



Clinicopathological analysis of conjunctival lesions: An experience from the eastern part of Türkiye

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ARTICLE INFO

Keywords:

Conjunctiva

Pterygium

Conjunctival intraepithelial neoplasia

Pathology

Neoplasm

Received: Jan 03, 2023

Accepted: Mar 07, 2023

Available Online: 24.03.2023

DOI:

[10.5455/annalsmedres.2023.01.09](https://doi.org/10.5455/annalsmedres.2023.01.09)

Abstract

Aim: The aim of our study is to determine the clinical-pathological features of conjunctival lesions operated in a tertiary-care hospital in the eastern region of our country over a 10-year period.

Materials and Methods: Demographic data of the patients and histopathological findings in the conjunctival biopsy specimens that were sent to our pathology laboratory between January 2010 and July 2020 were retrospectively analyzed. Lateralization, localization, distribution rates and frequency of lesions in different histopathological subgroups according to age and gender were evaluated.

Results: 286 conjunctival biopsy materials from 272 patients were analyzed. The age of the patients ranged from 1 to 95, and the mean age was 50.39 ± 23.59 . One hundred and sixteen (43%) of the patients were female and 156 (57%) were male. Of the lesions, 144 (50.3%) were located in the right eye, and 142 (49.7%) were located in the left eye. In our series, the most common lesion was pterygium with a rate of 33.9%, and the second most common conjunctival lesion was nevi with a rate of 19.2%. Nevi were the most common melanocytic lesion with a rate of 93.2%. Melanocytic lesions are the most common lesions in childhood and adolescence, with a significant decrease in incidence with increasing age. Degenerative lesions were seen in all age groups, they were most common over the age of 45 (n:76, %78). In the 46-65 age groups pterygium was the most common lesion among all groups with a rate of 40.2%. Among epithelial neoplastic lesions, benign lesions, premalignant lesions, and malignant lesions were detected with a rate %2.4 %16.4, and %3.5 respectively. Most of the lesions were located in the bulbar conjunctiva (87.4%). This was followed by tarsal (5.2%), caruncle/fornix (4.9%) and limbus (2.4%) locations, respectively.

Conclusion: Melanocytic lesions are more common in the first two decades, and degenerative lesions are commonly seen after the 4th decade. In advanced ages (over 65 years), premalignant and malignant lesions are seen at a very high rate. Pterygium is accompanied by CIN with a rate of 7% and all conjunctival lesions should be directed to the pathology laboratory for histopathological examination.



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Introduction

The conjunctiva is a thin, transparent, mucous membrane covering the anterior surface of the globe [1]. It starts from the inner part of the eyelids and extends to the fornical portion, the bulbar surface, and the corneoscleral limbus [1]. It acts as a protective barrier for the eyes [2].

The conjunctiva has epithelial and stromal components. The epithelial component consists of stratified squamous epithelium and columnar epithelium [1,3]. Squamous epithelium is observed at the margin of the limbus and

columnar epithelium is observed at the fornix. The stroma consists of fibrovascular connective tissue [1]. The plica semilunaris and caruncle are the 2 special regions of the conjunctiva [1]. There is both a mucous membrane and a cutaneous structure in the caruncle, and tumors originating from both the skin and the mucous membrane can be seen in this area [4].

Lesions originating from the conjunctiva can be grouped differently as congenital and acquired, melanocytic and non-melanocytic, neoplastic and non-neoplastic [1,5,6,7]. Lesions with a wide spectrum ranging from benign lesions originating from both epithelial and stromal components to aggressive malignancies may develop (1,2). Since it is an

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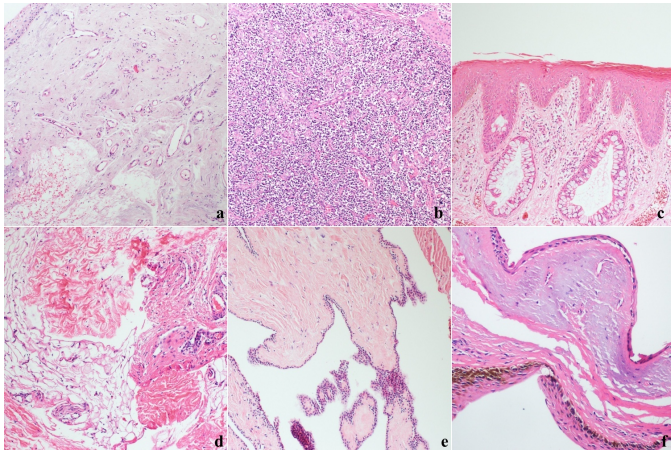


