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Intraocular medulloepithelioma: case series

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ABSTRACT

BACKGROUND: The purpose of this study was to report the outcomes of an extremely rare and misdiagnosed embryonal neuroepithelial intraocular tumor.

MATERIAL AND METHODS: The medical records of 28 nucleated eyes with unilateral vision loss in childhood and young adults were reviewed retrospectively. Demographic information, clinical history, visual acuity, indication for surgery, and histopathological findings were all noted. Cases of visual loss related to ocular trauma or endophthalmitis were not included in this study. B-scan ultrasonography was performed on patients due to media opacity.

RESULTS: A total of 7 eyes of 28 patients, age between 1–18 years, who were underwent enucleation surgery for intraocular malignancy were included in the study. The mean follow-up period was 29.4 ± 10.2 months (range, 15–60 months). The mean age of the patients was 5.85 ± 7.33 years. There were four females and three males with equal eye distribution. The patients had no light perception. Five of 7 patients were operated on for retinoblastoma in the early period of life with easily recognized clinical signs. The other two patients wanted surgery just because they were uncomfortable with the appearance of their eyes. One of them was a 15-year-old girl with a history of blind eye and glaucoma. She had been treated for congenital glaucoma since the age of 5. At the time of the research she was complaining about the painful, blind eye as an aesthetic defect. Histopathological diagnosis was reported as medulloepithelioma. As a long-term complication, submandibular lymph node metastasis was detected during the follow-up period. Otolaryngologists performed the radical neck dissection. The patient received radiotherapy and chemotherapy. She is now in her 30s. No other complication was observed during the follow-up period. The other patient was an 18-years-old boy, who had lost his vision for an unknown cause in childhood, and wanted to have surgery for aesthetic purposes due to opaque cornea. Ultrasonography detected a mass in the ciliary body. The enucleation surgery was performed, and histopathological diagnosis was reported as medulloepithelioma. The patient received radiotherapy, and no metastasis developed during the follow-up period.

CONCLUSION: Ophthalmologists need to be more familiar with early diagnoses and screening of the eye, especially detecting tumor cases "medulloepithelioma" which is often misdiagnosed and treated as glaucoma.

KEY WORDS: ciliary epithelium; enucleation; malignant; medulloepithelioma

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INTRODUCTION

Enucleation and evisceration are types of eye removal surgery used as a palliative treatment in cases of severe trauma, eye malignancy, endophthalmitis unresponsive to medical treatment, painful blind eye, absolute glaucoma, and phthisic eyes with severe cosmetic defects [1, 2]. Evisceration surgery is usually preferred in extremely severe trauma cases, while enucleation is used in advanced cases of intraocular malignancy. Both procedures result in an

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anophthalmic socket [1]. One review study stated that trauma accounts for 40.9% of enucleation cases, whereas tumors were 24.2%. In another study, endophthalmitis accounted for 45.5% of cases, whereas *phthisis bulbi* and trauma together were 39.5% [2–4]. Malignant intraocular tumors are managed by enucleation. This prevents the tumor spread into the orbital cavity. Retinoblastoma is one of the most common intraocular tumors in the pediatric age group. The other is medulloepithelioma, a rare embryonal neuroepithelial tumor arising from primitive medulloepithelioma. Medulloepithelioma tends to cause secondary glaucoma and often is misdiagnosed until adulthood [1, 2, 5–7].

There are some parameters used to distinguish these two intraocular tumors. These can be summarized as follows: intraocular cystic changes and the location of the more anterior position, such as the ciliary body or iris, are more common in medulloepithelioma, whereas retinoblastoma typically originates from the retina, and intratumoral calcification is a suitable differential parameter since it is less observed in medulloepithelioma [8–11].

There is no population-based information on the incidence or prevalence of medulloepithelioma. The literature consists mostly of single case reports and small series [12]. In a study involving 10 patients, authors stated that the age of medulloepithelioma was between 2 months and 10 years [13]. There is also limited information on long-term survival. Tumors confined to the globe have an excellent prognosis, with a 5-year survival of 90–95% after enucleation. Extension of the tumor into the extrascleral orbital soft tissues dramatically increases the rate of metastatic disease and recurrence, resulting in a poor overall prognosis.[14]

In our study, we wanted to emphasize the importance of the early diagnosis and treatment of medulloepithelioma, a rare childhood intraocular tumor.

