

Retinopatia Diabética

Associação Matogrossense de Oftalmologia



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Grupo PACORES (Pan-American Collaborative Retina Study Group)

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Deficiência visual

MUNDO

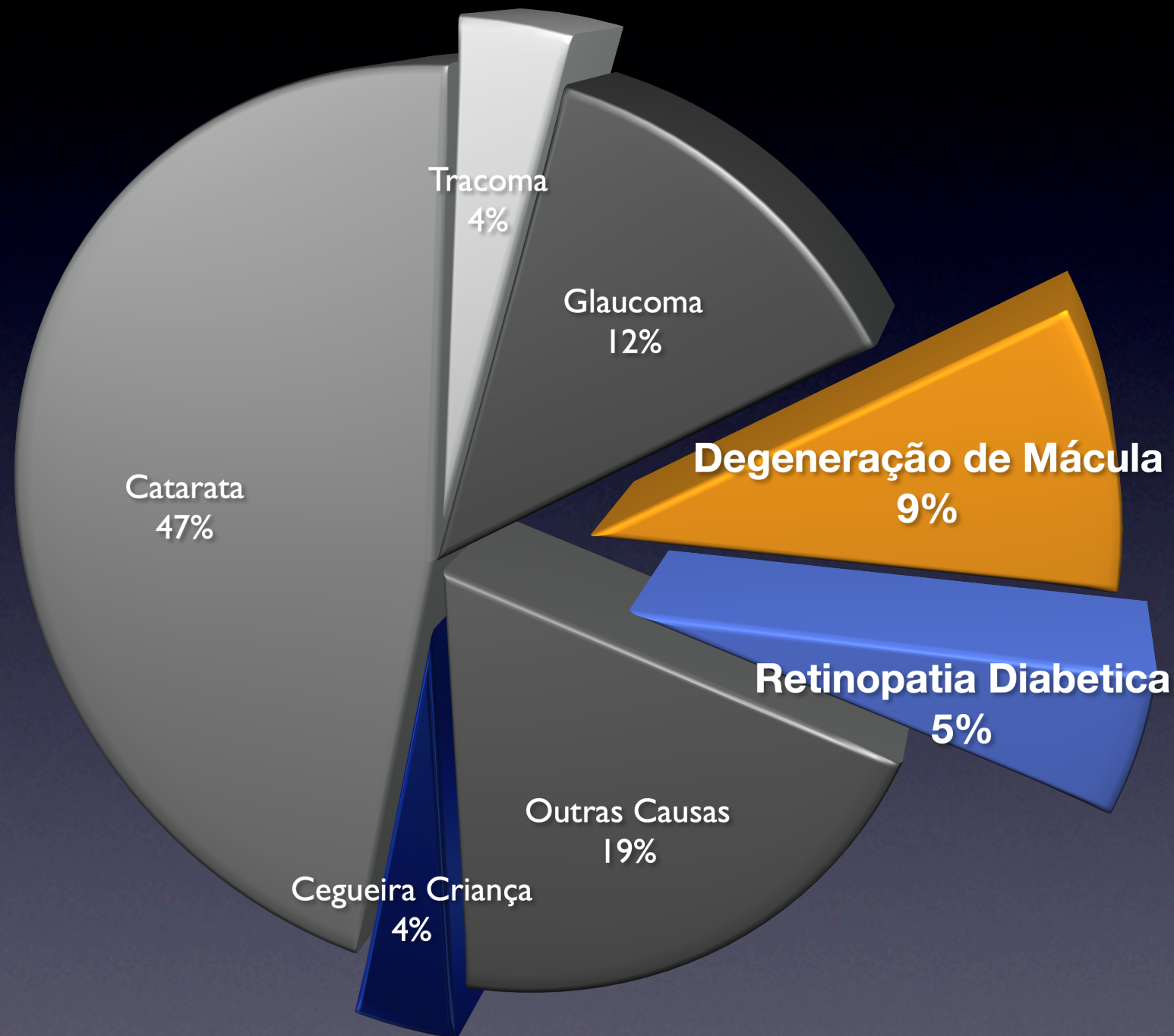
- 80 milhões de cegos (AV < 20/200 no melhor olho)
- 250 milhões com deficiência visual (AV entre 20/70 a 20/400 no melhor olho)
- U\$\$ 40 bilhões gastos diretos
- Gastos indiretos - Difíceis de mensurar

BRASIL

- 2,0 milhões de cegos (AV < 20/200 no melhor olho)
- 5 milhões deficiência visual AV entre 20/70 a 20/400 no melhor olho)
- U\$\$ 1 bilhao gastos diretos
- Gastos indiretos - Difíceis de mensurar

Doenças degenerativas da retina e do vítreo:

Causas de cegueira no Brasil



Salmomão S, Berezovsk A, Araújo-Filho, Belfort R, Ellwein L Prevalence and causes of visual impairment in Brazil. Ophthalmic Epidemiol 2008 15; 167-75

Taleb A, Avila M, Moreira H . In Condições de Oculares no Brasil 2009. Conselho Brasileiro de Oftalmologia. Walprint Grafica 1a ed. ISBN 978-85-62109-00-3 pag 10-23

Andregretti E, Silva M, José NK, **Maia M**. Social Inclusion for visually impaired: Experience from Assis. Arqu. Bras. Oftalmol. 2009, 72(6): 776-82

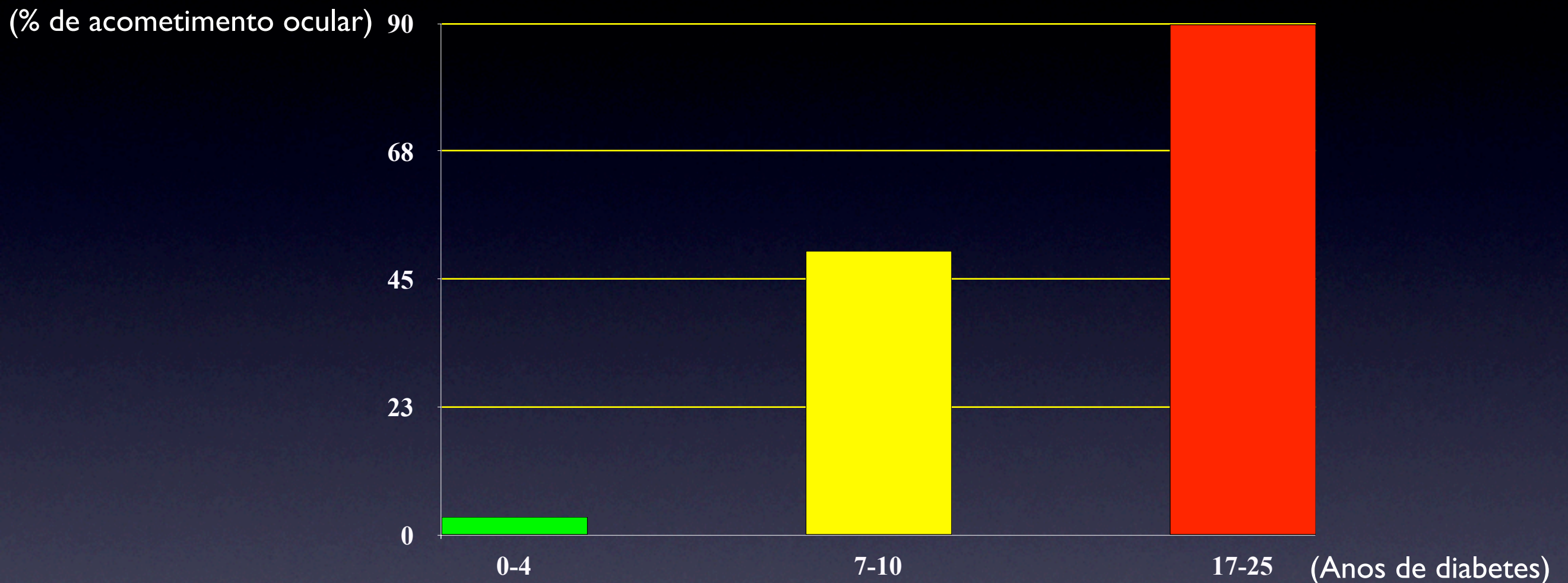
Retinopatia Diabética:

Epidemiologia

- Prevalência do diabetes: 3-5%, podendo chegar a 7%
- São 12-15 milhões de diabéticos no Brasil
- Cerca de 50% desconhecem a doença
- Principal causa de cegueira prevenível em adultos
- Totalizando 8% dos pacientes cegos no mundo

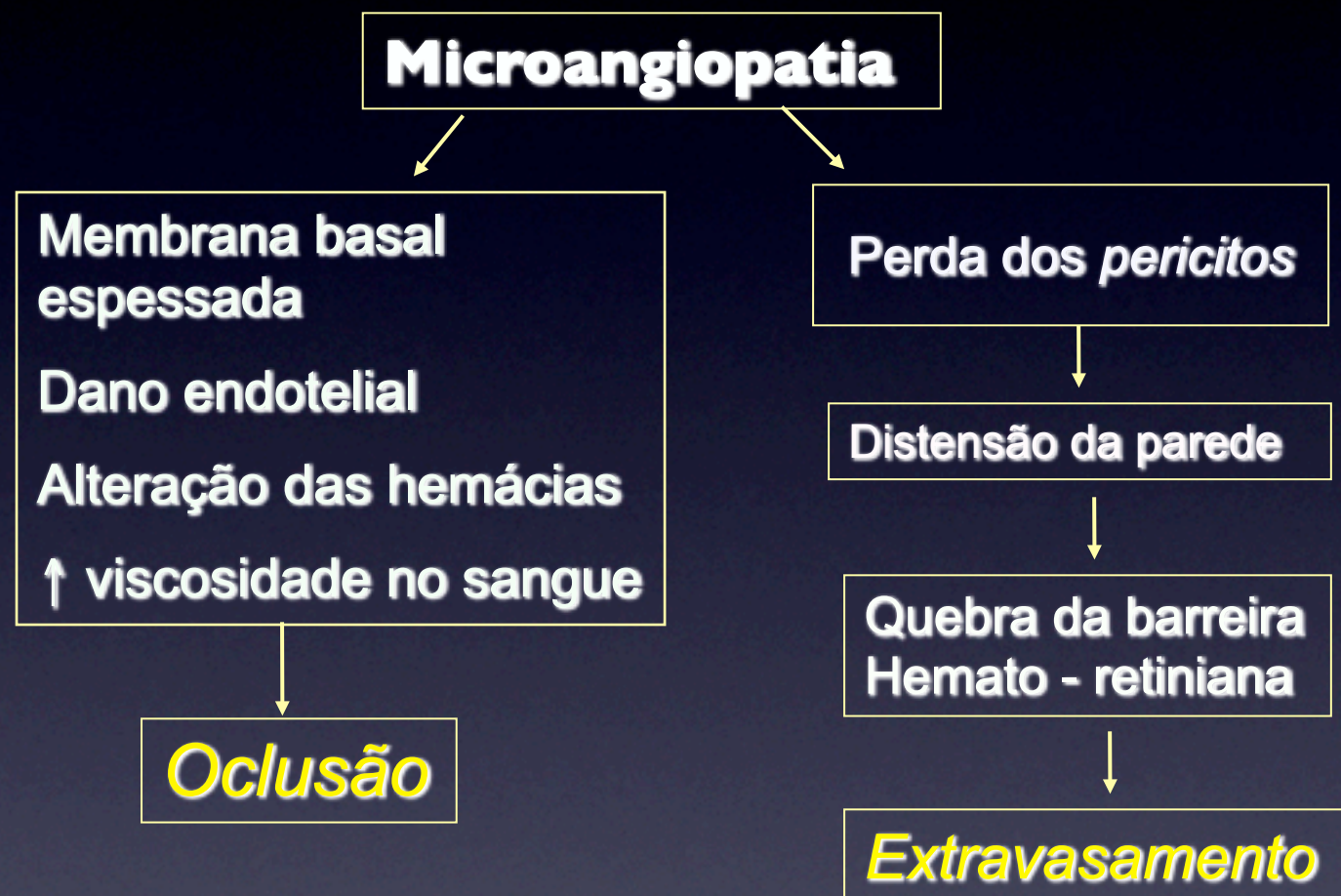
Retinopatia diabética:

Epidemiologia - chance de retinopatia



Em média, cerca de 50 a 60% dos diabéticos vão desenvolver retinopatia!

