Annals of Medical Research
DOI: 10.5455/annalsmedres.2018.11.264 2019;26(3):304-8

Original Article

The importance of clinical and histopathological correlation in the diagnosis of skin diseases: An eleven years' experience

Mahmut Sami Metin[1], Mustafa Atasoy[2]

[1]Batman Medicalpark Hospital, Clinic Department of Dermatology, Batman, Turkey
[2]Kayseri Education and Research Hospital, Department of Dermatology, Kayseri, Turkey

Abstract

Aim: In this study, we aimed to evaluate the correlation of preliminary diagnoses and definitive histopathological diagnoses in skin diseases.

Material and Methods: The study included the patients having at least one skin biopsy in a tertiary center for last eleven years. The clinical preliminary diagnoses were classified into different groups and the correlation between the first three preliminary diagnoses and the definitive histopathological diagnoses was investigated.

Results: The number of the biopsies performed in young and adults was higher than the number of biopsies performed in children and older patients. The most common cutaneous conditions biopsied were tumors, papulosquamous diseases and nevi. The rate of the correct clinical diagnosis including one of the first three preliminary diagnoses was 58.8%. The same rate was found to be 79.1% with the cooperation of the dermatologists and pathologists.

Conclusion: Our study showed that the repetitive biopsies and strong cooperation of dermatologists and pathologists may increase the rate of precise histopathological diagnosis.

Keywords: Clinicopathological Correlation; Dermatopathology; Skin Biopsy.

INTRODUCTION

Skin is an organ in which biopsy is taken more easily than the other organs. This situation provides us finding out diagnosis, stages of lesions, pathogenesis and even etiological factors of dermatological diseases. There are many techniques such as histopathology, immunopathology, polymerase chain reaction, and electron microscopy for diagnosis of disease after biopsy. A successful dermatopathologist is one who does not decide without evaluating of all clinical and histopathological findings (1). Diagnosis of skin diseases is not based on just clinical findings but also on histopathological findings. Sometimes, diseases which cannot be diagnosed clinically can easily be diagnosed with specific microscopic features (2). Our aim in this study is to evaluate age, gender, clinical preliminary diagnoses of patients biopsied and to correlate these preliminary diagnoses with definitive histopathological diagnoses.

MATERIAL and METHODS

Our work has been approved by the Regional Ethic Committee of Ataturk University and done in compliance with the medical protocols and ethic-related principles of Helsinki Protocol. This study included data of biopsy performed patients in our hospital between January 2002 and February 2013. Preliminary diagnoses were classified as dermatological diseases (papulosquamous diseases, vesiculobullous diseases, eczematous diseases, connective tissue diseases, vascular diseases), infectious diseases (bacterial, viral, mycobacterial, fungal and parasitic infection), drug eruption, ultraviolet related diseases, tumors (benign, premalignant, malign, nevus, pigmented lesions, adnexal diseases, metabolic/systemic diseases, adipose tissue diseases, genodermatosis, immunologic diseases, cystic lesions and unclassified other diseases. Our study consisted data related to age, gender, correlation of preliminary diagnoses with definitive

Received: 25.11.2018 **Accepted:** 06.12.2018 **Available online:** 13.12.2018
Corresponding Author: Mahmut Sami Metin, Batman Medicalpark Hospital, Clinic Department of Dermatology, Batman, Turkey
E-mail: drmsamimetin@gmail.com

pathologic diagnoses, numbers of preliminary diagnoses different from the first three preliminary diagnoses, number of insufficient biopsies, distribution of ages according to diseases, distribution of biopsy numbers according to age, the most common diseases which were biopsied, the most common diseases in children which were biopsied, frequency of group of diseases, the status of surgical margins and repetitive biopsies. Data were analyzed by SPSS 20.0. Results contained number, percent, mean and standard deviation. Chi Square test was used for correlation of preliminary diagnoses and definitive histopathologic diagnoses. Student t test and one way variance test (ANOVA) were used for numeric variables. P<0.05 was accepted as statistically significant.

