Prostate carcinoma is the most common primary malignancy in men. The American Cancer Society estimated that, in 2017, there would be 161,360 new cases of prostate carcinoma, comprising 19% of all new cases of cancer in men.\(^1\) The number of deaths from this malignancy last year was estimated to be 26,730, representing 8% of all estimated cancer deaths in men.\(^1\)

Recent data have shown that about one in seven men will be diagnosed with prostate cancer in their lifetimes and that most cases (60%) will occur in those aged 65 years and older.\(^1\) Despite this remarkably high incidence, most cases of prostate cancer follow a slow, indolent course.\(^2\) In fact, the risk of death from other causes (eg, heart disease, peripheral vascular disease, and others) is generally regarded as far greater than the risk of death directly from the prostate cancer itself.\(^2\)

**Mortality and Metastasis**

Daskivich et al studied comorbidities and competing risks in a cohort of 3183 men with nonmetastatic prostate cancer. They found that the 14-year risk for other-cause mortality was 24%, 33%, 46%, and 57%, respectively, for those with zero, one, two, and three comorbid conditions.\(^2\) The 10-year risk of mortality specific to prostate cancer was 3% in patients graded as low risk, 7% for those with intermediate risk, and 18% for those with high risk, whereas the 10-year mortality rate from other causes was approximately 33%.\(^2\) In light of this information, prostate cancer treatment is now offered typically to those with advanced disease, while those with lower grade or more localized disease are managed with cautious observation and surveillance.\(^2\)

Prostate carcinoma rarely metastasizes to the eye. In one large study of 520 eyes with uveal metastasis, the top cancers to metastasize to the eye included cancers of the breast (47%), lung (21%), gastrointestinal tract (4%), skin (2%), kidney (2%), and prostate (2%).\(^3\) Prostate cancer ranked sixth overall and fourth in men for frequency of uveal metastasis.\(^3\) This is somewhat surprising, given the malignancy’s prevalence in the United States, but it is in accordance with its indolent behavior. It is estimated that 120 per 100,000 men and 619 per 100,000 men aged 65 and older are affected by prostate cancer.\(^4\)

In this article, we describe a patient with prostate carcinoma who was discovered to have multifocal large choroidal metastases that were successfully controlled with external beam radiotherapy (EBRT).

**Case Report**

A 68-year-old black man was referred to the Ocular Oncology Service at Wills Eye Hospital for evaluation of a mass in his right eye (OD) that had been incidentally discovered during cataract surgery 1 month previously. The patient had been experiencing photopsia and floaters OD during that time. Medical
history revealed prostate carcinoma with metastases to lung and bone, diagnosed 8 months earlier and treated with systemic chemotherapy. The patient also received abiraterone acetate (Zytiga, Janssen Oncology), a CYP17 inhibitor used to treat castration-resistant metastatic prostate cancer. He reported a 20-year history of cigarette smoking, which he had discontinued 34 years ago.

On ocular examination, best corrected visual acuity was light perception OD and 20/40 in his left eye (OS). Intraocular pressure was 19 mm Hg OD and 33 mm Hg OS. Anterior segment evaluation revealed pseudophakia in each eye (OU). Fundus examination OD (Figure, A) disclosed two yellow choroidal tumors associated with extensive exudative retinal detachment involving the macular region. The largest mass, located inferiorly, measured 19.0 mm in base and 10.4 mm in thickness, and the smaller tumor, located superiorly, measured 10.0 mm in base and 3.3 mm in thickness. Fundus examination OS showed a single yellow choroidal mass located superotemporally and measuring 9.0 mm in base and 1.9 mm in thickness. There was no retinal detachment OS. B-scan ultrasonography confirmed two solid, dome-shaped, choroidal masses with underlying subretinal fluid OD (Figure, B) and a smaller choroidal mass OS. Optical coherence tomography (OCT) through the lesions yielded poor quality images due to extensive subretinal fluid OD and peripheral location OS.

These features were consistent with multifocal bilateral choroidal metastasis in a patient with systemic metastases from prostate carcinoma. Oncology systemic evaluation confirmed no sign of primary lung cancer. The patient was treated with 10 sessions of external beam radiotherapy (EBRT) to each eye. Six weeks after treatment, visual acuity improved to hand motion OD and 20/20 OS. The inferior choroidal mass OD showed regression (Figure, C) from 10.4 mm down to 6.4 mm in thickness (Figure, D), and the superior mass regressed from 3.3 mm to 1.6 mm, with dramatic reduction in subretinal fluid confirmed on OCT (Figure, E). There was complete regression of the tumor OS to a flat mass. This eye was managed conservatively with observation. Serial injection of periocular triamcinolone was planned to further reduce the subretinal fluid OD.