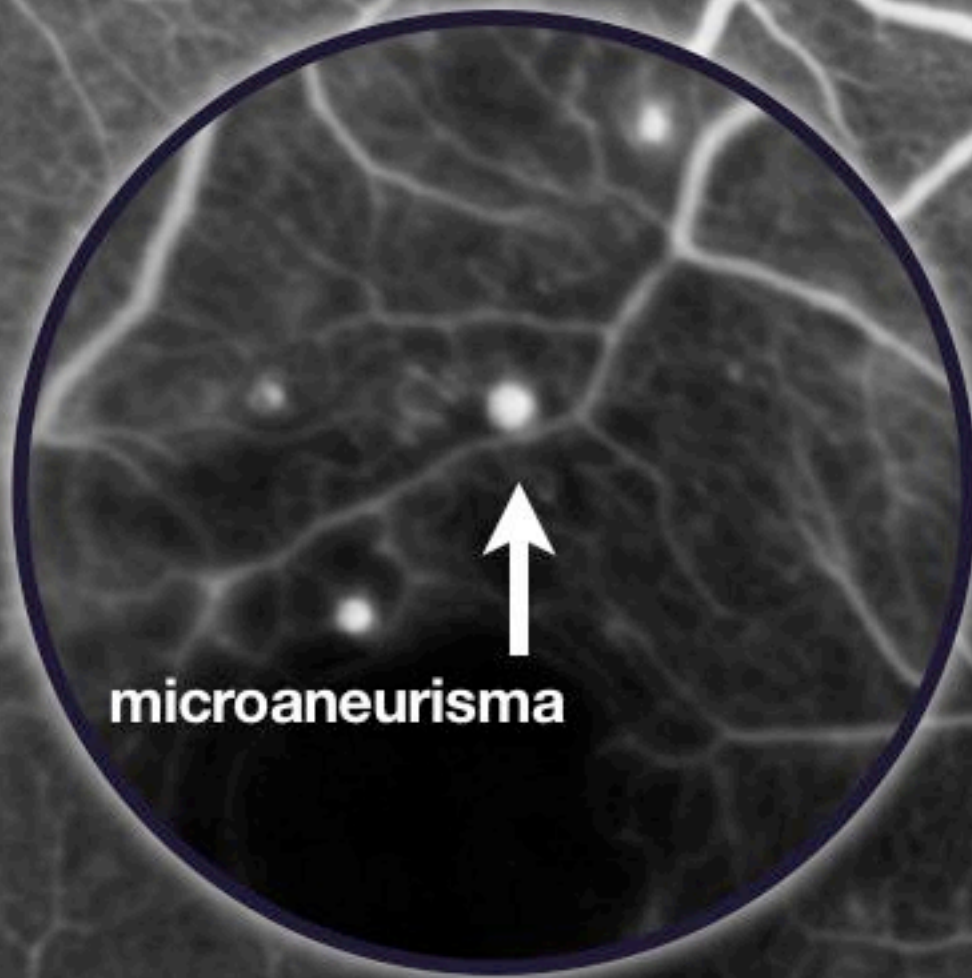
Retinopatia diabética: Fisiopatogenia



Patogênese

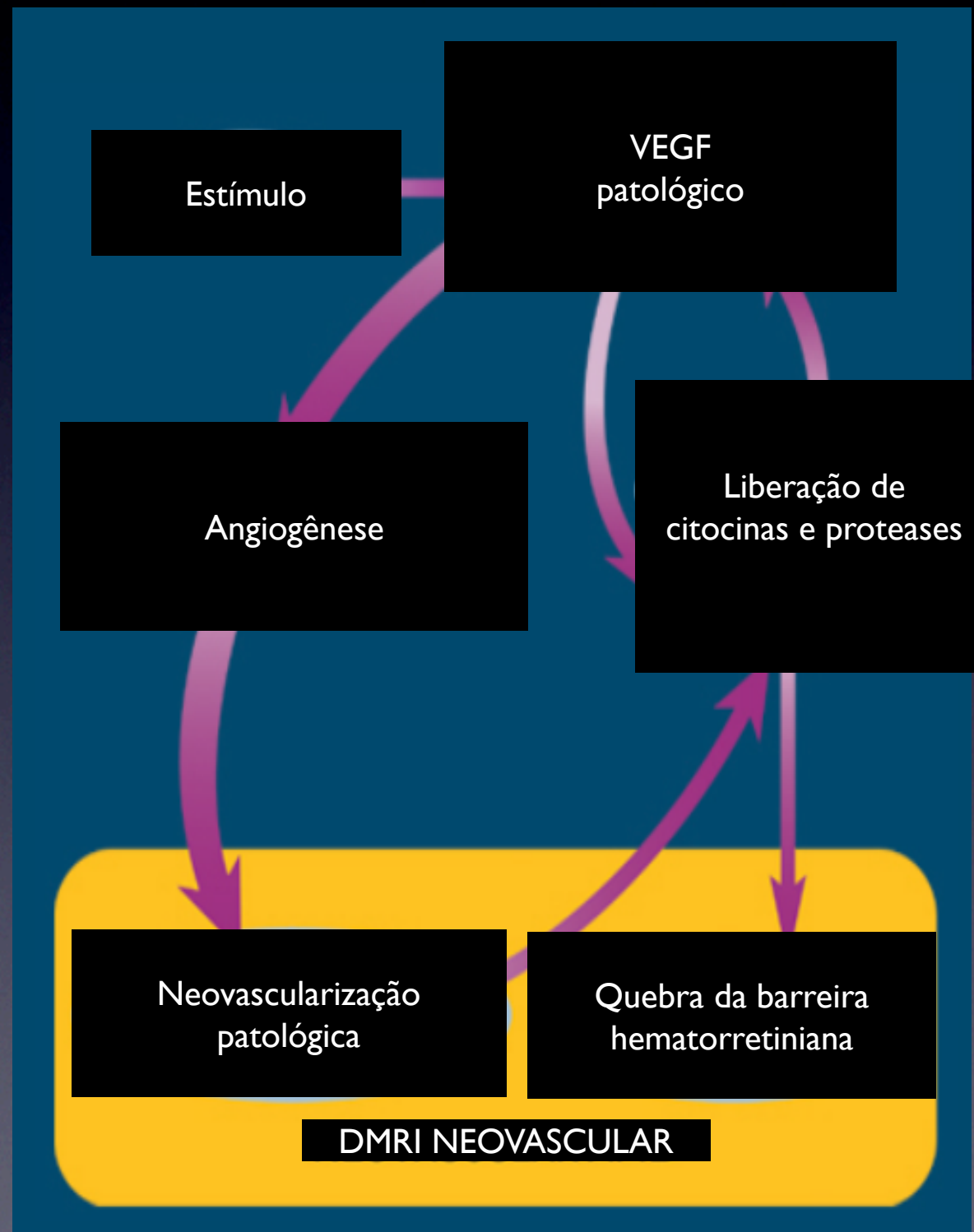


Retinopatía diabética: Fisiopatogenia



Retinopatia Diabética: Tratamento

Papel do fator de crescimento endotelial (VEGF)



Retinopatia diabética: Manifestações clínicas/classificação

A-Retinopatia diabética não-proliferativa Microaneurismas, exsudatos duros, hemorragia



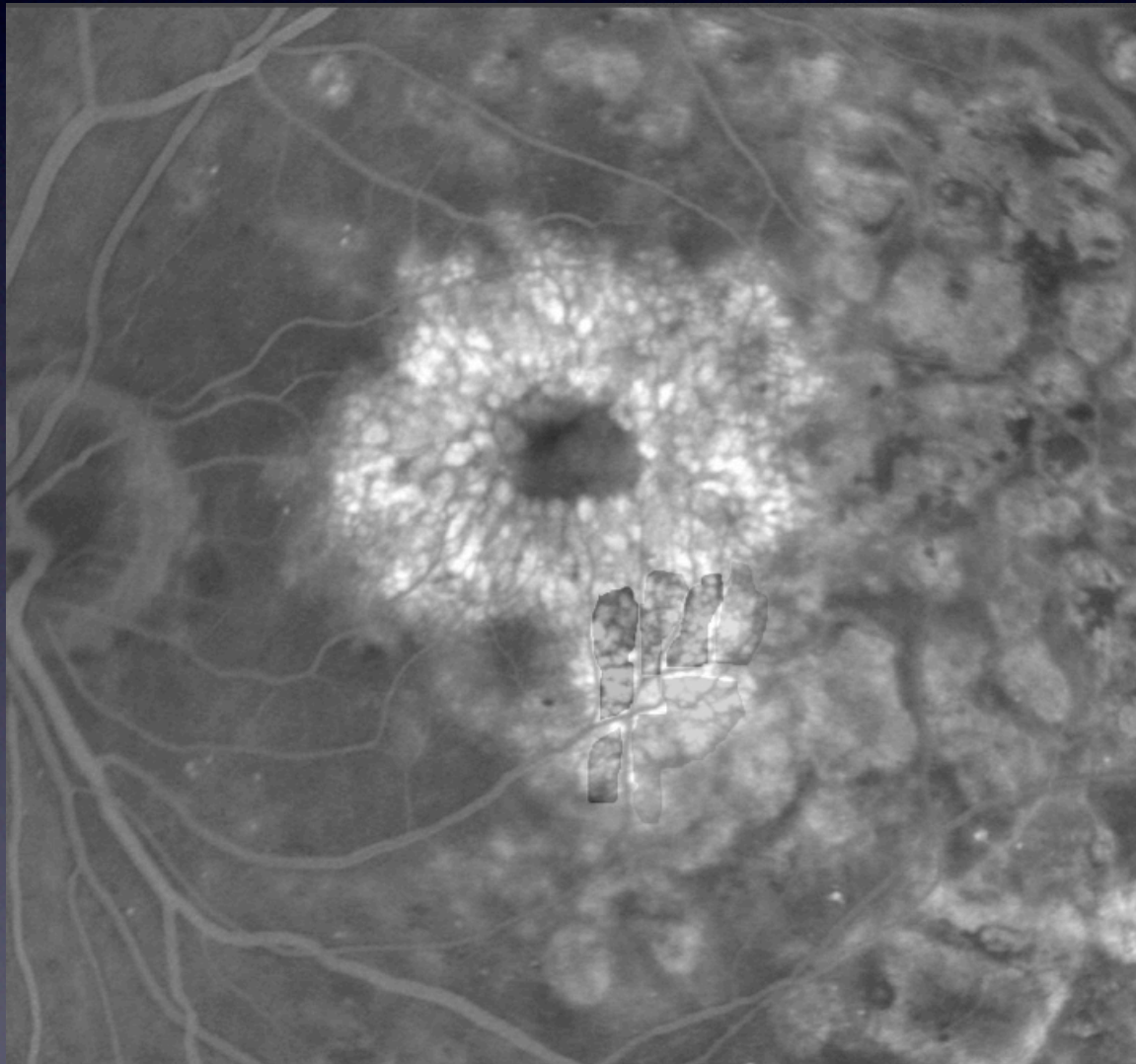
Retinopatia diabética: Manifestações clínicas/classificação

