Ophthalmologica Indonesiana
Vol. 52 No. 2 2026, 82-87
E-ISSN: 2460-545X | P-ISSN: 0126-1193
Publisher: Perdami (Perhimpunan Dokter Spesialis Mata Indonesia)

Original Article

Characteristics of Conjunctival Melanocytic Tumor Patients in a Tertiary Hospital: A 4-Year Study

Fadhila Khairunnisa Poerwoko[1], Raja Erinda[2], Faiza Rizky A.S[3]
[1,2]Department of Ophthalmology, Faculty of Medicine, Universitas Diponegoro, Semarang
[3]Departement of Anatomical Pathology Department, dr. Kariadi Hospital, Semarang
Corresponding email: fkhairunnisap@gmail.com

ARTICLE INFO

Article History
Received : 24-03-2025
Revised : 16-04-2026
Accepted : 30-08-2026
Published : 31-08-2026

Keywords
Conjunctival Melanocytic Tumor
Melanoma Maligna
Compound Nevi

Access this article online

https://doi.org/10.35749/journal.v51i2.101945

Quick Response Code:

ABSTRACT

Introduction: Conjunctival neoplasms includes melanocytic and nonmelanocytic tumors, and most are benign. Due to their rarity in the general population, it is important to consider the demographic, clinical signs, symptoms, and histopathological features to make the correct diagnosis. This study aims to describe the demographic, clinical, and histopathology of Conjunctival Melanocytic Tumors patients in a Tertiary Hospital. Methods: A retrospective study held from the medical record of patients with diagnosis conjunctival melanocytic tumor from January 2019 - September 2023 in a Tertiary Hospital. Age, sex, laterality, clinical signs, symptoms, procedure, and histopathology results were recorded. Results: Thirteen patients were identified (n=13). The distribution was nearly equal between genders (54% male, 46% female), with a mean age of 39 years (range: 4–69 years). All cases were unilateral. The most frequent clinical presentation was a painless lump (69%), primarily localized in the temporal region (77%). Surgical interventions included simple excision (69.2%) and wide excision (30.8%). Histopathological analysis revealed that 61.5% of lesions were malignant melanoma, while 38.5% were compound nevi. Conclusion: In this study, it was found that conjunctival melanocytic tumor was found equal in both genders, majority in adult age, mostly presenting with painless lumps on the temporal region of bulbar conjunctiva. Most patient in this study were diagnosed with melanoma maligna, because usually patient with nevi were not referred to tertiary hospital. Majority of the patient underwent excision while the others underwent wide excision.

Introduction

Conjunctiva has unique histological features that can not be found in the skin. It is composed of epithelium and stroma, with the epithelial component consisting of both stratified nonkeratinized squamous epithelium and columnar cells, including

numerous goblet cells. However, similar to the skin, dendritic melanocytes reside along the basal layer of the conjunctival epithelium. Neoplasms affecting the conjunctiva can arise from the epithelium or stroma, and melanocytic lesions arise from the basal melanocytes of the conjunctiva.[1]

Conjunctival neoplasms include melanocytic and nonmelanocytic tumors, and most are benign. When a conjunctival biopsy sample is obtained, it is often very small and represents a subsample of a larger lesion, making it difficult to determine whether the histopathological features are truly representative of the entire lesion.[1,2,3] Because they are rare, diagnostic work is often done to identify conjunctival melanocytic lesions. The histopathological examination may be complicated by the fact that biopsy specimens are often very small and do not accurately depict the lesion. In addition, despite the availability of extensive data from around the world, there are few published data on these tumors in specific regional tertiary centers in Indonesia. The need to establish local clinical patterns is the primary motivation for this study, as it is necessary for early detection and specialized management. The rarity of the pathology and limited sample size imply that these findings offer important clues to clinical behavior and diagnostic outcomes in a high-acuity surgical setting. The purpose of this study is to describe the characteristics of Conjunctival Melanocytic Tumors patients in a Tertiary Hospital from January 2019 – September 2023.

Method

This retrospective descriptive study was conducted at a tertiary hospital following approval from the Research Ethics Committee of Diponegoro University Medical Faculty. Potential cases were identified through a search of the Ocular Plastics and Reconstructive Surgery clinic's registry from January 2019 to September 2023.

Inclusion criteria consisted of all patients who underwent surgical intervention and subsequent histopathological examination for suspected melanocytic lesions, including nevi (junctional, compound, stromal, blue, or amelanotic), primary acquired melanosis (PAM), and conjunctival melanoma. Patients with incomplete medical records regarding their primary clinical presentation or histopathological results were excluded to ensure data integrity.

Data were extracted from physical and electronic medical records. To ensure completeness, clinical findings were cross-referenced with surgical reports. Descriptive statistics were employed to analyze the frequency and distribution of age, sex, tumor location, symptoms, surgical techniques, and pathological outcomes. Given the sample size, data are expressed as means and percentages.

Results

Thirteen patients were diagnosed and treated for conjunctival melanocytic tumors during the study period.

