

Retinopathy of prematurity

Anti-VEGF treatment in ROP:
11 years of experience

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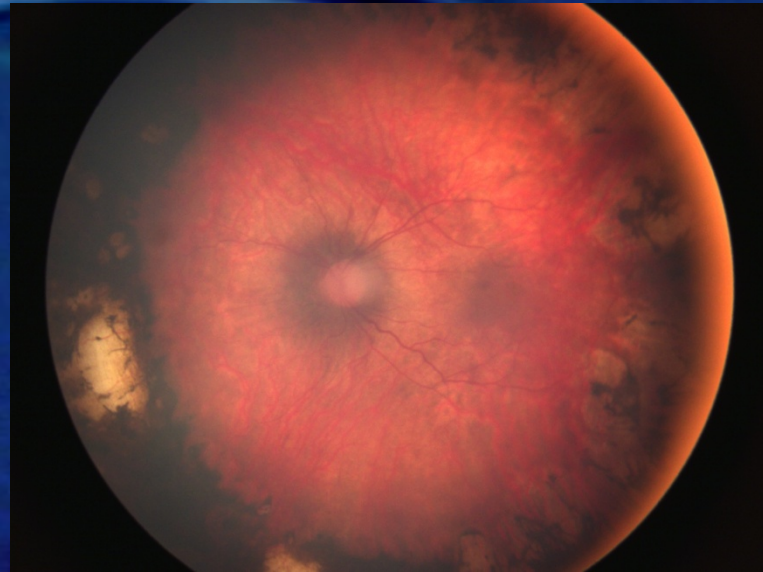
Hospital
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Introduction

Ablative treatment

Cryotherapy

Lasertherapy



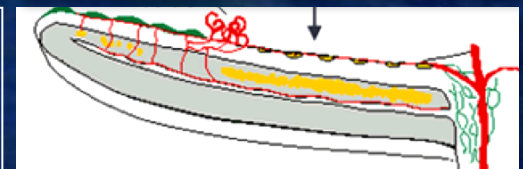
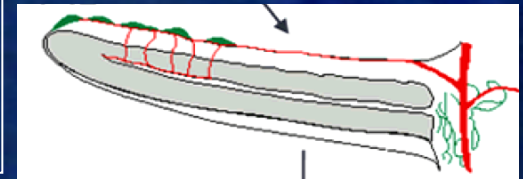
Angiomodulation

Hyperoxia → VEGF ↓
(Oxygen Induced Vessel Loss)

Hypoxia → VEGF ↑

PHASE I ROP
Ischemic

PHASE II ROP
Proliferative

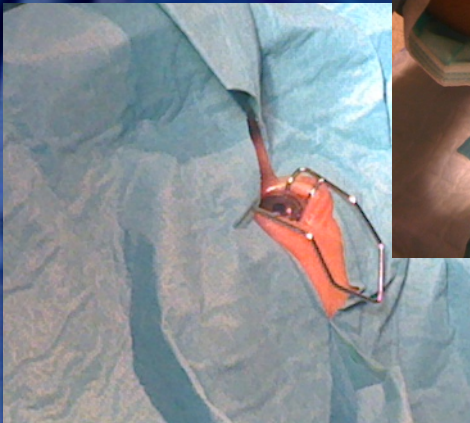


Anti-VEGF intravitreal injection

Intravitreal injection of bevacizumab

February 2006: First rescue combined treatment (laser + bevacizumab)

Since 2009 all aggressive posterior ROP (AP-ROP) underwent primary treatment (monotherapy with bevacizumab)



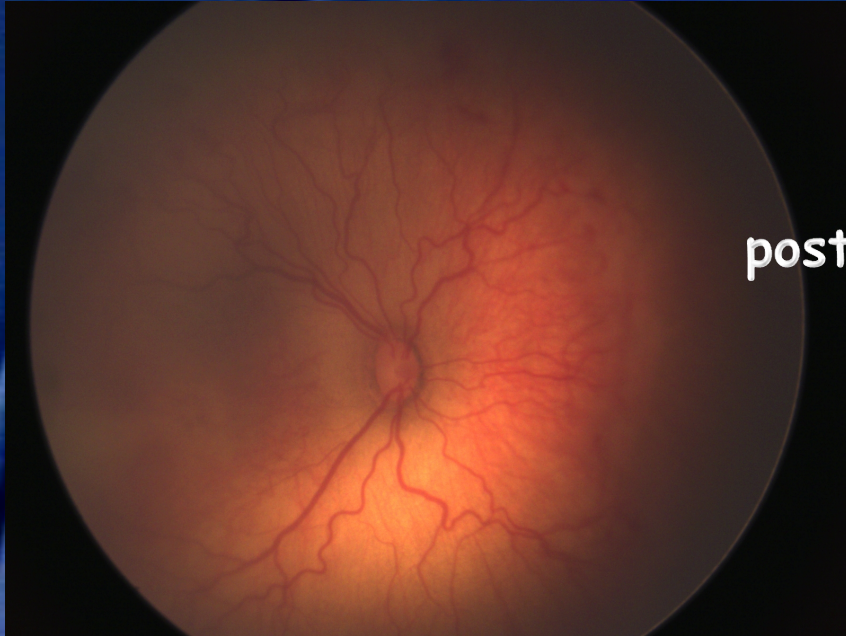
Sedation/topical anaesthesia
Careful Disinfection
Ocular Massage

