

Eyelid Tumors in Children over a 10-Year Period

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Abstract

Introduction: Eyelid tumors in children are rare and, fortunately, mostly benign. Reconstruction after excision of these tumors is an extremely responsible procedure, considering the early age of the patient.

Aim: To analyze the incidence and location of malignant and benign tumors in children up to 18 years of age over a period of 10 years.

Materials and methods: We conducted a retrospective study of 29 eyes from a cohort of 450 eyes with tumors operated on in our clinic between 2010 and 2019. Of all tumors of the eye and adnexa, only tumors of the eyelids were considered. All tumors were histopathologically examined after their surgical removal.

Results: Eyelid tumors in children account for 6.4% of the tumors studied in all age groups, and 0.2% of them are malignant. The ratio of women to men is 62% to 38%, with most of them residing in cities. The most common eyelid tumors in children are cysts (47%), followed by papillomas (17%) and nevi (10%). The distribution on the eyelid is as follows: medially located 31%, centrally 45% and temporally 24%.

Conclusion: Eyelid tumors in children prefer the female sex. Malignant tumors of the eyelids are rare. The average size of tumors is about 4-6 mm. The duration of the disease directly correlates with the size of the tumor. For tumors of the lower eyelid, a doctor is consulted earlier than for tumors of the upper eyelid. Inflammatory reaction around the tumor is more common in the right eye.

Keywords

eyelid tumors, dermoid cyst, oculoplastic surgery, tumors children

INTRODUCTION

Eyelid tumors in children are rare. Inflammatory diseases such as abscesses and hordeolum are more commonly observed. Eyelid tumors in children are not only rare but, fortunately, mostly benign.^[1] Some of them are congenital, others arise after obstruction of various glands, viral infections, vascular malformations and tumors from other parts of the eye.^[2] Eyelid tumors cause great stress to parents because they are located in the central part of the face. On the other hand, reconstruction after excision of these tumors is an extremely responsible procedure, considering the early age of the patients. In turn, they cause stress for the surgeon.

AIM

Analysis of the occurrence and localization of malignant and benign tumors in children up to 18 years of age over a 10-year period.

MATERIALS AND METHODS

Our study adhered to the tenets of the Declaration of Helsinki. All the participants or their legal guardian(s) provided written informed consent. The Review Board of Medical University Pleven approved study protocol for retrospective studies.

A retrospective study of 28 (29 eyes) patients operated on in the Eye Clinic in Pleven for the period from 2010 to 2019. Of all tumors of the eye and adnexa, only tumors of the eyelids were considered. All tumors were histopathologically examined after their surgical removal.

Apparent inflammatory diseases such as chalazion and abscess were excluded from the sample, as this would alter the statistical results.

All statistical analyses were performed with SPSS, version 26 (IBM Corp.).

RESULTS

Descriptive analysis

Over a 10-year period, 450 patients with eyelid tumors aged 0 to 81+ years were treated at the Pleven Eye Clinic, including both benign and malignant tumors. Of these, 29 (6.4%) were eyelid tumors in children 0 to 18 years of age.

Of all eyelid tumors in children, only 1 tumor was malignant (bone metaplasia), which accounts for 0.2% of all childhood tumors. We may conclude from our study that less than 0.5% of children during a ten-year period will develop malignant tumors.

Sex distribution: 11 males (38%) to 18 females (62%), which is significant ($p < 0.001$). We can conclude that tumors are more frequent in female children (Fig. 1). The distribution by place of residence is as follows: 25 (86%) live in cities and 4 (14%) live in a village.

The distribution by age is shown in Fig. 2. Broken down by affected eye, we observed eyelid tumors in 15 right eyes and 14 left eyes. By tumor location, we found that 12 tumors involved the lower eyelids and 17 – the upper eyelids. All three indicators showed an even distribution without statistical significance.

Based on the distribution of tumor size, we see that the majority of tumors are 4-6 mm in size, although no significance was found for this criterion (Fig. 3).

Regarding histology, the most common tumors in children were the various types of dermoid cysts (47%), followed by papillomas (17%) and nevi (10%). The remaining histological variants of tumors in children are shown in Fig. 4.

Surgical descriptive analysis

The location of tumors on the eyelids is of paramount importance for the choice of surgical technique. Of all tumors in children, 9 (31%) were medially located, one of which involved the medial margin completely. Thirteen (45%) tumors were centrally located, and 7 (24%) tumors were temporally located.