MATERIAL AND METHODS

The medical records of 7 eyes of 28 patients under 20 years of age were reviewed retrospectively. The study protocol adhered to the tenets of the Declaration of Helsinki and was approved by the ethics committee. Fully informed, written consent forms from patients were obtained. The patients' demographic information, clinical history, visual acuity, indication for surgery, duration of follow-up, complications encountered during the follow-up period, and histopathological findings were all noted. B-scan ultrasonography was performed on patients due to media opacity. Inclusion criteria for enucleations were: eye malignancy unresponsive to medical therapies or eye malignancy when medical treatments were impossible at the advanced stages during the diagnosis. Exclusion criteria were visual loss related to ocular trauma or endophthalmitis.

RESULTS

Seven eyes of 28 patients (aged between 1 and 18 years) underwent evisceration or enucleation surgery between 2000 and 2018. The mean follow-up period was 29.4 ± 10.2 months (range 15–60 months). The average age of all patients was 5.85 ± 7.33 years. There were four females and three males with equal eye distribution. All cases of eye removal were uniocular. Related features include painful blind eye and glaucoma 14.3% (n = 1), retinoblastoma 71.4% (n = 5), and ciliary body mass 14.3%(n=1). The patients' demographics were summarized in Table 1.

Of the seven patients who underwent enucleation, five were operated on for retinoblastoma. One patient, who had been treated for congenital glaucoma for many years and then operated on for a painful blind eye, developed cystic dilatation in the anophthalmic socket (Fig. 1, 2).

One patient was operated on for ciliary body mass detected on ultrasound. Histopathology of two enucleated eyes was reported as medulloepithelioma (Fig. 3); these patients received radiotherapy. In one of these two patients, submandibular lymph node metastasis extending to the midjuguler region was detected as a long term complication during the follow-up period. Radical neck dissection was performed by otolaryngologists, and the patient received radiotherapy and chemotherapy. The other patient received radiotherapy after enucleation surgery. No metastatic finding was observed during the follow-up period.

Table 1. Surgical indications of patients who underwent total eye removal

Indication	Number of cases n (%)
Painful blind eye/absolute glaucoma	1 (14.3%)
Ciliary body mass	1(14.3%)
Malignancy (retinoblastoma)	5 (71.4%)

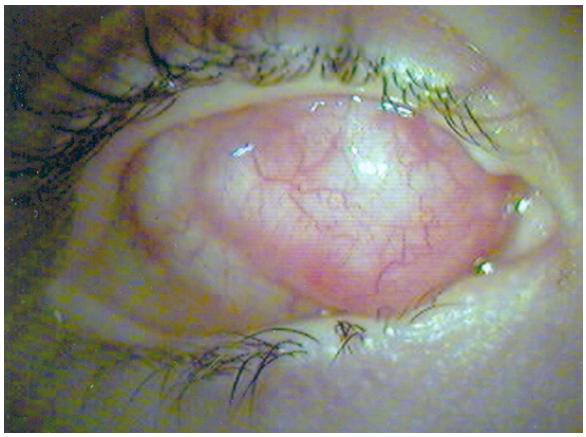

FIGURE 1. Preoperative view of the anophtalmic socket of the patient with cystic dilatation

