

Prostate Carcinoma, a Common Cancer in Men, Rarely Metastasizes to the Eye

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The choroid is the most common site of uveal metastases. In a report of 950 cases of uveal metastases, 838 (88%) were choroidal.¹ Choroidal metastasis often presents as a creamy yellow subretinal mass with secondary retinal detachment and can originate from a primary cancer of the breast, lung, gastrointestinal tract, kidney, skin, or prostate.¹ Despite the frequency of prostate cancer in the older male population, this malignancy rarely metastasizes to the eye. Far more common is lung cancer metastasis in men. Choroidal metastases can be treated with chemotherapy, external beam radiotherapy, plaque radiation therapy, hormone therapy, or resection, according to the clinical features of each particular case.¹

CASE DESCRIPTION

A man aged 68 years noted photopsia in his left eye for 4 months. He had previous congenital cataract extraction in both eyes at the age of 9 years. His medical history revealed systemic hypertension, secondary emphysema, and a 300 pack per year history of smoking discontinued 34 years previously.

On ocular examination, best-corrected visual acuity was 20/25 in the right eye and 20/60 in the left eye. Both eyes showed anterior segment aphakia with updrawn pupil toward a limbal wound in the right eye and posterior capsular wrinkling in the left eye. Fundus examination of the right eye disclosed previous retinal detachment repair with chorioretinal atrophy. The fundus of the left eye revealed an amelanotic choroidal

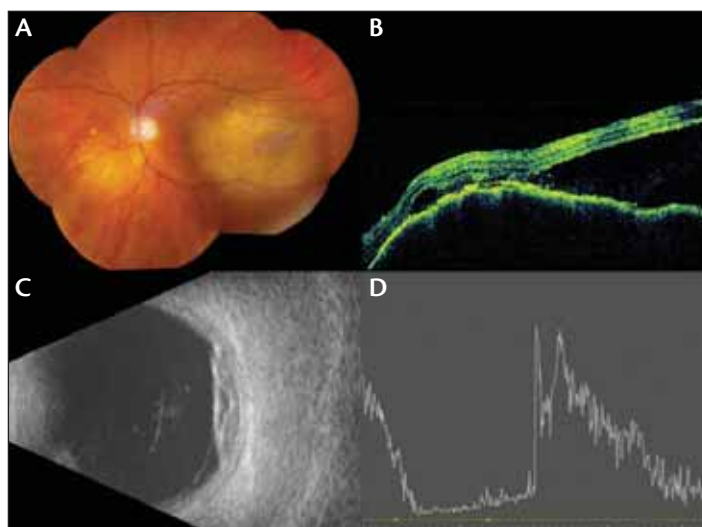


Figure 1. Features of choroidal metastasis from prostate cancer. The amelanotic metastasis is located in the temporal macula (A). Optical coherence tomography (OCT) confirms subretinal fluid (B). B-scan ultrasonography demonstrates a bilobed choroidal mass measuring 3.6 mm in thickness with overlying subretinal fluid (C). A-scan ultrasonography shows medium internal reflectivity (D).

mass measuring 10 x 9 x 3.6 mm with moderate clear subretinal fluid located over the lesion. B-scan ultrasonography showed a slightly acoustically hollow mass with a bilobed appearance and overlying subretinal fluid. A-scan ultrasonography depicted medium internal reflectivity of the mass. Optical coherence tomography (OCT) confirmed subretinal fluid overlying the slightly irregular surface of the choroidal lesion. Fluorescein angiography revealed early hypofluorescence and late staining of the choroidal mass (Figure 1).

