

Supplementary File 1

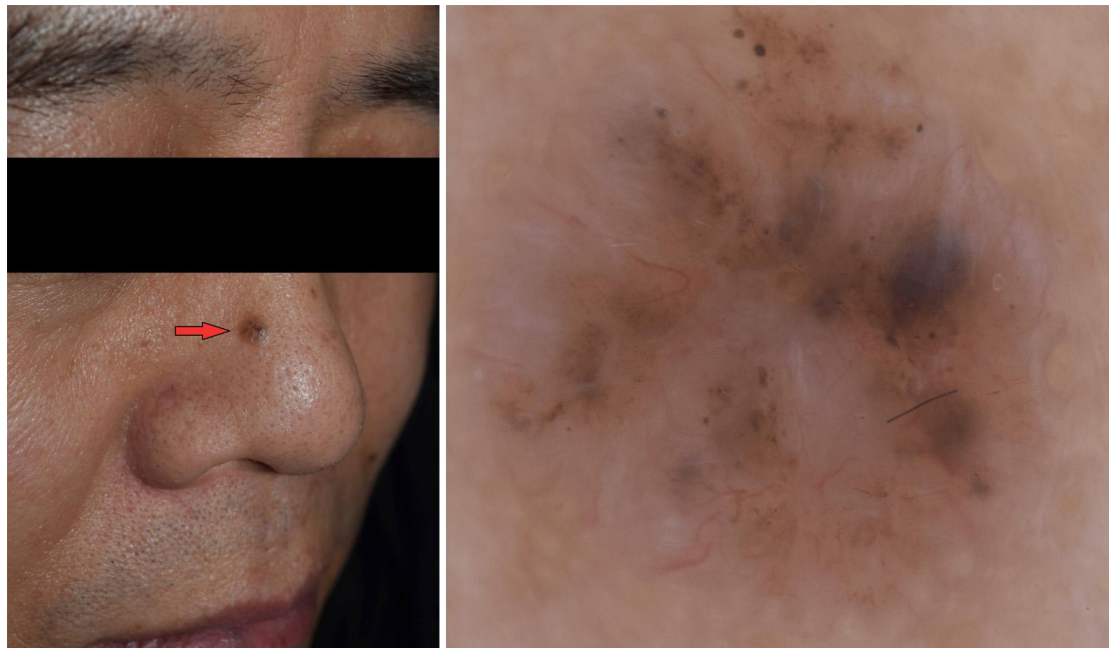
Imaging diagnosis ability test of skin tumors in Chinese dermatologists

Skin tumors are common diseases in clinic and mainly diagnosed by histopathological examination. In recent years, skin image technology has developed rapidly, and dermoscopy has become one of the supporting diagnostic tools for skin tumors. The Dermatology Committee of National Telemedicine and Internet Medical Center, Chinese Skin Image Database (CSID) project, and Youmai Doctor jointly conducted a web-based test to assess skin tumor diagnosis ability (assessment judgment and disease diagnosis) in Chinese dermatologists. The questionnaire was designed with 20 questions, providing a brief medical history, clinical and dermoscopic images. All cases described in the questionnaire were confirmed by pathology. Participants are asked to recognize the classification of the cases and diagnose the disease. This questionnaire needs to be completed independently within an hour.

Reminder: intradermal nevus, junctional nevus, compound nevus, blue nevus, Spitz nevus are classified as “pigmentation nevus”.

Question 1

Gender: Male; Age: 52 year-old; Location: right side of nose; Chief complaint: 7 years time, no symptom. **(Left is the clinical image; right is the dermoscopic image)**



1. The classification of this disease: benign? malignant? borderline (suspicious)?
2. What is the disease?

Question 2

Gender: Female; Age: 35 year-old; Location: chest; Chief complaint: 1 year time, obvious itching at night.



