

Dramatic Regression of Persistent Tunica Vasculosa Lentis Associated With Retinopathy of Prematurity Following Treatment With Intravitreal Bevacizumab

Darin R. Goldman, MD, Caroline R. Baumal, MD

ABSTRACT

The authors describe a preterm infant who developed advanced retinopathy of prematurity bilaterally with a prominent tunica vasculosa lentis. Treatment with intravitreal bevacizumab resulted in regression of the tunica vasculosa lentis and posterior manifestations of the retinopathy of prematurity. RetCam imaging (Clarity Medical Systems, Pleasanton, CA) of the anterior segment was used to document the dramatic tunica vasculosa lentis resolution. [*J Pediatr Ophthalmol Strabismus* 2013;50:e27-e29.]

INTRODUCTION

Retinopathy of prematurity (ROP) is a leading cause of childhood blindness with a global prevalence of more than 50,000 blind children.¹ The incidence of ROP in the United States over a 5-year period has been estimated at 0.12%.² Treatment for ROP is targeted at the avascular retina that fails to mature appropriately and has traditionally been administered with ablative therapies including laser photocoagulation and cryotherapy. As with other retinopathies, increasing evidence has supported a critical role for vascular endothelial growth factor in the pathogenesis of ROP.³ Following the results of the BEAT-ROP study, which showed improved efficacy of intravitreal bevacizumab monotherapy

over conventional laser in reducing abnormal vascularization in certain types of ROP,⁴ questions remain as to the exact role of bevacizumab in the treatment of ROP in clinical practice.⁵ The effects of bevacizumab on the posterior segment manifestations of advanced ROP are fairly dramatic and well documented with rapid resolution of retinopathy and plus disease. The effects of bevacizumab on anterior segment manifestations of advanced ROP, such as a persistent tunica vasculosa lentis, are not as clear. The reported case illustrates dramatic bilateral resolution of persistent tunica vasculosa lentis in an infant treated with intravitreal bevacizumab for ROP.

CASE REPORT

A premature male infant with a gestational age of 23 weeks, 6 days and a birth weight of 610 grams developed type I ROP bilaterally 6 weeks after birth. His postnatal course included a diagnosis of respiratory distress syndrome, which required prolonged oxygen therapy and neonatal intensive care unit monitoring. Fundus examination 6 weeks after birth revealed zone 1, stage 3 ROP with plus disease in the right eye, although the view was limited by media opacity (**Figure 1A**). Anterior segment examination revealed a prominent persistent tunica vasculosa lentis (**Figure 1B**), which was the cause of the media opacity. This precluded the ability to

From the Department of Ophthalmology, New England Eye Center, Tufts Medical Center, Boston, Massachusetts.

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Correspondence: Caroline R. Baumal, MD, Department of Ophthalmology, Tufts Medical Center, 800 Washington Street, Box #450, Boston, MA 02111. E-mail: cbaumal@tuftsmedicalcenter.org

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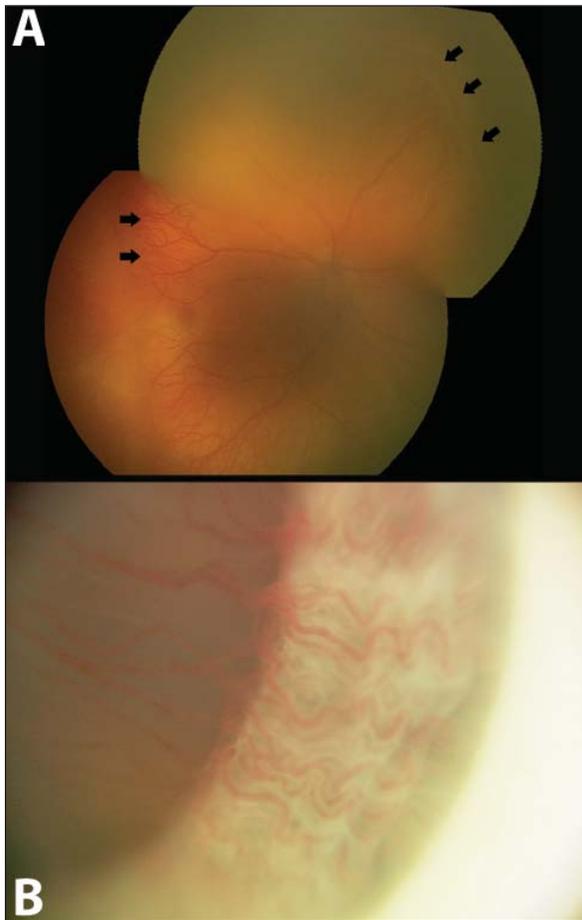


Figure 1. (A) RetCam fundus photograph (Clarity Medical Systems, Pleasanton, CA) of the right eye, which was limited by significant media opacity from a persistent tunica vasculosa lentis, showing zone 1, stage 3 (arrows) retinopathy of prematurity with plus disease. (B) RetCam anterior segment photograph of the right eye showing a prominent persistent tunica vasculosa lentis, with vessels extending from the peripheral iris all the way across the pupillary axis in a 360 degree fashion. Images were acquired using the RetCam D1300 lens, which can be used to image the fundus and anterior chamber of pediatric patients.