**DISCUSSION**

Prostate carcinoma is currently the second leading cause of cancer deaths in males in the United States. It is estimated that nonwhite men have a 74% higher risk of prostate cancer compared with white men. Other well-established risk factors for prostate cancer include increasing age, familial predisposition, and certain genetic conditions such as Lynch syndrome and BRCA1 and BRCA2 mutations. The most common type of prostate cancer is adenocarcinoma (90-95%), with small-cell, squamous, transitional, and prostatic sarcoma much less common. The American Joint Committee on Cancer’s tumor, nodes, and metastasis (TNM) classification and stage grouping is the most widely accepted system for prostate cancer. Classification is based on the extent of tumor (T), lymph node (N), metastasis (M), Gleason score, and prostate-specific antigen level at the time of diagnosis. The Gleason score is based on five different histopathology patterns from normal (score 1-2) to malignant (score 4-5). Two regions of the tumor are selected and scored, and the combined score is the final Gleason score of 1 to 10.

In 2005, the International Society of Urology Pathology modified the original Gleason system to more accurately categorize patients into prognostic groups: Gleason score ≤ 6 (prognostic grade group 1); Gleason score 3+4 = 7 (group 2); Gleason score 4+3 = 7 (group 3); Gleason score 4+4 = 8 (group 4); and Gleason score 9 to 10 (group 5). The 5-year biochemical recurrence-free survival for men with tumors at biopsy belonging to groups 1, 2, 3, 4, and 5 were 95%, 83%, 65%, 63%, and 34%, respectively. Although early-stage prostate cancer is typically asymptomatic, advanced stage symptoms include increased frequency of urination, weak or interrupted urine flow, painful urination, and blood in urine.

Vast advances have been made in the past decade in both the screening and treatment of prostate cancer. Because the value of early detection in reducing mortality and morbidity due to prostate cancer is not clear, universal screening of all men over age 50 years is no longer recommended. Risk of biopsy complications, the consequences of overtreatment, and often limited...
survival benefits confound the decision to undergo early screening. The American Cancer Society now suggests that men make informed decisions with their physicians about whether to be screened for prostate cancer.

The adverse effects of treatment and questionable survival benefits have also changed the dynamics of treating prostate cancer. It is estimated that one in seven men is diagnosed with prostate cancer during his lifetime, but only one in 39 will die from this malignancy. With 5-year survival rates in localized cases approaching 100%, there has been a paradigm shift from active intervention to watchful waiting in early prostate cancer. The PROTEC trial found no significant differences in prostate-specific mortality or overall mortality in men with localized prostate cancer, whether treated with active surveillance, radiation, or surgery.

Hormonal therapies, including androgen deprivation therapy and luteinizing hormone-releasing hormone agonists, continue to be used as first-line treatments in advanced metastatic prostate cancer. Docetaxel-based chemotherapy regimens are used in patients who are resistant to hormone therapy.

Advanced prostate cancer most commonly spreads to bone, followed by lung, liver, pleura, adrenal glands, and, rarely, the eye. In a 1996 study by Eliassi-Rad et al, ocular metastasis was found in only 4.2% of patients dying from prostate cancer. In a study of 520 eyes with uveal metastasis, 57% of eyes had improved or stabilized visual acuity after palliative treatment with EBRT. So far, there have been three reports on EBRT for choroidal metastasis secondary to prostate cancer, and all showed nearly complete tumor resolution following EBRT.

The main disadvantages of EBRT include ocular adverse effects from radiation such as dry eye, erythema, corneal ulceration, cataract, retinopathy, and blindness. A TREATMENT PLAN

Despite the high incidence of prostate cancer in men, this malignancy maintains an indolent course and rarely metastasizes to the choroid. In this case, we found that EBRT can be a viable treatment option for patients with multifocal large choroidal metastases resulting from prostate carcinoma.

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No conflicting relationship exists for any author.

Support provided by the Eye Tumor Research Foundation, Philadelphia, Pa. (CLS). The funders had no role in the design and conduct of the study, in the collection, analysis, and interpretation of the data, or in the preparation, review, or approval of the manuscript. Carol L. Shields, MD, has had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.