Non-adjuvant Single Low Dose Bevacizumab Intravitreal Injection Causes Resolution of Choroidal Metastases from Breast Carcinoma

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INTRODUCTION

Choroidal metastasis occurs in 7–11% of patients with breast carcinomas (1). Treatment includes external beam radiation therapy, tamoxifen, aromatase inhibitors (letrozole) and chemotherapy, including systemic bevacizumab (1–3). Bevacizumab, a monoclonal antibody, is anti-angiogenetic, thereby limiting tumour vascularization and growth. It has been approved for systemic use in colon carcinomas (4). Its "off label" use in ophthalmology has evolved from the treatment of age-related macular degeneration (ARMD) to proliferative diabetic retinopathy (PDR) and macula oedema (5–8). Bevacizumab is also an anti-vascular endothelial growth factor (VEGF) agent which reduces permeability and allows resorption of subretinal fluid.

Keywords: Bevacizumab, breast carcinoma, choroidal metastasis, intravitreal injection

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CASE REPORT

A 50-year old female presented in February 2014 with a twomonth history of gradual blurred vision in her right eye (only eye). She had breast cancer in 2009 and underwent a radical mastectomy (2010) and radiation (2011). Three months prior to presentation, she developed bone metastasis, but opted not to have chemotherapy.

Her best corrected visual acuity was 20/50 in the right eye and she could only visualize hand motions in the left eye. The left eye was amblyopic, with poor vision from birth and she had an esotropia (convergent squint) and a white cataract obscuring the fundal view. The right eye had a large 'creamish' elevated choroidal mass with neurosensory detachment, 6 disc diameters in diameter in the macula and also superior to the disc (Fig. 1a). B scan ultrasound of the left eye revealed multiple subretinal hyperechoic areas in the

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Fig. 1a: Right fundus pre-intravitreal bevacizumab.

macula area. An optical coherence tomography (OCT) scan of the right eye showed a solid choroidal mass in the macula with subretinal fluid [foveal thickness 502 μ m] (Fig. 2a).



Fig. 1b: Right fundus 4/52 post-intravitreal bevacizumab.

She refused chemotherapy, but wanted visual improvement in her only functioning eye (right eye). She underwent right intravitreal bevacizumab injection (1.25 mg in 0.05 ml). The choroidal mass reduced in four weeks (Figs. 1b, 2b). At the six-week review, her vision had improved to 20/20 in the right eye, and the choroidal metastasis in the posterior pole had resolved (Fig. 1c). Repeat OCT scan showed significant reduction in the foveal thickness to almost normal thickness [256 μ m] (Fig. 2c).



Fig. 1c: Right fundus 6/52 post-intravitreal bevacizumab.

Fig. 1: Fundus photographs of the right eye. (A) Pre-bevacizumab intravitreal injection with large elevated choroidal metastasis in the macular area. (B) Four weeks post-intravitreal injection with some resolution of the choroidal mass. (C) Six weeks post-intravitreal injection with resolution of macula metastases.

DISCUSSION

Bevacizumab, an anti-angiogenic agent, reduces vascular permeability when used intravitreally. The "off label" use of bevacizumab has increased over the past decade with evolving uses and varying concentrations for intraocular use. Amselem *et al* used 4 mg (0.16 ml) of bevacizumab intravitreally to treat choroidal metastases from breast carcinoma and noted visual improvement from 20/100 to 20/60 in three weeks (9). Yao *et al* used adjuvant bevacizumab 2.5 mg (0.1 ml) post chemotherapy with improvement from 20/400 to 20/30 at six months (10). The index case had significant improvement with a non-adjuvant (no previous systemic chemotherapy), single intravitreal bevacizumab injection at a lower dosage (1.25 mg/0.05 ml). This shows that intraocular use can be effective on metastasis at a very low dosage and volume (0.05 ml).

Early treatment before significant exudation and tumour growth may yield good results, possibly due to less chronic destruction of the choroid and inner retinal layer. Monitoring with the high definition OCT is important in the management. Low dose and low volume intravitreal (intraocular) bevacizumab injection is safe and effective in treating choroidal metastasis from breast carcinoma. It also reduces the risk of systemic chemotherapy complications, especially in a patient with only one functioning eye, as in this case, and who achieved return of normal vision within a few weeks of treatment.



Fig. 2: High definition optical coherence tomogram (OCT) of the right central foveal thickness (CFT). (A) Pre-bevacizumab injection, CFT 507 μm. (B) 4/52 post-injection with CFT 278 μm. (C) 6/52 post injection with CFT return to normal thickness of 256 μm.

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