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Bilateral choroidal melanoma – case analysis and literature review

Analiza przypadków obustronnego czerniaka błony naczyniowej w materiale własnym i przegląd piśmiennictwa

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Summary: Uveal melanoma is the most common primary intraocular neoplasm in adults. Its bilateral localization is extremely rare. The aim of the paper is analysis of the cases of bilateral uveal melanoma. Five bilateral uveal melanoma patients were diagnosed in the Department of Ophtalmology and Ocular Oncology beetwen 1980 and 2014. Both eyes of four patients were threated with brachytherapy. Final enulcleation of the one eye was performed in three patients. It was the primary treatment in one patient. The presence of uveal melanoma was confirmed by pathological examination in all cases after surgical removal of eyeball and in one after local resection of iris tumor. Metastatic lesions were diagnosed in lungs and liver in two patients. Three patients are still followed-up at our institution. The possibility of bilateral uveal melanoma should considered although it is extremely rare.

Key words: bilateral uveal melanoma, brachytherapy, enucleation.

Streszczenie: czerniak błony naczyniowej jest najczęstszym pierwotnym nowotworem wewnątrzgałkowym u osób dorosłych. Jego obustronne występowanie jest niezmiernie rzadkie. Celem opracowania jest analiza przypadków występowania obustronnego czerniaka błony naczyniowej w materiale Oddziału Okulistyki i Onkologii Okulistycznej Szpitala Uniwersyteckiego w Krakowie. W latach 1980–2014 stwierdzono 5 takich przypadków. Obustronnej brachyterapii poddano czworo pacjentów. W trzech przypadkach przeprowadzono ostatecznie wyłuszczenie jednej gałki ocznej. W jednym przypadku było to leczenie pierwotne. We wszystkich przypadkach po enukleacji i w jednym po wycięciu guza tęczówki badaniem histopatologicznym potwierdzono obecność czerniaka błony naczyniowej. U dwojga pacjentów stwierdzono ogniska przerzutowe w wątrobie i płucach. Troje chorych pozostaje pod stałą kontrolą okulistyczną w tutejszej klinice. Chociaż czerniak błony naczyniowej rzadko występuje obustronnie, podczas badania należy wziąć pod uwagę taką ewentualność.

Słowa kluczowe: obustronny czerniak błony naczyniowej, brachyterapia, enukleacja.

Introduction

Uveal melanoma is the most common primary intraocular neoplasm in adults (1, 2). Every year, 6–7 new cases are diagnosed in one million of Caucasian population (3, 4). About 200–300 new cases are diagnosed in Poland every year, but there is no precise data due to the absence of central register of uveal melanoma in Poland. Intraocular melanomas are located within the uvea in 85% of cases, within cilliary body in 9% and within the iris in 6%, most frequently being unilateral lesions (5). Bilateral uveal melanoma is extremely rare (6–99). Its estimated incidence is 1 case per 50 million of European population (8,10). According to the United States data, such cases are observed once every 18 years (2, 11, 12). Few cases of bilateral uveal melanoma have been reported in the literature, so we decided to present an analysis of such cases diagnosed, treated and monitored at the Department of Ophthalmology and Ocular Oncology of the University Hospital in Krakow (5, 12–15).

Material and methods

Bilateral uveal melanoma was diagnosed in 5 patients at the Department of Ophtalmology and Ocular Oncology of the Univeristy Hospital in Krakow between 1980 and 2014. Complete ophthalmic examinaion of both eyes including: visual acuity measurement, examination of the anterior segment of the eye using the slit lamp and of the posterior segment using the Volk lens as well as ocular ultrasonund of intraocular tumor was performed in all cases.

Bilateral uveal melanoma was diagnosed in 3 men and 2 women at the Department of Ophthalmology and Ocular Oncology beetwen 1980–2014. Enucleation of one eye was performed in 3 of our patients. Brachytherapy was used in 3 patients. One patient was not treated at our clinic (he has chosen therapy at another institution). Patient age in our material ranged from 39 to 73 years (mean age 50.5 years). Clinical features and ultrasound examinations led to the diagnosis, which was confirmed histopathogically in four cases, including three patients after enucleation and one person after resection of tumor located within the iris (Ttab. I).

Four patients with bilateral uveal melananoma were treated at our department, one person did not consent to treatment at our institution.

Below, the detailed characteristics of five cases have been presented.