Figure 1. Non-neoplastic lesions a) Pterygium, H&E100x; b) Pyogenic granuloma, H&E100x; c) Keratosis, H&E100x; d) Dermolipoma, H&E100x; e) Apocrine hydrocystoma, H&E100x; f) Pterygium and melanosis, H&E200x.

easily recognizable region, lesions developing from the conjunctiva can be detected at an early stage. Factors affecting the development of conjunctival epithelial lesions include sunlight, HPV 6,11,16 subtypes, advanced age, male gender and being fair skinned [8,9,10].

Different studies on conjunctival lesions have been conducted in different countries of the world. The study in which conjunctival lesions were evaluated histopathologically in a large patient group is limited in the literature. In a large-series study by Grossniklaus et al. on conjunctival lesions, conjunctival inflammatory degenerative lesions took the first place with a rate of 41%, and acquired epithelial lesions were found at a rate of 26.2% and pigmented lesions at a rate of 12.9% [11]. There are different findings in the literature, and in a study examining conjunctival biopsies in the Egyptian population, it was reported that pyogenic granulomas (30.7%) and nevi (22.9%) were the most common lesions [12].

Similarly, there are very few studies documenting conjunctival lesions in large series in our country, and in a study conducted in our country, pterygium was shown to be the most common non-neoplastic lesion. It has been shown that the most common neoplastic lesion is nevus with a rate of 9.2% [13].

There is no study in the literature covering Malatya or eastern provinces. The aim of our study is to determine the prevalence of conjunctival lesions, the age distribution of the patients, the most common lesions and their clinicopathological features over a 10-year period, who were operated in İnönü University Medical Faculty Hospital, which is a tertiary-care hospital in the eastern region of our country.

Materials and Methods

In this study, it was planned to retrospectively examine the demographic data of the patients and histopathological findings of the specimens which were sent for examination in the Pathology Department of Inonu University Faculty

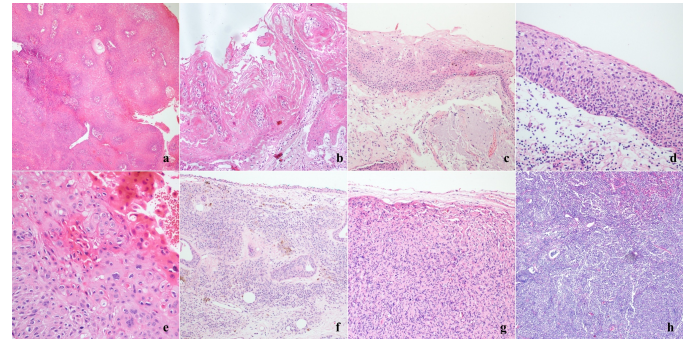


Figure 2. Neoplastic lesions a) Squamous papilloma, H&E 40x; b) Keratoacanthoma, H&E100x; c) CIN Grade2 and pterygium, H&E100x; d) CIN Grade2 and Grade3, H&E200x; e) Carcinoma in situ, H&E200x; f) Nevus, H&E100x; g) Schwannoma, H&E100x; h) Lymphoma, H&E40x.

of Medicine from the Department of Ophthalmology, between January 2010 and July 2020. Approval was obtained from the ethics committee of Inonu University Health Sciences Non-Invasive Clinical Research Ethics Committee. Total population sampling was used and the cases were histopathologically divided into two main groups as non-neoplastic and neoplastic lesions. Then, non-neoplastic lesions were divided into groups such as degenerative, inflammatory, hamartomatous, and cystic lesions (Figure 1) and neoplastic lesions were divided into different groups as benign, premalignant and malignant squamous epithelial lesions, pigmented lesions, lymphoid lesions and mesenchymal tumors (Figure 2). Any lesion excised was considered separately, and recurrences were counted as individual lesions.

