

Original Article

Cognitive biases in orbital mass lesions – Lessons learned



Heather M. McDonald^{a,*}; James P. Farmer^{a,b,c,d}; Paula L. Blanco^{a,b}

Abstract

Purpose: A patient's presentation and clinical diagnosis can at times be clouded by their past medical history. Clinicians' anchoring bias towards initial information, such as a history of cancer, may lead them astray when creating a differential diagnosis for a patient who presents with new signs and symptoms of a mass lesion, assuming metastatic disease without seeking tissue confirmation.

Methods: The presentation, workup, diagnosis, and treatment of two patients who presented with orbital masses in the context of a primary prostate cancer are presented in this report.

Results: In both cases, prostate cancer metastasis to the orbit was top on the differential. Ultimately, histopathological examination of biopsies taken from the orbital masses revealed orbital lymphoma in both patients.

Conclusion: With mounting rates of patients who have survived a previous cancer, multiple primary cancers within one patient are becoming increasingly common. While prostate cancer metastasis to the orbit is a relatively rare event, orbital lymphoma is a more common diagnosis in orbital masses. Therefore, when patients present with orbital masses in the context of prostate cancer, the conclusion should not immediately be metastasis and a tissue diagnosis should be sought; especially given that the treatment of these entities is different.

Keywords: Orbital metastasis, Prostate cancer, Orbital lymphoma, Hickam's Dictum, Multiple primary cancers

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Introduction

An increasing source of medical error resulting in unfavorable patient outcomes is cognitive bias in the diagnostic process. A study done by the Institute of Medicine published in 1999 indicated that between 44,000 and 88,000 patients die each year within the United States as a result of medical errors, with 18% of patients being injured during their course in hospital and the cost of preventable adverse events between US\$17 and US\$19 billion per year.¹

Cognitive errors and biases refer to context specific prejudices that influence our thought processes. Crosskerry refers to these default processes as "cognitive disposition to respond".² This is a process that is innate to human cognition and can significantly influence implicit decisions made in medicine. Anchoring bias refers to the human tendency to place too much emphasis on initial data during the diagnostic process.³ When new crucial information is obtained, there is a failure to reconsider the diagnosis due to this anchoring bias. Occam's Razor is a theory that supports one unifying

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^a Faculty of Medicine, University of Ottawa, 451 Smyth Road, K1H 8M5 Ottawa, ON, Canada

^b Department of Pathology and Laboratory Medicine, The Ottawa Hospital, 501 Smyth Road, K1H 8L6 Ottawa, ON, Canada

^c Department of Ophthalmology, Hotel Dieu Hospital, 166 Brock Street, K7L 5G2 Kingston, ON, Canada

^d Faculty of Medicine, Queen's University, 18 Barrie Street, K7L 3N6 Kingston, ON, Canada

* Corresponding author at: 8 Davenport Private, K1K 4W5 Ottawa, ON, Canada.

e-mail addresses: hmcd032@uottawa.ca (H.M. McDonald), jfarmer@toh.ca (J.P. Farmer), pblanco@eorla.ca (P.L. Blanco).

diagnosis to explain all of a patient's signs and symptoms. In modern medicine, this is referred to as diagnostic parsimony, or the desire to attribute multiple symptoms to the fewest possible diagnoses.⁴ Hickam's Dictum proposes that there is no limit on the potential number of diagnoses which may explain a patient's presentation. In fact, it is statistically more likely that a patient's symptoms are secondary to several common disease entities as opposed to a single rare disease to explain a myriad of symptoms.⁵ The presentation, workup, and diagnosis of two cases of orbital masses in the setting of a primary prostate cancer are presented in this report as an example of anchoring bias and the potential pitfalls in the diagnosis.

Materials and methods

Two cases of orbital lymphoma in patients with suspected metastatic prostate cancer were collected by one pathologist in Ontario, Canada. Their files were reviewed looking at their clinical presentation, laboratory workup, diagnostic imaging, pathology results, and management. A brief literature review was performed to analyze the prevalence of orbital lymphomas as compared to prostate cancer metastases in the orbit.

Results

Patient 1

A 79-year-old male presented to the Ophthalmology service with a 1-month history of gradually progressive proptosis of the right eye. Neuroimaging confirmed a 5 mm mass in the superotemporal orbit without bone erosion. Nine months' prior the patient had been diagnosed with locally advanced prostate cancer, at which point he had decided to forgo biopsy confirmation. The patient opted for androgen deprivation therapy to treat his prostate cancer, which was discontinued after 8 months due to intolerable side effects. Upon discovering the patient's orbital mass, he underwent further testing including computed tomography (CT), which revealed a large prostate gland invading the bladder base, multiple ring-enhancing hepatic lesions, a 3 cm splenic lesion, and a 5 cm infrahilar mass with bilateral hilar lymphadenopathy and endobronchial disease.