RESULTS

A total of 4,229 biopsies were performed in 3,610 patients. Ages of the patients ranged from 0 to 100 years. 1,827 (50.6%) of the patients were males and 1,783 (49.4%) were females. The most common age group was the 21-30 years group (n=638, 17.7%) followed by 31-40 years (n=621, 17.2%), 41-50 years (n=577, 16.0%). and 91-100 years groups (n=9, 0.2%). The most common reported definitive diagnoses for 21-30 years group were dermal nevus, psoriasis vulgaris, and epidermal-keratinocyte cysts. The biopsies were performed for once in 3125 (86.6%) patients, twice in 377 (10.4%) patients, three times in 72 (2.0%) patients, four times in 22 (0.6%) patients and five or more times in 14 (0.3%) patients. Pathologists reported 886 (20.9%) of the biopsies as 'descriptive report' which means that histopathological findings are not enough specific for a definitive histopathological diagnosis. These types of reports included a description of histopathological findings without stating any specific diagnosis. "Descriptive reports" emphasized that the diagnosis should be made on the basis of clinic and pathological correlation. The list of the definitive histopathological diagnoses was detailed in Table 1. Correlation of the clinical and histopathological diagnoses was listed in Table 2. The first three preliminary diagnoses and the definitive histopathological diagnoses showed a correlation in 58.7% of all the biopsies. Ten most common definitive histopathological diagnoses were listed in Figure 1. Malignancy was reported in 397 of the patients. The surgical margins were free of malignancy in 137 (34.5%) of the patients. 72 (18.1%) of the patients had positive surgical margins. There was no any statement regarding the surgical margins in 188 (44.7%) of 397 patients. All the reported "inadequate samples" were associated with the first biopsies. None of the second, third, fourth and fifth biopsies were reported as inadequate sample. None of these "inadequate samples" had a definitive histological diagnosis. The pathologists reported "inadequate sample" in 7 (0.9%) of the descriptive reports. Compatibilities between the first three preliminary diagnoses and definitive histopathological diagnoses in dermatological diseases were statistically significant (p=0.001). The frequency of incompatibility between preliminary diagnoses and definitive diagnoses was the highest in the 'other disease" group (65.4%, n=102), followed by "adnexal disease" group (54.5%, n=2) and "connective tissue disease" group (45.4%, n=12).

Table 1. Distribution of the biopsies regarding to the disease and age groups

Disease Groups	Number of Biopsy	Percent (%)	Mean of Age
Histopathological description (descriptive reports)	886	21.0	39.0
Tumors	1103	26.0	53.8
Papulosquamous disease	459	10.9	34.3
Nevus	434	10.3	31.5
Cysts, papilloma-polyps.	218	5.2	34.7
Vascular disorders	199	4.7	36.2
Vesiculobullous diseases	175	4.1	48.7
Other diseases	160	3.8	40.0
Eczematous diseases	138	3.3	39.9
Connective tissue diseases	102	2.4	35.8
Immunological diseases	99	2.3	34.7
Infectious diseases	80	1.9	36.1
Adipose tissue diseases	71	1.7	42.9
Metabolic/systemic diseases	23	0.5	34.9
Pigmentation disorders	19	0.4	31.8
Genodermatosis	18	0.4	28.0
Drug eruptions	17	0.4	51.0
Diseases related to UV	15	0.4	43.7
Adnexal diseases	12	0.3	40.8
Total	4229	100.0	40

