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CASE STUDY

A CASE OF CONJUNCTIVAL MALIGNANT MELANOMA EFFECTIVELY TREATED BY TUMOR RESECTION AND CRYOTHERAPY IN A 14-YEAR-OLD BOY

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Abstract Background: Conjunctival melanoma occurs mostly in patients over 50 years of age. In contrast, conjunctival melanoma in children is extremely uncommon.

Case: A 14-year-old boy presented with a pigmented mass of bulbar conjunctiva in his right eye.

Observations: Surgical excision was performed and pathological examination showed his conjunctival tumor was malignant melanoma. Thereafter his tumor was treated by extended resection and cryotherapy. After the second operation, no abnormal findings have been detected.

Conclusion: Even in younger age, pigmented conjunctival regions may sometimes be malignant. Therefore, we should consider this possibility and evaluate such patients very carefully. Combined management with surgery and cryotherapy may be effective for conjunctival melanoma in children.

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Key words: childhood conjunctival melanoma; cryotherapy.

症例研究

腫瘍切除および冷凍凝固術により良好な経過を辿った 14歳結膜悪性黒色腫の1症例

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抄録 緒言：結膜黒色腫はその多くは50歳以上の患者にみられ，小児期にみられることは非常に稀と考えられている．今回我々は，14歳の少年にみられた結膜悪性黒色腫の1例を経験したので，文献的考察を加えて紹介する．

症例：患者は14歳少年，12歳時に右眼球結膜に色素沈着を伴う隆起性病変があることに気づき，最近増大したため精査加療を求めて弘前大学眼科を受診した．腫瘍切除を施行したところ，病理学的検査により腫瘍は悪性黒色腫であることが判明し，直ちに結膜の拡大切除と冷凍凝固術が施行された．2回目の手術後，現在まで再発はみられていない．

結論：小児期の結膜色素病変は，時に悪性のこともあるので，注意深い経過観察が必要と思われる．また，小児結膜悪性黒色腫において，腫瘍切除と冷凍凝固術の併用は有効な治療手段の一つと考えられる．

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キーワード: 小児結膜黒色腫; 冷凍凝固術.

Introduction

Conjunctival melanoma occurs with a high frequency in patients over 50 years of age[1-3]. In contrast, there have only been a few case reports on childhood conjunctival melanoma

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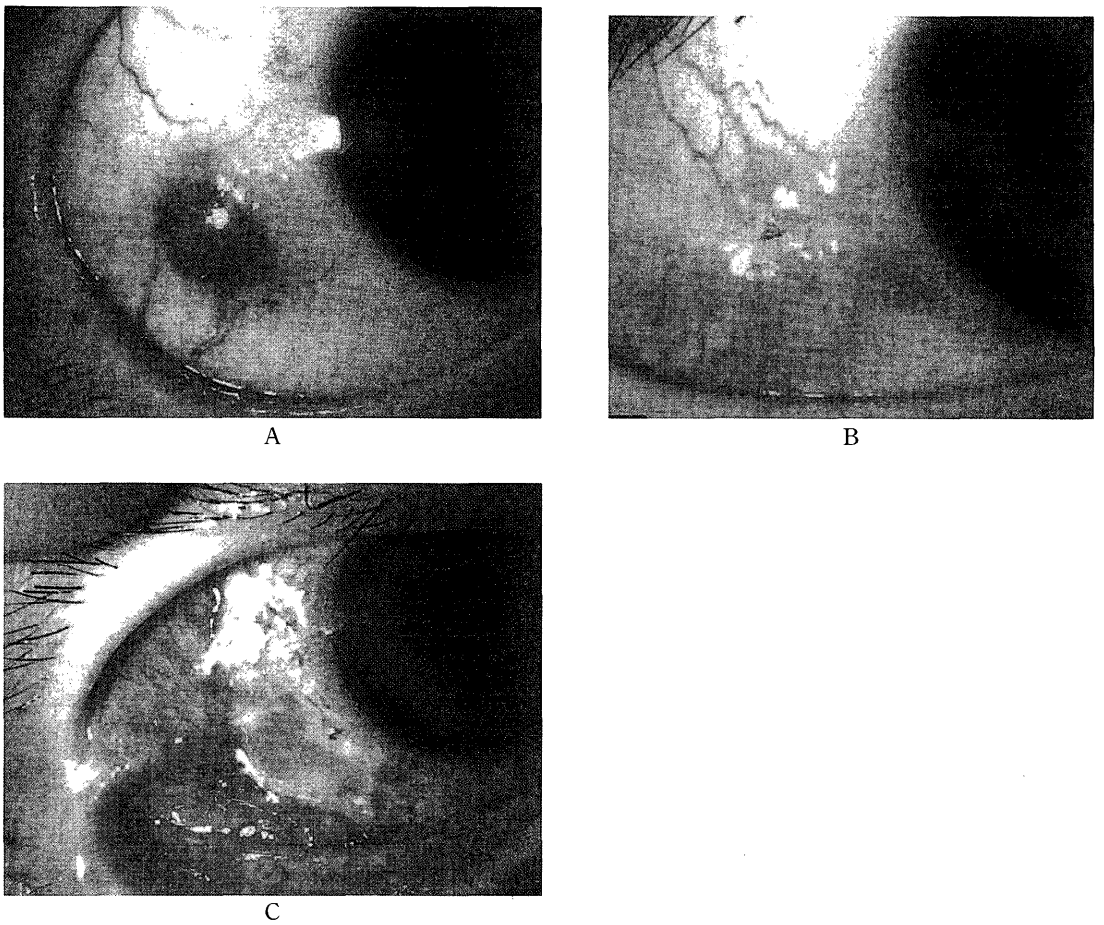

