JOJ
Ophthalmology

Case Report
Volume 1 Issue 2 - November 2015

JOJ Ophthal

Unusual Visual Presentation from Optic Neuropathy Secondary to Recurrent Oral Squamous Cell Carcinoma

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Submission: November 06, 2015; **Published:** November 14, 2015

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Abstract

A number of medical conditions may present to the emergency department involving a change or loss of vision. Many of these conditions are sudden in onset and may result in complete or partial loss of vision, such as stroke or multiple sclerosis. A 53 year old male with a past history of oral squamous cell carcinoma presented with a headache and changes in color hue in his right eye. CT imaging revealed recurrent oral squamous cell carcinoma involving the right sphenoid and ethmoid sinuses with extension into the right middle cranial fossa and orbit. It is important to note that a change in color vision may be from optic nerve dysfunction, which was found to be the case for this patient. The patient was diagnosed with optic neuropathy secondary to recurrent oral squamous cell carcinoma, which represents the first case report of such condition.

Keywords: Human Papillomavirus

Abbreviations: OSCC : Oral Squamous Cell Carcinoma

Introduction

Oral squamous cell carcinoma (OSCC) represents the most frequent malignancy of the oral mucosa [1,2]. Tobacco and alcohol are strong risk factors [2], and a number of studies have commented on the association between human papillomavirus and OSCC [3,4]. It represents a significant clinical challenge, requiring aggressive surgical resection with staging of the tumor. Chemotherapy and radiation therapy are required to achieve remission [5] and management requires evaluation by MRI and PET [6]. The most frequent spread of OSCC is to the cervical lymph nodes and lung, followed by metastasis to bone and liver [7]. Nasopharyngeal spread may occur in up to 28% of cases; however secondary ocular spread is rare [8]. We report a patient who presented to the emergency room with symptoms of color vision changes which was found to be secondary to metastatic spread of OSCC.

Materials and Methods

Biomicroscopy, color vision testing, visual field testing, dilated indirect ophthalmoloscopy, optical coherent tomography, fundus photography, and fluorescein angiography were performed. Subsequent CT and PET imaging were also obtained.

Case Report

A 53 year old male presented to the emergency room with headaches and decreased contrast sensitivity in his right eye. He was a nonsmoker, but would occasionally drink alcohol and use recreational drugs. Family history was unremarkable for malignancy. Medical history included controlled hypertension and OSCC involving the tongue, with spread into the cervical lymph node. After undergoing surgical resection, he underwent chemotherapy and radiation therapy to the head, neck, and lungs. Two years later he was noted to have a recurrence of OSCC, which involved his left maxillary and ethmoid sinuses with extension into the left orbit. He underwent left orbital exenteration, left external sphenoidectomy, left ethmoidectomy including resection of tumor at the cribriform plate, and left medial maxillectomy. The patient concurrently received an additional three month course of chemotherapy and radiation therapy.

The patient was referred for ophthalmologic consultation. Due to the patient's unusual presentation, there was concern for recurrence of OSCC in the right orbit. The patient was sent for MRI imaging of the brain and orbit. Due to surgical clips from the previous orbital exenteration, a CT scan was performed instead. He was referred to oncology for further evaluation, and received a PET scan and another CT scan. The patient elected for hospice care rather than further surgical or medical treatment.

Results

Ophthalmic examination disclosed a best corrected visual acuity of 20/25-2 in the right eye, and an intraocular pressure of 10 mmHg. There were no abnormalities of the right eyelids, conjunctiva, cornea, lens, pupillary response, or extraocular eye motility. There was no proptosis or pain or resistance on retropulsion. There were no abnormalities of color vision by Ishihara plate testing. Humphrey 24-2 visual field testing revealed an enlarged blind spot and small peripheral abnormalities (Figure 1). After dilation, the optic nerve showed mild hyperemia and mild retinal venous congestion (Figure 2A). No abnormalities of the macula, peripheral retina, or vitreous were noted. A fluorescein angiogram was performed and disclosed mild late staining of the optic nerve, with no other abnormalities (Figure 2B). Evaluation of the optic nerve by optical coherent tomography demonstrated mild optic nerve elevation, consistent with optic neuropathy (Figure 3).