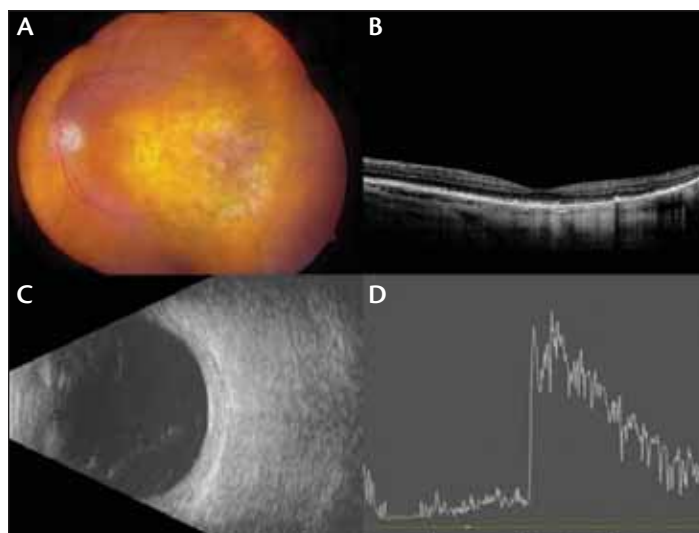


Figure 2. One year following plaque radiotherapy the tumor has regressed to 1.2 mm in thickness. The atrophic flat scar is visible (A). OCT shows complete resolution of subretinal fluid (B). B-scan demonstrates a flat scar (C). A-scan shows high internal reflectivity (D).

These features were suspicious for choroidal metastasis, but the patient denied primary malignancy, although he was previously a smoker and was aware of elevated prostate specific antigen (PSA) of 5.6 ng/mL (reference range <OR = 4.0 ng/mL).

Fine-needle aspiration biopsy of the choroidal mass using a trans-pars-plana approach with a 27-gauge needle into the temporal portion of the tumor 4 mm from the foveola was performed. Cytology revealed epithelial cells positive for AE1/AE3 and EMA and negative for HMB-45 and Melan A, supporting the diagnosis of an epithelial neoplasm, favoring metastatic adenocarcinoma. Further evaluation by an oncologist disclosed biop-

sy-proven primary prostate carcinoma.

The choroidal metastasis was treated with I-125 plaque radiotherapy, delivering 3500 cGy to the apex. One year following treatment, visual acuity improved to 20/25 OS and there was complete resolution of subretinal fluid and a flat tumor scar (Figure 2). Repeat systemic evaluation by an oncologist following ocular therapy revealed bone metastasis from prostate carcinoma, confirmed with abdominal CT scan. The patient was treated with systemic anti-androgen hormonal treatment as well as zoledronic acid for bone metastasis.

DISCUSSION

The prostate is one of the five leading cancer sites in males when considering all ages, and prostate cancer is the second most common cause of cancer death among men aged 80 years and older.² Approximately 6% of men aged 60 to 69 years, 13% aged 70 years and older, and one in six from birth to death in the United States are expected to develop prostate cancer.² This malignancy accounts for 25% of newly diagnosed cancer cases in men and 9% of deaths due to cancer in men.² Statistics for 2009 estimated 192,280 new cases and 27,360 deaths related to prostate cancer.²

Clinical symptoms of prostate cancer include lower urinary tract obstruction, urination frequency, dysuria, lower back pain, weight loss, anemia, hematuria, renal failure, generalized body weakness, and fecal incontinence.³ The average male in the United States should begin considering the possibility of prostate cancer at age 50 years. Factors that increase the risk include being black, positive family history, older age, and abnormal

TABLE 1. PRIMARY CANCER SITE IN 420 PATIENTS WITH UVEAL METASTASIS.*

Site of primary cancer	Number of patients (%)
Breast	196 (47%)
Lung	90 (21%)
Gastrointestinal tract	18 (4%)
Kidney	9 (2%)
Skin	9 (2%)
Prostate	9 (2%)
Other cancers	16 (4%)
Unknown	73 (17%)

* Information from Shields CL, Shields JA, Gross NE, Schwartz GP, Lally SE. Survey of 520 eyes with uveal metastases. *Ophthalmology*. 1997;104(8):1265-1276.

The management of choroidal metastasis depends on the systemic as well as ocular status of the patient.

screenings. With these risk factors, screening should begin at age 45 years.⁴ Other proposed risk factors for prostate cancer include smoking,⁵ vasectomy,⁶ and high saturated fat intake.⁷ Screening for prostate cancer includes a PSA blood test as well as digital rectal examination.⁴ Men should consider being screened biennially if PSA levels are less than 2.5 ng/mL and annually if they are 2.5 ng/mL or greater. Those with PSA levels of 4.0 ng/mL or greater should consider further evaluation or biopsy to confirm cancer.⁴ Methods for treatment of prostate cancer include hormonal therapy, external-beam radiation therapy, interstitial brachytherapy, and radical prostatectomy.⁴

