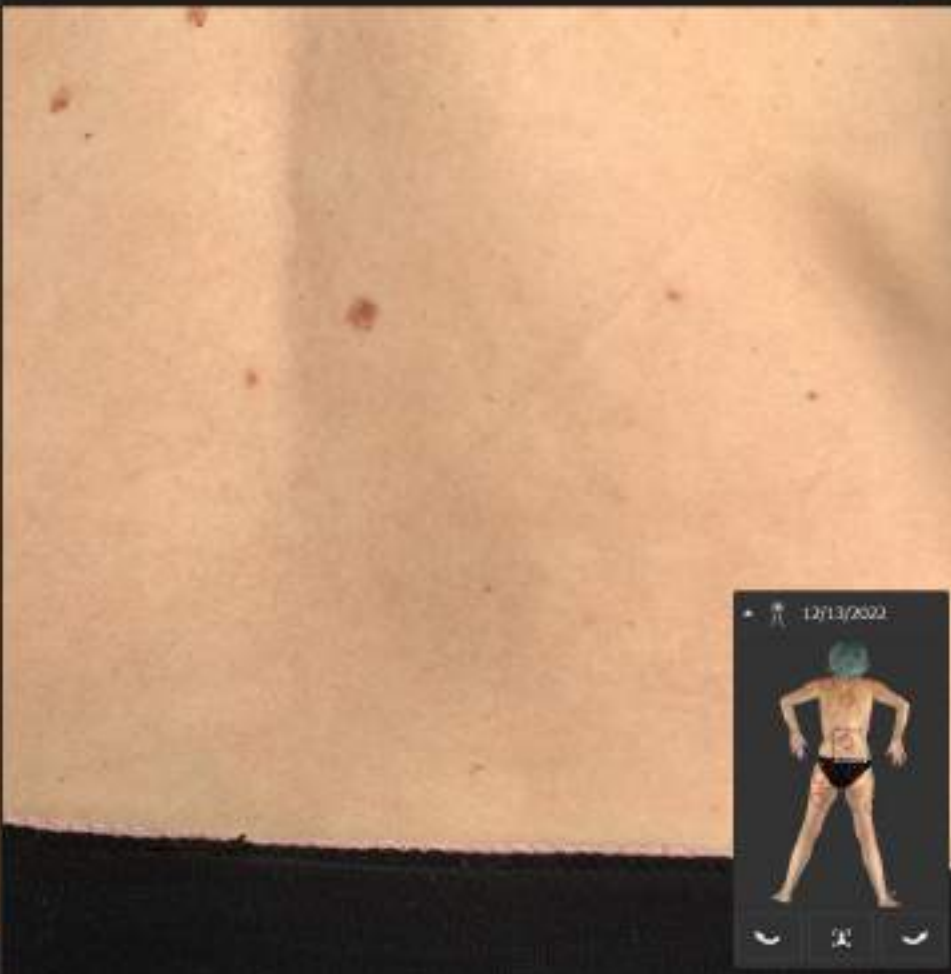
12/13/2022 11:10:22 AM

Risk assessment: **0.1**
 Asymmetry: 2.9
 Border: 1.0
 Color: 5.3
 Diameter: 3.0mm

12/13/2022 11:10:22 AM - 12/13/2022 11:10:22 AM
 Set lesion 2 status to Followup.

12/13/2022 12:44:44 AM - 12/13/2022 12:44:44 AM
 Set lesion 2 status to No Remark.
 Set lesion remark on 2.

Live View



7/8/2022

A body map showing the location of the lesion on the back. The map is a silhouette of a person's back with a red dot indicating the location of the lesion. The map is dated 7/8/2022.

12/13/2022

A body map showing the location of the lesion on the back. The map is a silhouette of a person's back with a red dot indicating the location of the lesion. The map is dated 12/13/2022.

⏪ ⏩ week 01 0 / 10 images
0 0 18 0 0 0 0
📍

Plan by date

Lesson 12 🔴 Compare
7/6/2022 Following

🗑️ 📄 ⬇️ 📷



12/13/2022

🌙

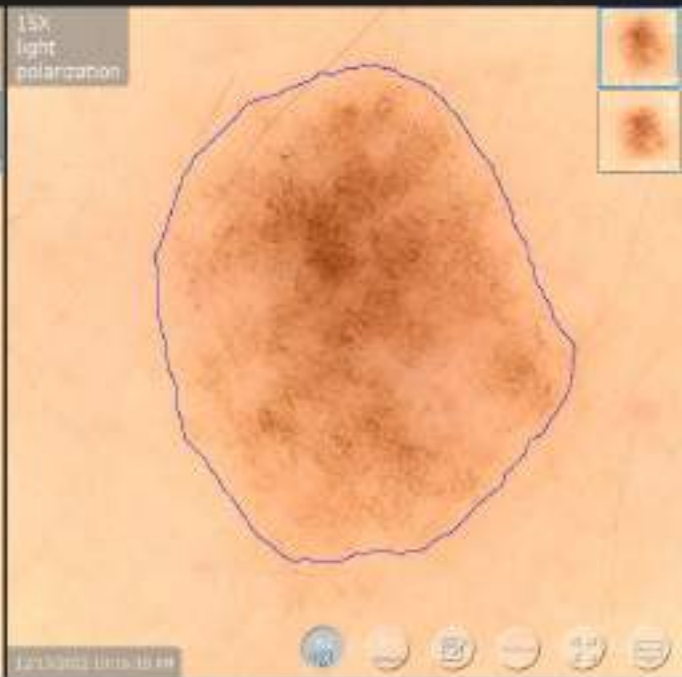
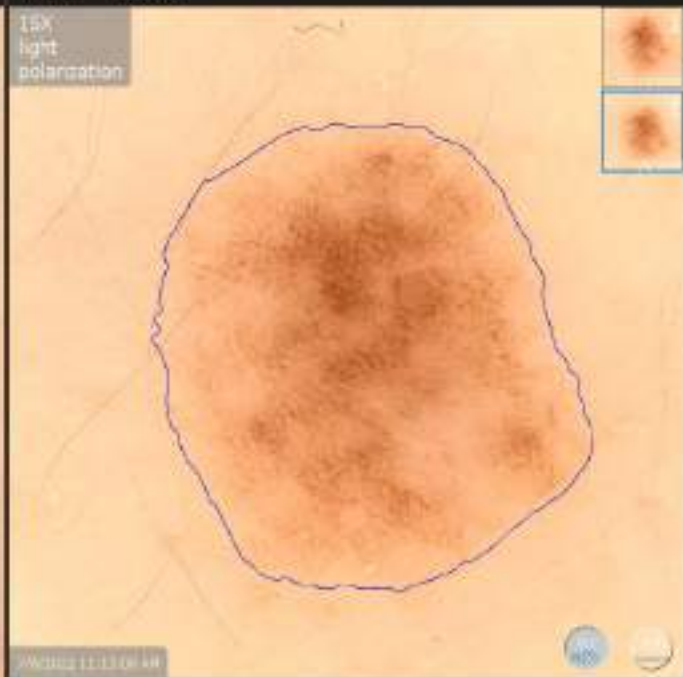


📄 7/6/2022 11:17:08 AM - 10/10/2022 11:17:08 AM
 Set lesion 12 status to Following.

📄 12/13/2022 10:16:46 AM - 10/10/2022 10:16:46 AM
 Set lesion 12 status to No Remark.
 Set lesion name as 12.

📄 12/13/2022 10:16:46 AM - 10/10/2022 10:16:46 AM
 Set lesion 12 status to No Remark.
 Set lesion name as 12.

Live View



Risk assessment
0.1
Asymmetry
1.4
Border
0.8
Color
5.3
Structure
7.7mm

Risk assessment
0.1
Asymmetry
2.4
Border
1.1
Color
5.3
Structure
7.8mm

12/13/22 11:13:06 AM - HOPSPHOTO
 Set lesion 12 status to Followup.