B-Retinopatia diabética proliferativa Neovasos e descolamento da retina

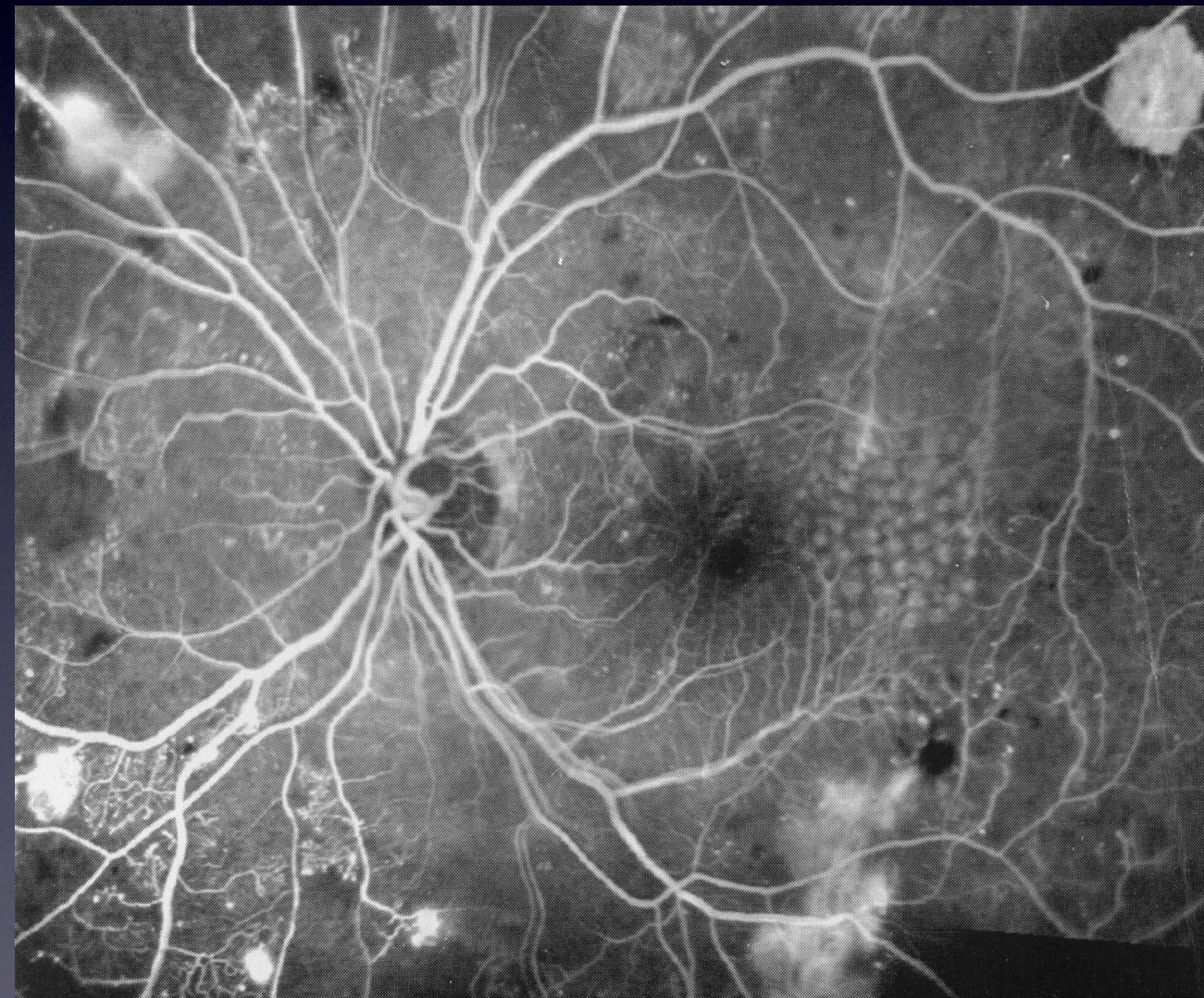


Retinopatia diabética: Diagnóstico

Angiografia fluoresceínica
Vazamento na mácula - edema
Retinopatia diabética **não-proliferativa**



Angiografia fluoresceínica
Vazamento difuso e má-perfusão: neovasos
Retinopatia diabética **proliferativa**



Retinopatia Diabética

Tratamento do EMD e da Retinopatia Proliferativa

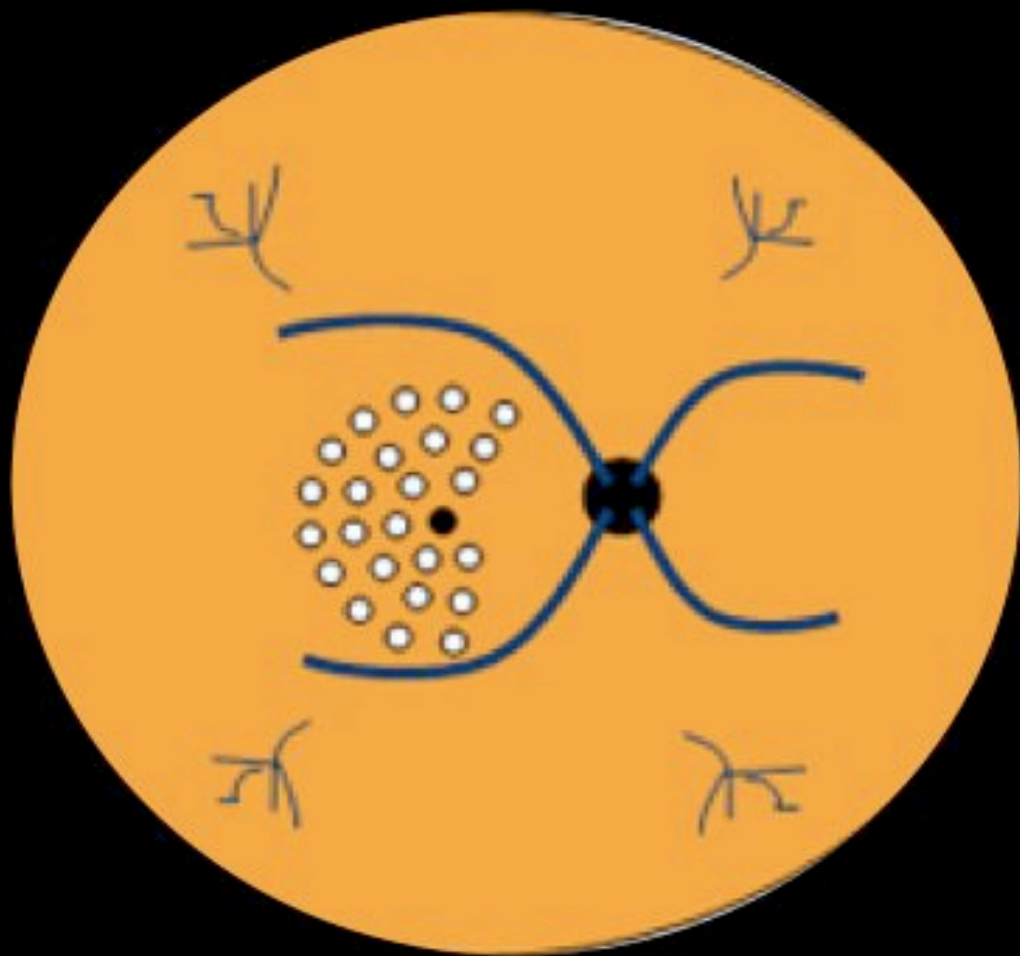
Bevacizumabe em humanos: economia se comparado ao ranibizumabe