1. The classification of this disease: benign? malignant? borderline (suspicious)?
2. What is the disease?

Question 3

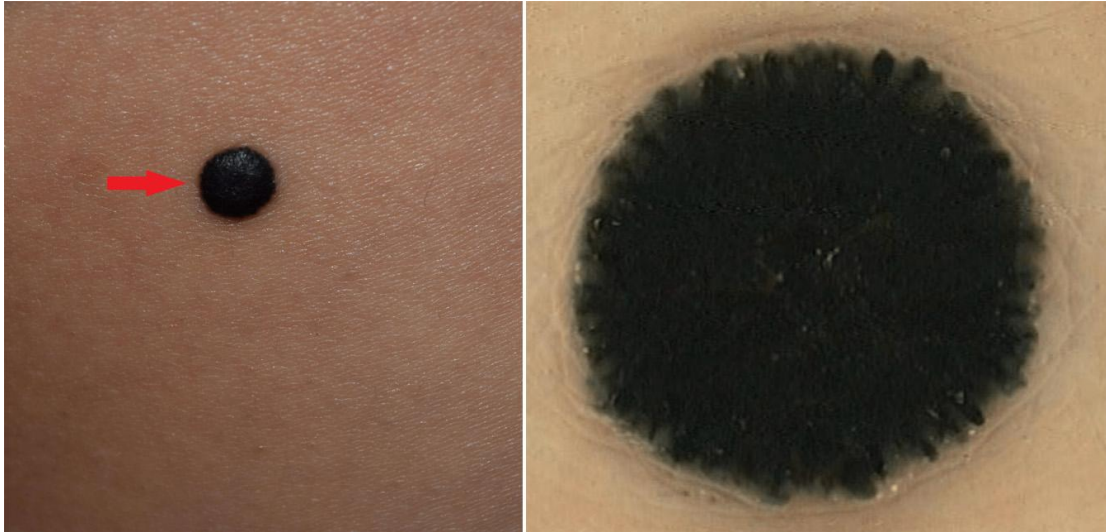
Gender: Male; Age: 27 year-old; Location: right shoulder; Chief complaint: 2 years time, no symptoms.



1. The classification of this disease: benign? malignant? borderline (suspicious)?
2. What is the disease?

Question 4

Gender: Female; Age: 21 year-old; Location: inner side of the left thigh; Chief complaint: 6 years time, no symptoms.



1. The classification of this disease: benign? malignant? borderline (suspicious)?
2. What is the disease?

Question 5

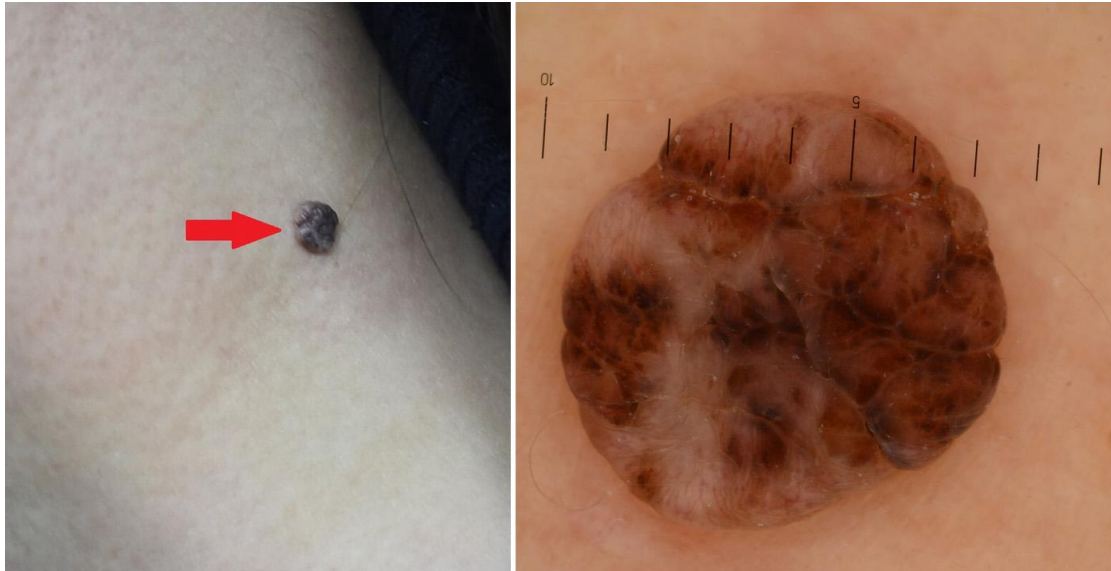
Gender: Male; Age: 51 year-old; Location: right side of nose; Chief complaint: 1 year time, increased pain in the past 1 month.