12/13/22 11:13:16 AM - HOPSPHOTO
 Set lesion 12 status to No Remark.
 Set lesion remark as 1.3

⏪
⏩
1/35 images
0
0
18
0
0
0
0
0
0
📍

Lesion 7
7/6/2022
Follow-up
🗑️
📄
⬇️
📷



12/13/2022

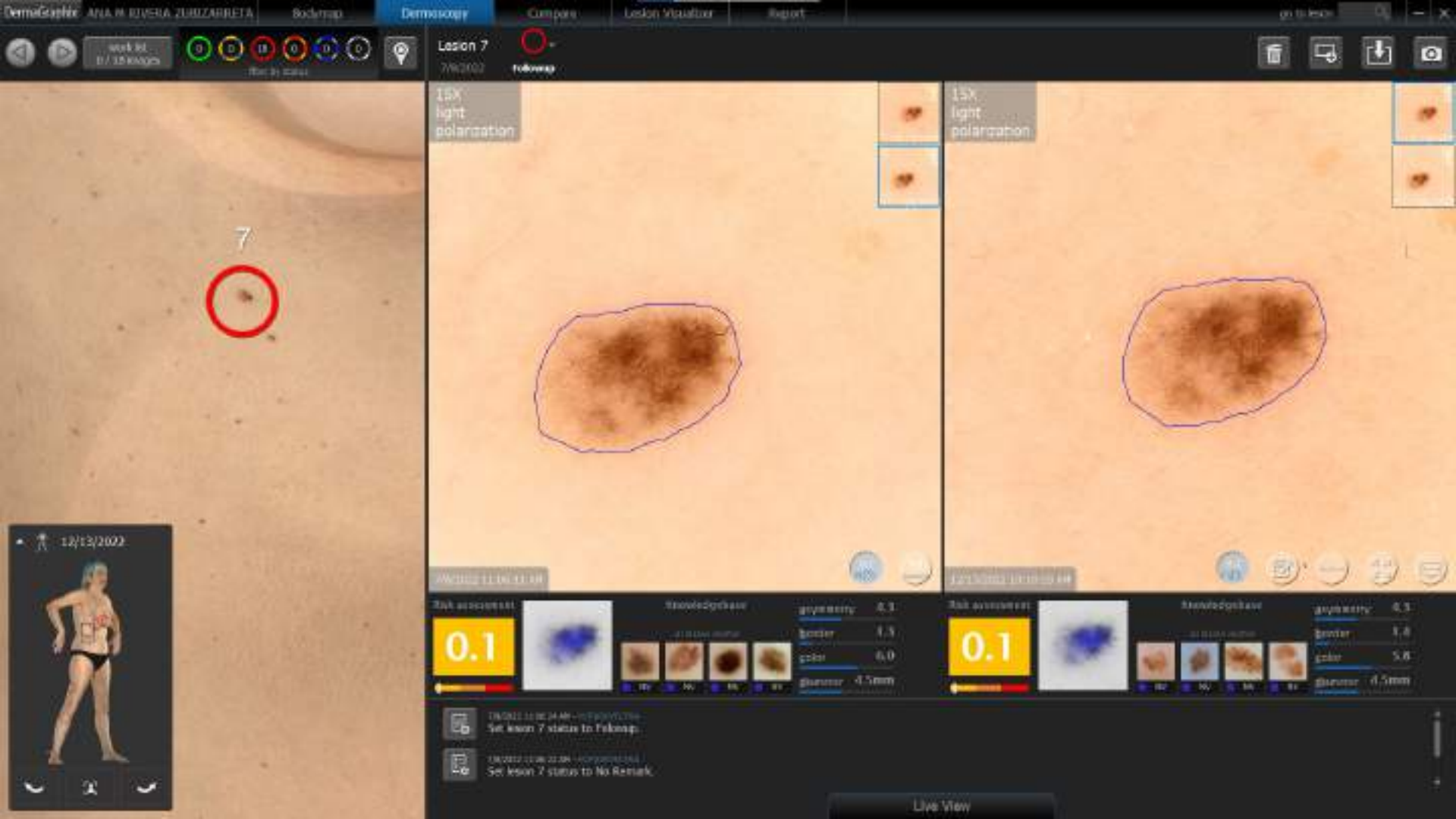
🌙 🔄 🌙

📄 7/6/2022 11:06:24 AM - 10/13/2022 11:54
Set lesion 7 status to Follow-up.

📄 7/6/2022 11:06:22 AM - 10/13/2022 11:54
Set lesion 7 status to No Remark.

📄 7/6/2022 11:06:21 AM - 10/13/2022 11:54
Set lesion name as 7.

Live View



week 14 11/13/2022

0 0 11 0 0 0 0

Bodymap

Lesson 15

7/6/2022

Followup

on to desk

🗑️ 🖨️ ⬇️ 📷



12/13/2022

7/6/2022 11:14:45 AM

7/6/2022 11:14:45 AM - 10/10/2022 11:14

Set lesion 15 status to Followup.

7/6/2022 11:14:52 AM - 10/10/2022 11:14

Set lesion 15 status to No Remark.

Set lesion name as 15.

