



Case report

Ciliary body metastasis from renal cell carcinoma successfully treated with intravitreal bevacizumab

Margaret Wong, MD^{*}, W. Barry Lee, MD, Robert L. Halpern, MD, James H. Frank, MD

Private Practice, Eye Consultants of Atlanta, 3225 Cumberland Boulevard, Suite 800, Atlanta, GA 30339, United States

ARTICLE INFO

Article history:

Received 1 October 2016

Received in revised form

9 January 2017

Accepted 9 January 2017

Available online 14 March 2017

Keywords:

Ciliary body

Renal cell carcinoma

Metastasis

Bevacizumab

ABSTRACT

Purpose: To report an innovative new treatment option for ciliary body tumor metastasis from renal cell carcinoma treated with intravitreal bevacizumab.

Observations: A 70-year-old Caucasian man presented with a ciliary body tumor as a result from metastasis from renal cell carcinoma. It was preferable to treat the ciliary body tumor in the least invasive manner possible based on the patient's health, systemic metastasis, and the invasiveness of local resection. The tumor was treated with intravitreal bevacizumab for attempted tumor regression. Complete tumor resolution occurred following three injections.

Conclusions and importance: There is no consensus on treatment for ciliary body metastases from renal cell carcinoma. Based on the successful result of our patient, intravitreal bevacizumab could be an acceptable treatment option for this type of intraocular tumor. It affords a relatively non-invasive method of tumor regression without undergoing major intraocular surgery.

© 2017 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Renal cell carcinoma represents a rare site for intraocular metastasis. Given the severity of systemic disease in many of these cases, intraocular treatment options remain limited and can be associated with significant ocular morbidity with limited benefit for vision restoration. The authors describe a novel treatment for renal cell carcinoma metastasis to the ciliary body. The ciliary body tumor was treated successfully with intravitreal bevacizumab, which provided complete tumor regression following three intravitreal injections, offering a relatively non-invasive method of treatment and significant vision improvement.

2. Case report

A 70-year-old Caucasian man presented for decreased vision in the left eye. Past medical history was significant for stage IV renal cell carcinoma (RCC), clear cell type, that was diagnosed two years previously. The RCC had metastasized to lung, bone, mediastinum, adrenal glands, and lymph nodes. There has been progression of the

RCC despite treatment with Pazopanib, Axitinib, and Afinitor. On presentation, best-corrected visual acuity was 20/20 and 20/80, respectively. Intraocular pressures were 8 mmHg in the right eye and 10 mmHg in the affected left eye. Slit-lamp exam of the right eye was normal. Exam of the left eye showed a flesh-like, pink, vascular mass in the angle between 4 and 6 o'clock that measured 2.5mm in length and 1.5mm in height. The lesion was associated with a 2mm layered hyphema adjacent to the mass (Fig. 1). Given the history of systemic metastasis and the location of the tumor, the tumor was most likely a ciliary body mass secondary to metastatic RCC. Fundus examination was normal in both eyes. Intravitreal bevacizumab (1.25mg/0.05 cc) was injected into the left eye. Eleven days later, vision improved to 20/30, and the size of the mass decreased to 1.5mm in length and 0.75mm in height with resolution of the hyphema (Fig. 2). Four weeks later, the patient received a second intravitreal bevacizumab injection and then a third injection six weeks later. The subsequent visit showed complete regression of the mass on exam (Fig. 3). The patient continues to receive intravitreal bevacizumab injections every 8 weeks to maintain resolution of the metastatic tumor.

3. Discussion

Renal cell carcinoma accounts for 3% of all adult malignancies.¹ The majority of metastases occur in lung and bone, but can spread

^{*} Corresponding author.

E-mail addresses: margaret.oph@gmail.com (M. Wong), wblee@mac.com (W.B. Lee), retinarob@yahoo.com (R.L. Halpern), mdatp@bellsouth.net (J.H. Frank).

