

# A Rare Case of Congenital Ocular Melanoma in a 3-Year-Old Child

<sup>1</sup>Shivakumar Thiagarajan, <sup>2</sup>Nanjundappa, <sup>3</sup>Prashanth V, <sup>3</sup>Akshay Shivappa Kundapaje  
<sup>4</sup>Clementina Rama Rao, <sup>5</sup>Namratha NR

<sup>1</sup>Resident, Department of ENT, Head and Neck Oncology, Kidwai Memorial Institute of Oncology, Bengaluru, Karnataka, India

<sup>2</sup>Professor, Department of Head and Neck Oncology, Kidwai Memorial Institute of Oncology, Bengaluru, Karnataka, India

<sup>3</sup>Resident, Department of Head and Neck Oncology, Kidwai Memorial Institute of Oncology, Bengaluru, Karnataka, India

<sup>4</sup>Professor, Department of Pathology, Kidwai Memorial Institute of Oncology, Bengaluru, Karnataka, India

<sup>5</sup>Assistant Professor, Department of Pathology, Kidwai Memorial Institute of Oncology, Bengaluru, Karnataka, India

**Correspondence:** Shivakumar Thiagarajan, Resident, Department of ENT, Head and Neck Oncology, Kidwai Memorial Institute of Oncology, Dr MH Marigowda Road, Bengaluru-29, Karnataka, India, e-mail: drshiva78in@gmail.com

## ABSTRACT

Ocular melanoma in the pediatric population is extremely rare, and the congenital variety is even rarer. We present a case of a 3-year-old female child presenting with a congenital ocular melanoma with no preexisting conditions, managed by surgical removal of the affected eye followed by postoperative radiotherapy. We also discuss the various features of the condition reviewing the literature.

**Keywords:** Ocular melanoma, Congenital, Treatment.

## INTRODUCTION

Eye is the commonest noncutaneous site to develop melanoma and 85% of them originate from the uvea. Melanoma of the eye is common in people with white complexion and lighter colored iris, it is very rare in Asian population. Uveal melanoma is common in adults, less common in younger age group and the natural history in these younger patients is not clearly established.<sup>1</sup> Most young patients with uveal melanoma are pubertal, although uveal melanoma can even be present at birth, very few cases have been reported in literature so far and very little from Indian or Asian population have been reported.<sup>2</sup>

## CASE REPORT

A 3-year-old female child presented with a mass in the right orbit, replacing the entire eye, since birth with no vision, and no other associated complaints. The mass was initially smaller in size which has gradually increased in size over the years. She was born out of a nonconsanguineous marriage and was the youngest of the two siblings, with no significant or similar complaints in the other sibling or any other family members. On examination there was a blackish brown mass occupying the entire right orbit with prominent proptosis, measuring about 4 × 6 cm (Fig. 1), firm in consistency and not bleeding on touch. The normal structures, such as the sclera, pupil, iris, were not seen as they were all replaced by this single mass and there was no vision on this side. Both the upper and lower eyelids were visualized and appeared to be stretched significantly but normal. The opposite eye was structurally and functionally normal. Rest



Fig. 1: Right orbital mass (ocular melanoma)

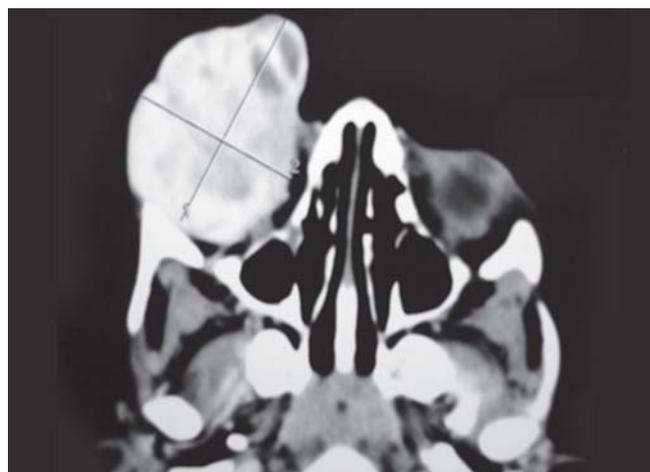
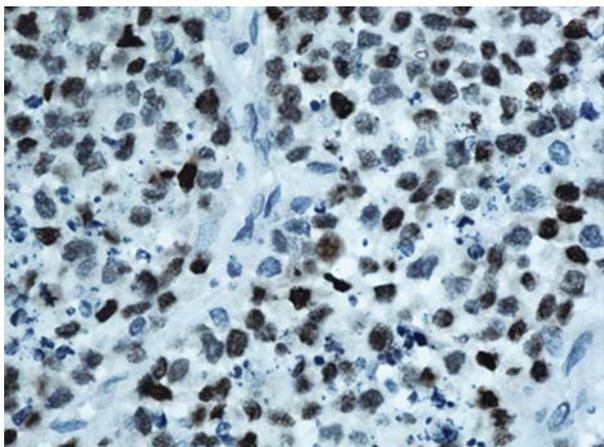