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No/ Nr	Sex/ Płeć	Age/ Wiek	First affected eye/ Pierwsze leczone oko	First treatment/ Pierwsze leczenie	Time interval between the onset of tumor in the first and second eye/ Czas od zdiagnozowania guza w 1. oku do zdiagnozowania guza w 2. oku	Second treatment/ Drugie leczenie	Survival/ Przeżycie	Follow-up time/ Czas obserwacji
1.	M/ M	63	RE/ PO	Co-60 brachytherapy and Xenon photocoagulation. Next, enucleation due to glaucoma/ brachyterapia Co-60 i fototerapia ksenonowa. Następnie enukleacja z powodu jaskry	32 years/ 32 lata	LE I-125 brachytherapy/ LO brachyterapia I-125	death (liver metastases)/ zgon – przerzuty w wątrobie	32 years/ 32 lata
2.	F/ K	49	RE/ PO	enucleation/enukleacja	21 years/ 21 lat	LE Ru-106 brachytherapy/ LO brachyterapia Ru-106	death (liver and lung metastases)/ zgon – przerzuty w wątrobie i płucach	29 years/ 29 lat
3.	F/ K	51	RE/ PO	Ru-106 brachytherapy and transpupillary thermotherapy (TTT). Enucleation after 2 y. due to recurrence/ brachyterapia Ru-106 i termoterapia przezźreniczna (TTT). Po 2 latach wznowa – enukleacja	2 years/ 2 lata	LE Ru-106 brachytherapy/ LO brachyterapia Ru-106	alive (without metastases)/ żyje (bez przerzutów)	5 years/ 5 lat
4.	M/ M	49	RE and LE/ PLO	RE Ru-106 brachytherapy LE iris tumor removal/ PO brachyterapia Ru-106, LO – wycięcie guza tęczówki	simultaneous diagnosis/ rozpoznanie jednoczasowe		alive (without metastases)/ żyje (bez przerzutów)	3 years/ 3 lata
5.	M/ M	39	RE and LE/ PLO	Treated at the different center (RLE PBRT)/ PLO radioterapia protonowa	simultaneous diagnosis/ rozpoznanie jednoczasowe		alive (without metastases)/ żyje (bez przerzutów)	1 year/ 1 rok

Tab. I. Bilateral uveal melanoma – case characteristics.
Tab. I. Charakterystyka przypadków obuocznego czerniaka błony naczyniowej.

Case 1.

Uveal melanoma of the right eye was diagnosed in 63-year-old male in 1980. He was treated with primary brachytherapy with Co-60 isotope and xenon photocogulations which led to tumor regression. However, four years later the right eye was removed due to secondary glaucoma and pain. Histopathological examination confirmed the mixed type uveal melanoma according to Callender classification. Thirty-two years later, the same patient was diagnosed with uveal melanoma in his left eye. The apical height of the tumor was 6 millimeters and it was located in the temporal portion of the uvea, above the macula. Radioactive I-125 isotope used for brachytherapy caused its regression. However, metastatic spread to lungs was confirmed in 2013. We lack data on this patient survival at the moment.

Case 2.

A 49-year-old female was diagnosed with intraocular tumour with optic disc involvement in 1983. Histopathological examination following the enucleation of the right eye confirmed uveal melanoma. After 21 years of follow-up, the patient was diagnosed with uveal melanoma of the fellow (left) eye. The 3.5 milimetre high tumour was located within the mid-periphery, temporally from the macula. Brachyterapy with Ru-106 was started, which caused tumour regression. Later during the follow-up, the patient was also treated for skin melanoma and sigmoid colon cancer. The presence of liver and lung metastases was confirmed in 2011. The total follow-up period was 29 years.

Case 3.

Uveal melanoma of the right eye was diagnosed in a 51-year-old woman in 2009. The tumor, whose apical height was 3.9 mm, was located within the macula (Fig. 1). The patient was treated with Ru-106 brachyterapy and transpupillary thermotherapy. Tumor regression was observed. Marginal recurrence was diagnosed 2 years later. The right eye was enucleated due to tumour location, which involved the optic disc (Fig. 2). Histopathological examination confirmed the mixed type uveal melanoma according to Callender classification.

The presence of the left eye uveal melanoma was diagnosed during the patient's hospitalisation. The tumor, whose apical height was 2.5 mm, was located temporally, above the macula (Fig. 3). The patient underwent the Ru-106 brachytherapy, which caused tumor regression. No metastases were revealed during the 5-year follow-up.