Two types of anesthesia were used during surgery – general and local. Fourteen children were operated with local anesthesia and 15 with general anesthesia. Local anesthesia is preferred in older children, in whom verbal contact and consent to manipulations are possible.

Two types of surgical techniques were used to reconstruct the excisional defect: direct closure and Laissez-faire (free healing). The surgical wounds of the eyelids of 27 children were closed directly, and the wounds of 2 children were allowed to heal freely.

Important indicators for choosing a surgical technique are the presence of an inflammatory reaction around the tumor and whether the eyelid margin is affected by the tumor. We found an inflammatory reaction around the tumor in 6 children. The eyelid margin was involved in 6 children. These two findings were not statistically significant, but involvement of the eyelid margin determined the choice of reconstructive technique. However, the involvement of the eyelid margin was mainly lamellar and allowed partial thickness excision. All excisions of eyelid tumors in children were performed in partial thickness.

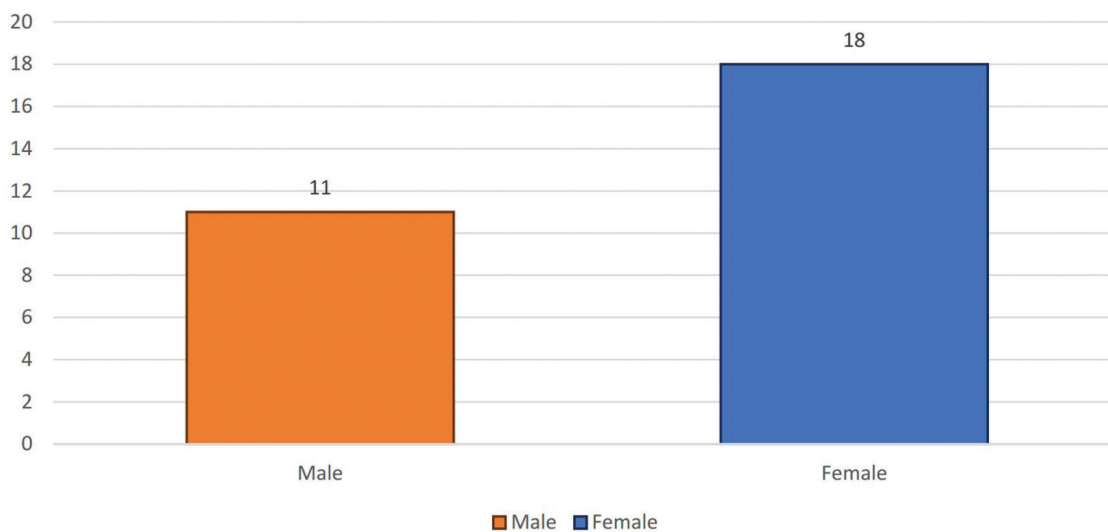


Figure 1. The sex distribution is in favor of women ($p < 0.001$).

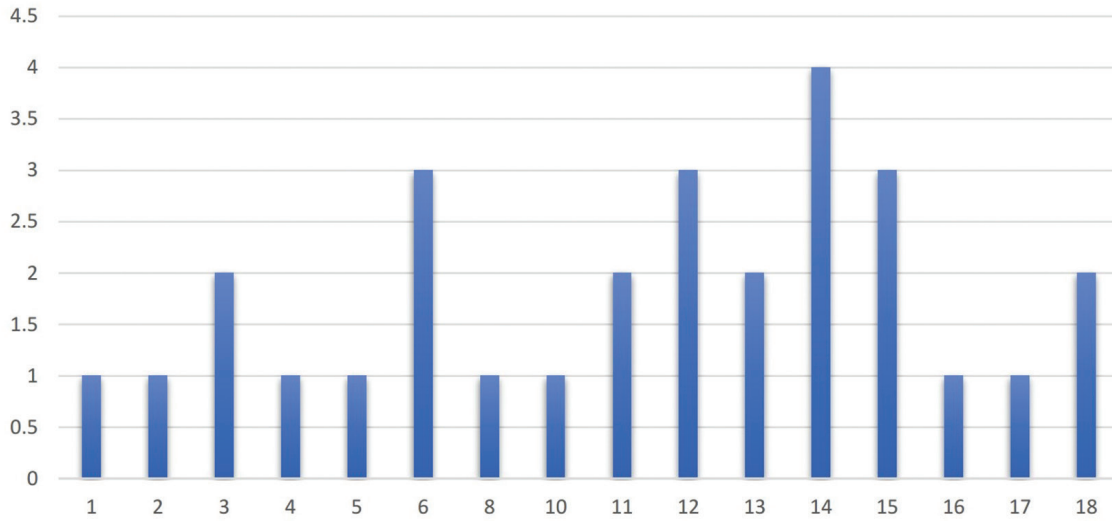


Figure 2. Distribution by age.