Figure 1 Slitlamp photographs of right eye.
A: initial examination, B: after 1st operation, C: after 2nd operation.

in patients under age 20, and its occurrence in patients under 15 years is extremely rare[4]. In the previous literature, most younger patients with conjunctival malignant melanoma showed a poor prognosis[5].

Herein we report a case of conjunctival melanoma in a 14-year-old boy who was successfully treated by a combination of tumor resection and cryotherapy.

Case

A 14-year-old boy had a pigmented bulbar conjunctival mass since 12 years of age and noticed its enlargement, and then was referred to our hospital for further evaluation and management of the tumor. He had no history of systemic disease including malignant tumors. Best-corrected visual acuities of both eyes were 1.2 at his initial examination in our institute. Intraocular pressures were 18 mm Hg in both eyes. Ophthalmic examinations revealed no abnormalities in the left eye. Slit lamp examination of his right eye showed a pigmented tumor, which was round-shape with clear margin, 4 mm in diameter and approximately 0.5-0.8 mm in height, and had prominent feeder vessels on the bulbar conjunctiva in the temporal quadrant. Tumor was not attached to the limbus. And the blue-pigmented sclera was seen just adjacent to the tumor (Fig. 1A). We did not find pigmented tumors on the palpebral skin, nor palpebral conjunctiva. Indirect funduscopic examination did not reveal any abnormality in either eye. No abnormal

