## Clinical Features and Outcomes of Infants with Retinopathy of Prematurity Who Fail Anti-VEGF Therapy

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• The authors have no financial disclosures



## Summary Slide

- Treatment failure rate after intravitreal anti-VEGF was 8.3% at our institution
- The majority of treatment failures occurred prior to 50 weeks PMA
- Most eyes that failed intravitreal anti-VEGF had favorable anatomic outcomes



Method

## To describe characteristics and outcomes of patients with retinopathy of prematurity (ROP) who failed treatment with intravitreal anti-VEGF.



Methods

- Retrospective review of patients with type 1 ROP evaluated at Children's Healthcare of Atlanta (CHOA) with a history of intravitreal anti-VEGF treatment.
- Treatment failure was defined as
  - Need for repeat anti-VEGF or laser prior to post-menstrual age (PMA) 50 weeks, or
  - Recurrent plus, or
  - Recurrent stage 3, or
  - Stage 4 or 5 ROP at any PMA
- Clinical features and outcomes were collected for patients who failed initial treatment.







#### Method

### Results

## **Comparison of Variables by Patient**

	Treatment success group (n = 103)	Treatment failure group (n =16)	p – value
Number of females (%)	42 (41%)	8 (53%)	0.35
Ethnicity*: number (%) <ul> <li>Caucasian</li> <li>African American</li> <li>Hispanic</li> <li>Asian</li> <li>Native American</li> </ul>	33 (32%) 31 (30%) 10 (9.7%) 2 (1.9%) 1 (1%)	3 (19%) 5 (31%) 2 (13%) 0 (0%) 0 (0%)	0.87
Median GA in weeks (IQR)	24.7 (23.9 – 25.4)	24 (23.0 – 25.0)	0.18
Median birthweight in grams (IQR)	630 (540 – 737)	560 (505 – 722)	0.12
Time from initial treatment to last follow up in months (IQR)	13 (4 – 31)	13.5 (4.25 – 41)	0.70
Deceased as of 3/2020 (%)	6 (5.8%)	1 (6.3%)	0.95

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GA = gestational age, IQR = interquartile range, \*32 patients with missing ethnicity data

### Results

Conclusion

## Comparison of Variables by Eye

	Treatment success group (n = 198 eyes)	Treatment failure group (n = 24 eyes)	p – value
Median PMA in weeks at initial treatment (IQR)	35.7 (34.3 – 36.9)	35.6 (34.1 – 36.0)	0.53
Zone of ROP at initial treatment: number (%)* • Zone 1 • Zone 2	146 (81.6%) 33 (18.4%)	15 (88.2%) 2 (11.8%)	0.49

PMA = post menstrual age, IQR = interquartile range, \*26 eyes missing zone data



#### Method

### Results

# Median time to failure: 9.1 weeks after intravitreal anti-VEGF (IQR 5.5-13.3)



### Results





\*Eyes may have more than 1 manifestation: i.e. recurrent plus and recurrent stage 3

### Results





#### Method

### Results

- 7 of 24 (29%) eyes failed a second treatment
  - Median 21 weeks after initial treatment (IQR 16 31.9)





## Retinal Detachments

- 9 of 24 eyes (37.5%) with treatment failure had retinal detachments
  - 5 eyes had RD as manifestation of initial failure
  - 3 eyes had RD with second failure (all previously treated with laser)
  - 1 eye had RD with third failure (previously treated with combined IVB/laser, then laser)

Time to Failure by Post Menstrual Age





## Patient Example

Caucasian girl born at 22 weeks 5 days, 510 grams. Treated with intravitreal bevacizumab OU for zone 1, stage 3, plus disease



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OU: PMA 49w. Recurrent plus and recurrent stage 3. Treat with laser





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## Patient Example

Caucasian girl born at 22 weeks 5 days, 510 grams. Treated with intravitreal bevacizumab OU for zone 1, stage 3, plus disease

OU: PMA 51w. Stage 4A detachment. Treat with IVB+PPV





## Long Term Followup

- Follow-up of ≥6 months was available for 15 of 24 eyes (62.5%)
  - 7/9 eyes that had RD
- The retina was fully attached in 14 eyes (93%) and detached in 1 eye (7%).
- Fixation behavior was present in 7 eyes (47%).
  - 1/7 eyes that had RD







- Treatment failure rate after IVB was 8.3% (18/216 eyes) at our institution
- The most common manifestations of failure were recurrent plus and recurrent stage 3.
- The majority of treatment failures occurred prior to 50 weeks PMA and were successfully managed with laser.
- Most eyes that failed intravitreal anti-VEGF had favorable anatomic outcomes and half demonstrated fixation behavior.