Live View

week list 11 / 15 images

0 0 11 0 0 0

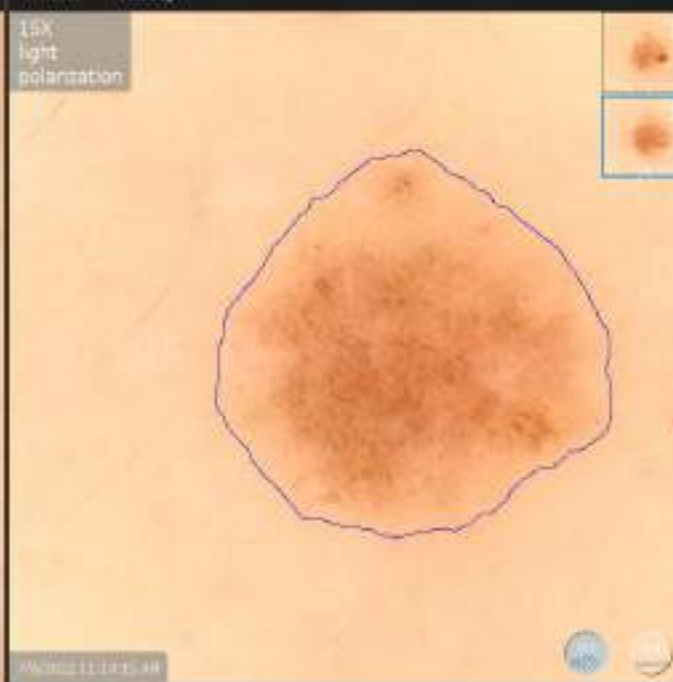
Ready to share



Lesson 15

7/6/2022

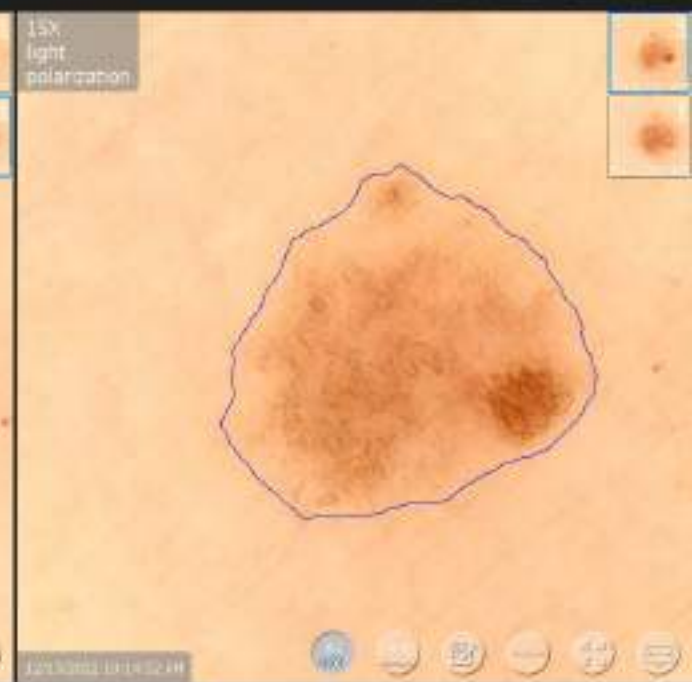
Followup



Lesson 15

7/6/2022

Followup



12/13/2022 11:14:45 AM

Risk assessment

0.1

Structure base

Asymmetry 1.9

Border 1.3

Color 2.8

Structure 6.1mm

12/13/2022 11:14:52 AM

Risk assessment

0.1

Structure base

Asymmetry 1.0

Border 2.0

Color 1.3

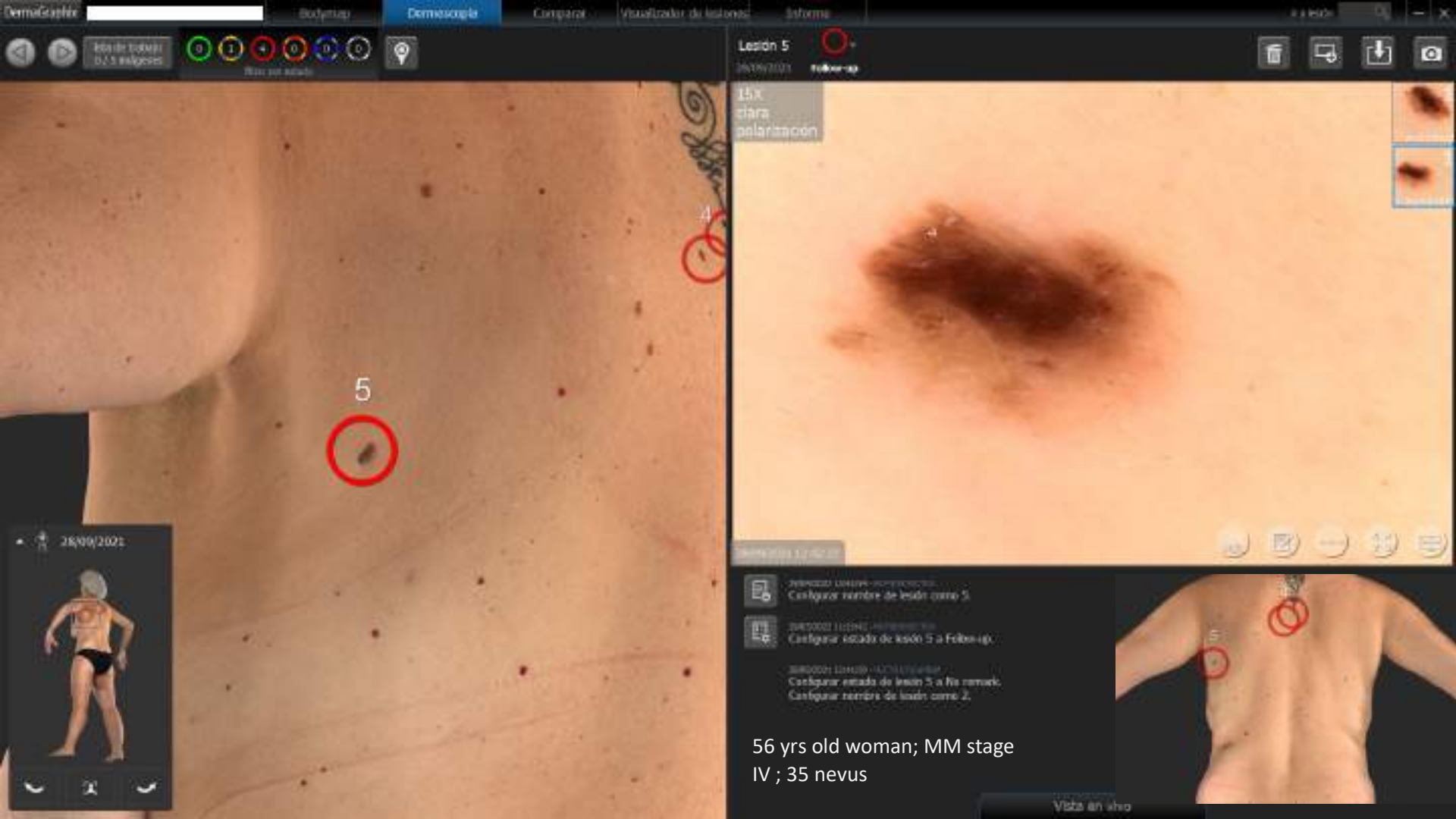
Structure 6.0mm

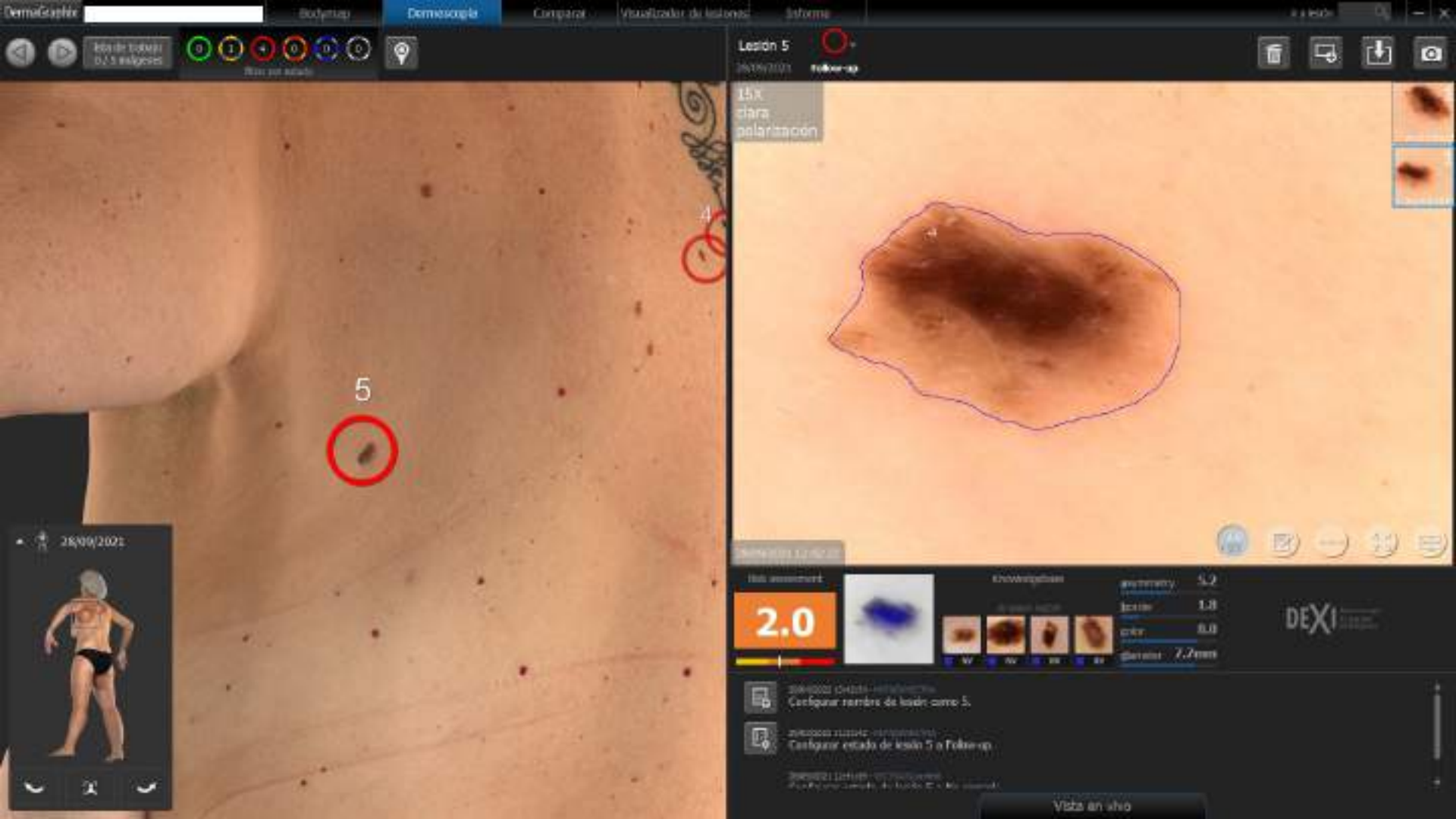
12/13/2022 11:14:45 AM - HOPSPROVIDER
Set lesion 15 status to Followup.