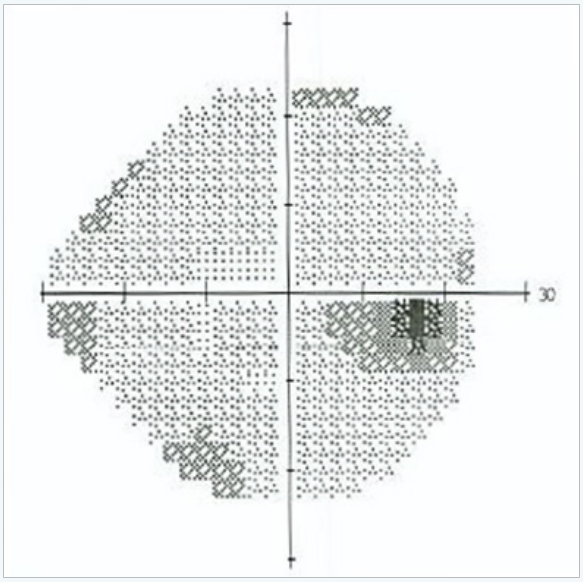

Figure 1: An enlarged blind spot and peripheral visual field defects in the right eye formally tested using the Humphrey 24-2 testing algorithm.

The CT scan disclosed sphenoid and posterior ethmoid sinus disease (Figure 4). PET scan imaging demonstrated progression of malignancy at the level of the right skull base with extension into the right cavernous sinus and extension to the posterior nasopharynx and adenoid region. Extensive new skeletal metastatic disease was also noted. Within a month, he presented with proptosis and an orbital apex syndrome. Extensive tumor invasion into the right orbit was noted by an additional CT scan (Figure 5). The patient succumbed to his illness within three weeks of this examination.

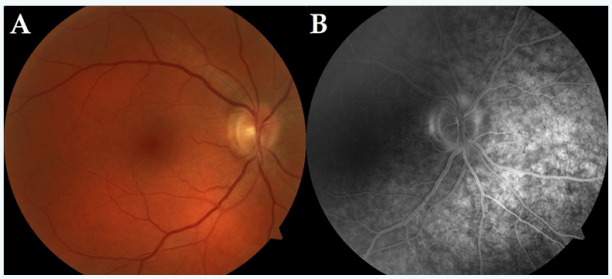

Figure 2: Fundus photography displaying mild hyperemia in the right optic nerve and retinal venous congestion (A), followed by fluorescein angiography displaying mild late staining of the optic nerve without other abnormalities of the macula or retinal vasculature (B).

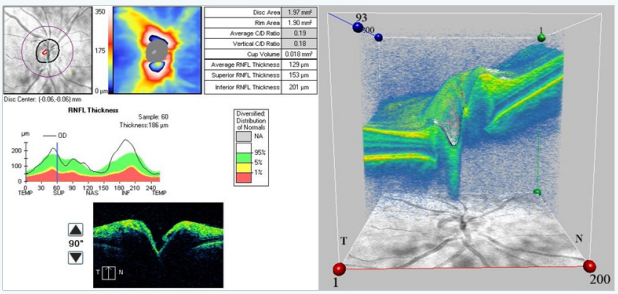

Figure 3: Cirrus-HD optical coherence tomography demonstrating slight optic nerve elevation consistent with right optic neuropathy.