The prevalence of lesions in different histopathological subgroups, and clinical characteristics of patients such as age, gender, and lesion location were evaluated. The age of the patients was examined in 4 groups as 1-20 years of age (childhood and adolescent), 21-45 years of age, 46-65 years of age and over 65 years old.

Statistical analysis

Normality of the quantitative data was assessed by Kolmogorov-Smirnov test and they were summarized with mean±standard deviation. The distribution of the qualitative variables were presented by count and percentage. Comparisons were performed by Pearson's chi-square test. Bonferroni correction was used for pairwise comparisons between categories. In all analysis, two-sided significance level was considered as 0.05. IBM SPSS Statistics for Windows version 22.0 (Armonk, NY: IBM Corp.) was used for the statistical analysis.

Results

Two hundred and eighty-six conjunctival biopsy materials from 272 patients were analyzed. The age of the patients ranged from 1 to 95, and the mean age was 50.39 ± 23.59 . One hundred and twenty (42%) patients were female and 166 (58%) were male. The M/F ratio was 1.383 and male

Table 1. The distribution of cases according to histopathological diagnosis and age.

DIAGNOSIS	0-20y n (%)	21-45y n(%)	46-65y n(%)	Over 65y n(%)	Total n(%)
Non-neoplastic Lesions					
Pterygium	3(6.3)	20(33.3)	38(42.5)	36(39.6)	97(33.9)
Hamartomatous lesions	4(8.3)	3(5)	2(2.3)	1(1.1)	10(3.5)
Cysts	3(6.3)	6(10)	4	1	14(4.9)
Inflammation	5(10.5)	2(3.3)	5(5.7)	1	13(4.7)
Pyogenic granuloma	1(2.1)	0	3(3.4)	2(2.2)	6(2.1)
Pinguecula	0	0	1(1.1)	1(1.1)	2(0.7)
Miscellaneous					
Fibrosis	0	0	2(2.3)	4(4.4)	6(2.1)
Pemphigoid lesion	0	0	0	1(1.1)	1(0.3)
Pseudoepitheliomatous hyperplasia	0	1(1.7)	0	1(1.7)	2(0.7)
Keratoses	0	2(3.3)	0	0	2(0.7)
Apocrine hydrocystoma	0	0	1(1.1)	0	1(0.3)
Sebaceous gland hyperplasia	0	0	0	1(1.1)	1(0.3)
Benign epithelial neoplastic lesions					
Squamous papilloma	0	1(1.7)	1(1.1)	2(2.2)	4(1.4)
Keratoacanthoma		1(1.7)	1(1.1)		2(0.7)
Actinic keratosis			1(1.1)		1(0.3)
Premalignant and malignant epithelial lesions					
CIN	0(0)	1(1.7)	14(16.1)	18(19.8)	33(11.5)
CIS	1(2.1)	1(1.7)	2(2.3)	10(11)	14(4.9)
SCC	0	0	2(2.3)	8(8.8)	10(3.5)
Melanocytic lesions					
Nevus	31(64.6)	16(26.7)	7(8)	1(1.1)	55(19.2)
Melanosis	0	2(3.3)	1(1.1)	1(1.1)	4(1.4)
Lymphoid lesions					
Lymphoma	0	1(1.7)	1(1.1)	1(1.1)	3(1)
Atypical lymphoid hyperplasia			1(1.1)		1(0.3)
Mesenchymal neoplasms					
Schwannoma				1(1.1)	1(0.3)
Hemangioma		2(3.3)			2(0.7)
Total	48	60	87	91	286

Table 2. Comparison of melanocytic lesions ratio among the other lesions according to ages.

	0-20y	21-45y	46-65y	66+	Total	p
Melanocytic lesions	31 (64.6%)	18 (30%)	8 (9.2%)	2 (2.2%)	59 (20.6%)	<0.001
Others	17 (35.4%)	42 (70%)	79 (90.8%)	89 (97.8%)	227 (79.4%)	
Total	48(%100)	60(%100)	87(%100)	91(%100)	286(%100)	

Table 3. Comparison of premalign-malign lesions ratio among the other lesions according to ages

	0-20y	21-45y	46-65y	66+	Total	p
Premalign-malign lesions	1 (2.1%)	2 (3.3%)	18 (20.7%)	36 (39.6%)	57 (19.9%)	<0.001
Others	47 (97.9%)	58 (96.7%)	69 (79.3%)	55 (60.4%)	229 (80.1%)	
Total	48(%100)	60(%100)	87(%100)	91(%100)	286(%100)	

dominance was observed. Lateralization was seen at equal rates, and 144 (50.3%) of the lesions were located in the

Table 4. Distribution of conjunctival lesions according to anatomic location and histopathological diagnosis.