1. The classification of this disease: benign? malignant? borderline (suspicious)?
2. What is the disease?

Question 6

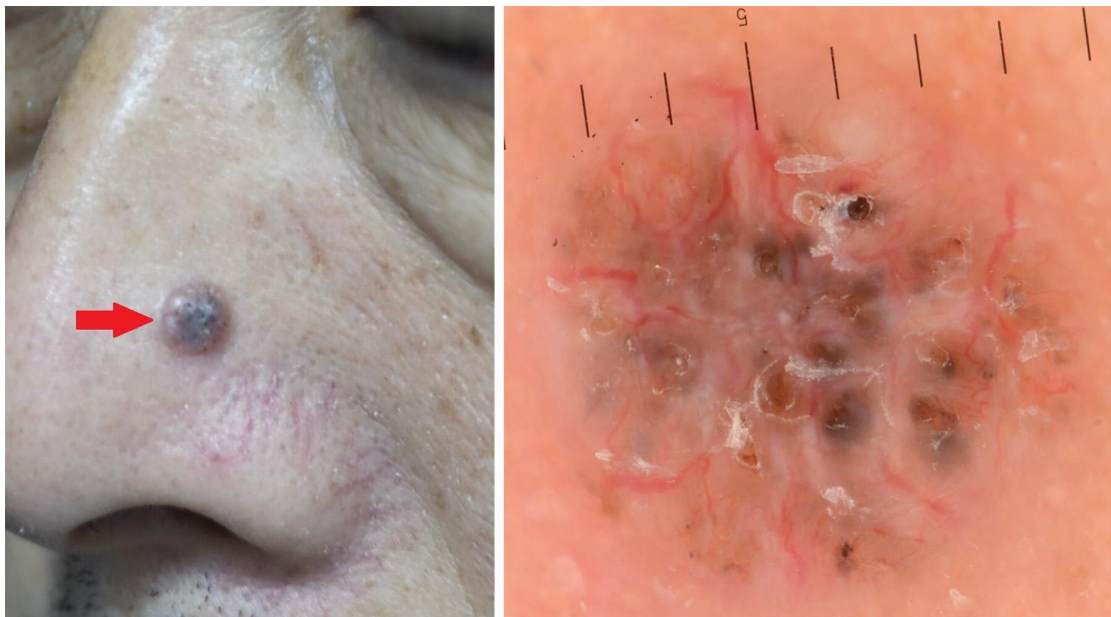
Gender: Female; Age: 31 year-old; Location: left neck; Chief complaint: 20 years time, significantly increased in the past 2 years.



1. The classification of this disease: benign? malignant? borderline (suspicious)?
2. What is the disease?

Question 7

Gender: Male; Age: 56 year-old; Location: left side of nose; Chief complaint: 2 years time, significantly increased in the past 1 week.



1. The classification of this disease: benign? malignant? borderline (suspicious)?
2. What is the disease?

Question 8

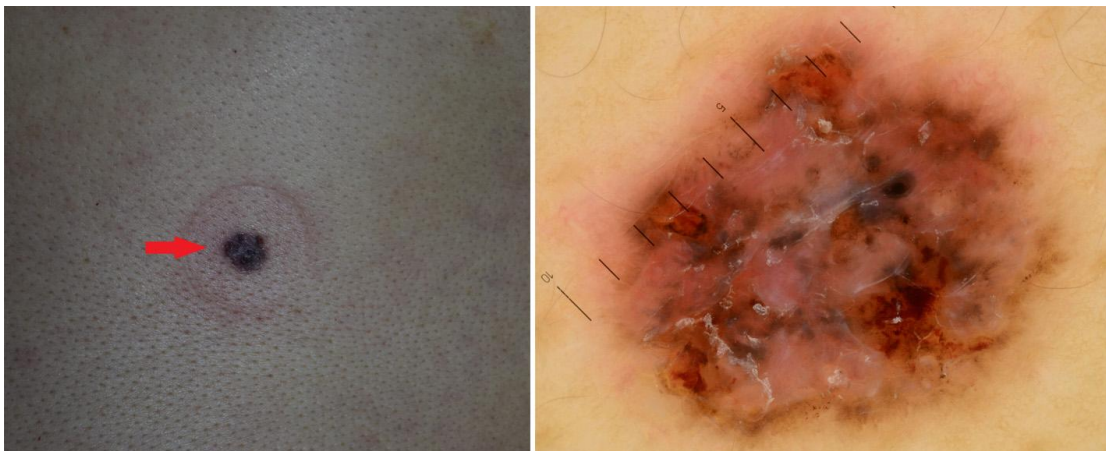
Gender: Male; Age: 63 year-old; Location: left side of face; Chief complaint: 10 years time, occasionally pain.