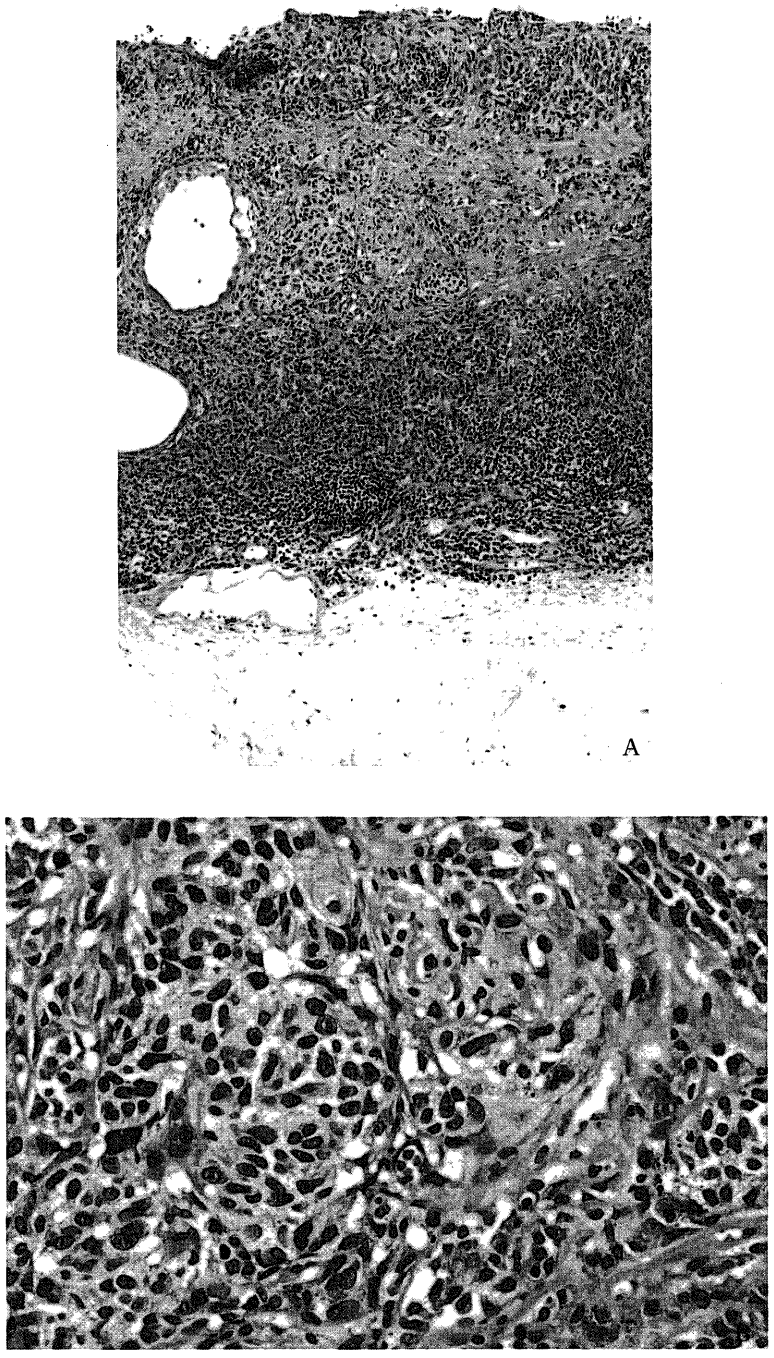

Figure 2 Light microscopy of conjunctival tumor resected by 1st operation (hematoxylin-eosin staining; A: × 100, B: × 400).

The glomerular and alveolar proliferation of oval to spindle-shaped atypical cells with prominent nucleoli and cytoplasmic melanin granules associated with infiltration of lymphocytes and plasma cells is seen.

findings were observed by whole body CT scan and Ga scintigraphy examinations.

The conjunctival tumor was totally resected with a 2 mm safety margin in case the tumor may be malignant melanoma (Fig. 1B). Pathological study revealed glomerular and alveolar proliferation of oval to spindle-shaped atypical cells with prominent nucleoli and

cytoplasmic melanin granules associated with infiltration of lymphocytes and plasma cells (Fig. 2). Immunohistochemical examination showed the positivity of HMB-45 and melan A, both anti-melanoma antibodies, of atypical tumor cells (data not shown). These findings were considered to be consistent with the diagnosis of malignant melanoma, and tumor cells were also observed at the resected margin. Thereafter, additional surgical intervention was performed to resect a wider area and the region was treated with cryopexy (Fig. 1C). Fortunately, the resected margin was free of tumor cells by pathological study. After the second operation, no recurrence and no metastasis have been observed so far. We are following the patient very closely to detect recurrence and metastasis.