12/13/2022 11:14:52 AM - HOPSPROVIDER
Set lesion 15 status to No Remark.
Set lesion remark as 15.

SSMM Breslow 0,3 mm

Live View





100 de 100 MP
0.3 segundos

0 1 2 3 4 5 6 7 8 9 10

Mapa del cuerpo



Lesión 5



28/09/2021 Follow-up

Icons for delete, share, download, and print

15x
clara
polarización



5



28/09/2021



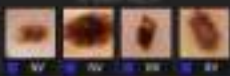
28/09/2021 12:02:02

100 assessment

2.0



Examen de polarización



asymmetry 5.2
border 1.0
color 0.0
structure 7.2mm

DEXI

28/09/2021 12:02:02 - 12:02:02
Configurar nombre de lesión como 5.

28/09/2021 12:02:02 - 12:02:02
Configurar estado de lesión 5 a Follow-up.

28/09/2021 12:02:02 - 12:02:02
Paciente con consulta de seguimiento de la lesión 5.

Vista en vivo



- 28/09/2021 11:26:00
- 28/09/2021 11:26:00 Configuración estado de lesión 3 a Follow-up
- 28/09/2021 11:26:00 Configuración asociar de lesión 3 a Ris renewal. Configuración nombre de lesión como 3.

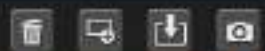