Table 2. The correlation between clinical and pathological diagnoses

The Biopsies	The correlation between preliminary diagnoses and definitive pathological diagnoses				The descriptive pathological diagnosis incompatible with the clinical diagnoses	The definitive pathological diagnosis incompatible with the clinical diagnoses	The biopsies incompatible with dermatological preliminary diagnoses
	The first preliminary diagnoses	The second preliminary diagnoses	The third preliminary diagnoses	The total of definitive diagnoses compatible with the first three preliminary diagnoses			
The first biopsies (n=3610)	45.6% (n=1648)	9.4% (n=338)	2.0% (n=72)	57.0% (n=2058)	21.3% (n=769)	21.7% (n=783)	43% (n=1552)
The second biopsies (n=474)	54.9% (n=260)	8.0% (n=38)	3.6% (n=17)	66.5% (n=315)	20.7% (n=98)	12.8% (n=61)	33.5% (n=159)
The third biopsies (n=101)	62.4% (n=63)	7.9% (n=8)	5.0% (n=5)	75.3% (n=76)	15.7%(n=16)	9%(n=9)	24.7%(n=25)
The fourth biopsies (n=33)	63.6% (n=21)	15.2% (n=5)	-	78.8% (n=26)	6.1% (n=2)	15.1% (n=5)	21.2% (n=7)
The fifth and over biopsies (n=11)	54.5% (n=6)	9.1% (n=1)	-	63.6% (n=7)	9.1% (n=1)	27.3% (n=3)	36.4% (n=4)
Total N=4229	47.2% N=1998	9.2% N=390	2.3% N=94	58.7% N=2482	20.9% N=886	20.4% N=861	41.3% N=1747