Given the patient's history, the urology oncology team felt that the new orbital mass causing his right proptosis was most consistent with metastatic prostate carcinoma and he was thus referred to radiation oncology for localized treatment. It was at this time that the radiation oncologist recommended a biopsy of the right orbital mass and liver lesion to rule out other potential underlying etiologies. The liver biopsy revealed metastatic carcinoma consistent with a prostate primary. The orbital biopsy, however, revealed follicular lymphoma Grade 2/3 (Figs. 1–3). It was therefore treated with radiation therapy of 2975 CGY. The patient also received palliative radiotherapy for his liver and subsequent bone metastases. He was restarted on androgen deprivation therapy with continued disease progression. The patient's course was one of relentless progression of disease and he died 3 years after the diagnosis of the orbital lymphoma.

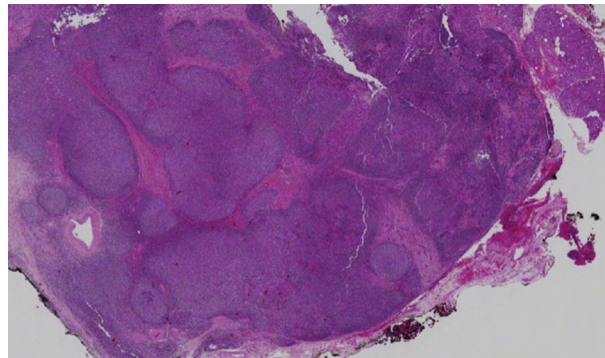


Fig. 1. Patient 1 – Low Power H&E Stain of Orbital Mass. Low power magnification of the orbital biopsy shows a mass arising out of the lacrimal gland with a follicular configuration (25 \times).

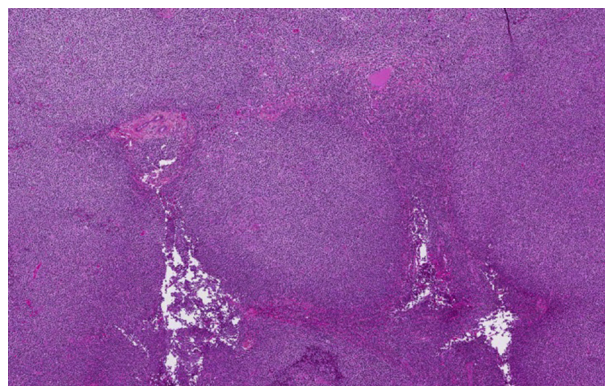


Fig. 2. Patient 1 – Medium Power H&E Stain of Orbital Mass. Medium power magnification of the orbital biopsy shows the nodular (follicular) architecture and the absence of any glandular or epithelial structures (100 \times).

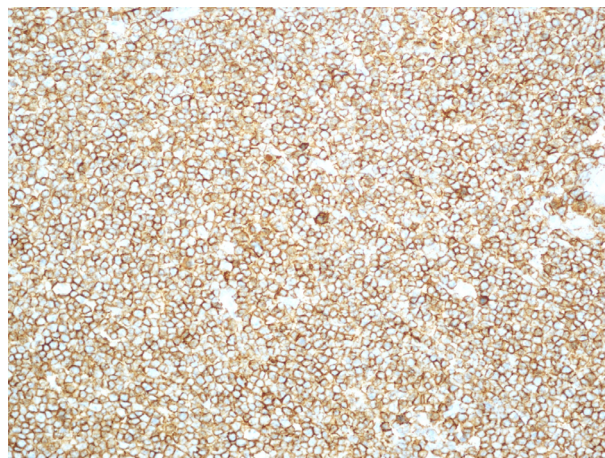


Fig. 3. Patient 1 – Medium Power B Cell Marker CD20 of Orbital Mass. Medium power magnification of the orbital biopsy shows diffuse positivity for the pan B cell marker CD20 (100 \times).

Patient 2

A 53-year-old man presented to the Ophthalmology service with a 3- to 4-week history of swelling of the left eyelid without a palpable mass. CT scan of the orbits revealed a 2.1 \times 2.3 \times 0.9 cm left superotemporal orbital mass with local

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