28/09/2021

Vista en vivo



Lesión 3
24/09/2021 follow-up



15x
clara
polarización



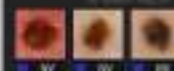
24/09/2021 11:26:01

100 assessment

0.1



Extracciones



asimetría 3.5

border 2.0

color 6.7

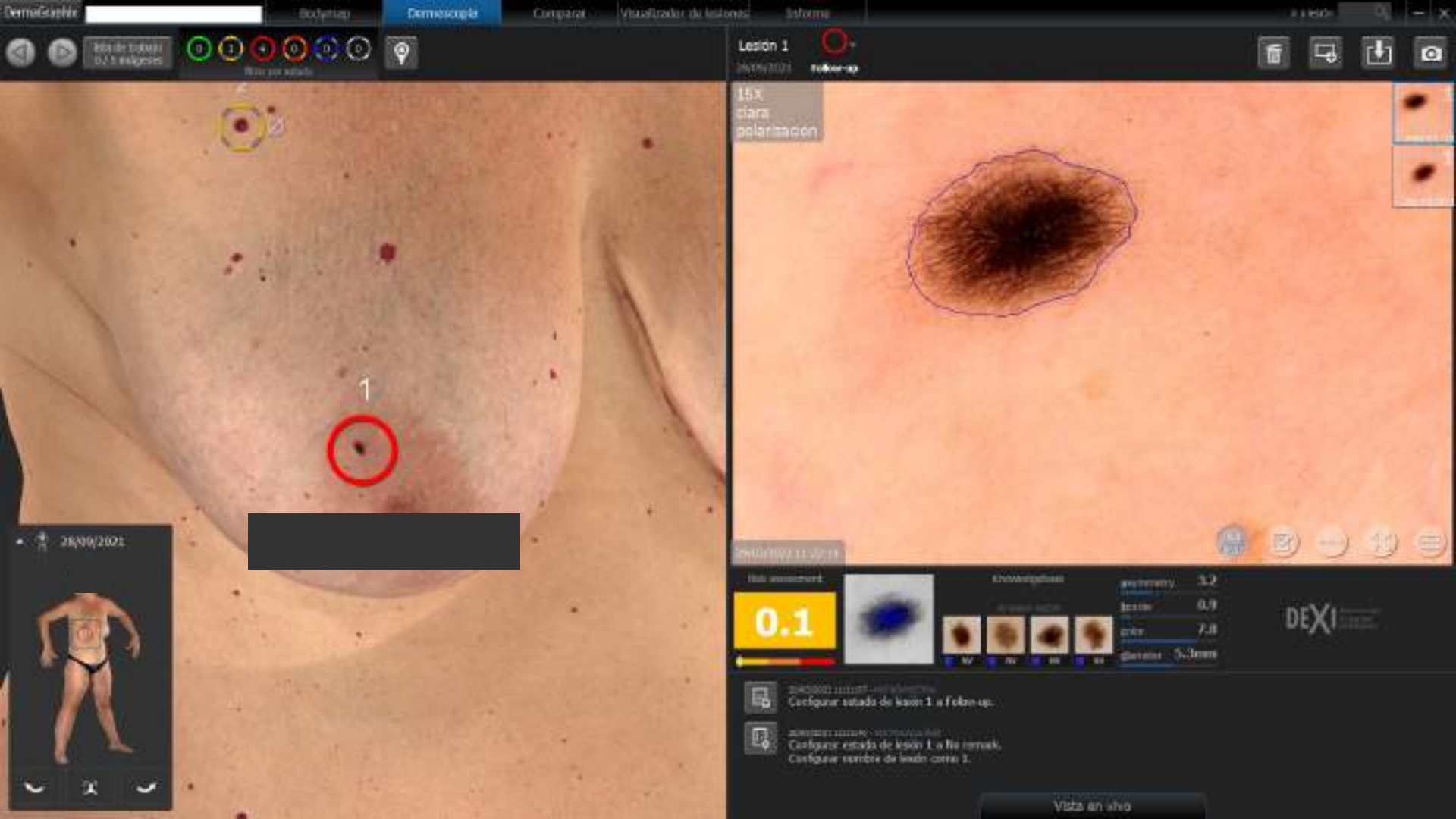
diámetro 3.2mm

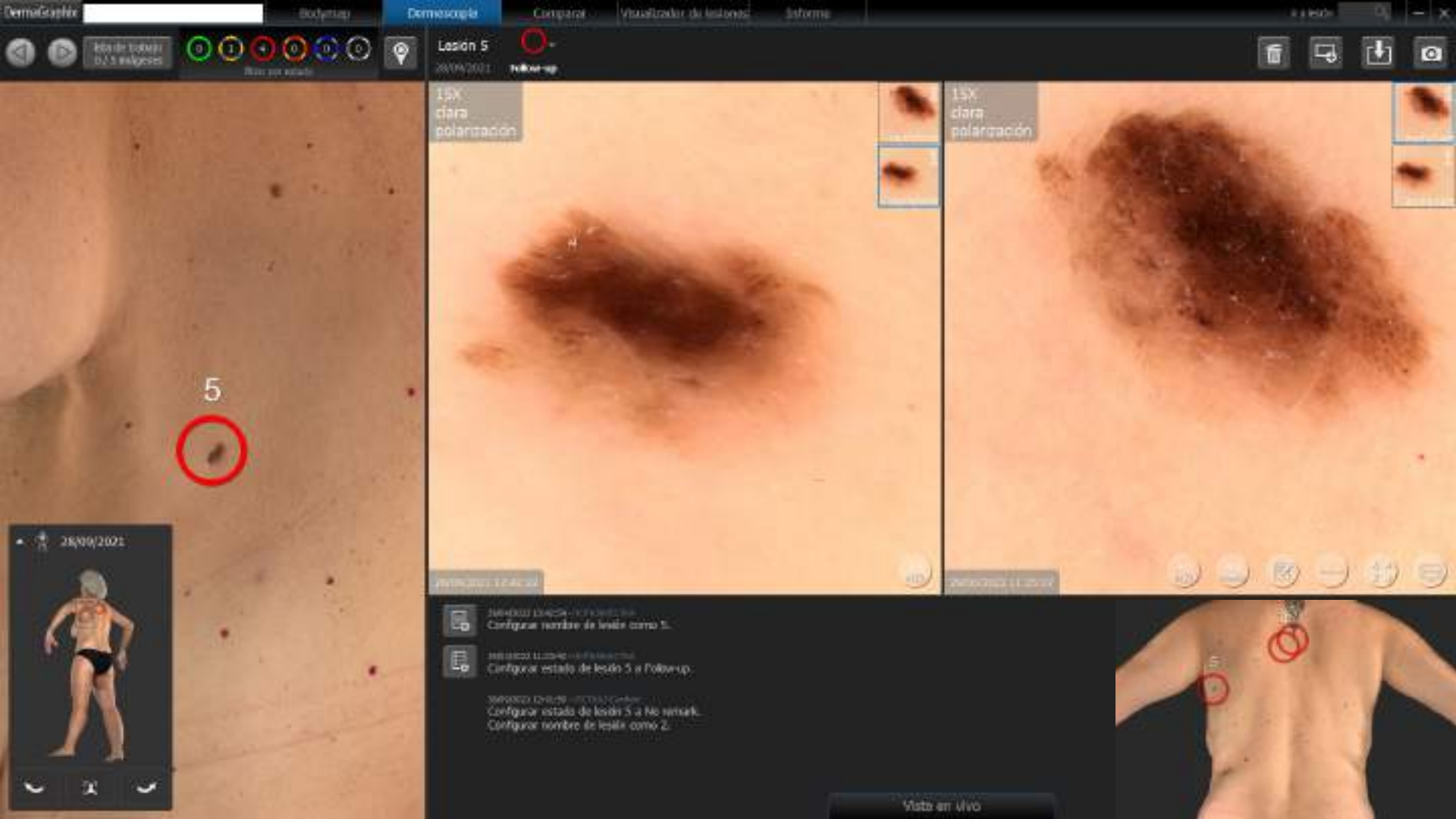
DEXI

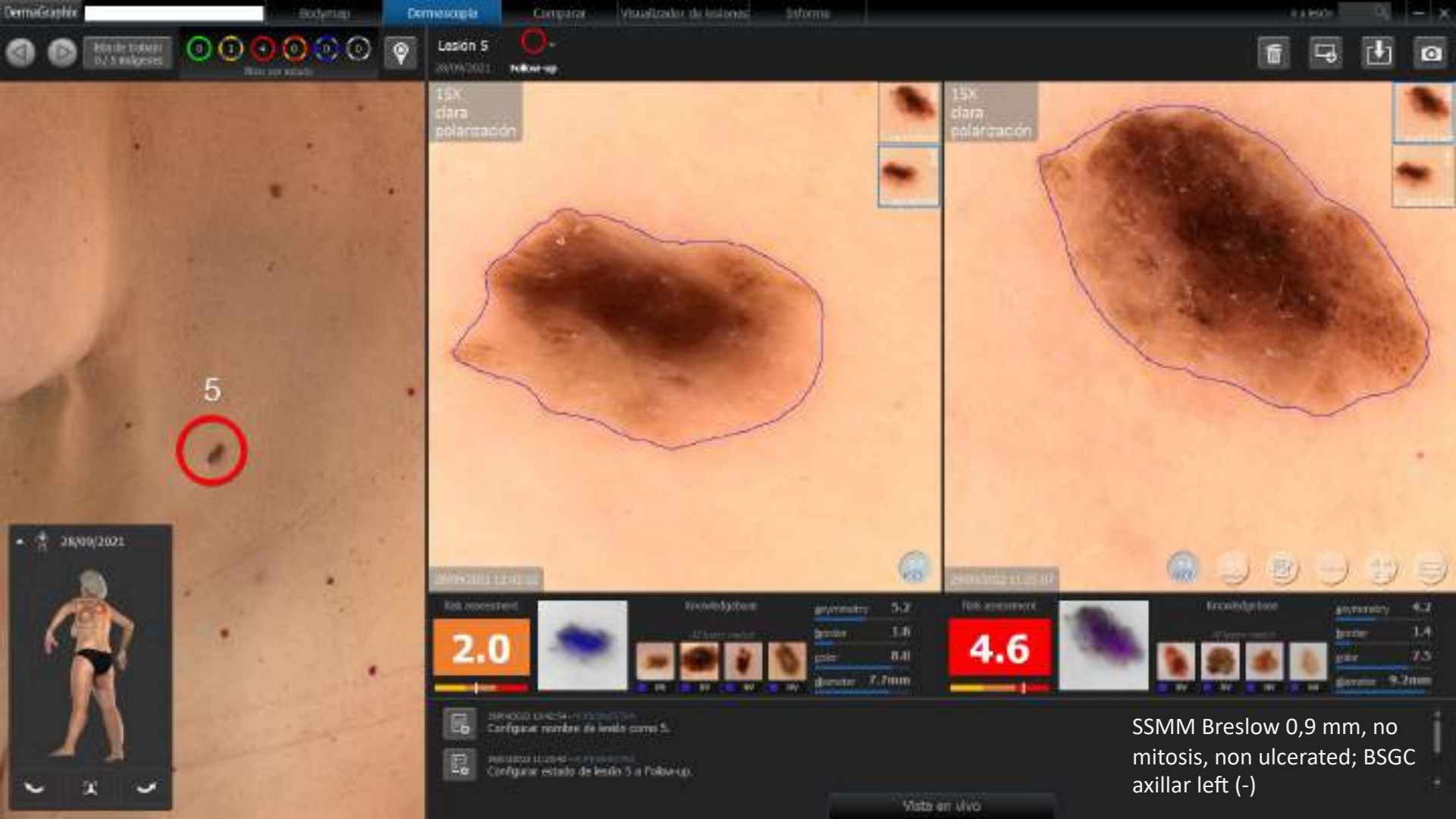
24/09/2021 11:26:01 - 11:26:01
Configurar estado de lesión 3 a Follow-up.

24/09/2021 11:26:01 - 11:26:01
Configurar estado de lesión 3 a No remark.
Configurar nombre de lesión como 3.

Vista en vivo







SSMM Breslow 0,9 mm, no mitosis, non ulcerated; BSGC axillar left (-)

THE EVIDENCE : STUDIES OF 3D TBP

Reproducible Naevus Counts Using 3D Total Body Photography and Convolutional Neural Networks

Brigid Betz-Stablein^{a,b} Brian D'Alessandro^c Uyen Koh^b Elsemeike Plasmeljer^{a,d}
 Monika Janda^a Scott W. Menzies^{e,g} Rainer Hofmann-Wellenholz^f
 Adele C. Green^{a,i} H. Peter Soyer^{b,h}