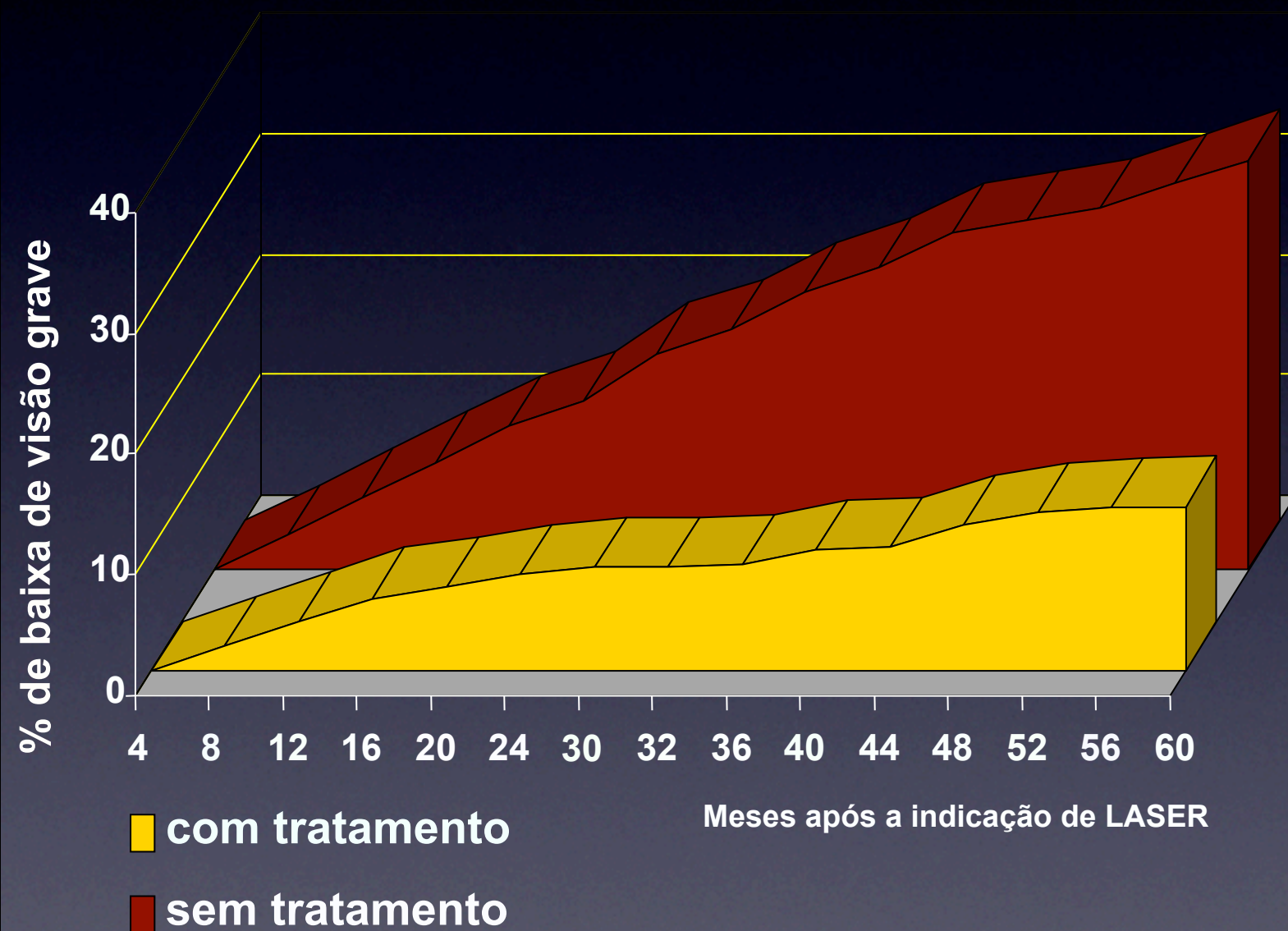
- 1.PACORES.Comparing outcomes in patients with CNV secondary to ARMD treated with two doses of Bevacizumab: at the 12-month follow-up. Japanese Journal of Ophthalmology, v.53, p.125-130, 2009.
- 2.PACORES. Comparison of two doses of intravitreal Bevacizumab as primary treatment for macular edema secondary to branch retinal vein occlusions. Retina, v.29, p.1396-1403, 2009.
- 3.PACORES.Intravitreal Bevacizumab for refractory pseudophakic cystoid macular edema: the Pan-American Collaborative Retina Study Group. Ophthalmology, v.116, p.1481-1487, 2009
- 4.PACORES.Primary intravitreal Bevacizumab for diffuse diabetic macular edema the Pan-American Collaborative Retina Study Group at 24 Months. Ophthalmology, v.116, p.1488-1497.e1, 2009.
- 5.PACORES. Bevacizumab for subfoveal CNV In ARMD: results of the Pan-American Collaborative Retina Study Group at 12 months follow-up. Retina (Philadelphia), v.28, p. 1387-1394, 2009
- 6.PACORES.Tractional retinal detachment following intravitreal Bevacizumab (Avastin®) in patients with severe proliferative diabetic retinopathy. British Journal of Ophthalmology, v.92, p.213-216, 2008.
- 7.PACORES.Comparison of two doses of intravitreal Bevacizumab (Avastin®) for treatment of macular edema secondary to branch retinal vein occlusion. Retina (Philadelphia), v.28, p.212-219, 2008 .
- 8.PACORES.Tractional retinal detachment following intravitreal Bevacizumab (Avastin®) in patients with severe proliferative diabetic retinopathy. Br J Ophthalmol (London, UK), v. 92, p.213-216, 2007.
- 9.PACORES.Intravitreal Bevacizumab (Avastin®) for proliferative diabetic retinopathy: 6-months follow-up. Eye (London), p.1-7, 2007.
- 10.PACORES.Primary intravitreal Bevacizumab (Avastin®) for diabetic macular edema. Pan-American Collaborative Retina Study Group at 6-month follow-up. Ophthalmology, v.114, p.743-750, 2007.
- 11.PACORES.Primary intravitreal Bevacizumab for pseudophakic cystoid macular edema. Pan-American Collaborative Retina Study Group. Journal of Cataract and Refractive Surgery. v.33, p.2098-05, 2007
- 12.PACORES.Twelve-month safety of 4303 intravitreal injections of Bevacizumab (Avastin®): results of (PACORES). Graefe's Archive for Clinical and Experimental Ophthalmology, v.246, p.81-87, 2007.

Retinopatia diabética não proliferativa: Tratamento - LASER (fotocoagulação) macular

Laser na mácula (focal ou em grade)



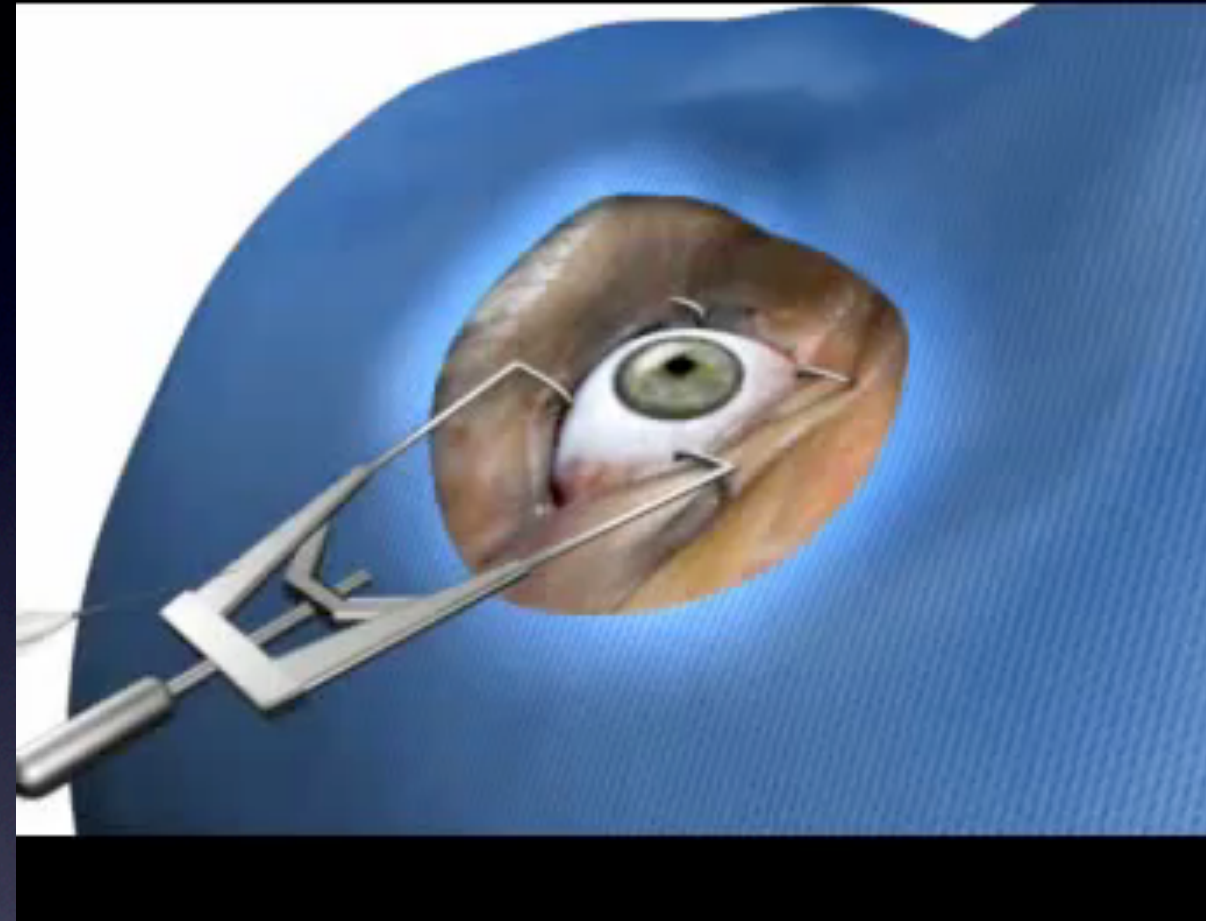
Early Treatment of Diabetic Retinopathy Study (ETDRS)



Retinopatia Diabética: Tratamento do Edema Macular Diabético

TRATAMENTO INIBIDORES DO VEGF

- Injeção intravítrea
- Técnica asséptica + colírio de PVPI 5%
- Bevacizumabe 1.25mg (0.05ml)
- Ranibizumabe, Aflibercepte, Faricimabe