1. The classification of this disease: benign? malignant? borderline (suspicious)?
2. What is the disease?

Question 9

Gender: Male; Age: 60 year-old; Location: back; Chief complaint: more than 10 years time, accompanied by mild tenderness.



1. The classification of this disease: benign? malignant? borderline (suspicious)?
2. What is the disease?

Question 10

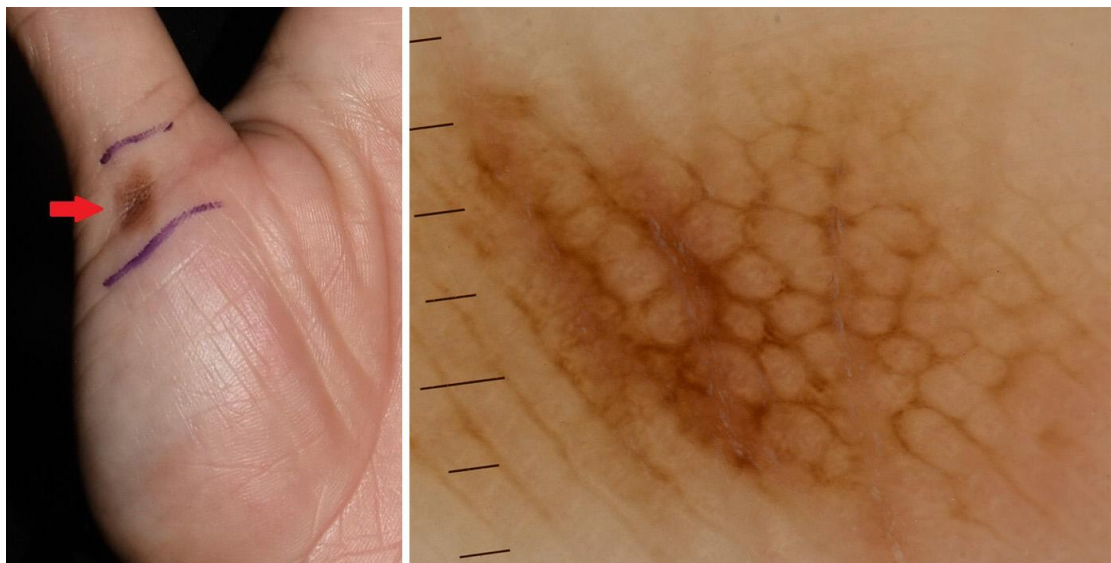
Gender: Female; Age: 77 year-old; Location: left side of face; Chief complaint: 6 years time, itching, pain.