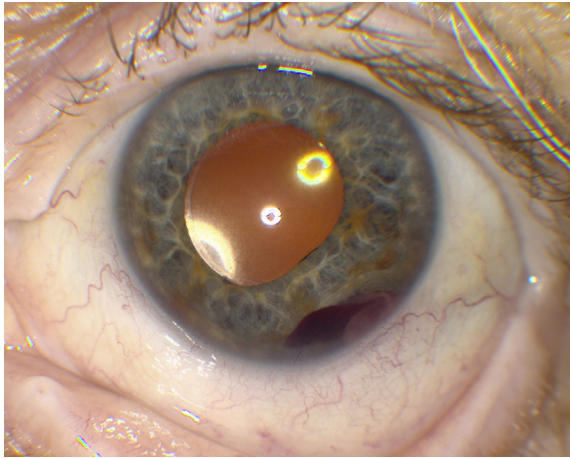


Fig. 1. Ciliary body tumor on presentation. The tumor measures 2.5mm in horizontal length and 1.5 mm in vertical height. There is an adjacent layered hyphema.

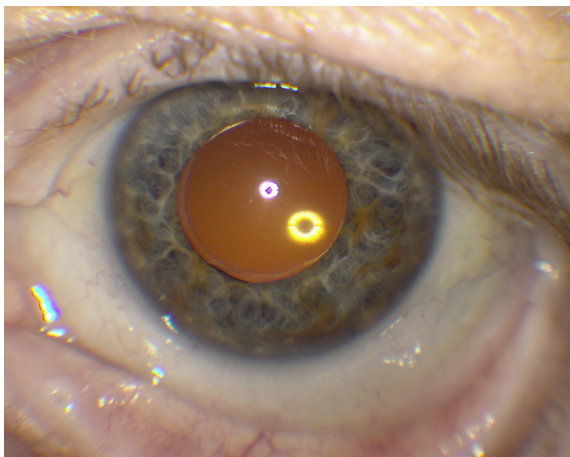


Fig. 2. Ciliary body tumor following first bevacizumab injection. The tumor is regressing and measures 1.5mm in horizontal length and 0.7mm in vertical height. The hyphema has resolved.

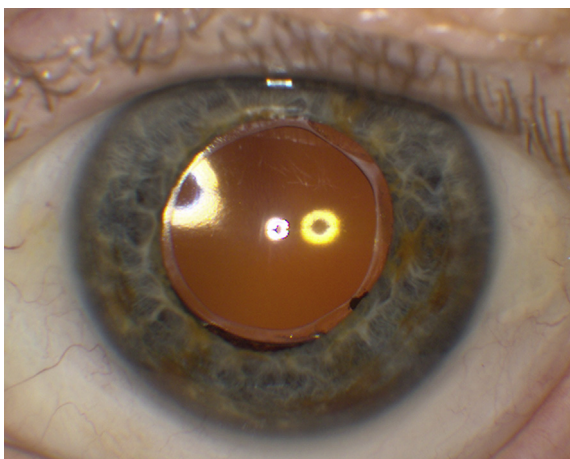


Fig. 3. Complete regression of ciliary body tumor following three bevacizumab injections. There is no tumor seen on examination.

metastatic disease to the ciliary body and iris. Ferry and Font studied 227 patients with ocular metastatic disease; there were 196 intraocular metastases and 7 of these were from the kidney.³ Shields et al. performed a survey of 520 eyes with uveal metastases and found 2% of eyes with ciliary body metastases and 9% with iris metastases; only one case from the ciliary body and one from the iris were from the kidney.⁴ Boniuk and et performed a review of the literature and found only 4 cases of ciliary body metastases from RCC.⁵ Due to the lack of RCC metastases to the ciliary body or iris reported in the literature, there have been no consensus on the treatment of these metastatic tumors. Shields et al. reported external beam radiation, plaque radiation, resection, and a combination of these methods for possible treatment options.⁴ Haimovici et al. made the observation that the metastases from RCC generally respond well to local irradiation.⁶ Another patient was treated with radiotherapy, plaque radiation, and finally enucleation.⁷