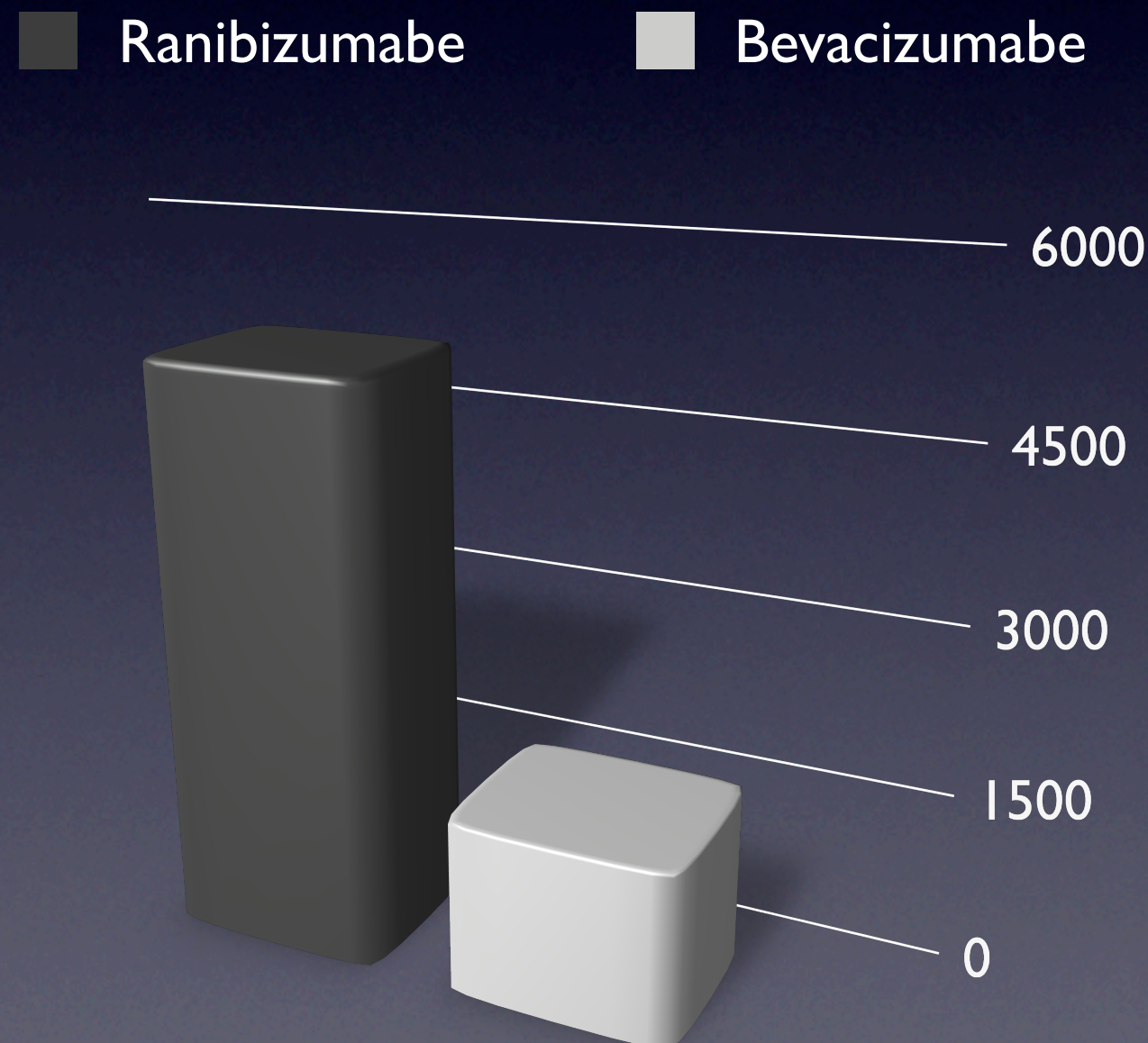


Cortesia: Dr Eduardo Rodrigues

Degeneração macular relacionada à idade: Tratamento do Edema Macular Diabético

Bevacizumabe (Avastin™) x ranibizumab (Lucentis™) em humanos

Custo por injeção do ranibizumabe é 39 vezes maior



Rosenfeld P et al. Ophthalmic Surg Lasers Imaging 2005;36:331-339

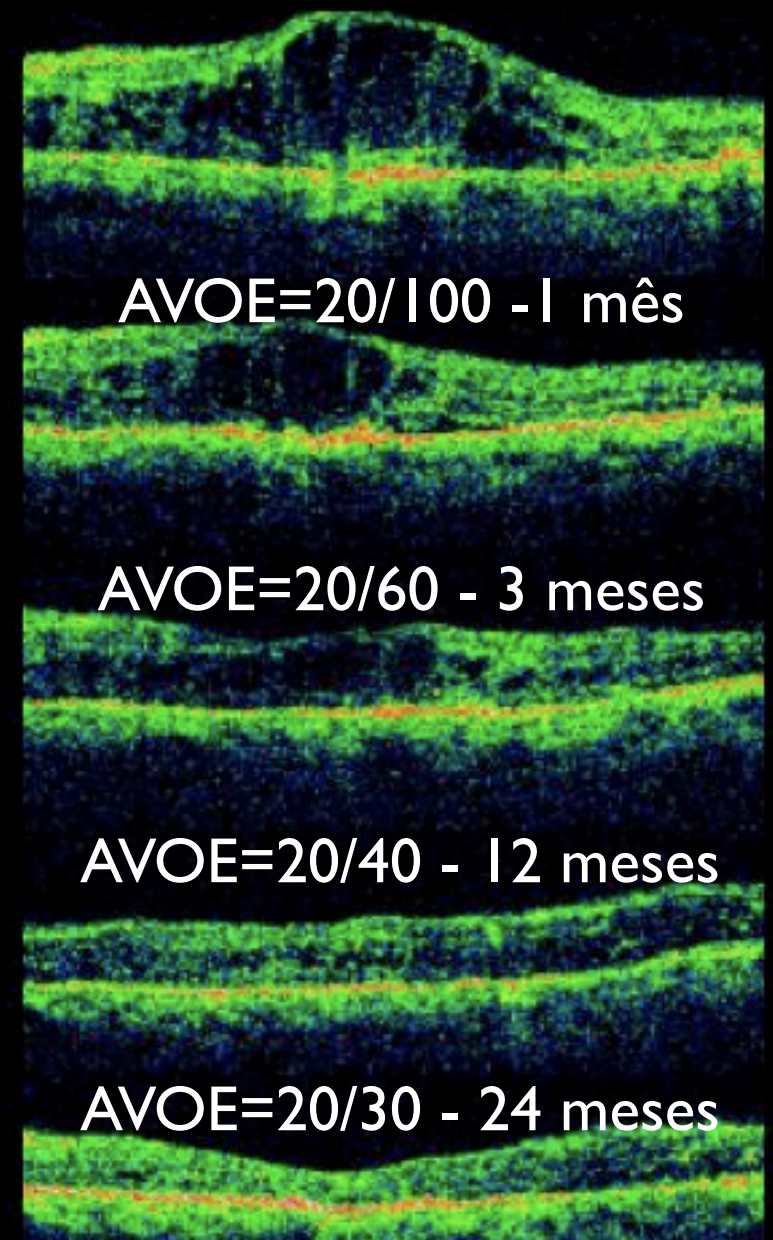
PACORES Twelve-month safety of intravitreal injections of bevacizumab: 4303 injections .Graefes Arch Clin Exp Ophthalmol. 2007

Retinopatia diabética não proliferativa:

Estabilidade da visão por 2 anos
6 injeções de bevacizumabe intravítreo



AVOE=20/100 - basal



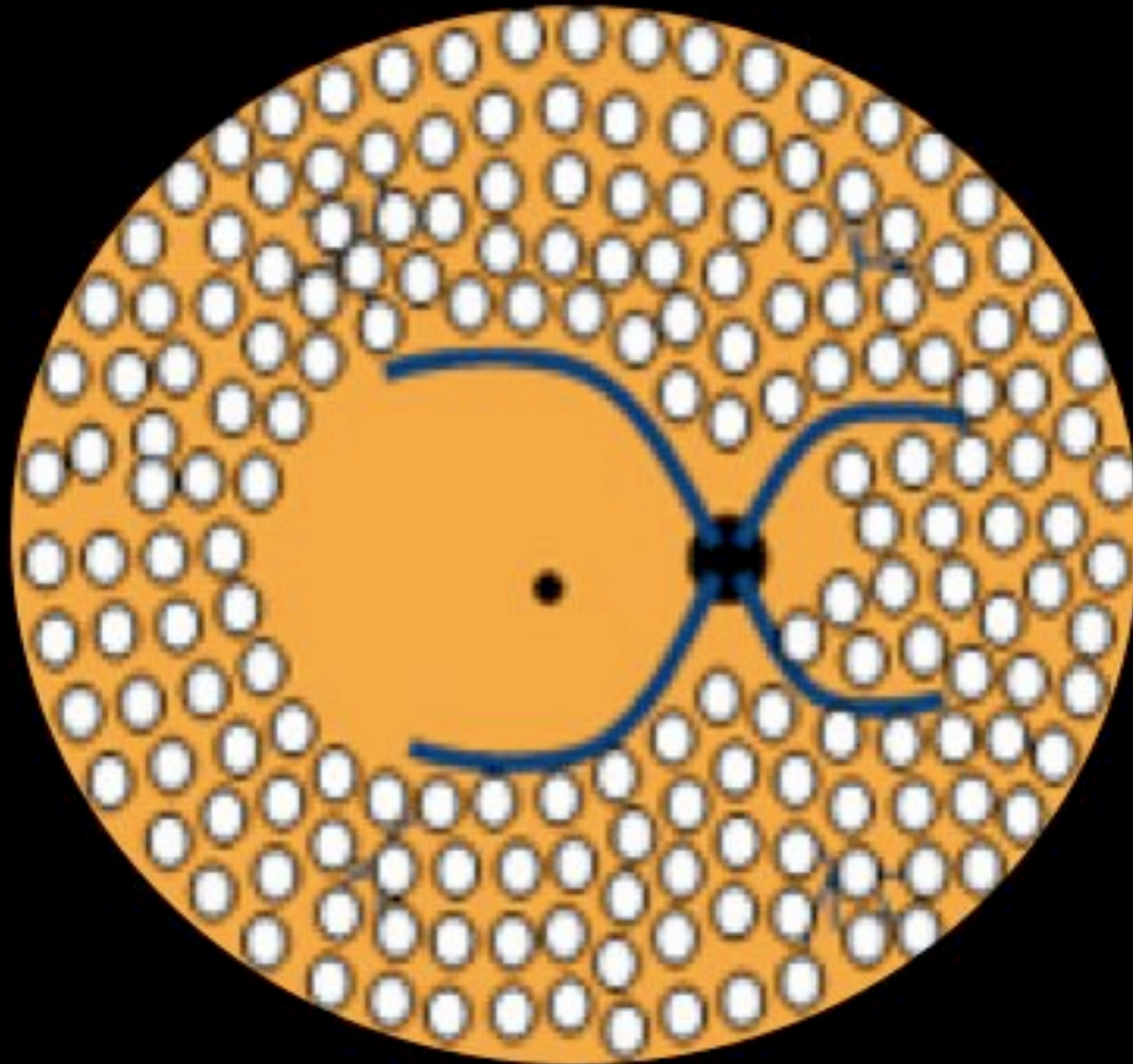
AVOE=20/100 - 1 mês

AVOE=20/60 - 3 meses

AVOE=20/40 - 12 meses

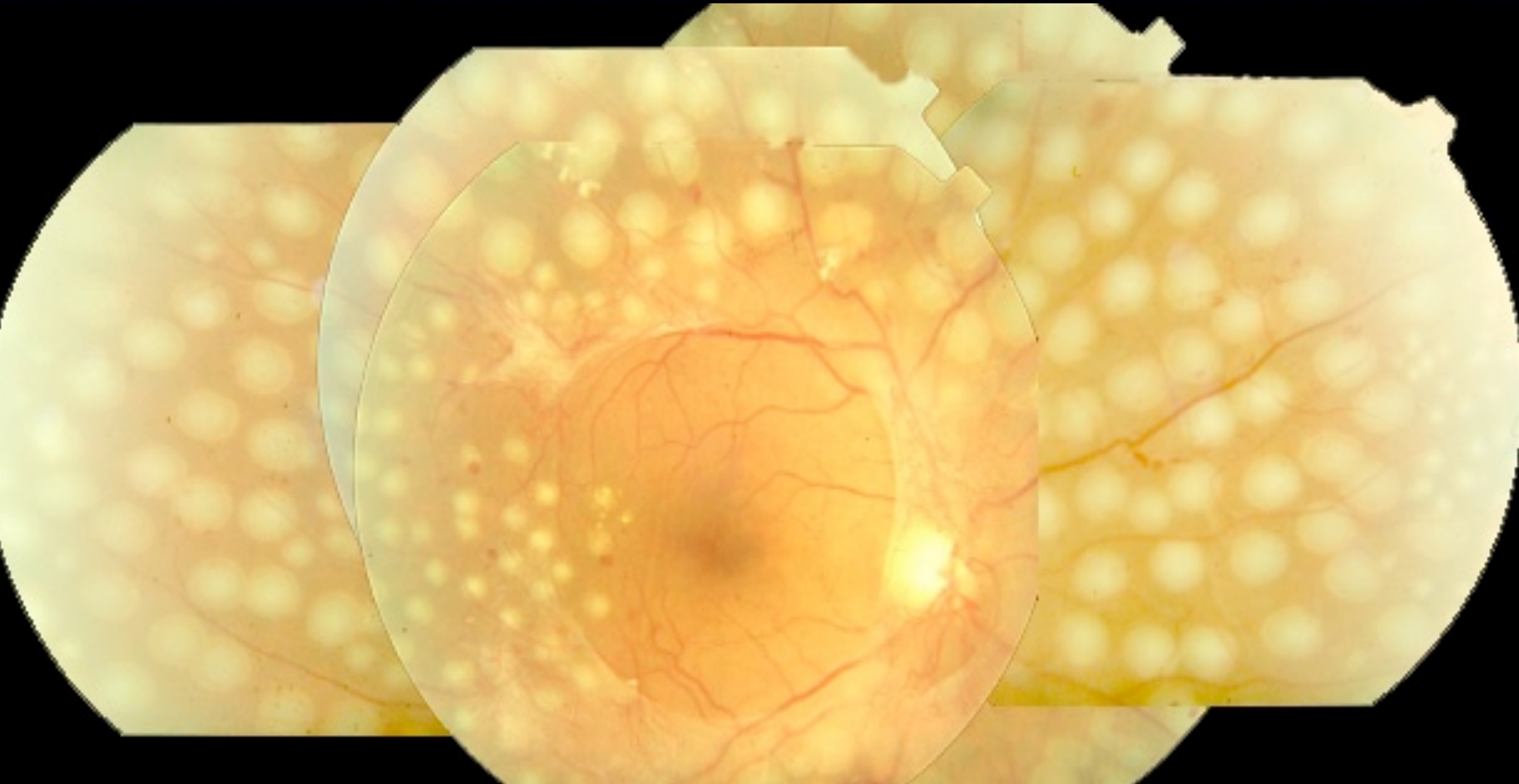
AVOE=20/30 - 24 meses

Retinopatia diabética proliferativa: Tratamento - panfotocoagulação a LASER



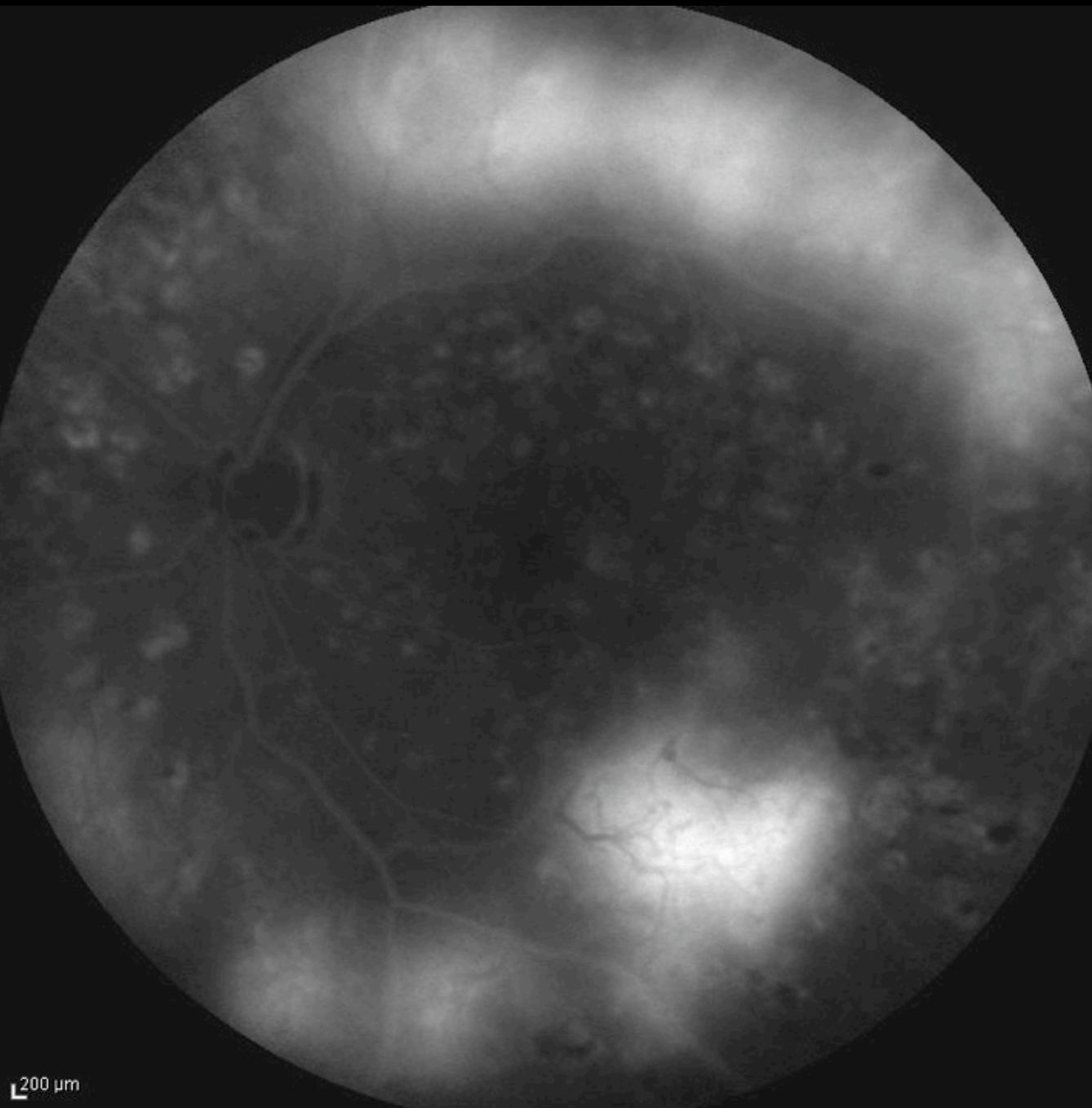
RDP

Tratamento - panfotocoagulação a LASER

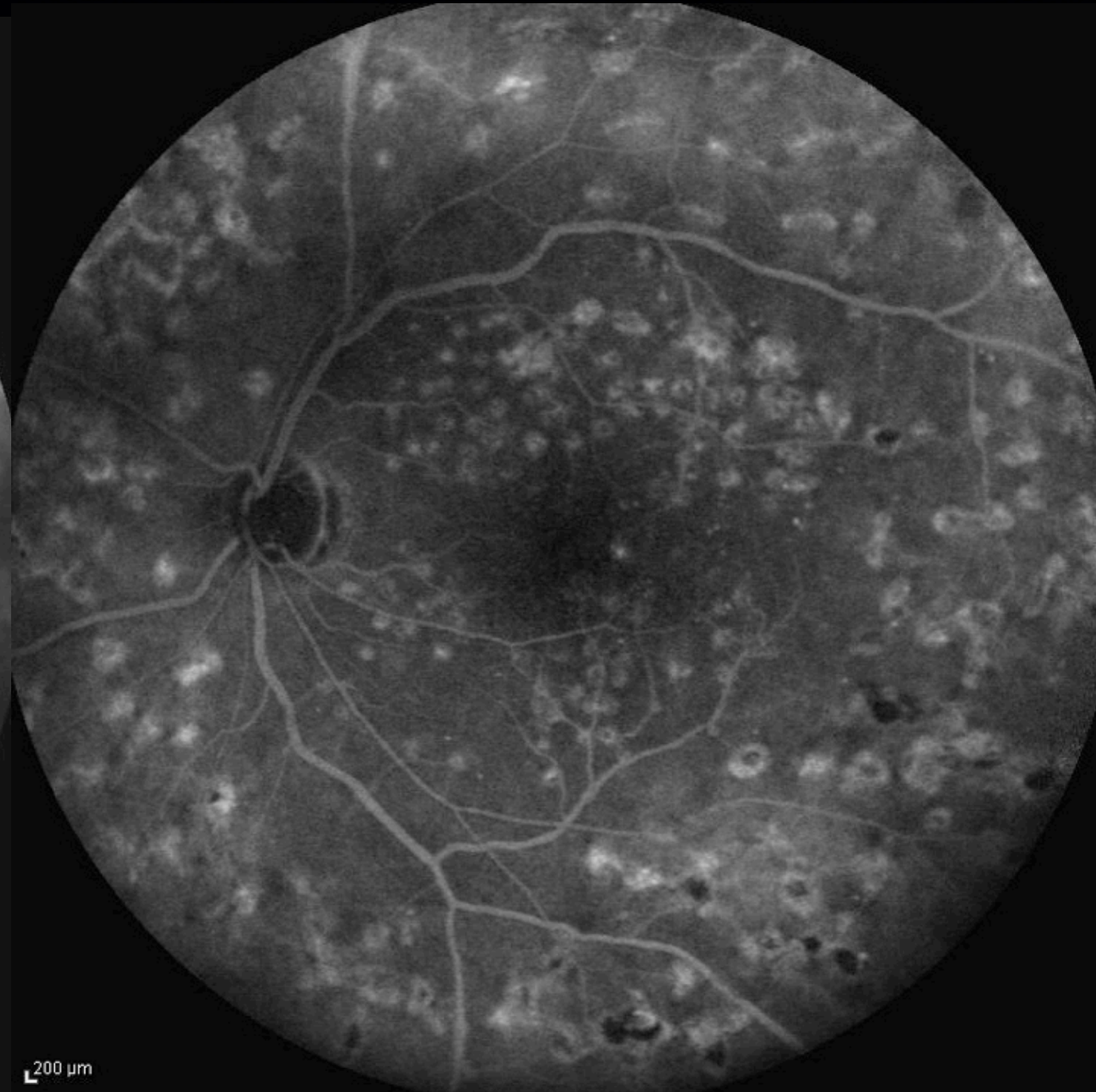


Retinopatia diabética proliferativa

Pré Bevacizumabe 1.25mg



Pós Bevacizumabe 1.25mg



22/9/2009, OS
FA 7:32.35 55° ART

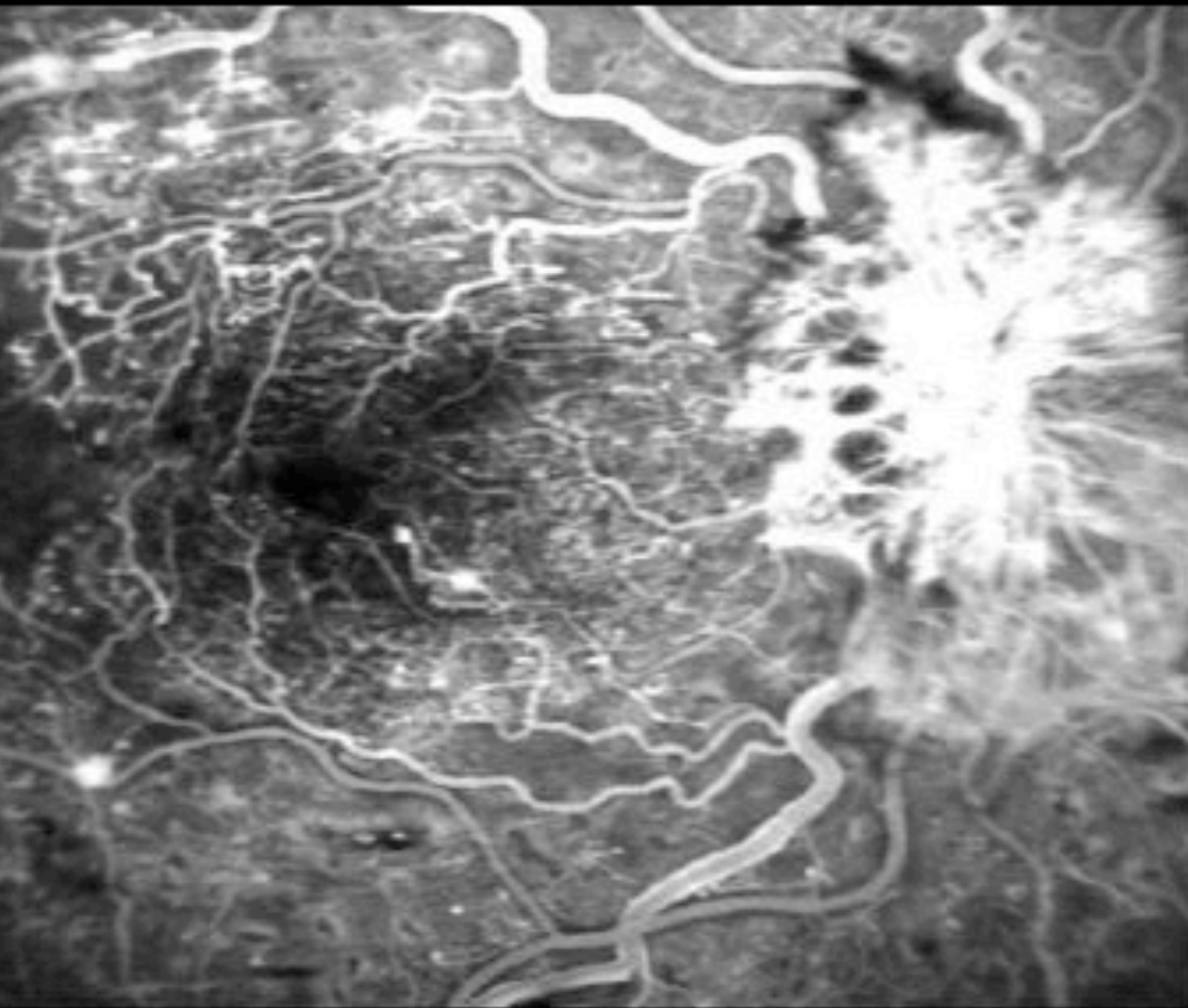
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ENGINEERING