Fig. 2: CECT of the orbit showing the intraorbital mass with no extension intracranially

of the examination, including that of CNS and per abdomen was normal. A CECT of the orbit and brain showed a



**Fig. 3:** Intraoperative picture showing the mass being removed *en bloc*, sparing the eyelids



**Fig. 4:** High magnification showing heavily pigmented cells

contrast enhancing mass occupying the entire right orbit measuring  $4.46 \times 3.34$  cm with no intracranial extension (Fig. 2). FNA of the mass showed sheets of neoplastic cells with melanin pigments obscuring nuclear details-malignant melanoma. USG-abdomen was normal. Other investigations, like chest X-ray, routine blood investigations were all normal. With this clinical picture the patient was taken up for orbital exenteration under general anesthesia. The mass was exenterated *en bloc* (Fig. 3), preserving both the eyelids as they were not involved by the disease, including the palpebral conjunctiva. The right orbital cavity was packed with antiseptic pack, which was removed after 48 hours. The postoperative period was uneventful. Grossly, the exenterated orbital mass was entirely replaced by the disease with no recognizable part of the eye. The histopathological report was malignant melanoma (epithelioid type) of the eye (uveal), with involvement of the orbital apex (Fig. 4). The patient was subsequently sent

for postoperative radiotherapy, where she received 18 Gy in 10 fractions of external-beam radiotherapy. Currently, the child has completed radiotherapy and is on regular follow-up.

## DISCUSSION

Malignant melanoma is rare in Indian population. Malignant melanoma constitutes 2/3rd of noncutaneous melanoma in adults, 5% of all melanomas and for 13% of all melanoma-related deaths, because of the high rates of distant metastasis, especially to liver and poor response to treatment.<sup>3</sup> Patients are at risk to develop metastases up to 20 years after the initial diagnosis. The most common site for metastatic uveal melanoma is to the liver. The fact that even an enucleated patient may develop metastases years after the treatment led to the speculation that micrometastases had already been seeded at the time of diagnosis. The uvea is a densely pigmented layer which is subdivided into iris, ciliary body and choroid. The main function of the uvea is to provide oxygen and other nourishment to the highly metabolically demanding retinal photoreceptors. Approximately 80% of uveal melanomas affect the choroids, 12% the ciliary body and 8% the iris.<sup>4</sup> Incidence of ocular melanomas increases steadily with age, but their incidence among younger age group is rare (< 1%), average age at onset is 55 years.<sup>5</sup> Most young patients with uveal melanoma are of pubertal age group although they can present at birth, as in our case, which is a very rare event, less often reported in the literature.<sup>6</sup> In a huge case series of uveal melanoma by Singh et al of 8000 patients, only 63 patients (0.8%) were aged 20 years or younger. Among these patients, only 10 patients (16% of children or 0.12% of all patients) were under the age of 10 years.<sup>6</sup> In Sheild's study, the incidence of uveal melanoma in patients aged less than 20 years was 1.1%,<sup>7</sup> and in another study by Biswas et al, only one patient among 103 was aged less than 20 years.<sup>8</sup> The clinical features and management of uveal melanoma in young patients are similar to those of uveal melanoma in adults.<sup>9</sup> Many aspects such as epidemiology, pathogenesis or treatment of this neoplasia continue being controversial. The etiology for development of uveal melanoma is not well understood, though environmental, host and genetic factors could be involved in the pathogenesis of uveal melanoma.<sup>10,11</sup> The potential role of UV light in the development of uveal melanoma is a matter of controversy. Ultraviolet radiation has been suggested as a major cause in adults, whereas its cause in younger age group patients is not known. In rare instances, uveal melanoma occurs in the presence of oculo (dermal) melanocytosis, neurofibromatosis type 1 and dysplastic nevus syndrome (familial atypical mole and melanoma syndrome), suggesting that at least in some cases, there may be an inherited predisposition to develop uveal melanoma. In the case series by Singh et al, oculo (dermal) melanocytosis was observed to be nine times more