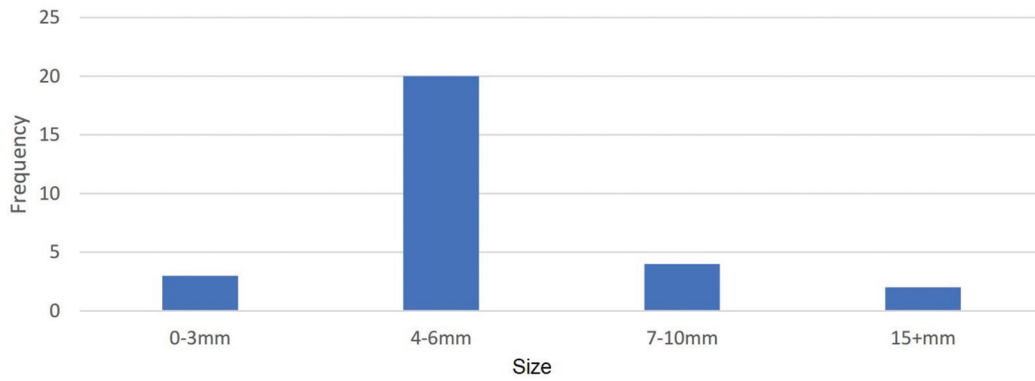


Figure 3. Tumor size.

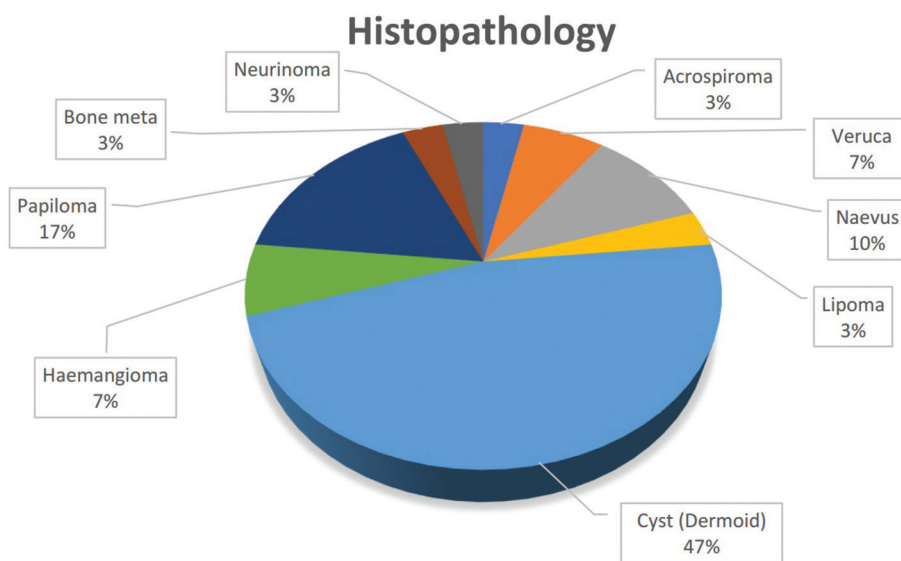


Figure 4. Histological variants of eyelid tumors in children.

Correlation analysis

Bivariate correlation analysis was performed to determine the relationship between baseline parameters in pediatric eyelid tumors. A greater percentage of inflammatory responses were found around right eye tumors and this relationship was significant ($p < 0.001$).

Another significant indicator is the duration of the disease, which is in favor of the upper eyelid ($p < 0.001$). In other words, tumors of the lower eyelids are more likely to seek actively to be seen by a physician than tumors of the upper eyelids.

Another significant relationship is that between the age of onset and the size of the tumor. As expected, the later the tumor was treated, the larger it was ($p < 0.001$) (Fig. 5).

