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The Accuracy of Clinical Diagnosis in 2135 Lesions on the Face. A Retrospective Analysis of Histopathological Records

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ABSTRACT

Introduction: Biopsy of facial skin lesions is an important supplement to dermatological diagnostics, especially in doubtful cases or suspected of being malignant.

Objectives: The aim of the retrospective study of 2135 histopathological records of lesions on the face was to: establish the most common indications for a skin biopsy in patients with facial lesions, establish the frequency of histopathological diagnoses, evaluate how often clinically suspected inflammatory lesions are identified as tumors in histopathology, evaluate the accuracy of clinical diagnoses of the most common skin tumors and dermatoses.

Methods: It was a retrospective study. Histopathological records from the lesions on the face from years 2010-2017 were analyzed.

Results: The mean age of patients was 69.3 [7-98]. Fifty-eight percent of the patients were women. Among 2135 clinical diagnoses skin tumors were suspected in 1905 cases. Among 2169 obtained histopathological results (34 biopsies showed 2 diseases), we identified skin tumors in 1940 cases, with 1388 confirmed as malignant. The clinical diagnosis of a specific benign or malignant skin tumor was accurate in 1013/1634 subjects, in comparison to inflammatory lesions, which were correct in 67/148 cases, (P = 0.0001). Among all preliminary inflammatory diagnoses, 33/204 lesions were identified as skin tumors in histopathology.

Conclusions: In conclusion in most cases of skin tumors the clinical diagnosis is confirmed by histopathological examination. In case of facial inflammatory lesions, the accuracy of clinical diagnosis is lower, with a significant number of facial lesions appearing inflammatory in clinical evaluation but being diagnosed as skin cancers in pathology.

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Introduction

Face is one of the special locations in dermatology with skin lesions easily visible having a negative impact on self-esteem and decreasing the quality of life. Many dermatoses on the face are easily diagnosed based on clinical examination and dermoscopy, and no skin biopsy is needed. Dermoscopic criteria of skin tumors on the face are well established and used in everyday clinical practice [1]. Also dermoscopic patterns of common facial inflammatory lesions were shown by Lallas et al [2].

However, in doubtful cases, when malignancy is suspected, a histopathological examination is mandatory, despite the fact, that skin biopsy may result in scar formation.

Objectives

The aim of the study was to analyze the histopathological records from lesions on the face, to define the most common indications for a skin biopsy, to establish the order of the common histopathological diagnoses, to evaluate how often skin biopsies suspected as inflammatory lesions turn out to be skin tumors, to evaluate the accuracy (the same clinical and histopathological diagnoses) of the most common skin tumors and dermatosis on the face.

Methods

It was a retrospective study performed at the Department of Dermatology, Medical University of Warsaw, Poland. Histopathological records from the lesions on the face from years 2010-2017 were analyzed. Patients for skin biopsies (punch, shave or excisional) were referred from our department as well as from many outpatients clinics in Warsaw area. The patients presented with skin phototypes I-III. The mean age of patients was 69.3 (range 7-98 years of age), and 58.28% of patients were women. Biopsies taken from the scalp and mucous membranes were excluded. A total number of 89 cases were nondiagnostic and were excluded from the study. In total 2135 biopsy records were evaluated, 750 from cheeks with zygomatic area, 718 from noses, 434 from foreheads, 110 from ears, 71 from lips and 52 from chins. Because in 34 cases 2 final diagnoses were established a total number of 2169 of final diagnoses were analyzed.

Statistical Analysis

The results were computed with Statistica 13.1 software (StatSoft Incorporated) licensed to the Medical University of Warsaw. Chi 2 test was used for assessing binary variables. A P value below 0.05 was considered statistically significant.

Results

Among 2135 clinical diagnoses, the skin tumors were suspected in 1905 (89.23%) cases, and in 1609 (75.36%) cases malignant skin tumor or precancerous lesion were considered.