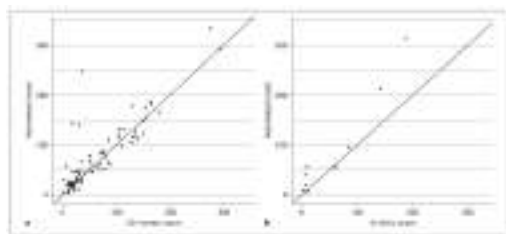
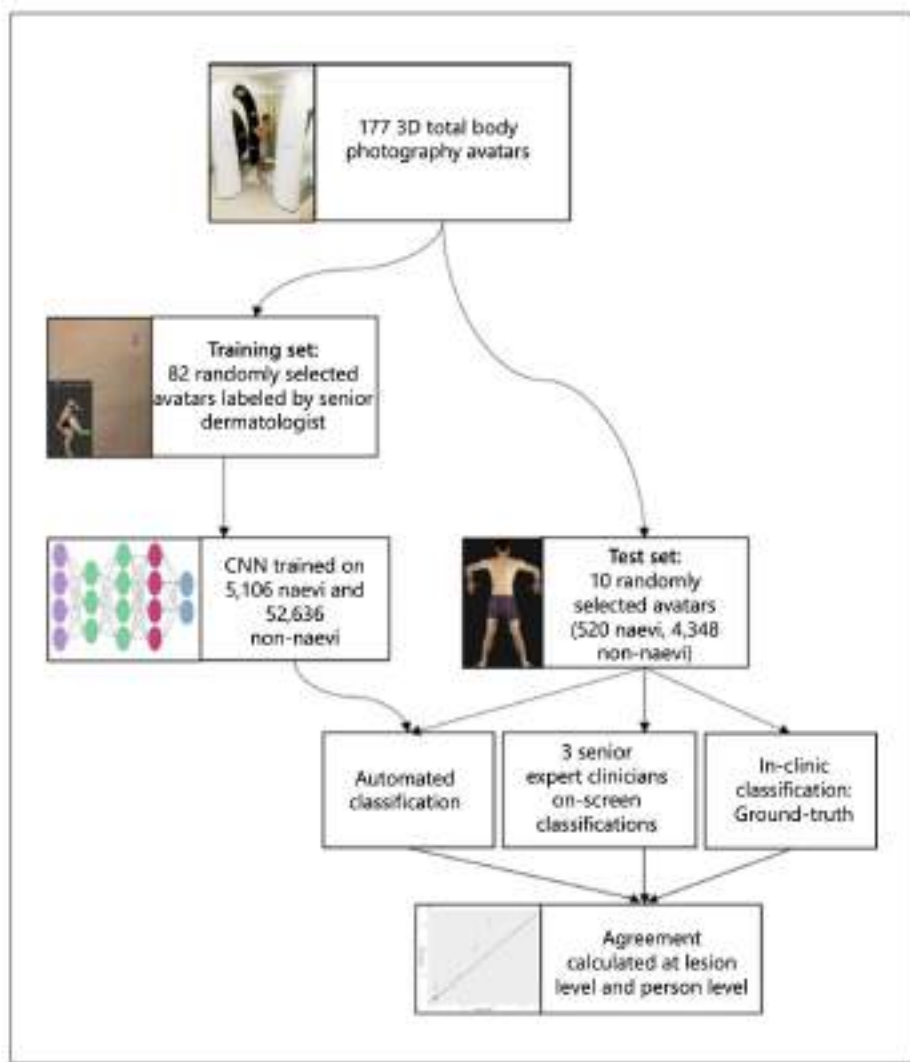


Fig. 4. Correlation between automated and manual naevus counts for the training dataset (a) and between automated and manual naevus counts for the test dataset (b).



Skin cancer excisions and histopathology outcomes when following a contemporary population-based cohort longitudinally with 3D total-body photography

H. Peter Soyer^{1,2} | Montana O'Hara^{1,3} | Carina V. Silva² |
Caitlin Horsham² | Dilki Jayasinghe² | Saira Sanjida^{1,2} |
Helmut Schaldler¹ | Joanne Aitken^{4,5,6} | Richard A. Sturm¹ |
Tari Prow^{1,7,8} | Scott W. Menzies^{9,10} | Monika Janda²

Background: Three-dimensional (3D) total-body photography is a new and emerging technology which can support clinicians when they monitor people's skin over time.

Objectives: The aim of this study was to improve our understanding of the epidemiology and natural history of melanocytic naevi in adults, and their relationship with melanoma and other skin cancers.

Methods: **Mind Your Moles** was a 3-year prospective, population-based cohort study which ran from December 2016 to February 2020. Participants visited the Princess Alexandra Hospital every 6 months for 3 years to undergo both a clinical skin examination and 3D total-body photography.

Results: A total of 1213 skin screening imaging sessions were completed. Fifty-six percent of participants ($n = 108/193$) received a referral to their own doctor for 250 lesions of concern, 101/108 (94%) for an excision/biopsy.

86 people (85%) visited their doctor and received an excision/biopsy for 138 lesions.

Histopathology of these lesions found 39 non-melanoma skin cancers (across 32 participants) and six in situ melanomas (across four participants).



Original Research

Diagnostic performance of augmented intelligence with 2D and 3D total body photography and convolutional neural networks in a high-risk population for melanoma under real-world conditions: A new era of skin cancer screening?

Sara E. Cerminara^a, Phil Cheng^b, Lisa Kostner^a, Stephanie Huber^a, Michael Kunz^a, Julia-Tatjana Maul^{b,c}, Jette S. Böhm^a, Chiara F. Dettwiler^a, Anna Gesser^a, Cécile Jakopovic^a, Livia M. Stoffel^a, Jelissa K. Peter^a, Mitchell Levesque^a, Alexander A. Navarini^a, Lara Valeska Maul^{b,c,*}

^a Department of Dermatology, University Hospital of Basel, Basel, Switzerland

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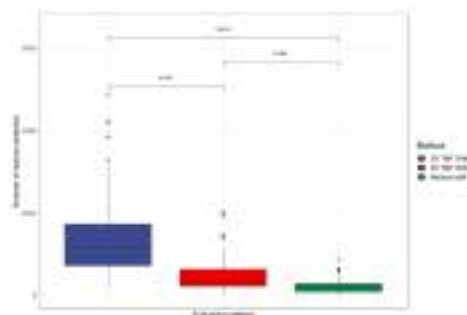


Fig. 4. Total score of all melanocytic lesions per patient. Comparison of annotated cases by 3D TBP CNN and 2D TBP CNN with gold standard medical data. Mean 2D TBP CNN lesion count of 11.6 (median = 11.64, range 1.0–60.0), 3D TBP CNN average lesion count of 39.9 (median = 39.9, range 10–202) and score medical staff result of 2.6 (median = 1.65, range 1–10) lesions. **** $p < 0.0001$. CNN, convolutional neural network; TBP, total body photography.

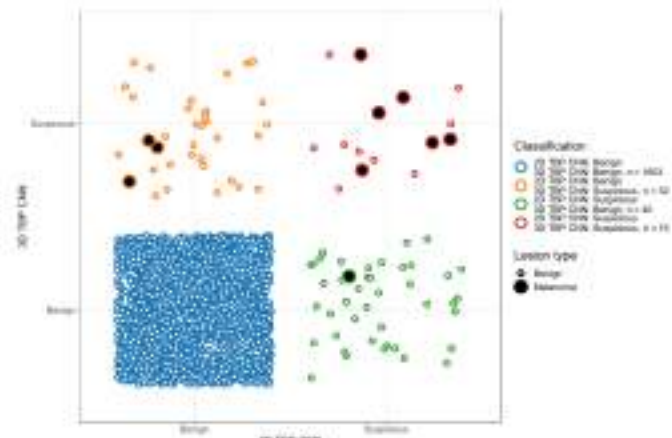


Fig. 1. Overview and accuracy of the dichotomous risk classification of melanocytic skin lesions by 3D and 2D TBP CNN. Blue circles = lesions categorised as benign ($n = 1003$) by 3D TBP CNN and 2D TBP CNN, orange circles = only 3D TBP CNN categorised lesions as suspicious ($n = 32$), green circles = only 2D TBP CNN classified as suspicious ($n = 48$) and red circles = suspicious lesions by both systems ($n = 13$). Big black dot = melanoma ($n = 10$), little circle = benign lesion. CNN, convolutional neural network; TBP, total body photography.

SE/SP risk-score

3D TBP = 90.0%/ 64.6% and ROC-AUC 0.92 [CI 0.85–1.00]

Dermatologists + augmented intelligence achieved the same sensitivity (90%), 86%, ROC-AUC (0.91 [CI 0.80–1.00], 2D TBP = 70%/ 40%/ ROC-AUC ROC-AUC: 0.68 [CI 0.46–0.90])

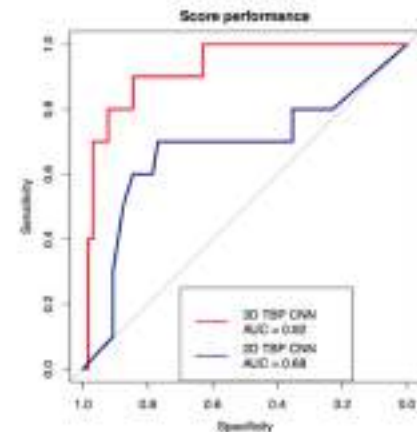


Table 3

Performance of the 3D TBP CNN, 2D TBP CNN and dermatologists with and without assistance by the AI systems in classifying pigmented skin lesions based on histology (n = 75).

