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LETTER TO THE EDITOR

Intravitreal bevacizumab for iris tumor metastasized from large cell neuroendocrine carcinoma of lung

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Dear Editor,

Metastasis of systemic carcinomas to the iris of the eye is not common, but when they do, the majority originate from carcinomas of the breast or lungs [1, 2]. Large-cell neuroendocrine carcinomas (LCNECs) of the lung were first reported by Travis et al. [3], and they are classified as high-grade neuroendocrine carcinomas with aggressive behavior [4, 5]. These characteristics also apply to small-cell lung carcinomas (SCLCs) [6]. We present a case of an iris carcinoma with secondary glaucoma which had metastasized from a LCNEC of the lung. The carcinoma was successfully treated with intravitreal bevacizumab (IVB).

A 64-year-old man who complained of eye pain and blurred vision in the right eye for 1 week was referred to the Chiba University Hospital. The patient had been diagnosed with LCNEC of the lung from a lung biopsy specimen 16 months earlier. He had undergone chemotherapy for metastases to the adrenal gland, abdominal lymph nodes, and bone as well as radiotherapy for brain metastasis.

Slit-lamp biomicroscopy showed a small orange solid mass with rich neovascularization on the surface on the iris of the right eye at 5 o'clock. The iris mass was tentatively diagnosis as a metastasis from the LCNEC of the lung. It rapidly increased in size to approximately 3.5×2.5 mm over a 3-week period (Fig. 1a). Fluorescein angiographic (FA) of the iris documented the presence of the iris tumor at 5 o'clock, and it showed profuse late hyperfluorescence and leakage (Fig. 2a and b). Despite anti-glaucoma therapy, the IOP was 36 mmHg OD, and the patient continued to complain of ocular pain and blurred vision (20/40 OD).

Three monthly intravitreally injections of 1.25 mg in 0.05 ml of bevacizumab (Avastin, Genentech, San Francisco, CA, USA) were given. Because the half-life of bevacizumab in the eye would be longer after an intravitreal injection, we selected to treat this iris tumor by the intravitreal route.

Two weeks after the first IVB, the neovascularization was reduced and the IOP decreased to 16 mmHg but the size of the tumor was not reduced (Fig. 1b).

After the third IVB, the anti-glaucoma medication was stopped, and 1 month later the tumor had almost completely regressed with atrophy of the inferior nasal areas or the iris (Fig. 1c). The visual acuity remained at 20/20 OD, and the IOP was within the normal range without anti-glaucoma medications. FA showed that the remnants of the tumor had both early and late hyperfluorescence in a much smaller area than before the IVBs (Fig. 2c and d). During the 6-month follow-up, there was no recurrence of the neovascularization (Fig. 1d).

Metastatic iris tumors are usually treated with chemotherapy, radiation therapy, and surgical resection, but these

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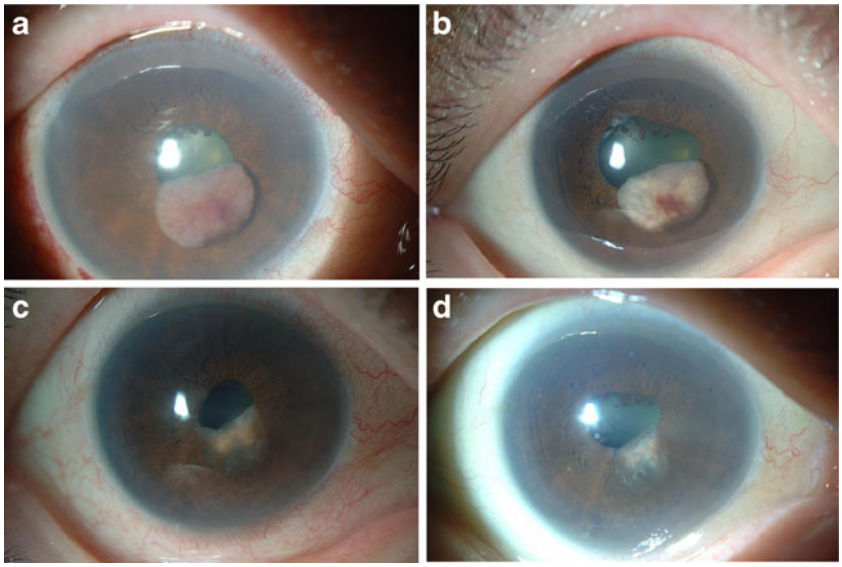