DISCUSSION

Most eyelid tumors in children are benign.^[2-5] Of these, the most common tumor in children is chalazion/hordeolum. We intentionally excluded this group from our follow-up because its incidence is much higher than that of other tumors, which statistically alters the tumor sample in children.^[6]

We have observed only one malignant tumor in the pediatric population – bone metaplasia, which accounts for less than 0.5% of all eyelid tumors in children. This percentage is similar in most other authors^[2], but some of them report a higher percentage (2.5%) of malignant tumors.^[7,8]

The distribution by sex is significant in females. This suggests that eyelid tumors in children occur predominantly in females. Most authors show a similar tendency^[9], only a few gives preference to the male sex.^[2]

In our sample, most children with eyelid tumors lived in cities. We could not find a comparison sample for this metric in other work, so we accept our result as credible.

Our age distribution is uniform. Other authors show a greater frequency of tumors at an older age.^[2,3] Moreover,

we have an even distribution between the left and right eyes and between the upper and lower eyelids. Such distribution in similar percentages is found in adult patients in many articles in the literature^[2,9-12], but we did not find similar statistics in children.

When comparing tumor size, we found that the 4-6 mm group had the most cases of eyelid tumors in children. Because of our small sample size, we were unable to demonstrate a significant difference, but we did have a clear trend. Despite our efforts to find an article tracking the size of eyelid tumors in children, we were not successful. Therefore, we accept our result as valid.

Tumor size is directly related to the age of onset. We have established with high statistical reliability a relationship between the size of the tumor and the time of seeking medical help. This relationship is logical and to be expected: the later medical help is sought, the larger the tumor. We have not found a similar relationship in other authors reporting on eyelid tumors in childhood.

The most common tumors in children are the various types of dermoid cysts, followed by papillomas and nevi, the others being represented in smaller percentages. This shows some similarity with other authors.^[2,3,5-7]

Regarding the surgical and biopsy technique, all patients were excised directly without prior biopsy. The edges of the wound were histologically controlled. Two closure techniques are mainly used: direct closure and ‘Laissez-Faire’ (free healing). In direct closure, the rule of horizontal traction of the eyelid after suturing was applied. Vertical traction is avoided due to the formation of positional anomalies after the wound defect is contracted.

In children, we preferred direct closure because the periocular structures are not still maturing, and complex reconstructions would result in rough cicatrices that become larger and more visible with age. Another reason we choose direct closure or free healing of the wound, especially in young children, is the fact that immediately after surgery, they try to remove the dressing and rub the wound.

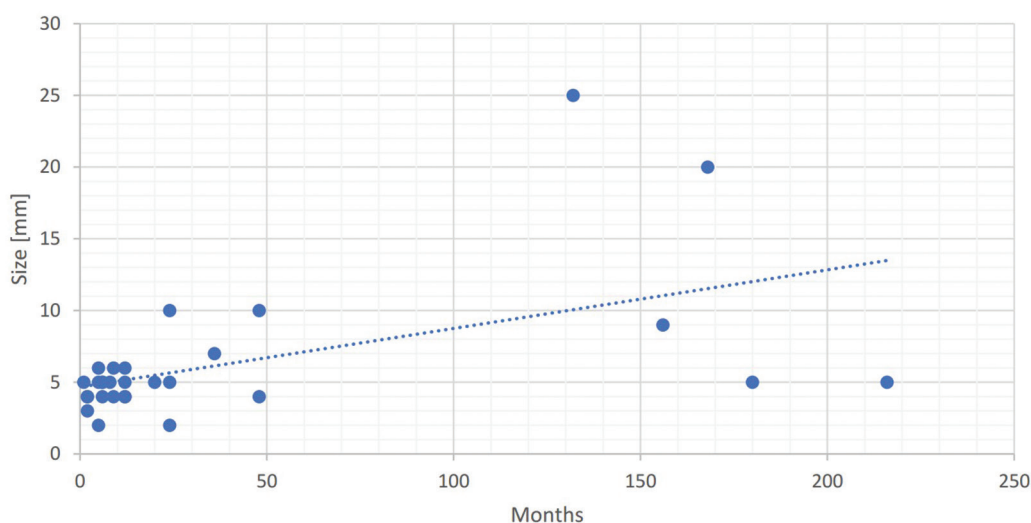


Figure 5. Relationship between tumor size and disease duration.