6/10/2009, OS
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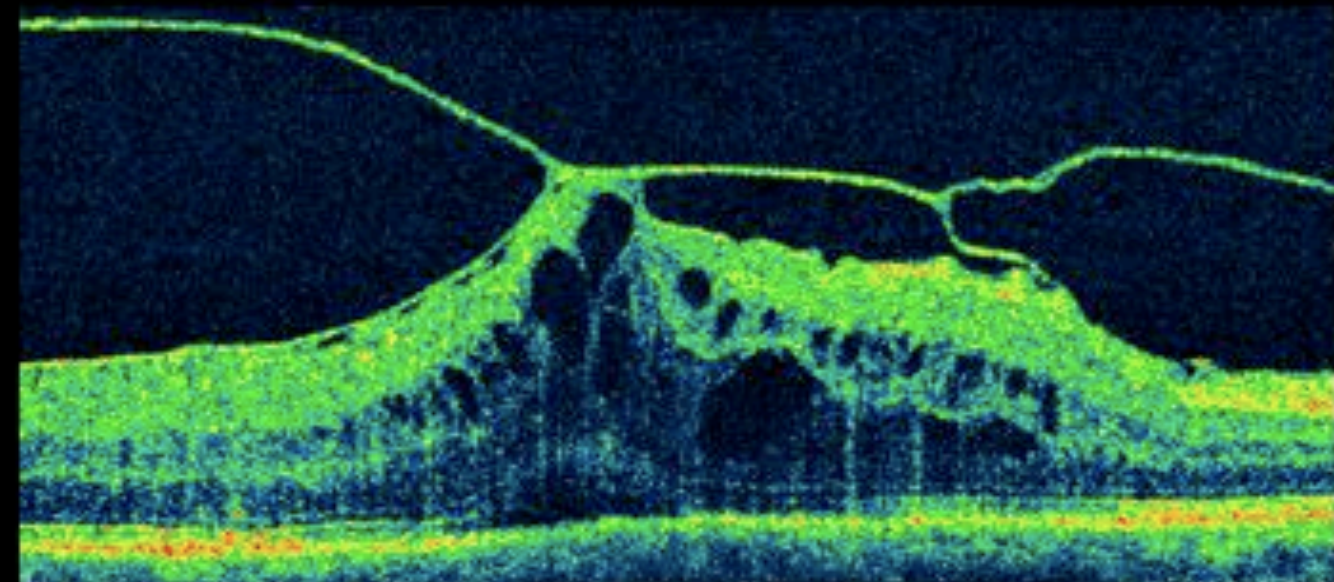
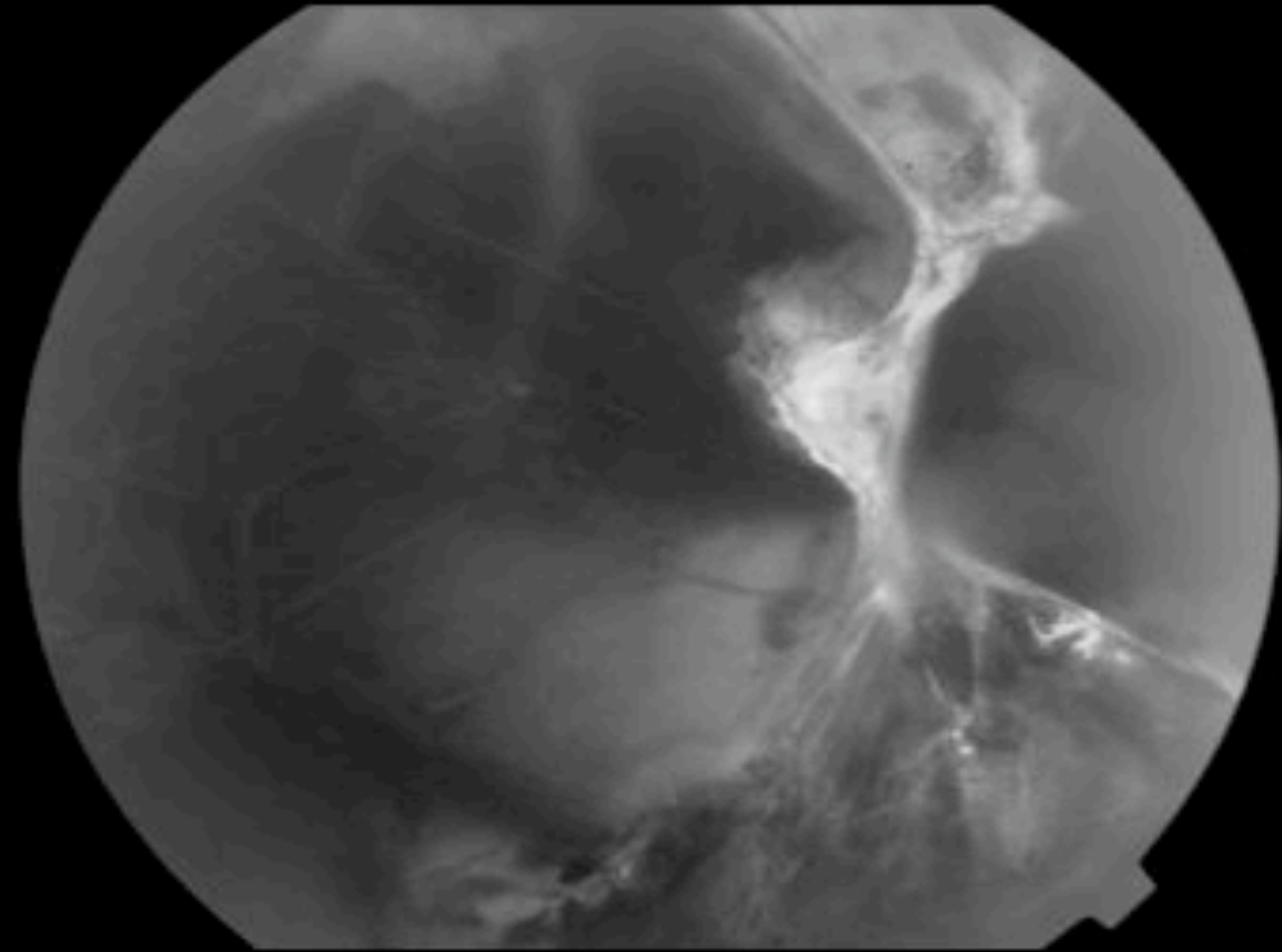
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Bevacizumabe pode causar DR em 5,4% dos casos

