

A Case of Homonymous Hemianopia Caused by Metastatic Melanoma: Incorporating Neuro-Ophthalmological Exams in Screening for Recurrent Metastatic Disease

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Abstract Central nervous system tumors cause about 11% of all cases of homonymous hemianopia.¹ Detection of visual field defects is important as it can aid in localization of cerebral lesions, especially in metastatic disease. These visual field defects are often unrecognized by the patient and may go undiagnosed without the proper screening. Here we present a case of left homonymous hemianopia caused by metastatic melanoma to the occipital lobe. Incorporating neuro-ophthalmological exams into current guidelines for surveillance of cutaneous melanoma may aid in the early detection of recurrent disease.

Keywords: *neuro-ophthalmology, melanoma, homonymous hemianopia*

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1. Introduction

Homonymous hemianopia is a visual field defect in which the brain fails to perceive visual information from the contralateral side of each eye. Central nervous system tumors make up about 11% of all cases of homonymous hemianopias and the associated visual field defects are often unrecognized by the patient. [1,2,3] Here we present a case of left homonymous hemianopia that was caused by metastatic cutaneous melanoma to the occipital lobe. Although cutaneous melanoma is the third most common form of cancer that metastasizes to the brain and has the ability to affect the optic radiations, there is limited literature on the incorporation of neuro-ophthalmological screenings in the surveillance of recurrent disease. [4] Guidelines for surveillance following primary treatment of cutaneous melanoma are complex and often based on insufficient evidence. [5] This case suggests that incorporating neuro-ophthalmological assessments to current guidelines may be beneficial in screening for recurrent disease.

2. Case Presentation

A 45-year-old female with past medical history of nodular melanoma of the left shoulder excised in September 2017 presented to her ophthalmologist in

December 2018 with intermittent episodes of ocular pain, flashing lights and ocular hallucinations for the past two months. The patient reported blurred vision and bright flashing lights that were followed by a rainbow aura. She had no prior history of ocular disease. Social history and family history were unremarkable.

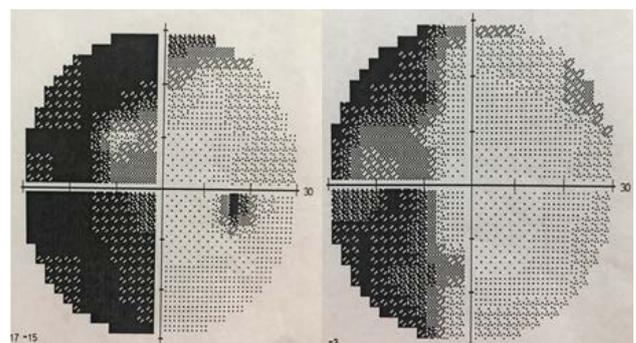


Figure 1. HVF testing revealed a left homonymous hemianopia

On exam, the patient's visual acuity was 20/20 OD and 20/25 OS. Humphrey visual field (HVF) testing demonstrated a left homonymous hemianopia (Figure 1). The remainder of the ophthalmological exam was without abnormalities. Neurological exam revealed no focal deficits. The patient subsequently had an MRI of her brain which revealed a heterogeneous 3 cm right occipital mass with features most consistent with a possible meningioma (Figure 2 - Figure 3). The patient was started on decadron

4 mg TID and keppra 500 mg BID in preparation for surgery and then underwent a stereotactic image guided craniotomy for tumor resection. Although the dural-based tumor had characteristics that were suspicious for a meningioma, pathology ultimately revealed metastatic melanoma.



Figure 2. Axial MRI view of the brain demonstrating occipital lobe mass



Figure 3. Coronal MRI view of brain demonstrating occipital lobe mass

3. Discussion

Although the incidence of cutaneous melanoma has increased in recent years and prognosis of advanced disease remains to be relatively poor, there continues to be a lack of consensus regarding the proper approach for disease surveillance following primary treatment. [6] There are several guideline societies that provide recommendations on follow-up care, however there is significant variation amongst these groups. [6] The current recommendations are mostly centered around self-examinations, physician clinical assessment and the use of labs and imaging but there is no one universally agreed-upon approach.

The National Comprehensive Cancer Network (NCCN) is one of the leading organizations that provide practice guidelines for management of cutaneous melanoma and their recommendations are crucial for the medical decisions carried out by many clinicians. The nodular melanoma discovered on the shoulder of the patient in this case was determined to be a stage II-C based on a Breslow

thickness of over 6.6mm but negative lymph node involvement. According to current NCCN guidelines these patients should undergo a thorough clinical assessment every 3-6 months for the first 2 years and then every 3-12 months for 3 years followed by annual assessments as indicated with emphasis placed on skin examinations and lymph node evaluation. Imaging to screen for recurrence or distant metastatic disease is labeled as a category 2B recommendation for this patient population based on low levels of evidence but a consensus that such interventions may be beneficial in certain individuals. [7] However, Hoffmann et al [8], determined that recurrences were most often detected with thorough history and physical exam assessment while routine imaging in surveillance was much less likely to detect recurrence but was responsible for almost 50% of total costs during follow-up of stage I, II and III cancers. [8] Shifting focus to thorough clinical assessments may be the most cost-efficient way to provide follow-up care. However, there remains debate on who should be involved in the follow-up care of these patients and there are currently no specific recommendations regarding the role of an ophthalmologist. [9]

It is well known that cutaneous melanoma has a tendency to metastasize to the central nervous system and most often presents with lesions in the frontal and temporal lobes of the brain. [4] This case demonstrates the ability of cutaneous melanoma to metastasize to the occipital lobe and present as a homonymous hemianopia that is unrecognized by the patient. This influence on the visual processing system raises the question of whether ophthalmologists should contribute to the follow-up care of melanoma especially in patients at high risk of recurrent and metastatic disease. The ophthalmologist was the first physician that the patient in this case presented to and a subsequent thorough ophthalmological exam including confrontational visual field testing followed by humphrey visual field testing eventually revealed a significant visual field deficit that may have been missed by other providers. This crucial finding led to further evaluation that confirmed recurrent metastatic melanoma.

Confrontation and automated perimetry are just two modalities used daily by ophthalmologists to evaluate a patients' visual field and can provide valuable information regarding the integrity of the visual processing system of the brain. A thorough neuro-ophthalmological exam can be incorporated into the routine clinical assessment during the follow-up period of patients at risk of developing recurrent metastatic disease from cutaneous melanoma. The presence of new or worsening visual field defects can prompt further imaging and possibly lead to earlier interventions especially in patients who are asymptomatic. In addition, a previous study demonstrated that nodular melanomas are more frequently associated with brain metastasis than any other subtype of melanoma and thus these patients may have the greatest benefit in undergoing routine assessments by an ophthalmologist during their follow-up. [10]

4. Conclusion

The guidelines for surveillance of cutaneous melanoma are complex and constantly changing. Many recommendations

exist but there is a lack of evidence regarding which approach is most effective. [9] Thorough clinical assessment seems to be the most valuable tool in detecting recurrent disease during follow-up. [5] This case demonstrates that incorporating neuro-ophthalmological exams in the surveillance of recurrent metastatic melanoma after primary treatment may be a positive addition to current guidelines. Visual field testing can be the first step in detecting early metastatic recurrence especially in asymptomatic patients and those with more aggressive melanoma subtypes. Further studies are needed to analyze the long-term benefit of this recommendation.

Conflicts of Interest

The authors declare no conflicts of interest.

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