Direct closure allows safer closure of the surgical wound in these young patients. Whenever possible, we used absorbable Vicryl and Vicryl Rapid sutures to avoid subsequent general anesthesia for suture removal.

Ciliary margin engagement in children is a major surgical challenge because during the growth process it is difficult to control laxity, eyelid position, and postoperative scarring. In children 0 to 6 years old, the immune response is immature and the scar formed is small. In contrast, in children between 6 and 16 years of age, the immune response is immediate and strong, and therefore a rougher cicatrix is formed.^[13] Fortunately, the tumors in our sample predominantly involved the anterior lamella of the eyelid, so we could better control the scar.

If the child is older and cooperates in surgery, we always use local anesthesia to reduce the overall surgical risk, although a number of studies indicate that it is low.^[14]

Our correlation analysis revealed two other significant relationships, for which we also have no comparative studies with other authors. The first is that the inflammatory reaction around eyelid tumors in children is more likely to occur with tumors of the right eye. The second association is again related to the timing of seeking medical attention, but this time it involves the lower eyelid. Patients with lower eyelid tumors were more likely to seek medical attention than patients with upper eyelid tumors. We have no explanation for this statistical fact, nor have we found similar studies by other authors. We hypothesize that this fact can be explained by the fact that tumors of the lower eyelid are more visually conspicuous than those of the upper eyelid, because the upper eyelid partially shortens during blinking movements, making the tumors of the upper eyelid less conspicuous than those of the lower eyelid. This claim of ours is more speculative than scientifically proven.

CONCLUSION

Eyelid tumors in children present a surgical challenge due to the paucity of reconstructive options, especially in the 0-6 age group. The female sex predominates, especially in the urban population. Malignant tumors of the eyelids are rare in children. Eyelid tumors are quickly noticed by parents, so children with small tumors of about 4-6 mm in size are operated on early. The age of onset of the disease directly correlates with the size of the tumor. Tumors of the lower eyelid are treated earlier than those of the upper eyelid. The peritumoral inflammatory reaction occurs predominantly in the right eye.

Ethical Statement

The study was conducted in accordance with the principles for human experimentation as defined in the Declaration of Helsinki, local Good Clinical Practice Guidelines and

local Medical University of Pleven Institution Guidelines (Ethics Committee approval No. 716-KENID/12.1.2023).

Informed consent

Written informed consent was obtained from the patients' legal guardian(s) for publication of the details of their medical cases and any accompanying images.

Conflict of Interest

The authors have no conflicts of interest to declare.

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No funding was received.

Author contributions

All authors have equally contributed to the paper including in the patient follow-up and article preparation. There are no other parties to acknowledge.

Data availability

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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Опухоли век у детей в течение 10-летнего периода

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Резюме

Введение: Опухоли век у детей встречаются редко и, к счастью, в основном доброкачественные. Реконструкция после удаления этих опухолей является чрезвычайно ответственной процедурой, учитывая ранний возраст пациента.

Цель: Анализ частоты и локализации злокачественных и доброкачественных опухолей у детей до 18 лет за период 10 лет.

Материалы и методы: Мы провели ретроспективное исследование 29 глаз из когорты из 450 глаз с опухолями, прооперированными в нашей клинике в период с 2010 по 2019 год. Из всех опухолей глаза и его придатков рассматривались только опухоли век. Все опухоли были гистопатологически исследованы после их хирургического удаления.

Результаты: Опухоли век у детей составляют 6,4% от изученных опухолей во всех возрастных группах, и 0,2% из них являются злокачественными. Соотношение женщин и мужчин составляет 62% к 38%, при этом большинство из них проживают в городах. Наиболее распространёнными опухолями век у детей являются кисты (47%), за которыми следуют папилломы (17%) и невусы (10%). Распределение на веке следующее: медиально расположенные 31%, центрально 45% и височно 24%.

Заключение: Опухоли век у детей предпочитают женский пол. Злокачественные опухоли век встречаются редко. Средний размер опухолей составляет около 4-6 мм. Длительность заболевания напрямую коррелирует с размером опухоли. При опухолях нижнего века к врачу обращаются раньше, чем при опухолях верхнего века. Воспалительная реакция вокруг опухоли чаще встречается на правом глазу.

Ключевые слова

опухоли век, дермоидная киста, окулопластическая хирургия, опухоли у детей