Fig. 1 Slit-lamp photographs of the right eye. **a** Before the intravitreal injection of bevacizumab, a large (approximately 3.5×2.5 mm), orange solid mass with abundant neovascularization can be seen on the surface of the iris of the right eye at 5 o'clock. **b** Two weeks after the first injection and before the second injection, the slit-lamp photograph shows a reduction of iris neovascularization. **c** One month later after the third injection, the size of the tumor has markedly decreased. **d** Six months after the third injection, there is no evidence of the tumor

procedures can have adverse side-effects [1]. In our patient, we found that there was a regression of the iris carcinoma with secondary glaucoma after IVB without the side-effects. The management of metastasized iris tumors with secondary glaucoma is extremely difficult, and to the best of our knowledge, our successful use of IVB is the first report on this therapy for metastasized iris carcinoma from a LCNEC.

The most likely mechanism for the response to the IVB is the anti-VEGF effect and reduction of permeability of the iris vessels. These findings were supported by the changes in the FA of the iris.

It has also been shown that IVB successfully treated an iris tumor with neovascular glaucoma that had metastasized from a SCLC [7]. Although the long-term success of the treatment remains to be assessed, these reports, including

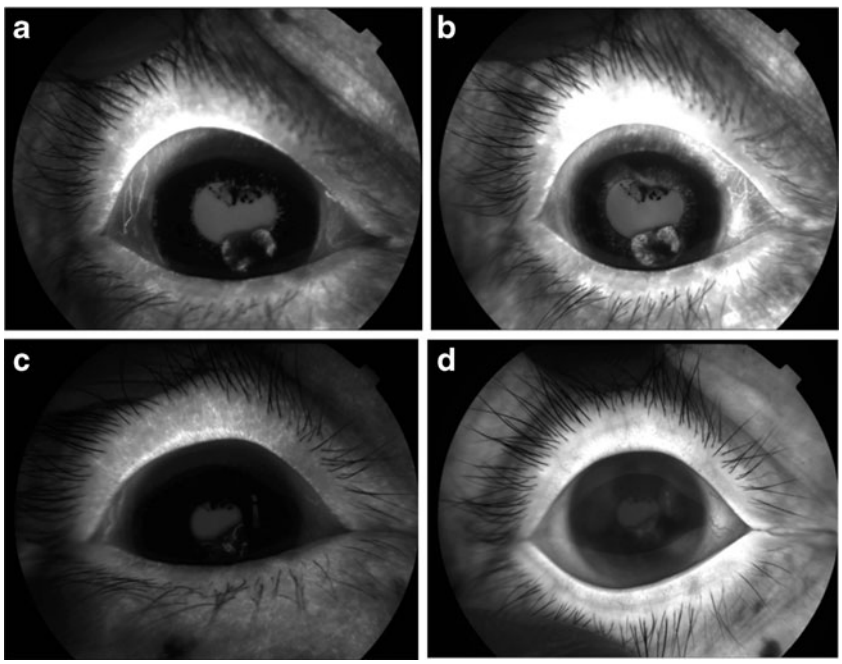

Fig. 2 Fluorescein angiograms of the right eye. Fluorescein angiogram of the iris before an intravitreal injection of bevacizumab. **a** Neovascularization of iris tumor can be seen in the early frames. **b** Note the profuse late hyperfluorescence and leakage. Three months after the third injection, fluorescein angiography shows a reduction of the tumor mass. **c** Early hyperfluorescence appears in a much smaller area. **d** The hyperfluorescence fades in the late phases

ours, suggest the usefulness of IVB treatment in iris metastasis with secondary glaucoma.

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