Table 1. The most common clinical diagnoses (≥ 3 cases) among 2135 skin biopsies. In some cases, more than one clinical diagnosis was given

	Total number of cases	%	CHEEK	CHIN	EAR	FOREHEAD	LIPS	NOSE
Basal cell carcinoma	984	46.09%	313	18	51	196	27	379
Actinic keratosis	424	19.86%	149	5	14	102	4	150
Seborrheic keratosis	108	5.06%	40	0	6	30	0	32
Fibroma	105	4.92%	49	5	3	11	6	31
Squamous cell carcinoma, keratoacanthoma	96	4,5%	22	4	17	12	10	31
Lupus erythematosus	88	4.12%	58	1	0	15	0	14

	Total number of cases	%	CHEEK	CHIN	EAR	FOREHEAD	LIPS	NOSE
Cutaneous horn	52	2.44%	23	3	4	9	2	11
Melanocytic nevus, blue nevus	38	1.78%	10	7	0	10	0	11
Sarcoidosis	37	1.73%	13	0	0	13	0	11
Skin tumor	32	1.50%	9	0	3	9	3	8
Pyogenic granuloma	23	1.08%	6	1	0	0	7	9
Verruca vulgaris	23	1.08%	10	0	2	5	0	6
Solar lentigo	14	0.66%	8	0	0	0	0	6
Facial granuloma	13	0.61%	3	0	0	4	0	6
Rosacea	10	0.47%	3	1	0	2	0	4
Eczema	8	0.37%	4	0	3	1	0	0
Lentigo maligna	8	0.37%	6	0	0	2	0	0
Lymphoma	7	0.33%	4	0	0	3	0	0
Granulomatous cheilitis	6	0.28%	0	0	0	0	6	0
Squamous cell carcinoma in situ. Bowen type	6	0.28%	4	0	0	2	0	0
Annular granuloma	6	0.28%	3	0	0	3	0	0
Sebaceous hyperplasia	5	0.23%	0	0	0	2	0	3
Cyst	4	0.19%	2	0	0	0	0	2
Lichen planus	4	0.19%	2	0	0	0	2	0
Lymphocytoma	4	0.19%	4	0	0	0	0	0
Dermatitis (superficial dermal inflammation)	3	0.14%	2	1	0	0	0	0
Morphea	3	0.14%	2	0	1	0	0	0

Table 2. **The most common histopathological diagnoses (≥3 cases) among 2169 skin biopsies. The number of the correct diagnoses in the most common skin lesions † clinical diagnosis was confirmed by histopathological examination; SCC, squamous cell carcinoma**

	Clinical diagnoses	Number of the correct diagnoses (%)[a]	Number of the correct diagnoses in total (%)[a] P = 0.0001	Number of cases with a skin tumor in histopathological diagnosis (%)	Number of cases with a skin tumor in histopathological diagnosis in total (%) P <0 .0001
SKIN TUMORS	Basal cell carcinoma	629/984 (63.92)	1013/1634 (61.99)	342/355 (96.33)	583/621 (93.88)
	Actinic keratosis	282/424 (66.51)		121/142 (85.21)	
	Squamous cell carcinoma in situ, Bowen type	2/6 (33.33)		4/4 (100)	
	Squamous cell carcinoma	29/74 (39.19)		42/45 (93.33)	
	Melanocytic nevus	22/38 (57.89)		16/16 (100)	
	Seborrheic keratosis	49/108 (45.37)		58/59 (98.3)	
INFLAMMATORY DERMATOSES	Facial granuloma	6/13 (46.15)	67/148 (45.27)	2/7 (28.57)	19/81 (23.46)
	Lupus erythematosus	49/88 (55.68)		12/39 (30.77)	
	Rosacea	5/10 (50.00)]		1/5 (20)	
	Sarcoidosis	7/37 (18.92)		4/30 (13.33)	

The most common clinical diagnosis was basal cell carcinoma (BCC), followed by actinic keratosis, seborrheic keratosis, fibroma, and cutaneous lupus erythematosus (Table 1).

Table 2 presents the most common clinical neoplasm and inflammatory diagnoses with the percentages of correct cases confirmed by histopathological examination. Clinical diagnoses of skin tumors were accurate in 1013/1634 (61.99%) cases, in comparison to inflammatory lesions, which were correct in 67/148 (45.27%) cases (P = 0.0001). Among 621 inaccurate clinical diagnoses of the most common skin tumors, 583 cases turned out to be other skin neoplasms (93.88%), and among 81 inaccurate clinical diagnoses of the most common inflammatory dermatoses 19 turned out to be skin neoplasms (23.46%)(P < 0.0001). Among all preliminary inflammatory diagnoses, 33/204 (16.17%) cases turned out to be skin malignancies, such as basal and squamous cell carcinomas.