1. The classification of this disease: benign? malignant? borderline (suspicious)?
2. What is the disease?

Question 11

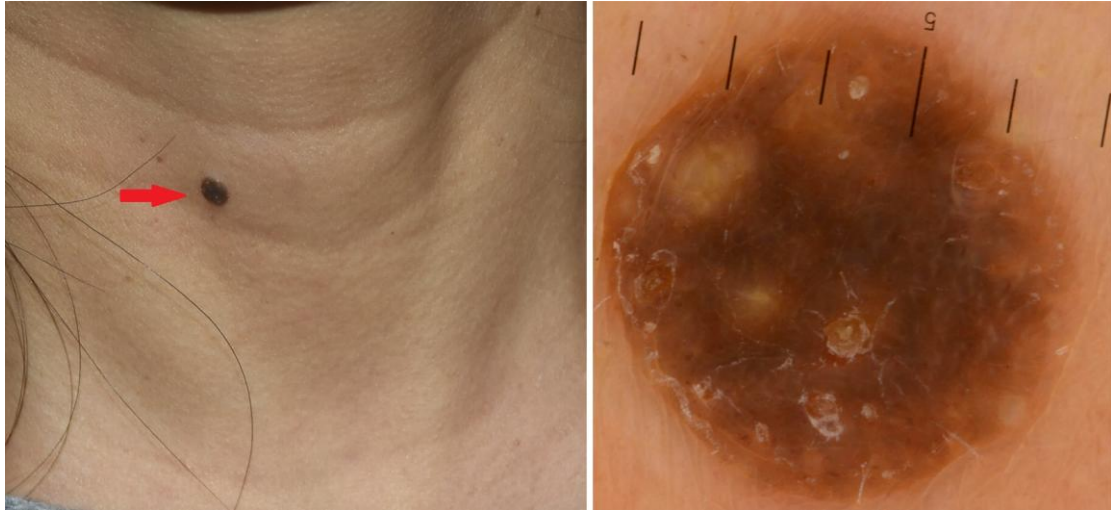
Gender: Female; Age: 32 year-old; Location: palm; Chief complaint: 10 years time, significantly increased in the past 1 year.



1. The classification of this disease: benign? malignant? borderline (suspicious)?
2. What is the disease?

Question 12

Gender: Female; Age: 43 year-old; Location: front neck; Chief complaint: 3 years time, no symptoms.



1. The classification of this disease: benign? malignant? borderline (suspicious)?
2. What is the disease?

Question 13

Gender: Female; Age: 38 year-old; Location: right armpit; Chief complaint: 3 years time, no symptoms.



1. The classification of this disease: benign? malignant? borderline (suspicious)?
2. What is the disease?

Question 14

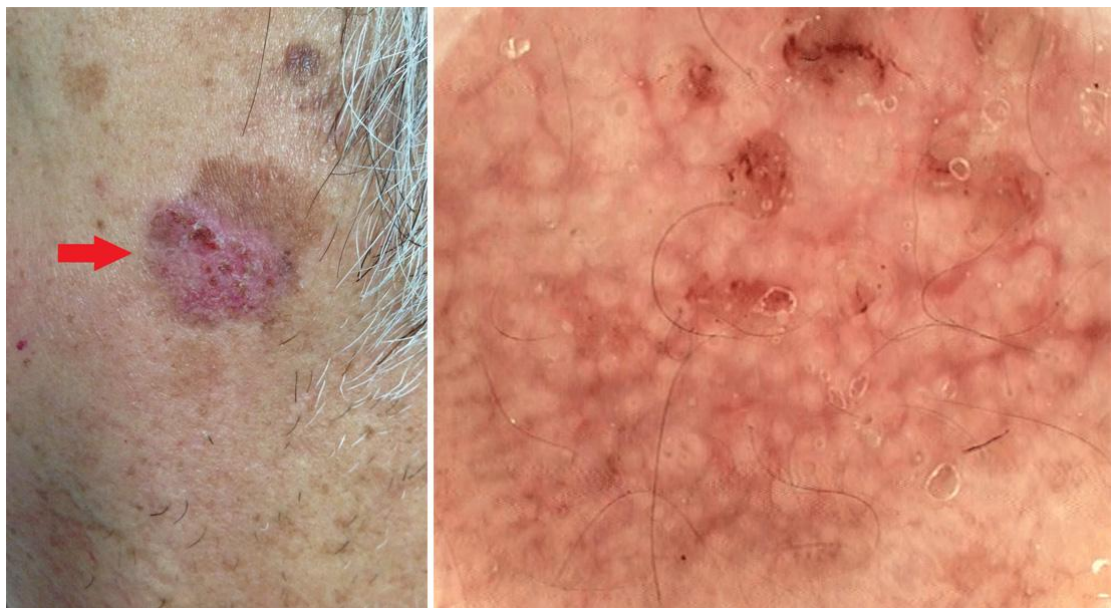
Gender: Female; Age: 42 year-old; Location: right shoulder; Chief complaint: 15 years time, no symptoms.



1. The classification of this disease: benign? malignant? borderline (suspicious)?
2. What is the disease?

Question 15

Gender: Male; Age: 64 year-old; Location: left frontotemporal area; Chief complaint: 7 years time, itching, pain.