	Bulbar	Caruncle/fornix	Tarsal	Limbal	Total
Pterygium	97 38.4%	0 0.0%	0 0.0%	0 0.0%	97 33.9%
Hamartomatous lesions	8 3.2%	0 0.0%	1 6.7%	1 14.3%	10 3.5%
Cyst	8 3.2%	1 7.1%	5 33.3%	0 0.0%	14 4.9%
Inflammation	9 3.6%	1 7.1%	1 6.7%	0 0.0%	11
Pyogenic granuloma	5 2.0%	0 0.0%	1 6.7%	0 0.0%	6 2.1%
Pinguekula	2 0.8%	0 0.0%	0 0.0%	0 0.0%	2 0.6%
Miscellaneous	11 4.4%	2 14.2%	3 20.0%	0 0.0%	16
Nevus	43 17.2%	8 57.1%	2 13.3%	2 28.6%	55 19.2%
Melanosis	4 1.6%	0 0.0%	0 0.0%	0 0.0%	4 1.4%
Benign epithelial neoplasms	5 2.0%	1 7.1%	1 6.6%	0 0.0%	7 2.1%
CIN	30 12.0%	0 0.0%	0 0.0%	3 42.9%	33 11.5%
CIS	14 5.6%	0 0.0%	0 0.0%	0 0.0%	14 4.9%
SCC	9 3.6%	0 0.0%	0 0.0%	1 14.3%	10 3.5%
Lymphoid lesions	3 1.2%	1 7.1%	0 0.0%	0 0.0%	4 1.4%
Mesenchymal lesions	2 0.8%	0 0.0%	1 6.6%	0 0.0%	3 1.05%
Total	250 87.4%	14 4.9%	15 5.2%	7 2.4%	286 100.0%

right eye and 142 (49.7%) were located in the left eye. Distribution rate of lesions by age is shown in Table 1.

Lesions consisted of 161 non-neoplastic, 125 neoplastic lesions. Among the conjunctival lesions, the most common lesion was pterygium with a rate of 33.9%. All of the cases with pigmented lesions consisted of benign lesions. Nevi were the second most common conjunctival lesion with a rate of 19.2% and were the most common melanocytic lesion with a rate of 93.2%. There were 4 cases of conjunctival melanosis. Melanocytic lesions are the most common lesions in childhood and adolescence, with a significant decrease in incidence with increasing age (Table 2).

The most common benign lesion among epithelial neoplastic lesions was squamous papilloma, and the malignant lesion was squamous cell carcinoma (SCC). A statistically significant increase was found in the rate of premalignant and malignant lesions in patients over 45 years of age

($p < 0.001$) (Table 3).

The distribution of the lesions according to histopathological diagnosis and anatomical location is listed in Table 4. Bulbar conjunctiva was the most common localization with a rate of 87.4%. While non-neoplastic lesions were more common in the nasal conjunctiva and pigmented lesions were more common in the temporal conjunctiva, no significant difference was observed for neoplastic lesions. Pterygium was detected in the nasal conjunctiva in 78.4%, while 47.3% of the nevi were detected in the temporal conjunctiva. Cysts (5 / 33%) were in the first place among the 15 lesions seen in the tarsal conjunctiva.

There were 48 lesions in the childhood and adolescent age groups. 31 lesions (64.6%) were in congenital nevus morphology, and the second most common lesions were hamartomatous lesions (8.3%). 29 female and 19 male patients were observed and female predominance was present.

The most common lesions in the patient group between the ages of 21-45 were pterygium in 17 patients and congenital nevus in 16 patients. There were 28 female patients and 31 male patients and they were approximately in equal proportion. In the 46-65 age groups, pterygium was the most common lesion among all groups with a rate of 40.2%.