The cohort showed a slight male predominance (54%) compared to females (46%). The mean age was 39 years, though the age range was broad (4 to 69 years), indicating that these lesions can manifest throughout the lifespan.

Ophthalmologica Indonesiana
Vol. 52 No. 2 2026 Year, 80-87

Table 1. Demography characteristics of conjunctival melanocytic tumor patients in a Tertiary Hospital from January 2019-September 2023 (n=13).

Demography characteristic	Frequency (n)	%
Sex		
Men	7	54%
Women	6	46%
Age (years old)		
Mean	39	
Range	4-69	

All cases presented unilaterally. The primary chief complaint was a lump (69%), followed by the presence of a spot or "freckle" (31%). Pain was a rare symptom, present in only 7.7% of the cohort. Notably, 77% of tumors were located in the temporal region of the bulbar conjunctiva, with the remaining 23% located nasally.

Table 2. Clinical signs and symptoms

Signs and symptoms	Frequency (n)	%
Laterality		
Unilateral	13	100%
Bilateral	0	0%
Chief complaint		
Lumps	9	69%
Spot/freckle	4	31%
Pain		
Present	1	7.7%
Absent	12	92.3%
Tumor location		
Nasal	3	23%
Temporal	10	77%

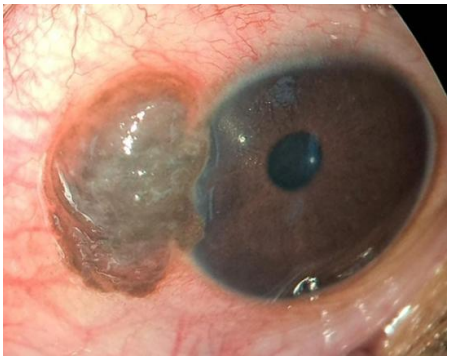

Figure 1. One of the preoperative clinical presentation of patient's left eye under operating microscope.

Excision was the primary treatment for 69.2% of patients, while 30.8% required wide excision with clear margins. Histopathological examination identified Malignant Melanoma in 61.5% (n=8) of cases and Compound Nevi in 38.5% (n=5).

Table 3. Histopathological results of the patients.

Anatomical Pathology Result	Frequency (n)	%
Melanoma Maligna	8	61.5%
Compound Nevi	5	38.5%

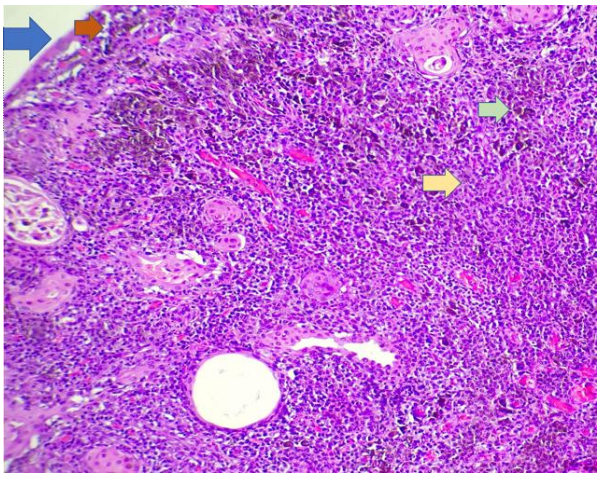

Figure 2. Anatomical pathology specimen of one of the patients, under 40x magnificiations showed stratified squamous epithelium (blue arrow), melanocyte on conjunctival epithelium (red arrow), melanocyte of subepithelium stroma (yellow arrow), melanocyte that contains melanin pigments (green arrow).

Discussion

This study describes the characteristics of conjunctival melanocytic tumor patients from January 2019 until September 2023, there were 13 patients diagnosed with conjunctival melanocytic tumor. The rarity of conjunctival melanocytic tumors observed in this study (13 cases over four years) aligns with global incidence rates, which estimate conjunctival melanoma at approximately 0.2 to 0.8 per million people.[1,3,4] In 2020, a population-based study of 41 European cancer registries found that the incidence of conjunctival melanoma was 0.46 per million people per year, with a prevalence of 0.48 per million per year in men (0.48 per million per year) and women (0.46 per million per year).[5] The incidence was similar to that in this study, in which there were seven men (54%) and six women (46%).

The incidence of conjunctival melanoma increases as the patient ages. Based on the study 629 patients with conjunctival melanoma from another study, it was reported older adults were more likely to have widespread tumor spread and local tumor recurrence did.[6] Only a few cases of conjunctival melanoma have been identified in children. For example, in a series of 806 patients younger than 21 years with conjunctival lesions, melanoma accounted for only 2.2% of the lesions.[7]

We report the range of age in this study, which is 4-69 years old, with the mean age for conjunctival melanocytic tumor patients are 39 years old. These findings are in line with the previous study, melanoma could be found in children until elderly. The highest incidence of Malignant Melanoma of conjunctiva occurs during the fifth decade of life, and it is estimated to occur in only 1% of children.[8]