1. The classification of this disease: benign? malignant? borderline (suspicious)?
2. What is the disease?

Question 16

Gender: Female; Age: 35 year-old; Location: the left side of the left foot; Chief complaint: 2 years time, recently aggravated.



1. The classification of this disease: benign? malignant? borderline (suspicious)?
2. What is the disease?

Question 17

Gender: Male; Age: 36 year-old; Location: outside of the right thigh; Chief complaint: 15 years time, mild tenderness.



1. The classification of this disease: benign? malignant? borderline (suspicious)?
2. What is the disease?

Question 18

Gender: Female; Age: 29 year-old; Location: left hind arm; Chief complaint: more than 1 year time, mild itching.



1. The classification of this disease: benign? malignant? borderline (suspicious)?
2. What is the disease?

Question 19

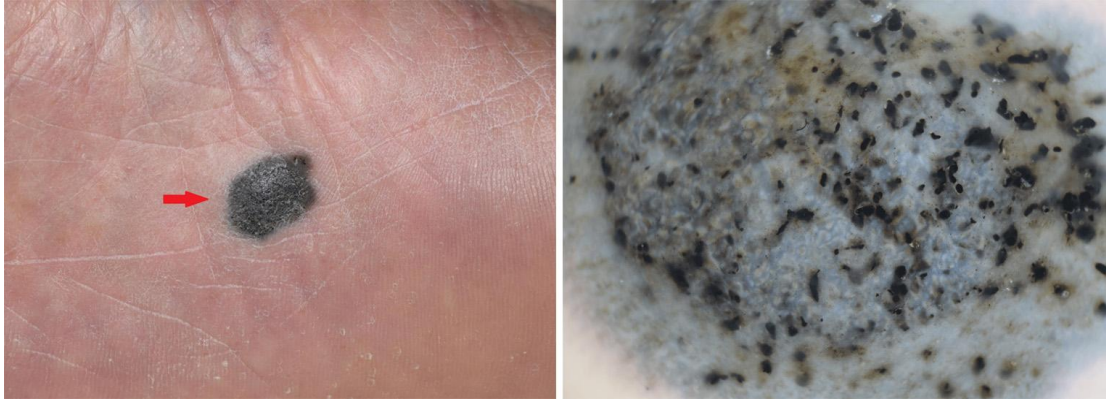
Gender: Male; Age: 44 year-old; Location: forehead; Chief complaint: found half a year ago, no symptoms.



1. The classification of this disease: benign? malignant? borderline (suspicious)?
2. What is the disease?

Question 20

Gender: Male; Age: 61 year-old, location: left foot bow; Chief complaint: 2 years time, no symptoms.