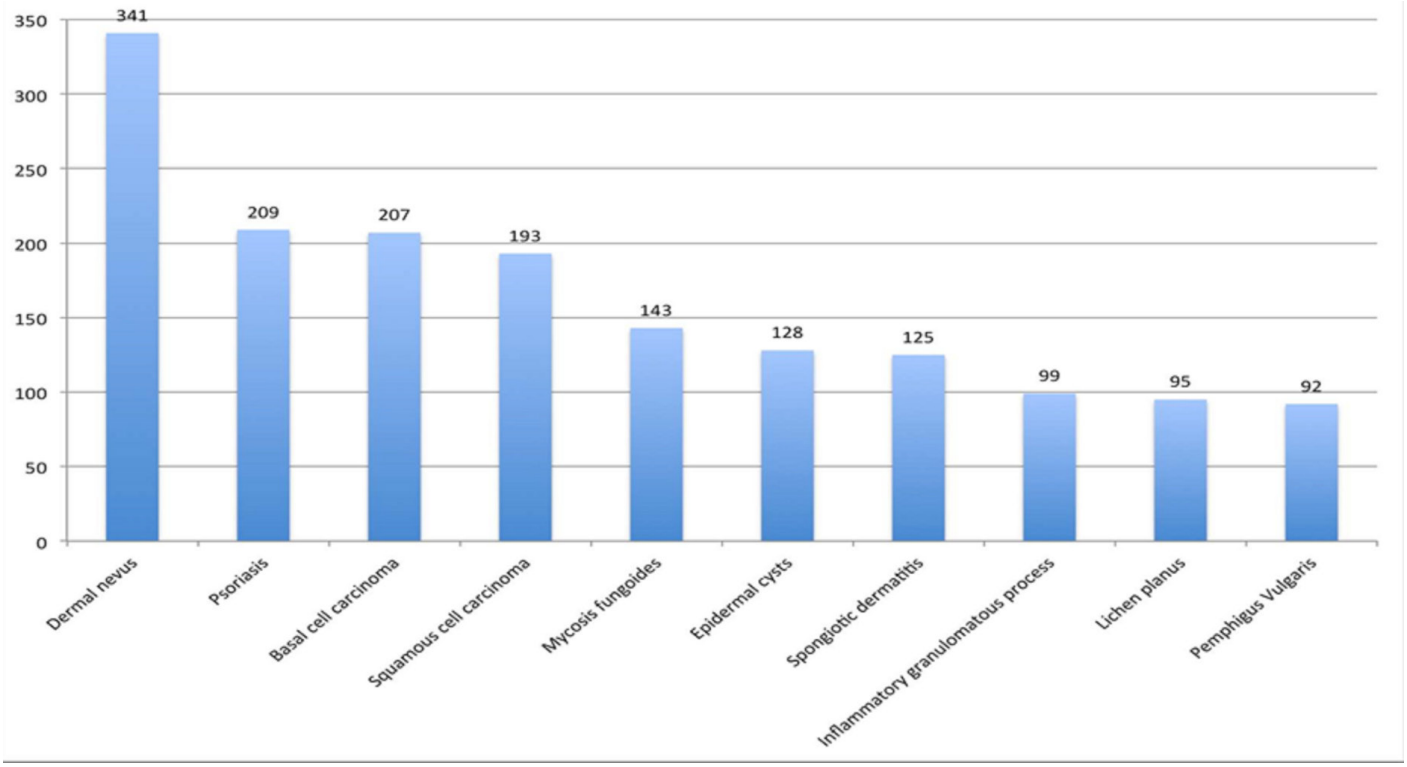

Figure 1. The 10 most common biopsied diseases

DISCUSSION

Despite many developed instruments, it is still not easy to reach a definitive diagnosis in many cutaneous diseases because of unclear clinical findings (3). Cooperation of experienced dermatologists and pathologists provides more success in diagnostic process (4-5). Sellheyer and Bergfeld studied the correlation of dermatology and pathology in common dermatological diseases. They found that the compatibility between preliminary diagnoses and definitive histopathological diagnoses was 34% for the biopsies performed by physicians other than dermatologist. The same rate was found as 71% for the biopsies performed by dermatologists. They suggested that histopathological diagnosis is difficult without having enough clinical knowledge (6). Skin lesions go through different stages and histopathological features of disease change when diseases progress. Because of this nature of the dermatological diseases, cooperation of dermatologists and pathologists are crucial in diagnosis of inflammatory and other neoplastic diseases (5,7). In a study that included biopsy performed 100 patients with skin disease, it is found that the rate of correct diagnosis without clinical information was 53%, however, the same rate was 78% after having the clinical information (8). It should be known that, histopathological examination is usually complementary and confirmatory. For a correct diagnosis; correct timing and choosing the correct lesion and, using the correct biopsy technique are needed. The most characteristic microscopic features can be obtained from the best developed lesions. Sometimes repeated biopsies are needed for definitive diagnosis. Biopsy should be examined with the previous one in repeated biopsies (9). Doubtlessly, biopsies should be interpreted along with clinical findings, laboratory investigations, medical history and clinical course (7). In our study, although the ratio of correlation between the first three preliminary diagnoses and definitive diagnoses was 58.7%, it increased up to 79.1% with the successful clinicopathological correlation. Our findings were similar to the study done by Aslan et al, in which clinicopathological correlation was seen in 76.8% (10). In the study of Gupta et al, histopathological correlation with clinical diagnosis was seen in 85.8% of the cases. They found that, the rate of discordance between clinical and histopathological diagnosis was 9.1%. The histopathological examination was noncontributory in 5.1% of the cases (11). In the study of Umarji et al, in which they focused only inflammatory dermatoses, the final diagnosis was included in the clinical differential diagnoses in 412 (90.5%) of the cases. (12). In the present study, we found that one of each five biopsies was reported descriptively without stating a precise diagnosis. This clearly showed the difficulty of precise diagnosis without clinical findings. Çalka et al. found that one of each three biopsies (n=106) were noninfectious papulosquamous diseases, 79 of the biopsies were noninfectious vesiculobullous diseases, 32 of the biopsies were connective tissue disorders, 21 of the biopsies were vascular lesions and 19 of the biopsies were cysts and tumors (13). Dilek et al. found that the most common diseases biopsied were papulosquamous diseases, followed by tumors and immunological diseases (14). In our study, the most common diseases biopsied were tumors followed by papulosquamous diseases, nevus and adnexal diseases, respectively. The results of Çalka et al's and Dilek et al's studies were similar to our study in term of the most common age group biopsied. In the present study, the rate of non-evaluated cases due to insufficient samples was 0.16% (n=7). The rate of the compatibility between the first three preliminary diagnoses and definitive diagnoses was 57.0% in the first biopsies, 66.5% in the second biopsies and 75.3% in the third biopsies. This showed that repetitive biopsies increase the rate of compatibility between preliminary diagnosis and definitive diagnosis. Investigation of the parameters like the number of the biopsies performed in same patient, surgical margins and the rate of the correct diagnosis with cooperation of dermatologists and pathologists were the novel aspects of our study.

Diagnosis of inherited cutaneous diseases is usually based on clinical findings but sometimes histopathological examination may also be needed. Dermatopathological evaluation can be useful in diagnosis of Hailey-Hailey disease, Darier disease, pseudoxanthoma elasticum and incontinentia pigmentosa. On the other hand, histopathological examination may not provide more clues for inherited bullous disease, congenital alopecia and keratinization disorders. However, recent developments in the field of molecular genetics have increased the role of dermatopathology in diagnosis of the inherited cutaneous diseases (15).