Characteristics	Overall		Detailed subgroups			
	Melanoma n = 10 ^a	Not melanoma n = 65 ^a	Melanocytic naevus n = 22 ^a	Dysplastic naevus n = 24 ^a	Melanoma n = 10 ^a	Others ^b , n = 19 ^a
2D TBP CNN						
Not melanoma suspicious	3 (30.0%)	26 (40.0%)	7 (31.8%)	14 (58.3%)	3 (30.0%)	5 (26.3%)
Melanoma suspicious	7 (70.0%)	39 (60.0%)	15 (68.2%)	10 (41.7%)	7 (70.0%)	14 (73.7%)
3D TBP CNN						
Not melanoma suspicious	1 (10.0%)	42 (64.6%)	20 (90.9%)	11 (45.8%)	1 (10.0%)	11 (57.9%)
Melanoma suspicious	9 (90.0%)	23 (35.4%)	2 (9.1%)	13 (54.2%)	9 (90.0%)	8 (44.4%)
Dermatologist						
Not melanoma suspicious	1 (10.0%)	60 (92.3%)	19 (86.4%)	22 (91.7%)	1 (10.0%)	19 (100%)
Melanoma suspicious	9 (90.0%)	5 (7.7%)	3 (13.6%)	2 (8.3%)	9 (90.0%)	0 (0%)
Dermatologist + AI						
Not melanoma suspicious	1 (10.0%)	56 (86.2%)	18 (81.8%)	20 (83.3%)	1 (10.0%)	18 (94.7%)
Melanoma suspicious	9 (90.0%)	9 (13.8%)	4 (18.2%)	4 (16.7%)	9 (90.0%)	1 (5.3%)

AI, artificial intelligence; CNN, convolutional neural network; TBP, total body photography.

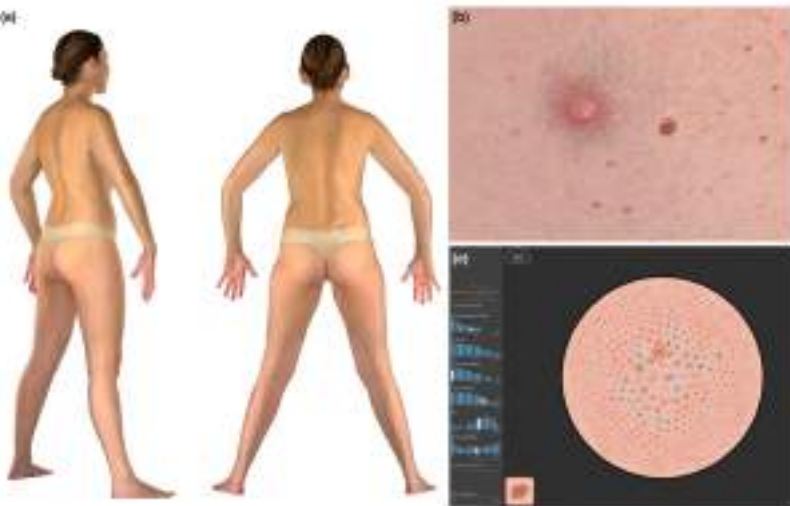
^a n (%).

^b Other lesions that were excised comprised pigmented basal cell carcinoma, lentigo solaris, seborrhoeic keratosis (pigmented), dermatofibroma, folliculitis with perifolliculitis, lichenoid keratosis.

3D Whole-body skin imaging for automated melanoma detection

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 B. M. D'Alessandro⁴ | J. DeFazio¹ | A. C. Halpern¹ | V. M. Rotemberg¹ |
 A. A. Marghoob¹

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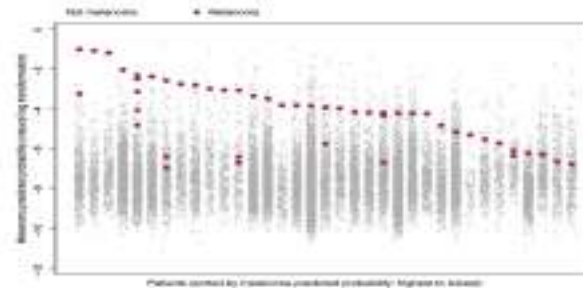


Objectives: To determine if melanoma can be distinguished from other skin lesions using data from automated analysis of 3D-images.

Methods: whole-body 3D-image captured within 90 days prior to the diagnostic skin biopsy. Automated data from image processing (i.e. lesion size, colour, border) for all eligible participants for analysis.

Results: A total of 35 patients contributed 23,538 automatically skin lesions (49 lesions of melanoma). The AUC for the prediction model was 0.94 (95% CI: 0.92–0.96).

Conclusions: using simple image processing techniques can discriminate melanoma from other lesions with high accuracy.



FUTURE

Apps

TBP for
screening

Deep
imaging

Deep
Phenotyping



Autonomous scanner

- Minimal human intervention for TBP and TBD
- High quality of imaging
- The patient follows the instructions of the robot
- Detection of body position
- TBP (n=36) with polarised light
- Software for the detection of lesions (Computer visión)
- Dermoscopic photos of the lesions

Comparative analysis of dermoscopic image quality obtained using a new automatised device and current manual dermoscope. N. Ricart, E. Campmol, N. Lobos, J. Gimenez, S. Andreani, L. Serra, J. Malvehy . EADO 2022

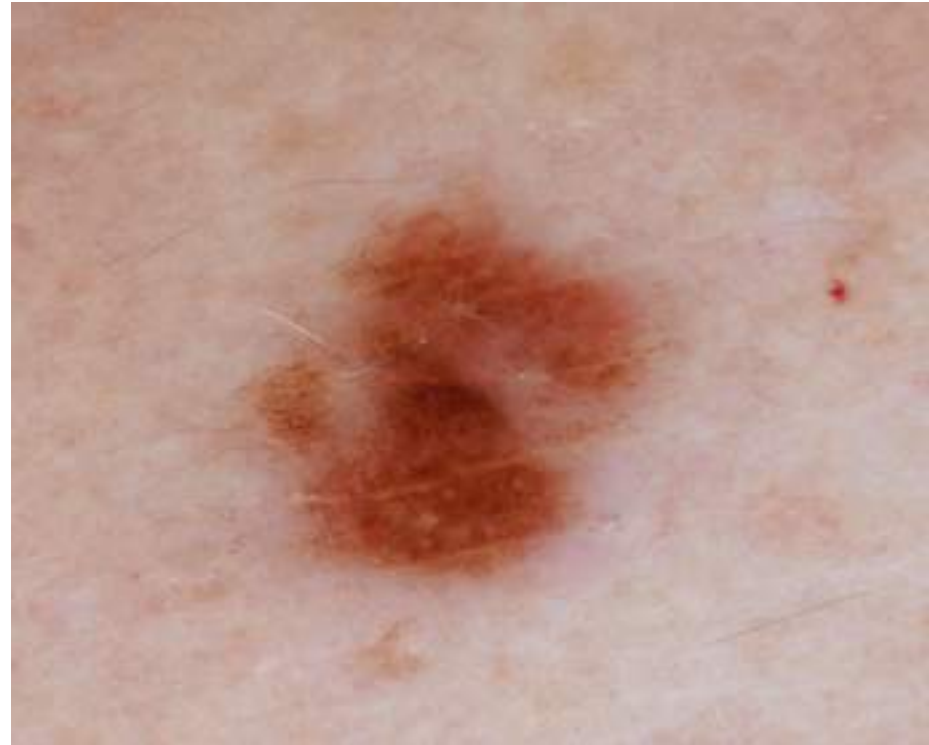






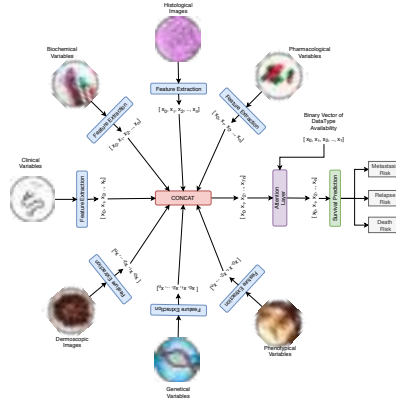


Comparative analysis of dermoscopic image quality obtained using a new automatized device and current manual dermoscope. N. Ricart, E. Campmol, N. Lobos, J. Gimenez, S. Andreani, L. Serra, J.Malveyh . EADO 2022



