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Case Report

A Case Report of Intravitreal Bevacizumab for Iris Metastasis of Small Cell Lung Carcinoma with Neovascular Glaucoma

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Keywords
Intravitreal bevacizumab · Iris metastasis · Neovascular glaucoma

Abstract
A 79-year-old man who had been diagnosed with small cell lung carcinoma (SCLC) complained of right ocular pain and blurred vision. His right intraocular pressure (IOP) was 30 mm Hg, and anterior chamber cells and multiple grayish white iris masses associated with peripheral anterior synechia (PAS) and neovascularization of the right iris were observed. We presumed that the iris masses were iris metastasis of SCLC. Despite therapy with topical eye drops and oral acetazolamide, the IOP was poorly controlled, so we injected intravitreal bevacizumab into his right eye for neovascular glaucoma. Neovascular glaucoma disappeared rapidly, but the IOP did not improve because of total PAS. To our knowledge, there is only one report of the use of intravitreal bevacizumab for SCLC metastasis in that eye and they reported that intravitreal injection resulted in successful short-term regression of presumed iris metastasis and improved control of secondary neovascular glaucoma, and the case had over one-half PAS. The previous report and our results suggest that secondary neovascular glaucoma with iris metastasis may be controlled by early intravitreal bevacizumab injection.

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Introduction

Metastasis to the anterior uvea is very rare compared with choroidal metastasis [1–3], with the majority of cases originating from carcinomas in either the breast or lungs [4]. The most common cancer type is non-small cell lung cancer (non-SCLC), and small cell lung carcinoma (SCLC) is rare [3–5]. We report a case of iris metastasis that caused neovascular glaucoma in a patient with SCLC, which was treated with bevacizumab.

Case Report

A 79-year-old man was referred to our hospital for right iris metastasis on May 17, 2016. He noticed right ocular pain and blurred vision 5 days prior to presentation, and visited his local doctor. He had been diagnosed 11 months earlier with SCLC (cT4N2 or 3M1b with left cerebellar metastasis, and invasion of the trachea and mediastinum.) and had undergone chemotherapy with 2 cycles of carboplatin/etoposide and secondary chemotherapy with amrubicin. His status was regarded as stable disease at that time.

His visual acuity was 0.1 (0.8 × S + 1.50 D Cyl –0.50 D A × 75°) OD and 0.5 (0.9 × S + 2.50 D Cyl –1.50 D A × 105°) OS. His intraocular pressure (IOP) was 30 mm Hg (OD) and 10 mm Hg (OS) measured using a Goldmann applanation tonometer (GAT). Right relative afferent pupillary defect (RAPD) was positive. Slit-lamp biomicroscopy revealed conjunctival injection and multiple temporal gray irregular iris masses associated with peripheral anterior synechia (PAS) and neovascularization of the iris (Fig. 1a). The PAS index was approximately 10%. The bilateral fundi were normal. Iris masses were observed by anterior optical coherence tomography (OCT) and ultrasound biomicroscopy (UBM). Anterior ocular segment fluorescein angiography revealed leakage due to iris neovascularization (Fig. 2).

The iris masses were presumed to be metastatic from SCLC. We diagnosed him as having neovascular glaucoma due to the iris metastasis from SCLC. We started therapy with topical latanoprost, brinzolamide, timolol maleate, and oral acetazolamide at 500 mg/day. After starting the therapy, the patient was admitted to another hospital to receive radiotherapy for brain metastasis. When he visited our hospital again on June 14, his right IOP had not improved (33 mm Hg); therefore, we injected 1.25 mg of bevacizumab into his right vitreous cavity on July 4 to treat neovascular glaucoma. The use of intravitreal bevacizumab received prior approval from the Miyazaki University Hospital Ethics Committee. After bevacizumab injection, the iris masses rapidly decreased and the neovascularization disappeared (Fig. 1b), but his right IOP did not improve because of the 100% PAS index. We thus performed trabeculectomy for his right eye on August 8. After surgery, his right IOP decreased to 10 mm Hg (GAT), but his right optic disc had already atrophied because of long-term high IOP, and as a result his right visual acuity did not recover (light perception positive OD).

Discussion

The majority of iris metastases originate from carcinomas of either the breast or lungs. Shields et al. [4] reported that the most common primary site was breast cancer (68%) in women and lung cancer (40%) in men. Metastasis to the anterior uveal region is very rare compared with choroidal metastasis. Ferry and Font [1] reported that 62% were choroidal metastases and 11% were iris metastases. Shields et al. [2] found that 7.8% were iris

metastases. Shah et al. [3] also reported that 88% had choroidal metastases and 10% iris metastases from lung cancer.