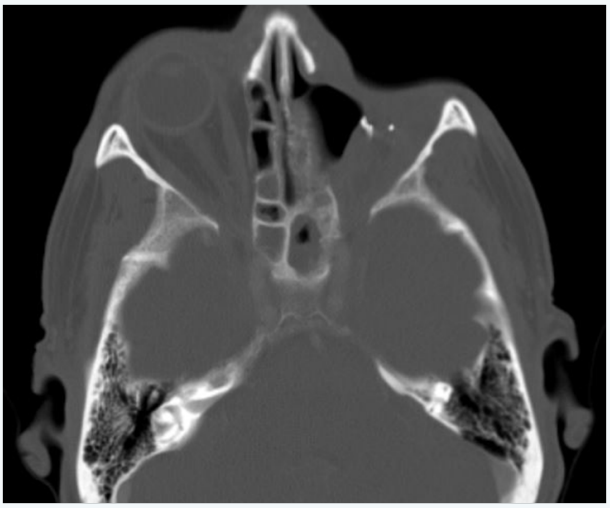

Figure 4: Computed tomography disclosing sphenoid and posterior ethmoid sinus disease.

How to cite this article: Victoria K, Ursula M A, Ahsan A A, Brandon M D, James B M. Unusual Visual Presentation from Optic Neuropathy Secondary to Recurrent Oral Squamous Cell Carcinoma. JOJ Ophthal. 2015; 1(2): 555557.DOI: 10.19080/JOJO.2015.01.555557

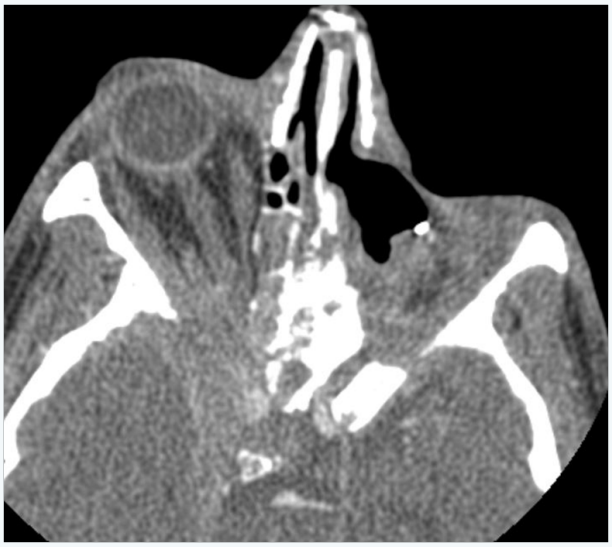

Figure 5: Computed tomography demonstrating proptosis and an orbital apex syndrome with extensive tumor invasion into the right orbit.

Discussion

Visual complaints can be a common presentation to the emergency department. This patient presented with a headache and changes in color hue, and was diagnosed with optic neuropathy secondary to recurrent OSCC. Given the ophthalmologic findings, CT and PET studies, it is likely the optic neuropathy was secondary to tumor spread in the cavernous sinus giving rise to the venous dilation and direct tumor involvement of the optic foramen from the sphenoid sinus. We suspect the patient's headache was secondary to meningeal involvement. Macrophage polarization and regional spread to the cervical lymph nodes, both of which this patient demonstrated, have been indicators of a poor prognosis [9]. Fewer than 10 cases involving ocular spread have been reported, which also carries a poor prognosis [7]. None of the reported cases have presented as an optic neuropathy. In 2007, Feng et al. reported the first case of acute visual loss in a head and neck cancer patient with ocular metastasis and sphenoid pyocele, however he points out that the visual loss occurred from compression of the optic nerve and the sphenoid pyocele [10].

This case serves to illustrate the unusual nature of visual complaints that may present to the emergency department and helps to illustrate the effectiveness of the multispecialty team approach in assessing complex patients.

Acknowledgments

The authors thank Dr. Vijay Suhag (Department of Oncology, Sutter Roseville Medical Center), Dr. Christopher Markus (Emergency Department, Sutter Roseville Medical Center), Dr. Randall Ow (Department of Otolaryngology, Sutter Roseville Medical Center), and Dr. Michael Kaplan (Department of Otolaryngology, Head and Neck Surgery, Stanford University Medical Center).

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