

Sir,  
**The effect of intravitreal bevacizumab treatment on choroidal metastasis of colon adenocarcinoma—case report**

We report a case of colon adenocarcinoma with choroidal metastasis. Intravitreal bevacizumab treatment was successful in one eye but failed in the other eye.

**Case report**

A 43-year-old man was diagnosed with colon adenocarcinoma in 2000. In 2008, bone metastasis was found and chemotherapy (oxaliplatin, fluorouracil, Calciumfolinat-Ebewe) was started. In April 2008, he complained of decreased vision OS. His vision was 20/20 OD and 20/400 OS. An elevated choroidal mass and exudative retinal detachment were seen in the temporal posterior pole extending beneath the macula OS (Figure 1a).

Radiotherapy or intravitreal bevacizumab was offered. The patient chose the latter for convenience. Informed consent was obtained. Intravitreal 4-mg bevacizumab was injected. The mass enlarged despite four injections (Figure 1b). Vision deteriorated to hand motion.

Meanwhile, two small choroidal masses were seen in the upper quadrant adjacent to the optic nerve OD (Figure 1c). In May, intravitreal 4-mg bevacizumab was injected and marked shrinkage was appreciated (Figure 1d). In July, vision remained 20/20 even after

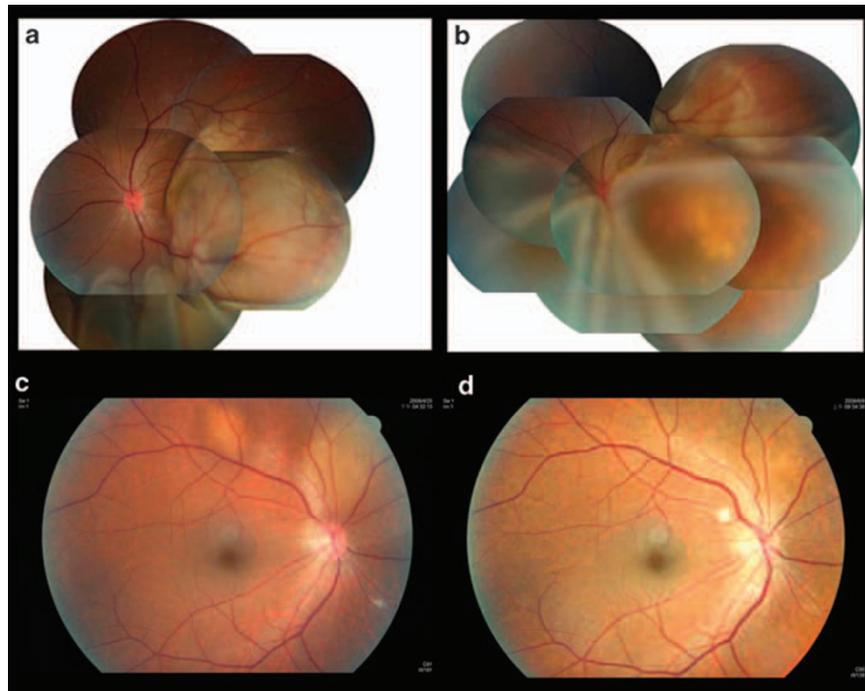
four injections. The patient expired in August 2008. His family denied the request of autopsy.

**Comment**

Bevacizumab (Avastin, Genentech, Inc., South San Francisco, CA, USA) is a full-length recombinant humanized antibody against all isoforms of VEGF-A. We report the short-term results of intravitreal bevacizumab treatment on choroidal metastases of colon adenocarcinoma in a patient. In his first eye the tumour progressed, whereas in the second eye it regressed. There is no report on successful treatment of choroidal metastasis in one eye but failure in the other eye with intravitreal bevacizumab.

The mechanisms for the response are the antiangiogenic and antipermeability effects of bevacizumab on new tumour vessels and smaller lesions. The massive exudation that hinders bevacizumab from reaching the metastatic tumour may explain the non-response.

Manzano *et al*<sup>1</sup> found bevacizumab not toxic to the retina at a concentration of 2.5 mg in rabbits. The safe dosage of intravitreal bevacizumab is presumed to be 7.5 mg in humans. Therefore, Amselem *et al*<sup>2</sup> chose 4 mg bevacizumab for choroidal metastasis secondary to breast carcinoma. Kuo *et al*<sup>3</sup> reported successful short-term regression treated with three monthly injections of 1.25 mg. In our case, 4 mg was used in



**Figure 1** (a) A large, elevated, orange choroidal mass in the temporal posterior pole extended beneath the macula to within 1 disc diameter of the optic nerve OS. Exudative retinal detachment was also found inferiorly. (b) Despite four intravitreal bevacizumab injections, the choroidal mass and massive exudative retinal detachment progressed OS. (c) Two small and orange choroidal masses were noted in the upper quadrant adjacent to the optic nerve OD. (d) After four intravitreal bevacizumab injections, the tumour masses had almost entirely regressed OD.

consideration of the large choroidal tumour and exudative retinal detachment.

Intravitreal bevacizumab seems to be effective for early and small choroidal metastasis of colon adenocarcinoma. Further studies and longer follow-up are required to verify its efficacy.

#### Conflict of interest

The authors declare no conflict of interest.

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#### Sir, Interactive computer-based self-reported, visual function questionnaire: the PalmPilot-VFQ

We read the article by Unver *et al*<sup>1</sup> with interest. The authors propose the PalmPilot-PDA as a method to overcome the barrier in implementing patient-reported outcomes (PROs). However, the work on using the Rasch analysis deserves further comment.

First, the authors calculate a total score from all questions in the PalmPilot-VFQ. However, a fundamental criterion underlying the Rasch models is unidimensionality. Unidimensionality refers to all items contributing to the measurement of a single underlying trait.<sup>2</sup> Although unidimensionality can be assessed by fit statistics as has been performed by the authors, recent studies suggest that these alone are inadequate and recommend performing principal components analysis (PCA) of the residuals for a detailed evidence of dimensionality.<sup>3</sup> It is crucial to establish unidimensionality because in its absence, the user will always be uncertain regarding the underlying latent trait being measured in a questionnaire. Reporting a total questionnaire score is invalid in such a scenario. Consider a multidimensional clinical

measure derived by combining visual acuity and IOP values to form a clinical score from 0 to 100. Although this may save time in the clinic, the output is of no use as it conveys no meaning. With recent studies suggesting that the NEIVFQ measures not QOL but visual functioning, establishing the underlying latent trait in this popular questionnaire assumes greater significance.<sup>4</sup> Therefore, researchers should perform a PCA of residuals to establish unidimensionality (or lack of unidimensionality thereof) during assessment of questionnaires.

Second, the authors have not examined the validity of the subscales of PalmPilot-VFQ. The present analyses were limited to assessing the NEIVFQ-25 as a single overall measurement. It is important to investigate the validity of subscales because the validity of an overall scale does not imply valid subscales. Usually the subscales have fewer items and so it is not uncommon to come across subscales that lack precision for meaningful measurement.<sup>5</sup> The precision, perhaps reported with person separation, should be reported for each subscale.

The initiative to develop a PalmPilot-VFQ is laudable, and with a fuller description of the psychometric properties, particularly unidimensionality and precision of the subscales, the PalmPilot-VFQ may improve the implementation of PRO measurement.

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