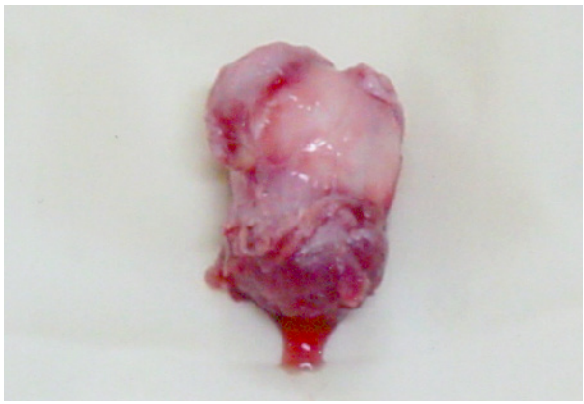

FIGURE 2. The enucleated orbital content with orbital sphere

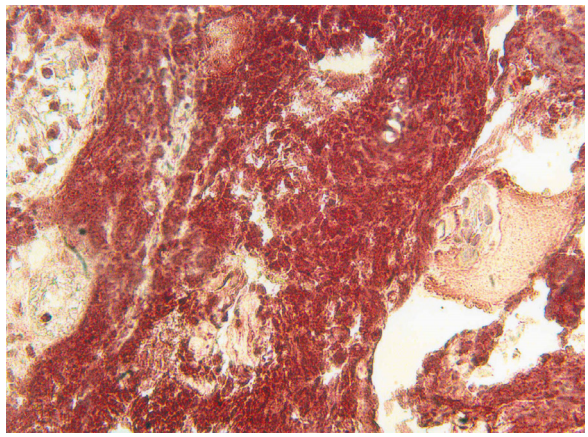

FIGURE 3. A rare embryonal neuroepithelial tumor (medulloepithelioma). It composed of poorly differentiated cells with hyperchromatic nuclei and high nuclear-to-cytoplasmic ratio and pseudostratified epithelium with tubular or trabecular arrangements (H & E x 200)

DISCUSSION

Enucleation is an accepted modality of treatment for patients with: severely traumatized eyes, advanced stages of tumors, and cosmetically unacceptable or painful blind eyes [15]. Indications of enucleation vary across different centers in the world [15]. In a review study, trauma was reported as the leading cause of enucleation (40.9% of cases), and intraocular tumors were the second leading cause (24–28% of cases) [2, 16]. Other conditions are glaucoma, and painful blind eye, cosmetically unacceptable eye. We performed enucleation surgery in tumors and absolute glaucoma with painful eyes. Tumors in our study constituted 25% (n = 7) of enucleated eyes.

The most common intraocular tumors of childhood are retinoblastoma; 90% of patients are diagnosed before reaching the age of five [6, 17, 18]. Leukocoria and strabismus are the most common first signs of the tumor [6]. Sometimes it can cause proptosis [6]. Treatment of retinoblastoma is complex and varied according to its clinical features. If left untreated, it will grow and extend beyond the eye, invading the regional lymph nodes, bone marrow, and the central nervous system [6]. We treated five patients diagnosed with retinoblastoma at the age of 1- and 2-years-old, performing enucleation surgery. We did not encounter any complications during follow-up.

Medulloepithelioma is another childhood ocular malignancy [17]. It is a rare embryonal neuroepithelial intraocular tumor stemming from primitive medullloepithelium, diagnosed in the first decade of life [7]. Small medulloepitheliomas of the ciliary body go undetected because they are hidden from view by the iris. It appears as a gray-white tumor of the ciliary body in the early stages. The growth of medulloepithelioma is slow, and it is locally invasive. Poor vision and pain are the most common presenting symptoms. Even after symptoms develop, clinical suspicion of a tumor is often overlooked — patients are treated for secondary complications of the tumor such as cataract or glaucoma before the underlying mass is discovered. While it slowly enlarges, the most common clinical signs include cyst or mass in the iris, anterior chamber, or ciliary body [7, 11, 19]. This was clearly seen in our study: one of our patients suffering from congenital glaucoma underwent trabeculotomy procedure. However, absolute glaucoma of the left eye was noted two years later during follow-up. The patient was subsequently operated on because of blind painful eye and also unpleasant appearance. The histopathology was reported as a neu-

roepithelial tumor (medulloepitelioma). The patient was later lost to follow-up. When she came back seven months after surgery, she had a small swelling of the right submandibular lymph node. Biopsy of the material was reported as medulloepithelioma metastasis. The patient was operated on and received radiotherapy and chemotherapy. No recurrence was observed during the follow-up period. She is now in her 30s, and no other complication was observed during the follow-up period. The other patient was an 18-years-old boy, who lost his vision for an unknown reason in childhood, and wanted to have surgery for aesthetic purposes due to opaque cornea.

CONCLUSIONS

Medulloepithelioma is a rare, slow-growing, and locally invasive childhood intraocular tumor. Poor vision and pain are the most common presenting symptoms. Patients often are treated for glaucoma for years, with medulloepithelioma not being noticed due to its tendency to cause secondary glaucoma. Therefore, getting to know the tumor well and treating it is very important to prevent future complications.

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Conflict of interest

The author has no relevant affiliations or financial involvement with a financial interest in or financial with the subject matter or materials discussed in the manuscript.

Statement of ethics

The study protocol was approved by the Ethics committee of Kartal, LutfiKirdar Education and Research Hospital, Istanbul,Turkey (decision number: 2020/514/177/41).

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