Discussion

Malignant melanoma often occurs in the conjunctiva in elderly people. In contrast, reports of conjunctival melanoma in children are extremely uncommon[1-2]. Shilds et al.[3] examined 150 consecutive patients with conjunctival malignant melanoma, and reported that the mean age at the first visit was 60 years old and only 2 (1%) were aged 16 to 20 years. Statistically, McDonnell et al.[4] reported that most conjunctival legions (91.5 %) in children are nevi, and that among 71 patients under 20 years old with conjunctival melanocytic proliferation, only a few cases were demonstrated to have malignant changes. In our survey of the literature, there have been 5 reported cases of conjunctival malignant melanoma in patients under 15 years of age[4, 6-8], and in Japan[9], there was only one case of conjunctival malignant melanoma under age 20 (Table 1). In a 20-year-old Japanese case[9], he had a pigmented conjunctival mass for 17 years and noticed that the lesion began to grow in 2 months accompanied with foreign body sensation. In addition, the lesion infiltrated to upper and lower palpebral conjunctiva. Although our present case had no palpebral lesion, he should be followed for a long time as conjunctival melanoma in childhood can show a rapid enlargement or infiltration of the palpebral conjunctiva. According to Table 1, bigger tumors (more than 4 mm) may tend to cause local invasion or systemic metastasis, but there is insufficient detailed clinical information in the literature to forecast the prognosis for children with malignant melanoma of the conjunctiva.

Grossniklaus et al.[10] reviewed clinicopathological aspects of 2400 conjunctival lesions in adults, and described that malignant melanoma was relatively rare and mainly arose from acquired conjunctival melanosis. Its mortality rate was 14-32% and prognostic factors depended on the localization of tumor, cell type, infiltration of the lymphatics, and

Table 1 Conjunctival melanoma in young patients under the age 20

Age (yrs) / Race / Sex	Tumor Size or Thickness (mm)	Metastatic Interval	Outcome / Interval
12[4] / W / M	NA	None	NED / 18 yrs
12[4] / W / M	4	Local, 5 mos	NED / 20 mos
16[4] / W / F	2.5	None	NED / 20 mos
10[6] / NA / M	NA	NA	NA
13[7] / NA / NA	NA	NA	NA
11[8] / W / M	27×12	Systemic, NA	NA
20[9] / J / M	7.5×5	Local, 13 mos	NED / 19 mos
14* / J / M	4×4, 0.5-0.8	None	NED / 19 mos

W = White; J = Japanese; NA = not available; NED = no evidence of disease
* = present case

tumor height. The risk of metastatic spread is high in the following tumors: height over 0.8 mm; mitotic rate over 5/10 hpf; invasion of caruncle or palpebral conjunctiva; missing inflammatory reaction around the tumor. In terms of young patients, Crawford[5] reported that five of eight fatal cases occurred in patients whose age was between 28 to 37, and concluded that conjunctival melanomas in younger patients had poorer prognosis. In the present case, tumor height was approximately 0.5-0.8 mm and tumor enlargement occurred, but no involvement of the palpebral, caruncular or forniceal conjunctiva was observed. According to the previously reported cases and our present case, increasing tumor size and/or thickness and the invasion of the palpebral conjunctiva are suspicious signs for malignancy in conjunctival melanoma in childhood.

In the past, there has been controversy regarding the optimal management of conjunctival melanoma. Reese recommended orbital exenteration with prophylactic radial neck dissection for melanoma arising from nevus and from primary acquired melanosis[11]. Sivers et al. suggested complete local resection of the tumor[12]. Lederman advocated local radiotherapy[13] and Zografos et al.[14] discussed indications for proton beam irradiation. However, Lommatzsch et al.[15] reported no difference in prognosis when comparing conjunctival melanomas treated with surgical excision associated with brachytherapy versus cryotherapy. Several authors[16,17] have advocated combined surgery and cryotherapy for conjunctival melanoma. In fact, the selective effectiveness of cryotherapy for melanocytic proliferation of the conjunctiva has been demonstrated both clinically and ultrastructurally. In the present case, we performed extended conjunctival resection and cryotherapy, and there has been no recurrence or systemic metastasis so far. However, this patient needs to be followed very closely throughout his life because the recurrence rate of conjunctival melanoma is described to be 26% at 5 years, 51% at 10 years, and 65% at 15 years follow-up[3], respectively.

In conclusion, even in young age, pigmented conjunctival regions may sometimes be malignant. Therefore, we should consider this possibility when taking care of such patients, with the understanding that combined surgery with cryotherapy may be effective for conjunctival melanoma in children.

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