2 mm from the limbus

0,03 ml Avastin® (0,75 mg bevacizumab)

Indications

Type 1 ROP



AP- ROP
zone I
posterior zone II

Impossibility to perform laser (iris rigidity,
tunica vasculosa lentis)



Systemic conditions that preclude general anaesthesia

Never perform in:

Very extensive into the vitreous fibrovascular proliferation

Stage IV

Unless it is before vitrectomy

Intravitreal injection of bevacizumab in ROP

February 2006/February 2017

57 infants - 94 eyes

Combined treatment - 11 eyes

Primary treatment - 83 eyes

Unilateral- 23 infants

Bilateral - 34 infants

Combined treatments

GA - 25,31±1.97
BW- 976.43±356.31
PMA Treat-36.83±1.17

Total treatments

GA - 25,2±1,36
BW- 771.42±220.13
PMA Treat-35.97±1,93

Primary treatments

GA -25,12±1,19
BW-731.85±187.78
PMA Treat-35,73±2.06

Primary treated infants had lower birth weight and the treatment was performed at a lower PMA than combined treatment

Primary treatment (bevacizumab monotherapy)

AP-ROP

GA - 25,39±1,81
BW- 751.64±283.37
PMA Treat- 34,15±1.86

Zone I ROP

GA - 24,75±0,69
BW- 697.90±121.79
PMA Treat- 35,14±1,39

Post. Zone II ROP

GA -25,47±1,47
BW-769.69±178.02
PMA Treat-37,14±1,64

Zone II ROP

GA -25,50±1,61
BW-943.00±288.01
PMA Treat-37,71±1,89

Primary treated infants with AP-ROP were treated at a lower PMA than the other infants

Regression of ROP - 88 eyes (93,6%)

Recurrent retinopathy (stage 3 +)

3 infants / 6 eyes - 6,4% (primary treated eyes)

Case number	GA	BW	RE	LE		PMA at treatment		PMA at Recurrence
13	27	700	A	A	av ODE	34w	IAP	48w
39	24	600	A	A	av ODE	33w	IAP	46w
46	24	670	A	A	av ODE	33,5w	I	46,5w

Case 13 had a second injection of bevacizumab RLE at 48w PMA. After missing appointments, at 1 year of age presented stage IV ROP RE.

A vitrectomy was performed with good anatomical results in the RE and laser of the avascular retina was performed in the LE.

Case 39 had laser of the avascular retina RLE at 46w PMA with regression of ROP

Case 46 had a second injection of bevacizumab RLE at 46,5w PMA and laser of the peripheral avascular area at 72w PMA

Recurrent retinopathy should be promptly treated. Close follow-up is paramount.

Refractive outcome

N=23 (3 years /10 years)

Case number	GA	BW	RE	LE		SE RE	SE LE
1	23,7	630	L	L	av OE	36	IAP -12 -10
2	23	590	L	L	av ODE	37	IAP -13 -13
3	28	1380	L	L	av ODE	38	IAP -5 -5
4	28	1200	L	L	av ODE	37	IAP -7 -7
6	25	780	L	L	av ODE	35	I -6 -6
16	27	790	L	L	av OD	38	II -5 -3

Laser + bevacizumab both eyes
(combined treatment)
myopia / high myopia

7	25	535	A	A	av ODE	35	I -1 -1
8	26,5	890	A	A	av OE	36	I -1 -1
10	26,2	840	A	A	av ODE	35	II p 1 1
11	29	1195	A	A	av OD	35	II p 3 4
14	24,6	678	A	A	av ODE	34,5	I 2 2
17	24,3	701	A	A	av ODE	33	I 0 0
21	25,5	628	A	A	av ODE	35	IAP 1 1,5
28	26	920	A	A	av ODE	39	II p 3 1