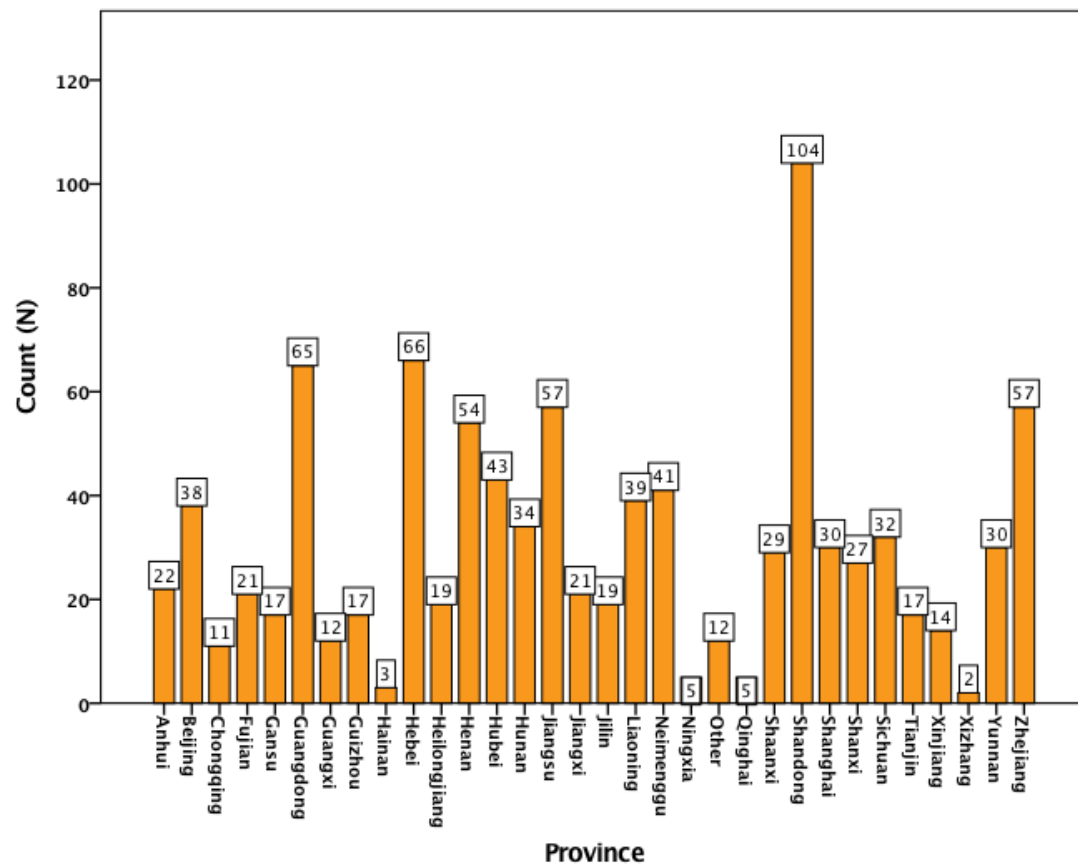


1. The classification of this disease: benign? malignant? borderline (suspicious)?
2. What is the disease?

Answers

No.	Classification recognition	Disease diagnosis
Q1	Malignant	Basal cell carcinoma
Q2	Benign	Seborrheic keratosis
Q3	Benign	Seborrheic keratosis
Q4	Benign	Pigmented nevus
Q5	Malignant	Basal cell carcinoma
Q6	Benign	Pigmented nevus
Q7	Malignant	Basal cell carcinoma
Q8	Malignant	Basal cell carcinoma
Q9	Malignant	Basal cell carcinoma
Q10	Borderline	Linear keratosis
Q11	Benign	Pigmented nevus
Q12	Benign	Seborrheic keratosis
Q13	Benign	Pigmented nevus
Q14	Benign	Pigmented nevus
Q15	Borderline	Linear keratosis
Q16	Malignant	Malignant melanoma
Q17	Benign	Hemangioma
Q18	Benign	Skin fibroma
Q19	Benign	Sebaceous gland hyperplasia
Q20	Malignant	Malignant melanoma

Supplementary Figure 1: The provinces distribution of participants



**Supplementary Table 1: Disease diagnosis and classification recognition of skin tumors
in Chinese dermatologists from different hospitals and with different professional titles**

Item No.	Hospital level				Professional title			
	Classification recognition		Disease diagnosis		Classification recognition		Disease diagnosis	
	χ^2	<i>P</i>	χ^2	<i>P</i>	χ^2	<i>P</i>	χ^2	<i>P</i>
1	21.15	6.10E-05	28.82	2.00E-06	1.68	6.42E-01	2.68	4.43E-01
2	1.97	5.79E-01	23.37	3.40E-05	3.20	3.61E-01	16.44	1.00E-03
3	21.92	6.80E-05	20.51	1.33E-04	5.58	1.34E-01	0.42	9.36E-01
4	16.56	1.00E-03	12.03	7.00E-03	8.43	3.80E-02	10.54	1.40E-02
5	5.16	1.61E-01	25.21	1.40E-05	3.41	3.32E-01	1.52	6.77E-01
6	5.23	1.56E-01	21.74	7.40E-05	10.34	1.60E-02	2.07	5.58E-01
7	18.11	4.18E-04	34.06	1.92E-07	2.47	4.81E-01	2.47	4.82E-01
8	3.61	3.07E-01	6.85	7.70E-02	2.09	5.54E-01	0.89	8.28E-01
9	1.67	6.43E-01	5.32	1.50E-01	2.71	4.39E-01	0.87	8.33E-01
10	2.94	4.01E-01	5.52	1.37E-01	1.50	6.82E-01	1.10	7.78E-01
11	1.11	7.74E-01	8.39	3.90E-02	10.40	1.50E-02	13.20	4.00E-03
12	4.93	1.77E-01	35.67	8.81E-08	2.44	4.87E-01	0.19	9.79E-01
13	0.91	8.24E-01	10.83	1.30E-02	8.48	3.70E-02	3.49	3.22E-01
14	6.68	8.30E-02	23.45	3.30E-05	11.09	1.10E-02	3.43	3.30E-01
15	3.30	3.48E-01	1.81	6.12E-01	4.92	1.78E-01	3.01	3.90E-01
16	3.13	3.71E-01	3.27	3.52E-01	10.84	1.30E-02	7.50	5.80E-02
17	17.49	1.00E-03	17.15	1.00E-03	7.27	6.40E-02	0.98	8.06E-01
18	13.80	3.00E-03	21.11	1.00E-04	3.92	2.70E-01	5.99	1.12E-01
19	6.72	8.10E-02	9.06	2.90E-02	1.20	7.53E-01	1.44	6.96E-01
20	18.13	4.14E-04	23.05	3.90E-05	0.04	9.98E-01	0.24	9.70E-01

