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### **Letter to the Editor**

Propranolol for Orbital Hemangioma

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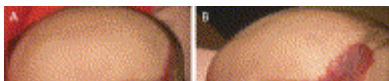
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### **Article Outline**

#### **References**

We report our experience treating a large, refractory orbital capillary hemangioma with propranolol in a 6-week-old girl. Propranolol therapy for a periocular hemangioma was first reported by Léauté-Labrèze et al<sup>1</sup> and also presented at the Fall Orbital Society meeting in New York. However, this therapy may still not be well known among the ophthalmic community.

A 6-week-old girl was referred for management of a large left orbital and periorbital capillary hemangioma ([Figure 1](#), [Figure 2](#), [Figure 3](#) and [Figure 4](#); available at <http://aaojournal.org>). The neoplasm had been present since birth and getting progressively larger with resultant occlusive, anisometropic, and strabismic amblyopia of the left eye. She had received 1 intralesional steroid injection 2 weeks prior to presentation with no significant change. She also had 2 other cutaneous capillary hemangiomas on her scalp and abdomen ([Fig 4](#); available at <http://aaojournal.org>). She was treated with systemic oral steroids (1 mg/kg/day). At 2 weeks follow-up, the tumor had not responded, or slightly progressed. She was then treated on outpatient basis with propranolol 2 mg/kg/day; simultaneously, oral steroids were tapered off over the next 2 weeks. She showed dramatic improvement, starting days after the initiation of the propranolol ([Fig 2](#); available at <http://aaojournal.org>). The propranolol was continued over 2 months, concurrent with amblyopia therapy. At 6-month follow-up, 3 months after discontinuation of propranolol, there has been no regrowth of the orbital neoplasm ([Figure 3](#) and [Figure 4](#); available at <http://aaojournal.org>). Of note, her other cutaneous lesions resolved completely after being on propranolol for a few weeks ([Fig 4](#); available at <http://aaojournal.org>). There was no systemic complication from using propranolol. The speed of resolution after initiating propranolol supports the role of propranolol in this case.



[Full-size image](#) (70K)

Figure 1.

A 6-week-old girl was referred for management of a large left orbital and periorbital capillary hemangioma.



[Full-size image](#) (57K)

Figure 2.

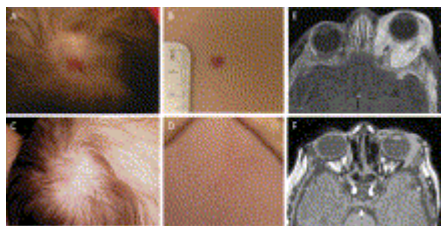
She showed dramatic improvement, starting days after the initiation of the propranolol.



[Full-size image](#) (88K)

Figure 3.

At 6-month follow-up, 3 months after discontinuation of propranolol, there has been no regrowth of the orbital neoplasm.



[Full-size image](#) (80K)

Figure 4.

(A-D) Her other cutaneous lesions resolved completely after being on propranolol for a few weeks. (E, F) Comparison of pre-treatment and post-treatment magnetic resonance images demonstrate reduced volume of the orbital tumor.

Léauté-Labrèze et al reported the use of systemic propranolol for refractory capillary hemangiomas in 11 children.<sup>1</sup> Systemic propranolol, at dose of 2 mg/kg/day, not only inhibited the growth of hemangioma, it resulted in involution. There was no rebound growth after discontinuation of therapy, unlike the case with systemic steroids. Their discovery of using  $\beta$ -blocker for capillary hemangiomas was accidental. They reported that cutaneous and orbital capillary hemangiomas underwent color change and involution soon after initiation of systemic propranolol to treat high cardiac output. They subsequently used propranolol for other capillary hemangiomas, which had been refractory to therapy with systemic steroids.

The mechanism of action of propranolol is not known, although various hypotheses have been proposed, including vasoconstriction, decreased expression of growth factors, and triggering of apoptosis of capillary endothelial cells.<sup>[1]</sup> and <sup>[2]</sup> Although systemic  $\beta$ -blockers have an acceptable safety profile, it is important to monitor infants receiving propranolol and avoid their use in the first week of life.<sup>[3]</sup> and <sup>[4]</sup> Currently, clinical trials to assess the drug's efficacy, safety, and optimal dosing are recruiting participants at the Children's National Medical Center<sup>5</sup> and at the University Hospital, Bordeaux.<sup>6</sup>

In summary, systemic propranolol appears to have a powerful effect on capillary hemangiomas, and may safely play a role in treating such lesions. Because the natural growth history of capillary hemangiomas is quite variable, it is often difficult to assess the therapeutic response to pharmacologic treatment in an individual patient (including our patient), especially when multiple treatment modalities are being used in a synergistic fashion. Propranolol may work synergistically with corticosteroids; additional experience (and ideally, a well-designed prospective study) is needed to clarify the role of propranolol in the management of capillary hemangiomas.

## References

- [1](#) C. Léauté-Labrèze, E. Dumas de la Roque and T. Hubiche *et al.*, Propranolol for severe hemangiomas of infancy, *N Engl J Med* **358** (2008), pp. 2649–2651. [Full Text via CrossRef](#) | [View Record in Scopus](#) | [Cited By in Scopus \(202\)](#)
- [2](#) S.K. Sommers Smith and D.M. Smith, Beta blockade induces apoptosis in cultured capillary endothelial cells, *In Vitro Cell Dev Biol Anim* **38** (2002), pp. 298–304. [View Record in Scopus](#) | [Cited By in Scopus \(28\)](#)
- [3](#) E.C. Siegfried, W.J. Keenan and S. Al-Jureidini, More on propranolol for hemangiomas of infancy, *N Engl J Med* **359** (2008), p. 2846. [View Record in Scopus](#) | [Cited By in Scopus \(57\)](#)
- [4](#) J.N. Love and N. Sikka, Are 1-2 tablets dangerous?: Beta-blocker exposure in toddlers, *J Emerg Med* **26** (2004), pp. 309–314. [Article](#) | [PDF \(81 K\)](#) | [View Record in Scopus](#) | [Cited By in Scopus \(20\)](#)

5 , Propranolol Versus Prednisolone for Treatment of Symptomatic Hemangiomas <http://clinicaltrials.gov/ct2/show/NCT00967226> Accessed October 20, 2009.

6 , Propranolol in Capillary Hemangiomas <http://clinicaltrials.gov/ct2/show/NCT00744185> Accessed October 20, 2009.

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