common in young patients with uveal melanoma than the general population with uveal melanoma.<sup>5</sup> Our patient did not show any such features. The concept of genetic predisposition to uveal melanoma is further supported by the occurrence of uveal melanoma in some families (familial uveal melanoma).<sup>12</sup> In 1931, Callender recognized distinct cell types in the spectrum of cells composing uveal melanomas. The Callender classification is based on cell size, shape, cytoplasmic features, nuclear and nucleolar characteristics and loss of cohesion. According to Callender's cytologic characterization, uveal melanomas are divided into following categories, spindle cell melanomas, predominantly composed of spindle cells, mixed cell melanomas—when fewer than half of the tumor sections examined are composed of epithelioid cells and epithelioid cell melanomas, when greater than half of the tumor sections are composed of epithelioid cells. Spindle cell tumors have the best prognosis and epithelioid cell tumors the worst.<sup>13</sup> In our case, histopathology was of epithelioid type. Patients with suspected intraocular melanoma should undergo a physical examination and metastatic work-up. Traditionally, it has been said that a younger age at the time of diagnosis is correlated to a higher survival rate. The better survival in young patients is attributed to the fact that they visit a specialist sooner to be diagnosed earlier than older patients, thus, presenting a tumor with better characteristics at the time of diagnosis.<sup>14</sup> There are little data regarding the prognosis or prognostic features of uveal melanoma in children. In 1978, Zimmerman et al, published their hypothesis that enucleations were responsible for disseminating uveal melanoma leading to metastases.<sup>15</sup> This claim urged ophthalmologists not only to revise the enucleation technique but also to reevaluate other treatment modalities, such as local irradiation (brachytherapy, I<sup>125</sup>) and external irradiation (proton beam).<sup>3</sup> When enough irradiation can be delivered to the tumor's apex brachytherapy is the treatment of choice. However, when the tumor is too high, or large or where melting of the sclera is more common, enucleation is recommended. Another indication for enucleation is extraocular extension of the tumor. In present case the ocular melanoma was so big and occupying the entire orbit such that surgery followed by postoperative radiotherapy was considered the appropriate treatment, after a thorough work-up to rule out distant metastasis.

## CONCLUSION

Very few cases of pediatric ocular melanoma have been reported in the literature, especially in children less than 10 years of age. Reports of congenital ocular melanoma are even rarer. Although this patient did not have any obvious predisposing factors, such as ocular (dermal) melanocytosis,

which is much more common in the children with ocular melanoma compared with adults and these are the patients who need long-term follow-up in particular. This case has been reported because of the rarity of its presentation.

## ACKNOWLEDGMENTS

We would like to thank the Head, Department of Head and Neck Oncology, Anesthetist and Director, Kidwai Memorial Institute of Oncology, Dr MH Marigowda Road, Bengaluru-560029, Karnataka, India.

## REFERENCES

1. Scotto J, Fraumeni JF Jr, Lee JA. Melanomas of the eye 1 and other noncutaneous sites: Epidemiologic aspects. *J Natl Cancer Inst* 1976;56:489-91.
2. Kanthan Gowri L, Grigg John, Billson Frank, Kourt Gina, Max Conway R. Paediatric uveal melanoma. *Clinical and Experimental Ophthalmology* 2008;36(4):374-76.
3. The COMS randomized trial of iodine 125 brachytherapy for choroidal melanoma: V. Twelve-year mortality rates and prognostic factors: COMS report No. 28. *Arch Ophthalmol* 2006;124:1684-93.
4. Hakulinen T, Teppo L, Saxe'n E. Cancer of the eye: A review of trends and differentials. *World Health Stat Q* 1978;31:143-58.
5. Singh AD, Bergman L, Seregard S. Uveal melanoma: Epidemiological aspects. *Ophthalmol Clin North Am* 2005;18:75.
6. Singh AD, Shieds CL, Shields JA, Sato T. Uveal melanoma in young patients. *Arch Ophthalmol* 2000;118:918-23.
7. Shields CL, Shields JA, Milite J, De Potter P, Sabbagh R, Menduke H. Uveal melanoma in teenagers and children. A report of 40 cases. *Ophthalmology* 1991;98:1662-66.
8. Biswas J, Kabra S, Krishnakumar S, Shanmugam MP. Clinical and histopathological characteristics of uveal melanoma in Asian Indians. A study of 103 patients. *Indian J Ophthalmol* 2004;52:41-44.
9. Barr CC, McLean IW, Zimmerman LE. Uveal melanoma in children and adolescents. *Arch Ophthalmol* 1981;99:2133-36.
10. Egan KM, Seddon JM, Glynn RJ, Gragoudas ES, Albert DM. Epidemiologic aspects of uveal melanoma. *Surv Ophthalmol* 1988;32:239-51.
11. Seddon JM, Evangelos S, Gragoudas. Host factors, UV radiation and risk of uveal melanoma: A case control study. *Arch Ophthalmol* 1990;108:1274-80.
12. Singh AD, De Potter P, Fijal BA, Shields CL, Shields JA, Elston RC. Lifetime prevalence of uveal melanoma in caucasian patients with ocular (dermal) melanocytosis. *Ophthalmology* 1998;105:195-98.
13. McLean IW, Foster WD, Zimmerman LE. Modifications of Callender's classification of uveal melanoma at the Armed Forces Institute of Pathology. *Am J Ophthalmol* 1983;96:502.
14. Sakamoto T, Sakamoto M, Yoshikawa H, Hata Y, Ishibashi T, Ohnishi Y, et al. Histologic findings and prognosis of uveal malignant melanoma in Japanese patients. *Am J Ophthalmol* 1996;121:276-83.
15. Zimmerman LE, McLean IW, Foster WD. Does enucleation of the eye containing a malignant melanoma prevent or accelerate the dissemination of tumour cells. *Br J Ophthalmol* 1978;62:420-25.