Among 2169 histopathological diagnoses, skin tumors were diagnosed in 1940 (89.44%) cases, and malignant skin tumors were diagnosed in 1388 (63.99%) cases. The most common final diagnosis was basal cell carcinoma, followed by actinic keratosis, squamous cell carcinoma, fibroma, seborrheic keratosis, and cutaneous lupus erythematosus (Table 3).

Majority of basal cell carcinomas were present on the nose (306 cases from 737; 41.5%), followed by cheeks (200; 27,13%). The most common locations of actinic keratosis constituted cheeks (171 out of 447; 38,2%) and nose (161; 36%), whilst squamous cell carcinomas were distributed on the cheeks (49 out of 146; 33.6%), nose (41; 28%) and forehead (23; 15.8%) (Table 3).

The most common diagnosed inflammatory dermatoses included cutaneous lupus erythematosus on the first place, followed by rosacea, demodicosis, facial granuloma, and sarcoidosis. Among patients older than 65 years, 74.83% (1124/1502) of cases were malignant skin tumors in comparison to incidence of 39.58% (264/667) among patients aged ≤ 65 years (P < 0.00001).

As far as regions of the face are concerned, no statistical difference between numbers of correct diagnoses on the ear, nose, lips, and other regions on the face (cheeks, chin, forehead) was found (Table 4).

Conclusions

Face, which is constantly exposed to solar radiation is a common location for skin tumors. According to study of Ferreira et al on topographic distribution of basal cell carcinomas head and neck area was the most frequent location of the tumor (75.55%), followed by trunk (10.5%) [3]. In another study, over 60% of nonmelanoma skin tumors presented in the head area [4].

In our study, as suspected, the most common clinical and histopathological diagnosis was a tumor: basal and squamous cell carcinoma, actinic keratosis, seborrheic keratosis, and fibroma. The most common distributions of squamous cell carcinoma were the cheeks, nose and forehead, and for basal cell carcinoma were the nose and cheeks. The results were in line with the study of Kato et al [5]. It was shown in a group of 106 Japanese patients, that the cheek (54.2%) and forehead (25.5%) were the most common facial distribution of squamous cell carcinoma [5].

BCChas correctly resulted as the most frequent skin lesion on the face. Among the common skin lesions, the most incorrect diagnoses occurred in the case of squamous cell carcinoma (only 33-39% of cases were correctly diagnosed). Squamous cell carcinoma was misdiagnosed with (in order of the most common): BCC, actinic keratosis. Another clinically misdiagnosed pairs of lesions are: for BCC - actinic keratosis, squamous cell carcinoma, seborrheic keratosis, epidermal nevus, for actinic keratosis - BCC, squamous cell carcinoma, seborrheic keratosis, morbus Bowen, papilloma, for seborrheic keratosis - papilloma, actinic keratosis, BCC, verruca vulgaris and for fibroma - verruca vulgaris, seborrheic keratosis, inverted follicular keratosis, cutaneous horn.

What is interesting, the diagnosis of a skin tumor was correct in only 61.99% of cases. This means, that in many cases of a clinically suspicious lesion the histopathological diagnosis was a benign tumor. The results showed that approach with taking a diagnostic biopsy before performing surgical procedure is reasonable and the result influences the need and extent of surgery. In case of benign diagnosis, the remnants of the lesion can be left and no surgical procedure is required.

Among inflammatory dermatoses (10.56% of cases), the most common were in order cutaneous lupus erythematosus, rosacea, demodicosis, facial granuloma, and sarcoidosis. In the study only 45.27% of clinical diagnosis of inflammatory lesions were consistent with histopathological results. Among cases with suspicion of inflammatory dermatoses skin tumors were diagnosed. These results showed that in doubtful inflammatory lesions on the face the biopsy is recommended for two reasons. First of all, to exclude a malignant tumor. The second reason is to establish a final diagnosis. It should be underlined, that among inflammatory dermatoses such as cutaneous lupus erythematosus and sarcoidosis, systemic involvement can occur, and patients with such diseases need additional laboratory and imaging tests, therefore the correct diagnosis has special importance and requires medical follow-up.