Biopsy has also an important role in differential diagnosis of pediatric dermatological diseases. Afşar et al. found that the most common pediatric dermatologic disease biopsied was Henoch-Schönlein purpura, followed by psoriasis and pityriasis lichenoides (16). In the present study, the most common disease biopsied between the 0-10 ages was psoriasis, followed by hemangioma and epidermal-keratinous cysts. The number of the disease biopsied was higher in the young and adults than the children and older in our study.

In conclusion, our study showed that repetitive biopsies and a strong cooperation of dermatologists and pathologists may increase the rate of precise histopathological diagnosis.

Competing interests: The authors declare that they have no competing interest.
Financial Disclosure: There are no financial supports
Ethical approval: Our work has been approved by the Regional Ethic Committee of Ataturk University and done in compliance with the medical protocols and ethic-related principles of Helsinki Protocol.

Mahmut Sami Metin ORCID: 0000-0002-5099-8521
Mustafa Atasoy ORCID: 0000-0003-1904-9878

REFERENCES

1. Anadolu RY, Erdem C. Dermatopatolojide yanlış adlandırmalar ve yanlış değerlendirmeler. Dermatopatoloji Derg 1996;5:116-23.

2. Tufan H, Ergenekon G, Tırpancı A, Why Must Dermatologist Understand Dermatopatology? Dermatopatoloji Derg 1996;5:129-31.
3. Salem OS, Maize JC. Clinicopathologic correlation in diagnosis of diseases of the skin. Am J Dermatopathol 1986;8:53-6.
4. Demirkesen C. Dermatopatolojiye Bakış. Türkderm Deri Hastalıkları ve Frengi Arşivi 1996;30:59-60.
5. Mehregan DR, Dooley VN. How to get the most out of your skin biopsies. Int J Dermatol 2007;46:727-33.
6. Sellheyer K, Bergfeld WF. A retrospective biopsy study of the clinical diagnostic accuracy of common skin diseases by different specialties compared with dermatology. J Am Acad Dermatol 2005;52:823-30.
7. Sina B, Kao GF, Deng AC, et al. Skin biopsy for inflammatory and common neoplastic skin diseases: optimum time, best location and preferred techniques. A critical review. J Cutan Pathol 2009;36:505-10.
8. Rajaratnam R, Smith AG, Biswas A, et al. The value of skin biopsy in inflammmatory dermatoses. Am J Dermatopathol 2009;31:350-3.
9. Gürbüz O. Dermatopatolojinin Dermatoloji İçin Önemi. T Klin J Dermatol 2002;12:7-8.
10. Aslan C, Goktay F, Mansur AT, et al. Clinicopathological consistency in skin disorders: A retrospective study of 3949 pathological reports. J Am Acad Dermatol. 2012;66:393-400.
11. Gupta P, Karuna V, Grover K, et al. The histopathological spectrum of skin diseases with emphasis on clinicopathological correlation: A prospective study. IP J Diagnostic Pathology and Oncology 2018;3:91-5.
12. Umarji S, Ravikumar G, Antony M, et al. Comparison of clinical diagnosis with histopathology in inflammatory skin diseases: a retrospective study of 455 cases. Egyptian J Dermatology and Venereology 2018;38:37-41.
13. Çalka Ö, Akdeniz N, Kösem M ve ark. Deri hastalıklarının tanısında histopatolojinin rolü. Tıp Araştırmaları Dergisi 2005;3:27-30.
14. Dilek N, Saral Y, Çobanoğlu B. Dermatozlarda Klinik ve Histopatolojik Korelasyon. F.Ü.Sağ. Bil. Tıp Derg 2009:23:81-4.
15. Bergman R. Dermatopathology and molecular genetics. J Am Acad Dermatol 2008;58:452-7.
16. Afşar FŞ, Aktaş S, Diniz G, et al. Pediyatrik Dermatopatolojide Biyopsinin Rolü. Türkderm 2011;45:137-9.