Comparative analysis of dermoscopic image quality obtained using a new automatised device and current manual dermoscope. N. Ricart, E. Campmol, N. Lobos, J. Gimenez, S. Andreani, L. Serra, J. Malvehy . EADO 2022

MELANOMA RISK SCORE: DEEP PHENOTYPING



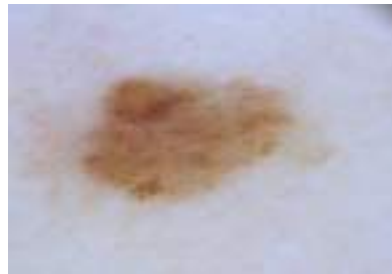
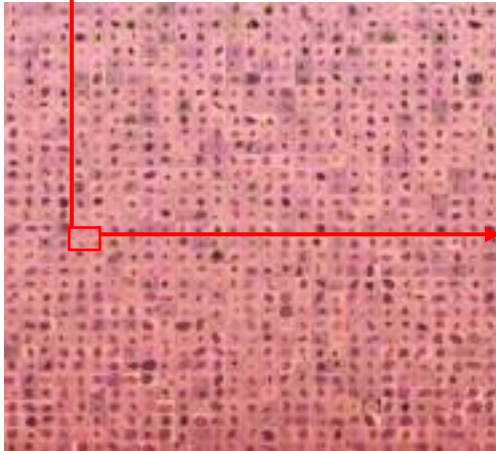
Age, sex, ethnicity, geography
Skin UV damage
Skin type (spectrophotometry)

CLINICAL

Clinical background
Previous MM
Familial MM
Medications

GENETIC

CDKN2A G101w
MITF wt, POT-1 wt, TERT wt
MC1R wt
Polygenic risk score



DEEP IMAGING

Full body Dermoscopy

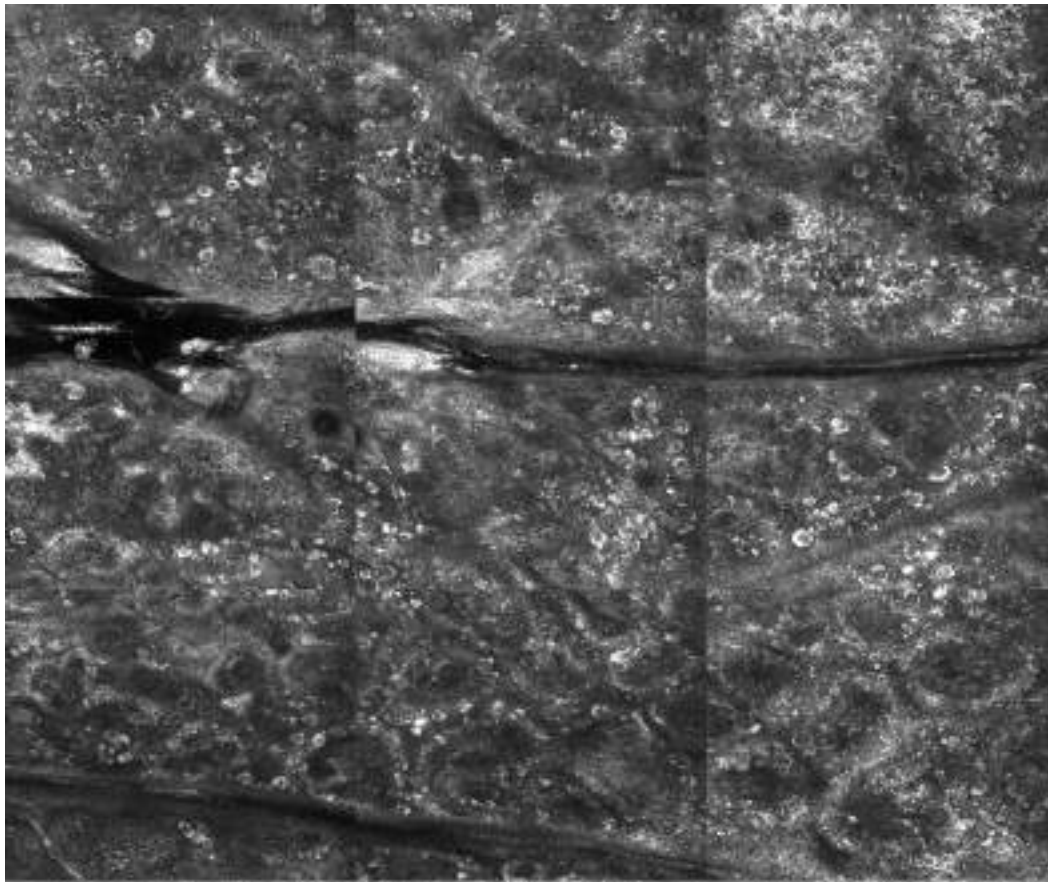
MELANOMA RISK SCORE: DEEP PHENOTYPING



Deep imaging (phenotype)

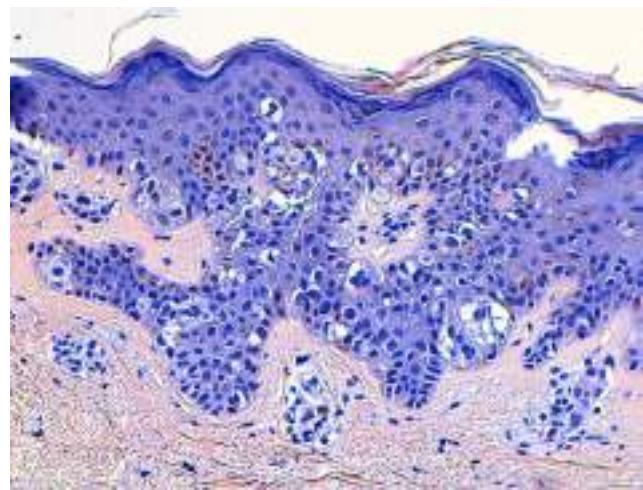
- Skin type
 - Skin color (spectrophotometry)
 - Hair/eyes color
- Photoaging signature
 - Atrophy
 - Hypertrophy
 - Dyschromia
 - Solar lentigos
 - Field cancerization
- Atypical mole syndrome
 - Number of melanocytic lesions
 - Diameter, color, ...
 - Distribution
- Dermoscopic characteristics
 - Pigmentation
 - Pattern: reticular, globular, homogeneous,...
- Other skin lesions





Lovatto L, Carrera C, Salerni G, Alós L, Malvehy J, Puig S. In vivo reflectance confocal microscopy of equivocal melanocytic lesions detected by digital dermoscopy follow-up. J Eur Acad Dermatol Venereol. 2015 Oct;29(10):1918-25

Stanganelli I, Longo C, et al. Integration of reflectance confocal microscopy in sequential dermoscopy follow-up improves melanoma detection accuracy. Br J Dermatol. 2015 Feb; 172(2):365-71



CONCLUSIONS

- Best current estimates suggest that in patients at high risk of melanoma, TBP-SDD is the best approach for early detection of MM and reducing NNT.
- New technologies with faster examination and computed aided
- 3D TBP has advantages and limitations
- The combination of Deep phenotyping with machine learning can improve detection of skin cancer and risk stratification of patients

9º CURSO

FORMATO HÍBRIDO

Avanzado de Dermatoscopia

Curso teórico-práctico

Amor a la página 2

Barcelona 21, 22 y 23
de Septiembre

PROGRAMA PRELIMINAR



Organizado por:

www.assoladerm.com
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Directores del Curso:

Dr. Josep Malvehy

Dra. Susana Puig

Servicio de Dermatología

Hospital Clínic Barcelona