However, it is well-known in the oncology literature that intravenous bevacizumab used either as monotherapy or in combination with other chemotherapy agents are effective treatment options for RCC.^{8,9} This is supported by the fact that RCC patients have elevated vascular endothelial growth factor (VEGF) levels.¹⁰ Therefore, it would make sense that an anti-VEGF agent, such as bevacizumab, would be a good treatment for RCC. There have been no cases, to our knowledge, of successful treatment of ciliary body metastases from RCC with intravitreal bevacizumab. There is one case of a ciliary body RCC metastasis that failed two intravitreal Avastin injections, but did respond to proton beam radiotherapy.¹¹ In the past, uveal tumors in the literature have been treated with external beam radiation, plaque radiation, and tumor resection. However, intravitreal bevacizumab is much less invasive and vision-preserving and can possibly be considered as an effective treatment option for patients who are too ill to undergo surgery or have failed radiation. We report a case of ciliary body metastasis from RCC, which showed complete resolution of the tumor following intravitreal bevacizumab injections. The success of the treatment and the rarity of the presentation make this a unique case.

4. Conclusions

We propose that intravitreal bevacizumab can be an effective and minimally invasive treatment for patients with ciliary body tumors from RCC. Our patient had complete regression of the tumor on examination after three injections. However, the frequency of injections needs further investigation with a greater number of patients.

Patient consent

Consent to publish the case report was not obtained. This report does not contain any personal information that could identify the patient. Approval of the Institutional Review Board was not required.

Funding

No funding or grant support.

Conflict of interest

The authors have no financial disclosures.

to any organ in the body.² Intraocular metastases from RCC have been infrequently reported in the literature. Even fewer are

Authorship

All authors attest that they meet the current JCMJE criteria for authorship.

Acknowledgements

Ray Swords, ophthalmic photographer.

References

- Garnick MB, Richie JP. Primary neoplasms of the kidney and renal pelvis. In: Schrier RW, Gottschalk CW, eds. *Disease of the Kidney*. fifth ed. 1. Boston: Little, Brown; 1993.
- Robbins SL. *Pathologic Basis of Disease*. Philadelphia: WB Saunders; 1974:1142.
- Ferry AP, Font RL. Carcinoma metastatic to the eye and orbit I. A clinicopathological study of 227 cases. *Arch Ophthalmol*. 1974;92:276–286.
- Shields CL, Shields JA, Gross NE, Schwartz GP, Lally SE. Survey of 520 eyes with uveal metastases. *Ophthalmology*. 1997;104:1265–1276.
- Boniuk M, Seregard S. Metastasis to the eye and orbit from renal cell carcinoma – a report of three cases and review of literature. *Surv Ophthalmol*. 2007;52: 213–223.
- Haimovici R, Gragoudas ES, Gregor Z, Pesavento RD, Mieler WF, Duker JS. Choroidal metastases from renal cell carcinoma. *Ophthalmology*. 1997;104: 1152–1158.
- Mancini V, Battaglia M, Lucarelli G, et al. Unusual solitary metastasis of the ciliary body in renal cell carcinoma. *Int J Urol*. 2008;15:363–365.
- Flaherty KT, Manola JB, Pins M, et al. BEST: a Randomized Phase II study of vascular endothelial growth factor, RAF kinase, and mammalian target of rapamycin combination targeted therapy with bevacizumab, sorafenib, and temsirolimus in advanced renal cell carcinoma – a trial of the ECOG-ACRIN cancer research group. *J Clin Oncol*. 2015;33:2384–2391.
- Lee-Ying R, Lester R, Heng D. Current management and future perspectives of metastatic renal cell carcinoma. *Int J Urol*. 2014;21:847–855.
- Dosquet C, Coudert M, Lepage E, Cabane J, Richard F. Are angiogenic factors, cytokines, and soluble adhesion molecules prognostic factors in patients with renal cell carcinoma? *Clin Cancer Res*. 1997;3:2451–2458.
- Alasil T, Khazai B, Loreda L, Rauser ME. Renal cell carcinoma metastasis to the ciliary body responds to proton beam radiotherapy: a case report. *J Med Case Rep*. 2011;5:345.