The study has some limitations. It was a single-centre study. Another restriction of our study is the fact that some cases of skin tumors are not biopsied due to clear clinical and dermoscopic aspects. It includes all cases where these

Table 3. The number of the correct diagnoses in the most common skin lesions. The most common histopathological diagnoses (> 10 cases) among 2169 skin biopsies

	Total number of cases	%	CHEEK	CHIN	EAR	FOREHEAD	LIPS	NOSE	Age <=65[a]	Age >65[a]
Skin neoplasms in total [a] P < 0.0001	1940/2169	89.44	664/769	43/56	99/105	388/443	58/71	688/725	515/667 (77.21%)	1425/1502 (94.87%)
Malignant skin tumors in total [a] P < 0.00001	1388/2169	63.99	450/769	21/56	83/105	273/443	40/71	521/725	264/667 (39.58%)	1124/1502 (74.83%)
Basal cell carcinoma	737	33.98	200	18	40	151	22	306	160	577
Actinic keratosis	447	20.61	171	0	14	92	9	161	77	370
Squamous cell carcinoma	146	6.73	49	2	22	23	9	41	22	124
Fibroma	125	5.76	49	5	3	32	4	32	64	63
Seborrheic keratosis	108	4.98	45	0	5	39	0	19	35	73
Cutaneous lupus erythematosus	57	2.63	37	1	0	7	0	12	50	7
Melanocytic nevus	56	2.58	12	9	1	13	1	20	46	18
Squamous cell carcinoma in situ, Bowen type	46	2.12	24	0	6	4	0	12	2	44
Rosacea	37	1.71	20	0	0	11	0	6	26	11
Inverted follicular keratosis	35	1.61	27	0	2	2	0	4	9	26
Keratoacanthoma	29	1.34	14	2	0	0	0	13	9	20
Verruca vulgaris	27	1.24	10	4	0	3	1	9	18	9
Cutaneous horn	26	1.20	10	0	3	5	0	8	3	23
Demodicosis	22	1.01	10	0	0	7	0	5	9	13
Pyogenic granuloma	21	0.97	9	0	0	1	5	6	16	5
Epidermal cyst	16	0.74	8	0	0	0	1	7	4	12
Trichilemmoma	16	0.74	6	0	0	0	0	10	4	12
Facial granuloma	14	0.65	3	0	0	5	0	6	12	2
Sarcoidosis	13	0.60	6	0	0	3	0	4	9	4
Sebaceous hyperplasia	11	0.51	5	0	0	0	0	6	5	6
Eczema	11	0.51	4	2	1	3	1	0	7	4

[a]P < 0.0001

Table 4. The percentage of the correct diagnoses on the different regions of the face

Region of the face	Number of the correct diagnoses (%)	P value with the comparison to the other regions
Ear	56/105 (53.33)	P = 0.734
Nose	417/725 (57.52)	P = 0.285
Lips	44/71 (61.97)	P = 0.253
Other regions (cheeks, forehead, chin)	698/1268 (55.05)	

lesions are treated with imiquimod, cryotherapy or photodynamic therapy. Moreover, the limitation of the study was the lack of dermoscopic descriptions and both clinical images and clinical diagnoses were based on experience of the referring physician. On the other hand, the patients were referred for punch, shave, or excisional biopsy from numerous public and private clinics. So, the analysis reflects a need for skin biopsy of the face in everyday life of dermatological practice and was not limited only to the academic settings.

It is important to underline the fact, that even in modern setting, with a standard help of dermoscopy and without easy access to confocal microscopy (which allows to reduce the number of diagnostic biopsies), there is still a high percentage of false-positive and negative cases that may be treated incorrectly in case of lack of collaboration with a dermatopathologist.

A suspicion of skin malignancy is the most common indication for biopsy from the lesions on the face. Because 10% of cases turned out to be inflammatory dermatoses, inflammatory entities should be also included in the differential diagnosis of the lesions on the face, especially in patients under 65 years of age. In most cases of skin tumors, the clinical diagnosis is confirmed by histopathological examination. In the case of inflammatory facial lesions, the accuracy of clinical diagnosis is lower, with a significant number of facial lesions appearing inflammatory in clinical evaluation but being diagnosed as skin cancers in pathology.

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