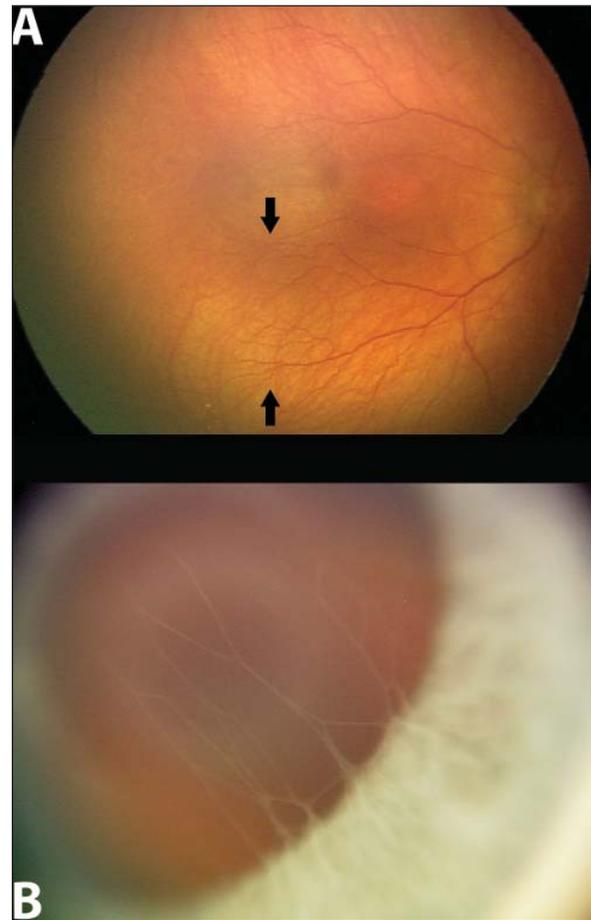


Figure 2. (A) RetCam fundus photograph (Clarity Medical Systems, Pleasanton, CA) of the right eye 1 month following treatment with intravitreal bevacizumab showing regression of retinopathy of prematurity and continued vascularization of the retina beyond the point where prior vascularization halted (arrows). (B) RetCam anterior segment photograph of the right eye 2 days following treatment with intravitreal bevacizumab (0.625 mg/0.025 mL) showing dramatic resolution of the tunica vasculosa lentis vessels, leaving behind ghost vessels.

perform fluorescein angiography due to leakage of dye into the anterior chamber, which blocked light transmittance back to the RetCam (Clarity Medical Systems, Pleasanton, CA).

The infant was treated with a single injection of intravitreal bevacizumab (0.625 mg/0.025 mL; Genentech, San Francisco, CA). Complete regression of ROP occurred (**Figure 2A**) along with regression of the persistent tunica vasculosa lentis within 2 days of treatment. The RetCam demonstrated residual nonperfused ghost vessels on the iris and anterior lens surface (**Figure 2B**). The left eye followed an identical course. A review of the chart showed that no other medical interventions were made dur-

ing this time to account for these changes (such as adjusting oxygen delivery). After resolution of the tunica vasculosa lentis, the view of the fundus improved significantly, with continued vascularization of the retina beyond the point of prior ROP.

DISCUSSION

The tunica vasculosa lentis is a normal anatomical structure that develops early during human embryogenesis, around 5 weeks gestational age. As the lens develops, the tunica vasculosa lentis begins to regress at 13 to 15 weeks gestational age near the same time that normal retinal angiogenesis begins. A prominent persistent tunica vasculosa lentis can

be a feature of ROP, particularly in advanced cases, and is thought to be due to elevated levels of vascular endothelial growth factor. A case series of 18 eyes describing the use of intravitreal bevacizumab for ROP included five eyes where a persistent tunica vasculosa lentis contributed to media opacity, which limited the ability to perform adequate conventional laser therapy, although further details were not provided.⁶ In the reported case, a persistent tunica vasculosa lentis prevented adequate visualization for conventional laser and also prevented detailed fundus examination. Complete resolution of a prominent tunica vasculosa lentis secondary to advanced ROP was demonstrated following treatment with a single dose of intravitreal bevacizumab. Anterior segment imaging with the RetCam was helpful in this case and is fairly straightforward to perform with the same contact lens hand piece that is used to image the posterior pole (D1300), a feature that is likely underused. Imaging of the anterior segment

in ROP may be helpful to monitor development and progression of anterior segment signs of ROP, as well as disease course and treatment response to anti-vascular endothelial growth factor therapy in cases of advanced ROP.

REFERENCES

1. Gilbert C. Retinopathy of prematurity: a global perspective of the epidemics, population of babies at risk and implications for control. *Early Hum Dev.* 2008;84:77-82.
2. Lad EM, Nguyen TC, Morton JM, Moshfeghi DM. Retinopathy of prematurity in the United States. *Br J Ophthalmol.* 2008;92:320-325.
3. Smith LE. Through the eyes of a child: understanding retinopathy through ROP the Friedenwald lecture. *Invest Ophthalmol Vis Sci.* 2008;49:5177-5182.
4. Mintz-Hittner HA, Kennedy KA, Chuang AZ; BEAT-ROP Cooperative Group. Efficacy of intravitreal bevacizumab for stage 3+ retinopathy of prematurity. *New Engl J Med.* 2011;364:603-615.
5. Moshfeghi DM, Berrocal AM. Retinopathy of prematurity in the time of bevacizumab: incorporating the BEAT-ROP results into clinical practice. *Ophthalmology.* 2011;118:1227-1228.
6. Axer-Siegel R, Snir M, Ron Y, Friling R, Sirota L, Weinberger D. Intravitreal bevacizumab as supplemental treatment or monotherapy for severe retinopathy of prematurity. *Retina.* 2011;31:1239-1247.