Supplementary Table 2: Mean scores of skin tumors diagnosis and classification recognition in Chinese dermatologists from different hospitals, with different professional titles, and from different provinces

Variables	Classification recognition		Disease diagnosis	
	Mean score	<i>P</i>	Mean score	<i>P</i>
Hospital level		8.67E-07		9.39E-11
Other	63.36		30.60	
Primary	63.00		33.20	
Secondary	68.90		41.83	
Tertiary	72.50		49.30	
Professional title				
Other	68.94	4.24E-01	45.45	5.53E-01
Primary	69.77		44.06	
Middle	70.71		45.69	
Senior	71.99		47.23	
Province	70.58	2.00E-08	45.43	3.64E-13

**Supplementary Table 3: Mean scores of classification recognition and disease diagnosis
of skin tumors in Chinese dermatologists from different provinces**

Province	N	Classification recognition		Disease diagnosis	
		Mean score	SD*	Mean score	SD
Beijing	38	74.08	15.98	51.84	25.35
Tianjing	17	65.29	17.81	37.65	26.41
Hebei	66	69.92	16.44	45.15	23.24
Shanxi	27	70.19	17.07	43.15	28.49
Neimenggu	41	85.24	17.57	71.71	29.91
Liaoning	39	74.87	19.52	55.38	30.10
Jilin	19	71.58	12.48	42.89	19.24
Heilongjiang	19	72.11	16.78	50.79	23.11
Shanghai	30	73.50	14.03	52.17	22.69
Jiangsu	57	72.11	15.64	50.18	24.82
Zhejiang	57	71.93	14.96	45.35	23.05
Anhui	22	74.77	12.58	53.41	21.95
Fujian	21	70.48	13.96	47.14	22.67
Jiangxi	21	63.33	12.18	30.95	17.58
Shandong	104	72.50	16.62	48.70	25.64
Henan	54	60.56	14.59	31.20	20.83
Hubei	43	71.74	13.58	47.33	23.28
Hunan	34	65.29	17.36	33.97	21.52
Guangdong	65	70.46	15.88	44.70	24.69
Guangxi	12	65.42	14.69	34.17	18.93
Hainan	3	61.67	17.56	33.33	27.54
Chongqing	11	70.45	14.40	47.27	24.44
Sichuan	32	67.34	14.37	38.28	22.99
Guizhou	17	65.59	17.04	36.18	22.68
Yunnan	30	68.00	15.06	40.00	21.17
Xizang	2	60.00	7.07	27.50	17.68
Shanxi	29	73.10	14.54	47.76	22.46
Gansu	17	59.41	11.16	28.24	16.00
Qinghai	5	63.00	14.41	27.00	14.83
Ningxia	5	72.00	13.51	47.00	19.56
Xinjiang	14	72.86	11.72	47.14	25.25
Other [†]	12	68.75	10.47	34.58	27.59
Total	963	70.58	16.09	45.43	25.26

*: Standard deviation; †: including Hong Kong, Macau, and Taiwan.