Over 65 years of age, 91 lesions were detected. Pterygium was detected in 33 patients (36.3%) and was the most common lesion. Conjunctival intraepithelial neoplasia (CIN) was the second most common lesion with a rate of 19.8%. Ten SCC, 9 carcinoma in situ (CIS), 13 CIN grade3, 3 CIN grade1, and 2 CIN grade2 were detected.

Discussion

External ocular examination and slit-lamp microscopy are often helpful in the diagnosis of conjunctival lesions. In the management of these lesions, clinical observation, incisional biopsy, and excisional biopsy can be applied based on the clinical pre-diagnosis depending on the size and extent of the lesion, or chemotherapy, radiotherapy, enucleation, extraction or a combination of these treatments can be applied according to the pathology result. Small benign-appearing lesions usually do not require a diagnostic biopsy. Clinical observation is the preferred clinical management method in benign lesions such as pingueculum, nevus, and dermolipoma. If there is a small lesion that requires biopsy, it is most appropriate to excise the entire lesion during the operation. Examples of these are symptomatic choristomas, squamous cell neoplasia or malignant melanoma. In large lesions (>15 mm basal dimension or > 4 clock hour limbal tumor), incisional biopsy is recommended [1].

Conjunctival lesions can be examined in 2 categories as non-neoplastic and neoplastic lesions [6]. Non-neoplastic lesions can be classified as UV-related lesions, drug-related lesions, autoimmune diseases, non-infectious inflammatory lesions, cystic lesions, and choristomas [6]. UV-related lesions can also be considered as degenerative lesions. Pterygium and pinguecula are the most common lesions. Concomitant epithelial racial melanosis can be observed in dark-skinned patients [6]. In our series, pterygium was the most common conjunctival lesion, accounting for 33.9% of all lesions. Two pinguecula were observed. One of the pterygium was accompanied by melanosis. The distribution of pterygium varies in the literature and it is observed to vary between 31.66% and 72.2% [5,11,14].

Samples can be taken for direct immunofluorescence (DIF) examination from cases with suspected ocular pemphigoid among autoimmune diseases. Positive DIF findings are diagnostic, but negative findings do not rule out the diagnosis [6]. In one of our cases, biopsy was taken with the suspicion of ocular pemphigoid and DIF findings were reported as negative. Conjunctival cystic lesions are retention cysts or dilated lymphatics. Retention cysts are lesions surrounded by conjunctival epithelium or epithelium with squamous metaplasia [15]. Similar to the study of Khan et al., conjunctival cyst was found with a rate of 4.9% in this study [16].

Pyogenic granulomas are inflammatory/degenerative lesions and are fleshy round masses located in the palpebral

or bulbar conjunctiva and seen histopathologically as granulation tissue. Generally, there is an underlying chalazion or a history of trauma [11]. There were 6 inflammatory granulation tissues in our series with a predominance of over 45 years-old.

Choristomas are congenital lesions seen in the conjunctiva, and the most common ones are epibulbar dermoids and dermolipomas. Histopathologically, they contain stratified squamous epithelium, skin appendages, collagen and adipose tissue. Complex choristomas may contain bone, lacrimal gland, or cartilage tissue. Dermolipomas are thought to be congenital lesions that remain asymptomatic for years and protrude from the orbit to the superotemporal fornix in adulthood. Unlike orbital fat herniation, they cannot be sent to the orbit with finger pressure [1,6]. In our series, dermoid was detected in 1 child and 1 adult, dermolipoma in 2 children, and 5 adult patients being bilateral in 1 child and 1 adult patients.

In this study, the age range of the patients was consistent with the literature and ranged from 1 to 95 years [5,13,17]. While the most common lesion in childhood and adolescence was melanocytic lesions, non-neoplastic lesions in the age range of 21-65 years and premalignant and malignant lesions in those over 65 years of age were the most common lesions. Similar to the Lee and Hirstin study, the incidence of premalignant and malignant lesions increased with age [9].

There are different results about the gender distribution in the literature, and contrary to Elshazly, the male patient ratio was found to be predominant [12,5,18].

The bulbar conjunctiva was the most common localization with a rate of 87.4%, consistent with other studies [5,11,14]. Subsequently, caruncle/fornix localization was observed in 14 patients and tarsal conjunctiva location was observed in 15 patients. One hundred and seventeen (41%) lesions were located in the nasal conjunctiva and 69 (24%) lesions were located in the temporal conjunctiva. While the most common lesion located in the nasal conjunctiva was pterygium, it was found that nevi were more common in the temporal conjunctiva.