Ocular involvement from prostate carcinoma is rare.¹ Of 420 patients with uveal metastasis, only 9 (2%) originated from prostate carcinoma.¹ In the same survey, the most common primary cancer sites to metastasize to the choroid included breast carcinoma (47%), lung carcinoma (21%) and gastrointestinal tract carcinoma (4%) (Table 1). Autopsies of 1,589 patients older than 40 years with a history of prostate cancer revealed hematogenous metastases in 35% involving mostly bone (90%).⁸ Unusual sites of prostate cancer metastases are classically associated with advanced disease and include orbit/skull base, lung, liver, intracranial, ocular, and adrenal.⁹ Regarding orbital involvement, a review of 100 patients with orbital metastasis revealed that 12% originated from a primary prostate carcinoma.¹⁰

The management of choroidal metastasis depends on the systemic as well as ocular status of the patient. For patients for whom the eye is the only metastatic site, treatment options include photodynamic therapy,¹¹ plaque radiotherapy,^{12,13} and external beam radiotherapy.¹⁴ In patients with widespread disease, however, systemic chemotherapy is generally employed.¹⁵

In our patient, plaque radiotherapy provided complete resolution of the metastasis and excellent visual acuity. Plaque radiotherapy is an ideal therapy for isolated choroidal metastases due to its shorter administration period and precise delivery of radiation to the tumor alone, as compared with external beam radiotherapy.¹² Furthermore, plaque radiotherapy is an effective alternative for patients in which external beam

treatment has failed. Of 36 patients with uveal metastasis treated with plaque radiotherapy, 34 (94%) showed complete and stable tumor regression. Patients with prostate cancer should have periodic eye examinations for monitoring to rule out ocular involvement. ■

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- Shields CL, Shields JA, Gross NE, Schwartz GP, Lally SE. Survey of 520 eyes with uveal metastases. *Ophthalmology*. 1997;104(8):1265-1276.
- Jemal A, Siegel R, Ward E, Hao Y, Xu J, Thun MJ. Cancer statistics, 2009. *CA Cancer J Clin*. 2009;59:225-249.
- Badmus TA, Adesunkanmi AR, Yusuf BM, et al. Burden of prostate cancer in southwestern nigeria. *Urology*. 2010;76(2):412-416.
- Wolf AMD, Wender RC, Elzioni RB, et al. American cancer society guideline for the early detection of prostate cancer. *CA Cancer J Clin*. 2010;60:70-98.
- Hsing AW, McLaughlin JK, Schuman LM, et al. Diet, tobacco use, and fatal prostate cancer: results from the Lutheran Brotherhood Cohort Study. *Cancer Res*. 1990;50(21):6836-6840.
- Honda GD, Bernstein L, Ross RK, Greenland S, Gerkins V, Henderson BE. Vasectomy, cigarette smoking, and age at first sexual intercourse as risk factors for prostate cancer in middle-aged men. *Br J Cancer*. 1988;57(3):326-331.
- Meyer F, Bairati I, Shadmami R, Fradet Y, Moore L. Dietary fat and prostate cancer survival. *Cancer Causes Control*. 1999;10(4):245-251.
- Bubendorf L, Schöpfer A, Wagner U, et al. Metastatic patterns of prostate cancer: an autopsy of 1589 patients. *Hum Pathol*. 2000;31(5):578-583.
- Long MA, Husband JE. Features of unusual metastases from prostate cancer. *Br J Radiol*. 1999;72(862):933-941.
- Shields JA, Shields CL, Brotman HK, Carvalho C, Perez N, Eagle RC Jr. Cancer metastatic to the orbit. *Ophthal Plast Reconstr Surg*. 2001;17(5):346-354.
- Maugel-Fayssse M, Gambrelle J, Quaranta-El Maftouhi M, Moullet. Photodynamic therapy for choroidal metastasis from lung adenocarcinoma. *Acta Ophthalmol Scand*. 2006;84(4):552-554.
- Lim JJ, Petrovich Z. Radioactive plaque therapy for metastatic choroidal carcinoma. *Ophthalmology*. 2000;107(10):1927-1931.
- Shields CL, Shields JA, De Potter P, et al. Plaque radiotherapy for the management of uveal metastasis. *Arch Ophthalmol*. 1997;115(2):203-209.
- Rosset A, Zografos L, Coucke P, Monney M, Mirimanoff RO. Radiotherapy of choroidal metastases. *Radiother Oncol*. 1998;46:263-268.
- Kosmas C, Malamos NA, Antonopoulos M. Complete regression of choroidal metastases from breast cancer after docetaxel-based systemic chemotherapy. *Med Pediatr Oncol*. 2000;34(3):229-230.

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