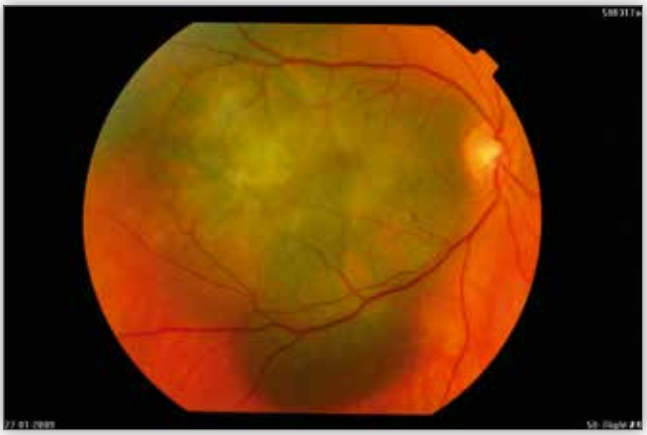

Fig. 1. Uveal melanoma of the right eye (case 3).
Ryc. 1. Czerniak naczyniówki prawego oka (przypadek 3.).

Fig. 2. Reccurence of the right eye melanoma (case 3).
Ryc. 2. Wznowa czerniaka naczyniówki prawego oka (przypadek 3.).

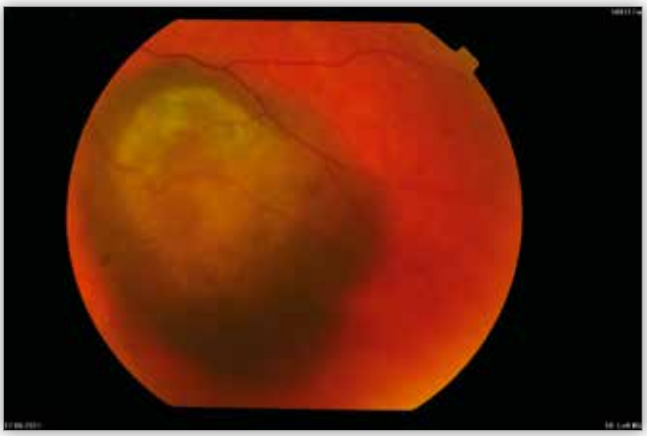

Fig. 3. Uveal melanoma of the left eye (case 3).
Ryc. 3. Czerniak naczyniówki lewego oka (przypadek 3.).

Case 4.

A 73-year-old male was diagnosed with choroidal melanoma of the right eye (2.8 mm high) and iris melanomoma of the left eye (0.9 mm high) in 2011. Ru-106 brachytherapy of the right eye melanoma caused tumor regression. One month later, iris tumor resection of the left eye was performed. Histopathological examination confirmed the mixed type iris melanoma according to Callender classification. No metastases were observed during the 3-year follow-up.

Case 5.

Uveal melanoma of the both eyes was diagnosed in a 39-year-old male in 2013. Right eye tumor, whose apical height was 6.7 mm, was located within the macular area. Left eye melanoma, whose apical height was 2.7 mm, was located temporally, below the macula. Brachytherapy with I-125 to the right eye tumor and proton beam radiotherapy to the left eye tumor were planned. However, the patient did not consent to treatment at our institution. He was treated with proton beam radiotherapy (PBRT) elsewhere and came back to our department for a follow-up.

Discussion

Bilateral uveal melanoma is extremely rare (6–8, 10). Its incidence is estimated 1 case per 50 million of European population (8, 9). According to the United States data, such cases are only observed once every 18 years (2, 11, 12). Sturm and Richard estimated a probability of bilateral uveal melanoma development in patients with single eye involvement to be 0.2% (13). According to Bhouri L et al. the prevalence of binocular uveal melanoma in France is 0.2% (14). We diagnose approximately 250 new cases of uveal melanoma per year, so the prevalence of bilateral uveal melanoma in Poland is 0.0006%, just as in the United States of America.

The time interval between the onset of tumor in the first and second eye is ranges from 6 months to 8 years according to Duke-Elder (15). According to Zygulska-Mach, this period is 1–5 years (5, 12). In one of our patients, bilateral uveal melanoma was diagnosed at the same time, but it is impossible to estimate the exact time of their onset. In other patients, this time interval ranged from 2 to 32 years. The incidence of bilateral uveal melanoma in our material is 5 cases per 34 years. The mean follow-up period was 13.8 years.

Histological examination confirmed the clinical diagnosis of melanoma in 4 patients after enucleation and iris resection. In 2 patients, metastases in liver and lungs were revealed. Two patients are still monitored in our department. The percentage of clinical diagnoses confirmed with histopathological evaluation and patients with metastases are similar to the ones reported by other authors (5, 12, 13, 15).

Conclusions

Although bilateral uveal melanoma is a very rare condition, its presence should be considered during examination of a patient with uveal melanoma.

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