All of the patient in this study presented with unilateral tumors involving the bulbar conjunctiva. A significant finding in our study was the predilection for the temporal region (77%). This distribution has significant clinical implications. The temporal bulbar conjunctiva is the area most exposed to ultraviolet (UV) radiation. This supports the hypothesis that cumulative UV exposure may play a role in the pathogenesis of these melanocytic lesions, similar to cutaneous melanoma. Interestingly, while literature suggests that nasal lesions are more frequently benign, our study highlights the necessity of doing biopsy for any enlarging temporal lesion regardless of initial appearance.[6]

Histopathological results showed a higher proportion of Malignant Melanoma (61.5%) compared to nevi. This contradicts some population-based studies where nevi are significantly more common.[6,7,9,10] This difference is likely due to referral bias, as benign-appearing nevi are often managed or observed in primary or secondary care settings, whereas suspicious, larger, or rapidly changing lesions are referred to our tertiary center for definitive management

The predominance of "painless lumps" as a presenting symptom (69%) is a critical diagnostic takeaway. Patients and

clinicians may delay consultation because the lesions are asymptomatic. However, the high rate of malignancy in our series suggests that any new or changing pigmented conjunctival mass should be treated with high clinical suspicion. The transition from simple excision to wide excision (30.8%) in our study reflects the need for aggressive surgical margins (at least 3-4 mm) when malignancy is suspected to reduce the high risk of local recurrence.

Conclusion

In this 4-year study, conjunctival melanocytic tumors presented most frequently in adults as painless, unilateral temporal lesions. While rare, the high incidence of Malignant Melanoma in this tertiary cohort emphasizes the need for early referral and histopathological confirmation. The strong association with the temporal location suggests that UV protection and regular ocular surface screening are vital, particularly for patients presenting with "painless lumps" that may be mistakenly dismissed as benign.

Declarations

Statement on the Use of Artificial Intelligence

Artificial Intelligence was used to assist in drafting the declarations section of this manuscript. The authors are responsible for verifying the accuracy of these statements before submission and for disclosing any additional use of artificial intelligence in preparing the manuscript.

Author Contribution Statement

Fadhila Khairunnisa Poerwoko: Conceptualization, data collection, formal analysis, and writing—original draft. Raja Erinda: Conceptualization, methodological guidance, supervision, and writing—review and editing. Trilaksana Nugroho: Co-supervision, expert clinical input, validation, and writingreview and editing. Faiza Rizky A.S: Acquisition, provision, and interpretation of histopathological data and images, and writing review and editing.

Funding Statement

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflict of Interest

The authors declare no financial or non-financial conflicts of interest related to this research or its publication.

References

1. Whittington CP, Bresler SC, Simon C, Shields CL, Patel RM. Melanocytic lesions of the conjunctiva: An up-to-date review. Diagnostic Histopathology. 2023.
2. Misotten GS, Keijser S, De Keizer JW, De Wolff-Rouendaal D. Con- junctival melanoma in the Netherlands: a nationwide study. Invest Oph- thalmol Vis Sci. 2005;46:75–82.
3. Norregaard JC, Gerner N, Jensen OA, Prause JU. Melanoma maligna of the conjunctiva: occurrence and survival following surgery and ra- diotherapy in a Danish population. Graefes Arch Clin Exp Ophthalmol. 1996;234:569–572.
4. Tuomaala S, Eskelin S, Tarkkanen A, Kivela T. Population-based assessment of clinical characteristics predicting outcome of conjunctival melanoma in

whites. Invest Ophthalmol Vis Sci. 2002;43:3399– 3408.
5. Virgili G, Parravano M, Gatta G, et al. Incidence and survival of patients with conjunctival melanoma in Europe. JAMA Ophthalmol. 2020;138:601–608.
6. Alkatan HM, Alshomar KM, Helmi HA, Alhothali WM, Alshalan AM. Conjunctival Lesions: A 5-Year Basic Demographic Data and Clinicopathological Review in a Tertiary Eye Care Hospital. J Epidemiol Glob Health. 2022 Mar;12(1):25-39.
7. Shields CL, Fasiuddin AF, Mashayekhi A, et al. Conjunctival nevi: clinical features and natural course in 410 consecutive patients. Arch Ophthalmol 2004 Feb; 122: 167e75. https://doi.org/10. 1001/archopht.122.2.167. Erratum in: Arch Ophthalmol. 2006 Feb;124(2):198.
8. Luong, H.N. and Ramasubramanian, A. (2023) 'Conjunctival tumors in children', Advances in Ophthalmology and Optometry, 8(1), pp. 59-73. doi:10.1016/j.yaoo.2023.02.006.
9. Grimes JM, Shah NV, Samie FH, et al. Conjunctival melanoma: current treatments and future options. Am J Clin Dermatol 2020 Jun; 21: 371e81.
10. Alkatan HM, Al-Arfaj KM, Maktabi A. Conjunctival nevi: Clinical and histopathologic features in a Saudi population. Ann Saudi Med. 2010 Jul-Aug;30(4):306-12. doi: 10.4103/0256-4947.65265. PMID: 20622349; PMCID: PMC2931783.