Although degenerative lesions can be seen in all age groups, they were found that it was most common over the age of 45. In other studies, the distribution of degenerative lesions by age was found to be more common between the ages of 41-60, 31-60 and 21-83 [5,19,20]. Hamartomatous lesions and nevi were the most common lesions in childhood and adolescence, consistent with the literature [21]. In the 25-40 age group, pterygium and nevi were found to be close to each other, and they were the most common lesions in this group.

Two different lesions were found together in 14 cases. Co-existence of nevus and pterygium in 6 cases, CIN and pterygium in 7 cases, and pterygium and melanosis in 1 case were observed. Low-grade CIN constituted the vast majority (4 of them) in whom CIN was detected. CIN was detected in approximately 7% of all pterygium cases. This supports the theory that the etiological factors for the development of pterygium and CIN are the same. And in accordance with the literature, it has been shown that, some of the pterygium that has not been excised may

progress to CIN, although it is unlikely, and that all excised lesions with a pterygium pre-diagnosis should undergo histopathological examination [22,23,24].

Conjunctival neoplastic lesions can be classified into 4 main categories: squamous epithelial lesions, melanocytic lesions, lymphoid neoplasms, and mesenchymal neoplasms. Conjunctival squamous epithelial lesions include squamous papilloma, keratoacanthoma, dacryoadenoma, and ocular surface squamous neoplasia (OSSN) [1].

Ocular surface squamous neoplasia constitutes a large group of diseases ranging from mild dysplasia to squamous cell carcinoma with localization of the conjunctiva and cornea. Although the terminology varies, there are opinions that accept the term as benign, preinvasive and invasive OSSN or intraepithelial neoplasia-invasive carcinoma [25,26,27]. Benign squamous epithelial lesions include squamous papilloma, actinic keratosis, keratoacanthomas [27].

HPV 6, 11, or 16 is involved in the etiology of most squamous papillomas. It tends to be larger and multiple in children. In adults, it can mimic SCC clinically [27,28]. In our series, squamous papilloma was detected at a rate of 1.4%, and all of them were detected in adulthood. Its incidence varies in the literature, ranging from 1.2 to 9% [14,23].

Most of the conjunctival intraepithelial neoplasia cases have a history of excessive sun exposure. Histopathological examination reveals a sharp transition between dysplastic epithelium and normal conjunctival epithelium. It is grouped as grade 1,2,3 or mild, moderate, severe dysplasia according to the severity of epithelial atypia. Presence of a full-thickness epithelial atypia is named as carcinoma in situ (CIS) [29]. When tumor cells destroy the epithelial basement membrane, squamous cell carcinoma develops [26,27]. In our series, CINs were the third most common lesion with a rate of 11.5%. In the study of Findik et al., CINs were found at a rate of 4.24%. Although a higher rate of CIN was detected in our study, there are similar publications in the literature with our study [14]. 54.5% of CIN lesions, 71.4% of CIS cases, and 80% of SCC cases developed over 65 years of age. It was observed that the incidence of invasive malignancy increased with age ($p < 0.001$). Consistent with the literature, male (62%) predominance was observed in CINs, and squamous cell carcinoma was found equally in male and female patients, contrary to the male predominance in the literature [11]. In our study, similar to the study of Findik et al., the rate of SCC was found to be 3.5%.

Atypia of the squamous epithelium may occur in cases of conjunctival malignant melanoma or SCC treated with mitomycin c eye drops. The nucleus-to-cytoplasm ratio is preserved, which is important not to be confused with CIN, in which the N/S ratio is increased. Chlorpromazine and minocycline can cause brown pigment formation [6]. In order to avoid diagnostic confusion, it will be useful to convey the clinical information of the patient to the relevant pathologist completely.