Injection of bevacizumab in
both eyes
(primary treatment)
No high myopia

9	25	735	L	A	av OE	38	I -2 3
12	26	950	L	A	av OE	35	I -3 0
15	26,4	635	A	L	av OD	39	II 1 0
18	29,6	1050	A	L	av OD	38	II 3 3
20	24,2	915	L	A	av OE	35	I -4 1
22	24,3	670	A	L	av OD	35	I 1,5 -7
23	24,2	750	L	A	av OE	35	I -14 -4
24	25	625	L	A	av OE	35	I -10 1
25	25	800	A	L	av OD	34	II 3 3

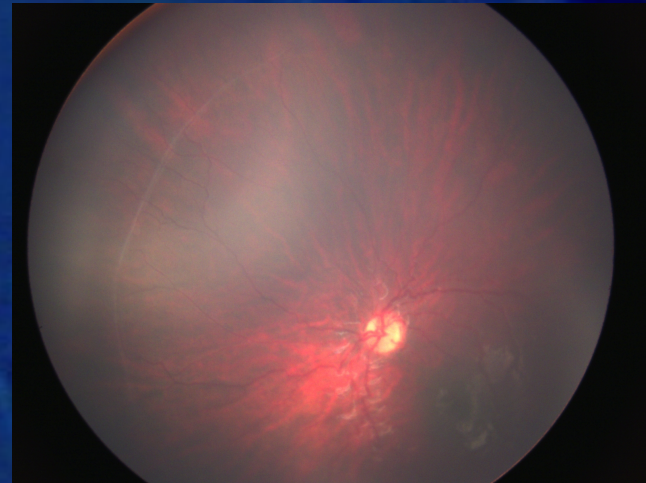
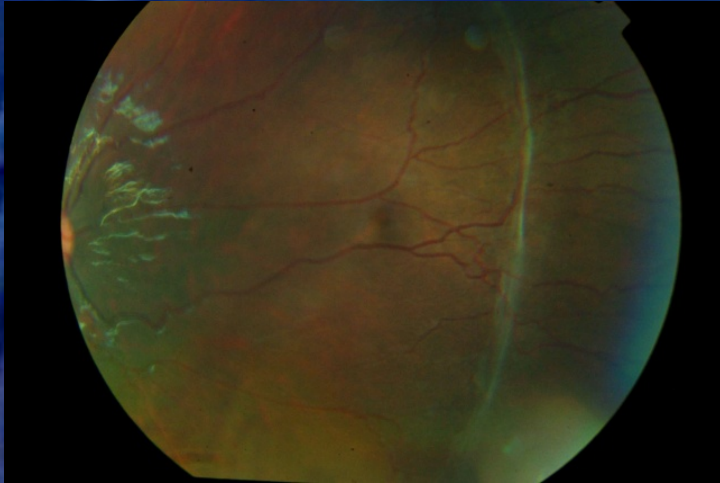
Laser one eye / Injection
in fellow eye
Induces amblyopia secondary
to high anisometropia

Hence - never perform different
treatments in the same infant

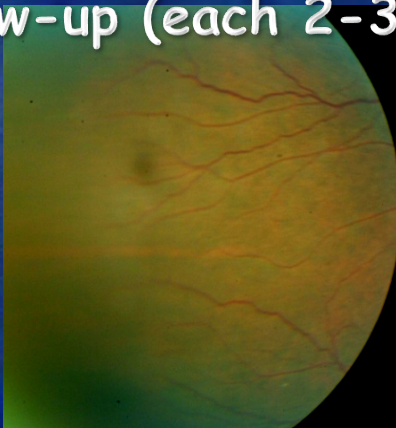
SE RE – Spherical equivalent of right eye in dioptres

SE LE – Spherical equivalent of left eye in dioptres

After intravitreal injection of bevacizumab, ROP regresses and peripheral vascularization progresses to zone III



Infants with lack of progression of peripheral vascularization (extensive avascular peripheral areas) should have a careful follow-up (each 2-3 weeks) to look for recurrent retinopathy



Conclusion

Intravitreal injection of bevacizumab is effective as monotherapy in the treatment of ROP

Timing injection, careful follow-up, prompt recognition and treatment of recurrent retinopathy are paramount. As there is no consensus, studies to address this topics are needed.