Non-SCLC was found to predominate over SCLC in cases of uveal metastasis from lung cancer in the study by Shah et al. [3] (non-SCLC vs. SCLC: 46.84 vs. 9.16%) as well as in the study by Kreusel et al. [5] (77 vs. 23%).

Treatment of uveal metastasis generally consists of external beam radiotherapy, systemic chemotherapy, brachytherapy, photodynamic therapy, surgical resection, and enucleation [3]. There are also reports of intravitreal injection of anti-VEGF antibodies as treatment for neovascular glaucoma caused by metastasis of iris tumors [6, 7]. However, to our knowledge, only one case of intravitreal bevacizumab for neovascular glaucoma caused by SCLC metastasis to the iris has been reported by Nakashima et al. [8]. Bevacizumab is a recombinant humanized monoclonal anti-VEGF. VEGF plays a central role in the regulation of angiogenesis [9]. Tumor angiogenesis is an important characteristic of cancer, and tumor angiogenesis is necessary due to increased metastatic cancer [10, 11]. Nakashima et al. reported that 2 weeks after the bevacizumab injection, the iris tumor had decreased in size, the iris neovascularization had resolved and IOP had also decreased. In Nakashima et al.'s study, the PAS was over one-half of the angle. On the other hand, in our case, IOP did not decrease after bevacizumab injection because of extensive PAS.

In summary, our case suggests the effectiveness of bevacizumab intravitreal injection for metastatic iris tumors. It also suggests that intravitreal injection of bevacizumab as early as possible enables control of the metastatic iris tumors resulting from SCLC and IOP in neovascular glaucoma patients.

Statement of Ethics

The authors followed the code of ethics of Miyazaki University.

Disclosure Statement

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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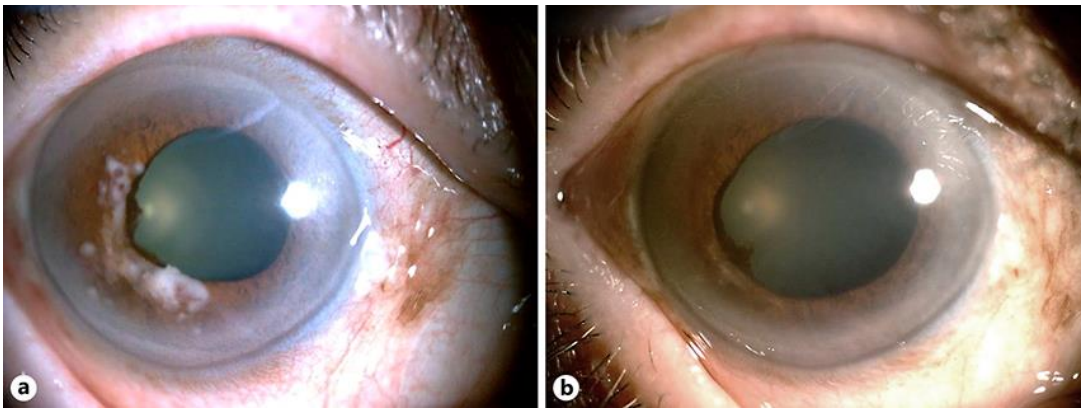

Fig. 1. **a** Slit-lamp examination before intravitreal bevacizumab. There were multiple temporal gray irregular iris masses associated with PAS and neovascularization of the iris. **b** Slit-lamp examination 1 month after intravitreal bevacizumab. The iris neovascularization disappeared and iris atrophy was noted where the original tumor had been.

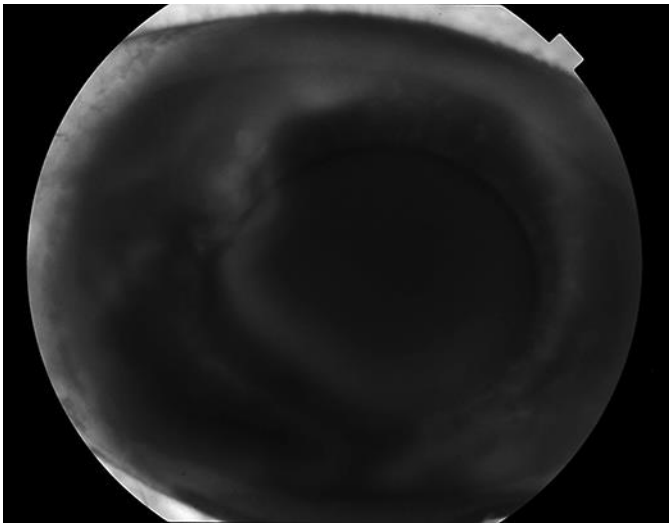

Fig. 2. Anterior ocular segment fluorescein angiography 4 min 24 s after injection showed leakage due to iris neovascularization.