Conjunctival melanocytic lesions are the most common one among all conjunctival tumors with a rate of 52% [7]. According to the 2018 WHO classification, conjunctival

melanocytic tumors are classified into three major groups: conjunctival nevus, conjunctival melanocytic intraepithelial neoplasia (primary acquired melanosis (PAM) with or without atypia), and conjunctival melanoma [30]. Nevus is the most common melanocytic tumor of the conjunctiva and usually occurs in the first or second decades of life [1]. Nevi can be classified histopathologically as junctional, subepithelial (equivalent to cutaneous intradermal nevus) or compound, similar to the cutaneous nevi. Thin microcystic invaginations are typical [1,27]. Most of them are compound and subepithelial subtype. Junctional nevus is rare in children and almost never seen in adults. If a junctional nevus is thought to develop in an adult, the possibility of PAM should be considered [27]. It typically involves the nasal or temporal conjunctiva, and the caruncle with a rate of 15% [27]. In our series, nevi were the most common melanocytic lesion, consistent with the literature, and 47.3%, 29.1% and 14.5% of them were located at temporal conjunctiva, nasal conjunctiva, and caruncle, respectively. Rates may differ between the studies. In the study of Shields, it was reported to be located at the temporal conjunctiva, nasal conjunctiva and caruncle with a rate of 46%, 44% and 15%, respectively. On the other hand, in the study of Negretti et al., the rates were reported as 53%, 42% and 4%, respectively [31,32].

Primary acquired melanosis is seen as diffuse, patchy, flat lesions that occur in middle-aged or elderly people. Unlike racial melanosis, it is seen as asymmetric and unilateral pigmentation in fair-skinned people. Abnormal melanocytes are observed at the basal layer in the pathological examination. It can be with or without atypia. It has been reported that there is a risk of melanoma progression ranges from 13% to 50% in the presence of atypia [1,33,34,27]. PAM without atypia is observed as limited pigmentation in conjunctival epithelial cells without melanocytic hyperplasia. It has no risk of developing into melanoma [1,27].

Among the pigmented lesions, 55 nevi, 3 PAM and 1 racial melanosis were detected. Atypia was not observed in any of the primary acquired melanosis cases. The most common melanocytic lesion in both adults and childhood was nevus, and no conjunctival malignant melanoma case was detected in our study.

Lymphoid neoplasms constitute 8% of all conjunctival tumors in adults [27]. Most of the conjunctival lymphomas are low-grade extra-nodal marginal zone lymphomas. More rarely, follicular, mantle cell lymphoma and diffuse large B-cell lymphoma, CLL/SLL involvement can also be seen [1,27]. In our series, three (1%) primary conjunctival lymphoma cases were over 45 years old and two were diagnosed as marginal zone lymphoma and one was diagnosed as diffuse follicle center lymphoma. In one of the cases diagnosed with marginal zone lymphoma, the first biopsy was evaluated in favor of chronic inflammation, and the diagnosis could be made after recurrent biopsy when it did not respond to steroid treatment. In particular, the possibility of low-grade lymphoma should be kept in mind when evaluating conjunctival lesions, and clinicopathological cooperation should be established.

The caruncle is a small nodular islet of skin surrounded by the conjunctiva near the medial canthus. It is surrounded

by keratinized epithelium and contains eccrine glands, accessory lacrimal glands, and pilosebaceous unit. Nevus, papilloma, sebaceous gland hyperplasia, inclusion cyst, oncocytoma and apocrine hydrocystomas can be found [27,35]. In our series, one apocrine hydrocystoma was detected and interestingly, it was located at the temporal conjunctiva. Apocrine hydrocystoma localized in the temporal or nasal conjunctiva has been reported in a very limited number in the literature [35]. In addition, we observed sebaceous gland hyperplasia in one case with caruncle location. The most common lesion located in the caruncle was nevi in our series with a rate of 57.1%.

Although mesenchymal tumors are rare, one capillary hemangioma, one cavernous hemangioma and one schwannoma were found in our series.

Conclusion

The most common lesions in our study are degenerative lesions. The most common benign epithelial lesion and malignant lesion is squamous papilloma and squamous cell carcinoma, respectively. The most common lesion in childhood and adolescence is nevi, and the frequency of premalignant and malignant lesions increases with age. Pterygium is accompanied by CIN with a rate of 7% and all conjunctival lesions should be sent to the pathology laboratory for histopathological examination. The correct histopathological analysis of these lesions is important in terms of applying early and definite treatment methods.

Ethical approval

This study was approved by Inonu University Health Sciences Non-Invasive Clinical Research Ethics Committee (reference: 2022/4080).

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