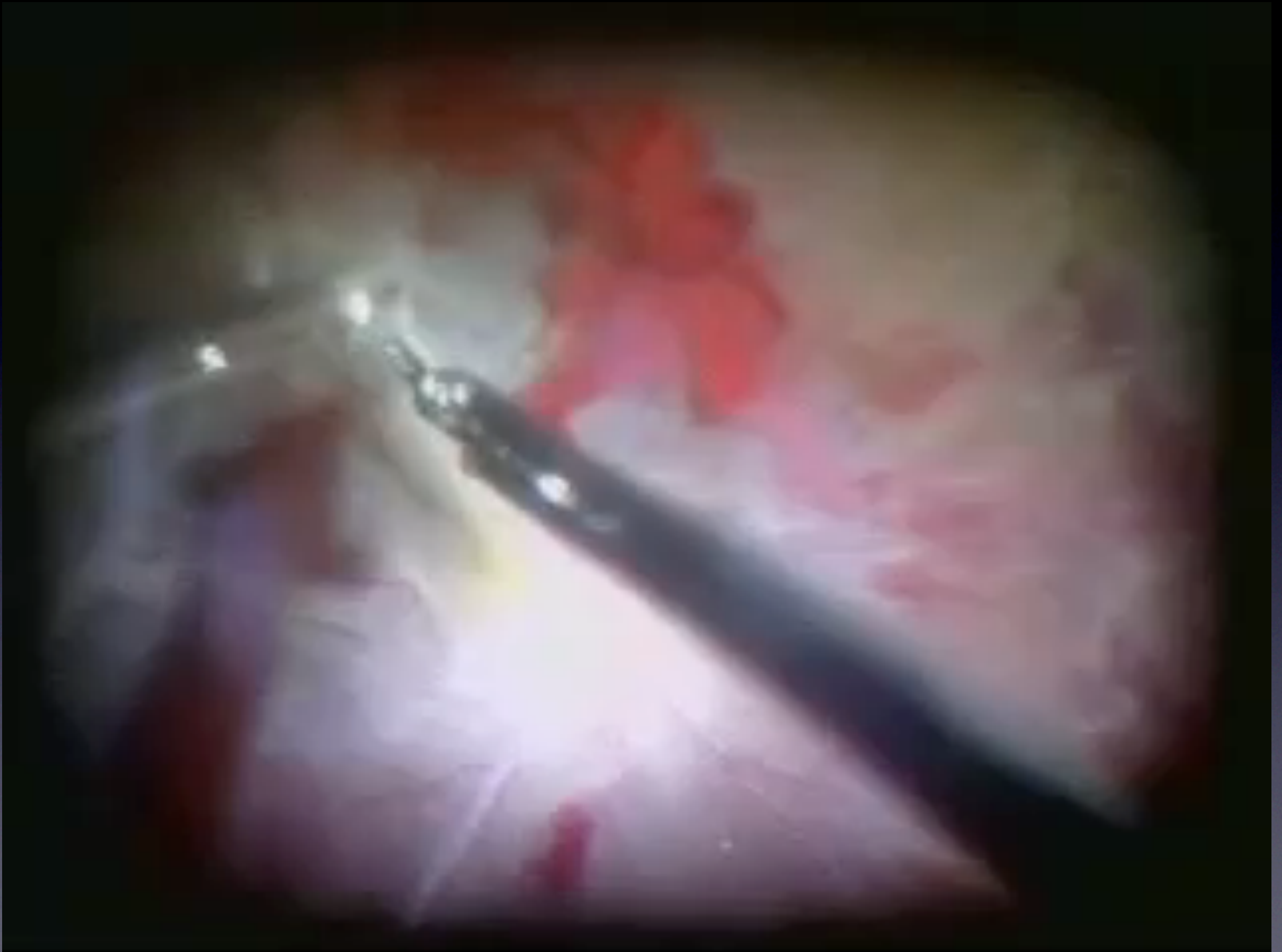
Pré



Pós



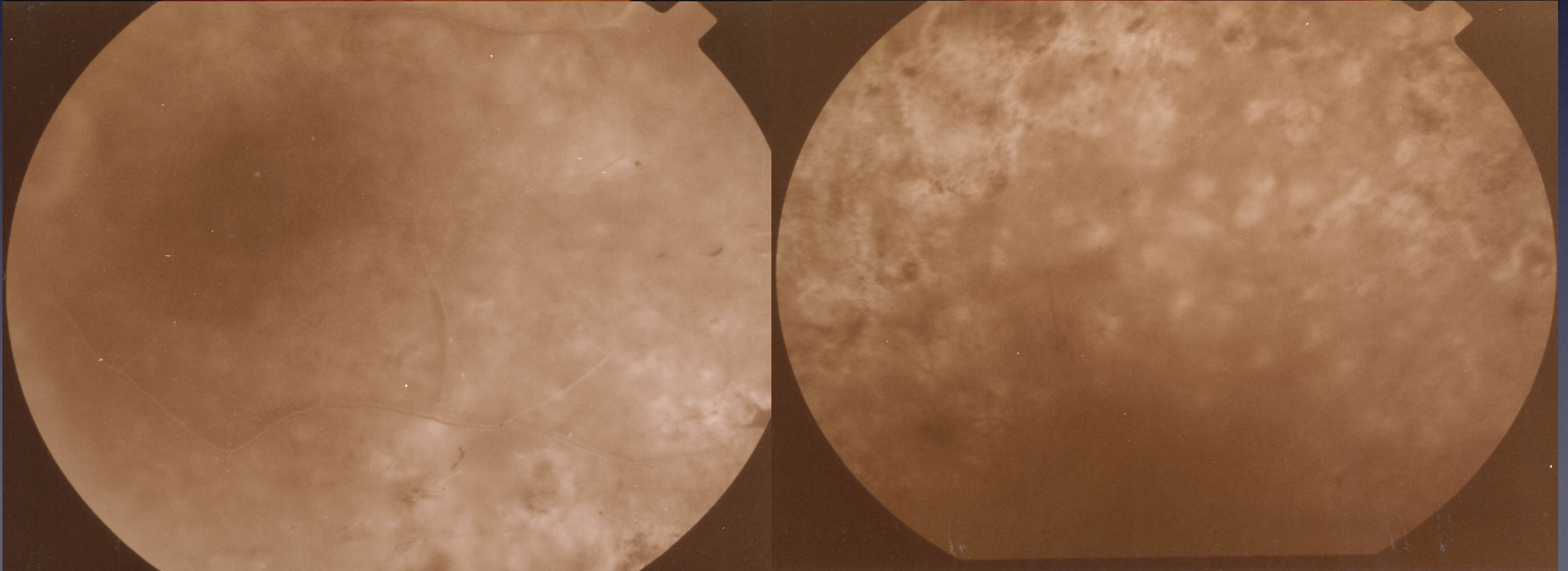
DR tracional após 2.5mg de bevacizumabe



- Arevalo JF, **Maia M**, Wu L, Flynn Jr H, Pieramici D, Avery R, Farah ME Tractional retinal detachment after intravitreal Avastin injection in proliferative diabetic retinopathy. BJO 2008

Pós-operatório

AVOE pós = 20/200



Hemorragia vítrea: vitrectomia bimanual



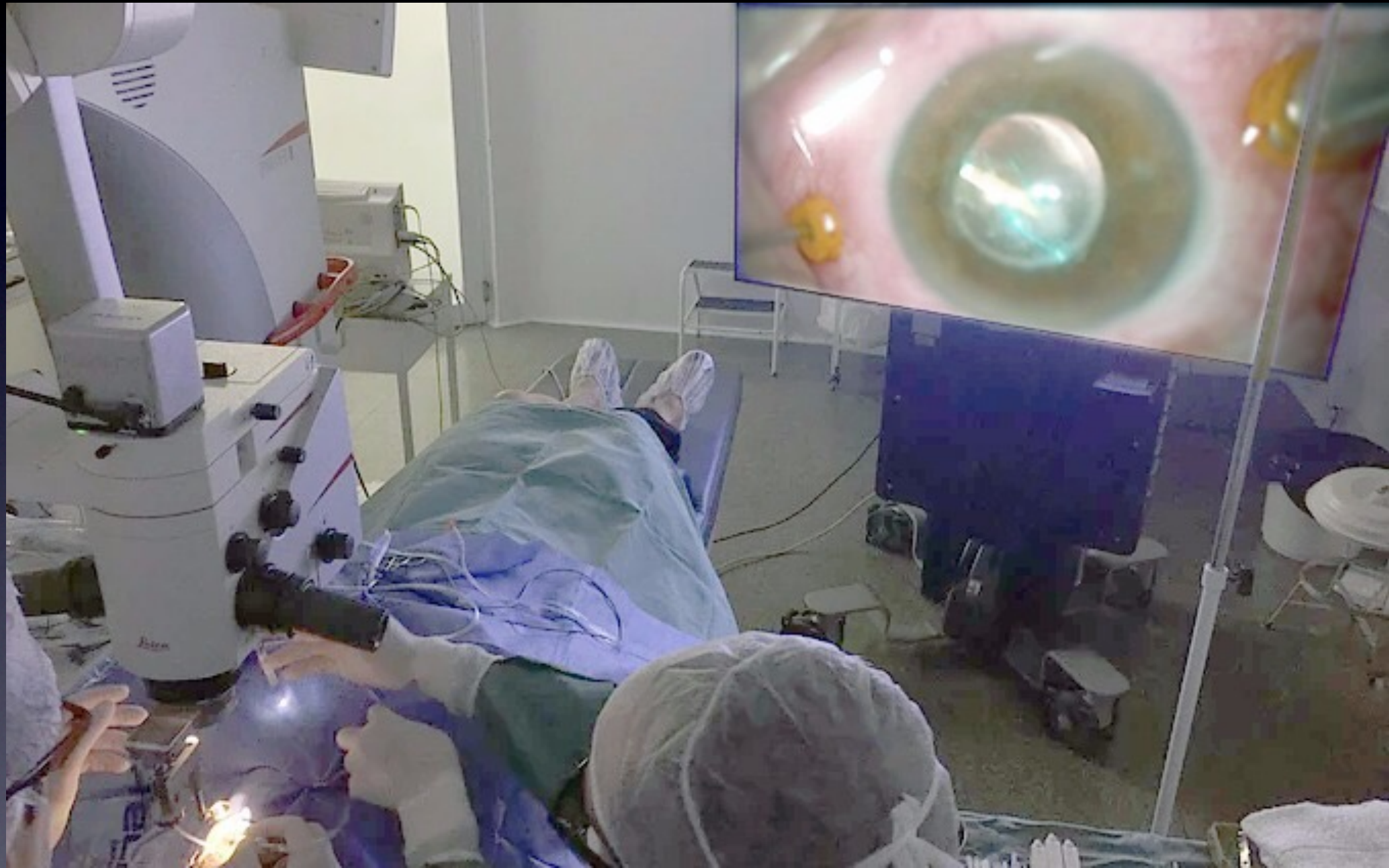
Retinopatia diabética:

Resumo - mensagens para casa I

- Retinopatia diabética não proliferativa:
I-Inibidores do VEGF + LASER sub-limiar se necessário pela angiografia; II-Inibidores do VEGF isoladamente; III-Corticoides IV se EMD+vazamento sobre nervo óptico pela angiografia
- Retinopatia diabética proliferativa:
I-LASER isoladamente na periferia - panfotocoagulação
II-LASER + inibidores do VEGF; Evitara apenas anti-VEGF pois pacientes podem ficar dependentes

2-Early Vitrectomy in Proliferative Diabetic Retinopathy and Preoperative Bevacizumab

3D Surgery - Ngenuity



Main Indications of PPV

- **Diabetic retinopathy classic complications as showed*:**
 1. Non-clearing vitreous hemorrhage
 2. Macular or impending macular tractional retinal detachment
 3. Combined tractional rhegmatogenous retinal detachment
 4. Severe neovascular proliferation
 5. Extensive fibrovascular proliferation
 6. Dense premacular hemorrhage
 7. Anterior hyaloid membrane fibrovascular proliferation
 8. Severe/refractory macular edema

1. Flynn HW Jr, Chew EY, Simons BD, Barton FB, Remaley NA, Ferris FL 3rd. Pars plana vitrectomy in the Early Treatment Diabetic Retinopathy Study. ETDRS report number 17. The Early Treatment Diabetic Retinopathy Study Research Group. Ophthalmology. 1992;99(9):1351-1357.

2. Early vitrectomy for severe proliferative diabetic retinopathy in eyes with useful vision. Results of a randomized trial--Diabetic Retinopathy Vitrectomy Study Report 3. The Diabetic Retinopathy Vitrectomy Study Research Group. Ophthalmology. 1988;95(10):1307-1320.

3. Lewis H, Abrams GW, Blumenkranz MS, et al. Vitrectomy for diabetic macular traction and edema associated with posterior hyaloidal traction. Ophthalmology. 1992;99:753-759.

Early PPV benefits

- **FOR ADVANCED, ACTIVE, EXTENSIVE NEW VESSELS PDR**
 - improve prognosis for final BCVA
- **FOR YOUNG, TYPE I DIABETES WITH SEVERE PDR**
 - more severe new vessels and fibrous proliferations
- **FOR DME, MODERATE VISION LOSS AND VITREOMACULAR TRACTION**
 - posterior hyaloidal traction

1. Jackson TL, Nicod E, Angelis A, Grimaccia F, Pringle E, Kanavos P. PARS PLANA VITRECTOMY FOR DIABETIC MACULAR EDEMA: A Systematic Review, Meta-Analysis, and Synthesis of Safety Literature. Retina. 2017;37(5):886-895

2. Lewis H, Abrams GW, Blumenkranz MS, et al. Vitrectomy for diabetic macular traction and edema associated with posterior hyaloidal traction. Ophthalmology 1992;99:753-759.

3. Diabetic Retinopathy Clinical Research Network Writing Committee, Haller JA, Qin H, et al. Vitrectomy outcomes in eyes with diabetic macular edema and vitreomacular traction. Ophthalmology. 2010;117(6):1087-1093.e3.

4. Shea M. Early Vitrectomy in Proliferative Diabetic Retinopathy. Arch Ophthalmol. 1983;101(8):1204-120

5. Jackson TL, Nicod E, Angelis A, Grimaccia F, Pringle E, Kanavos P. PARS PLANA VITRECTOMY FOR DIABETIC MACULAR EDEMA: A Systematic Review, Meta-Analysis, and Synthesis of Safety Literature. Retina. 2017;37(5):886-895

6. Diabetic Retinopathy Clinical Research Network Writing Committee, Haller JA, Qin H, et al. Vitrectomy outcomes in eyes with diabetic macular edema and vitreomacular traction. Ophthalmology. 2010;117(6):1087-1093.e3.

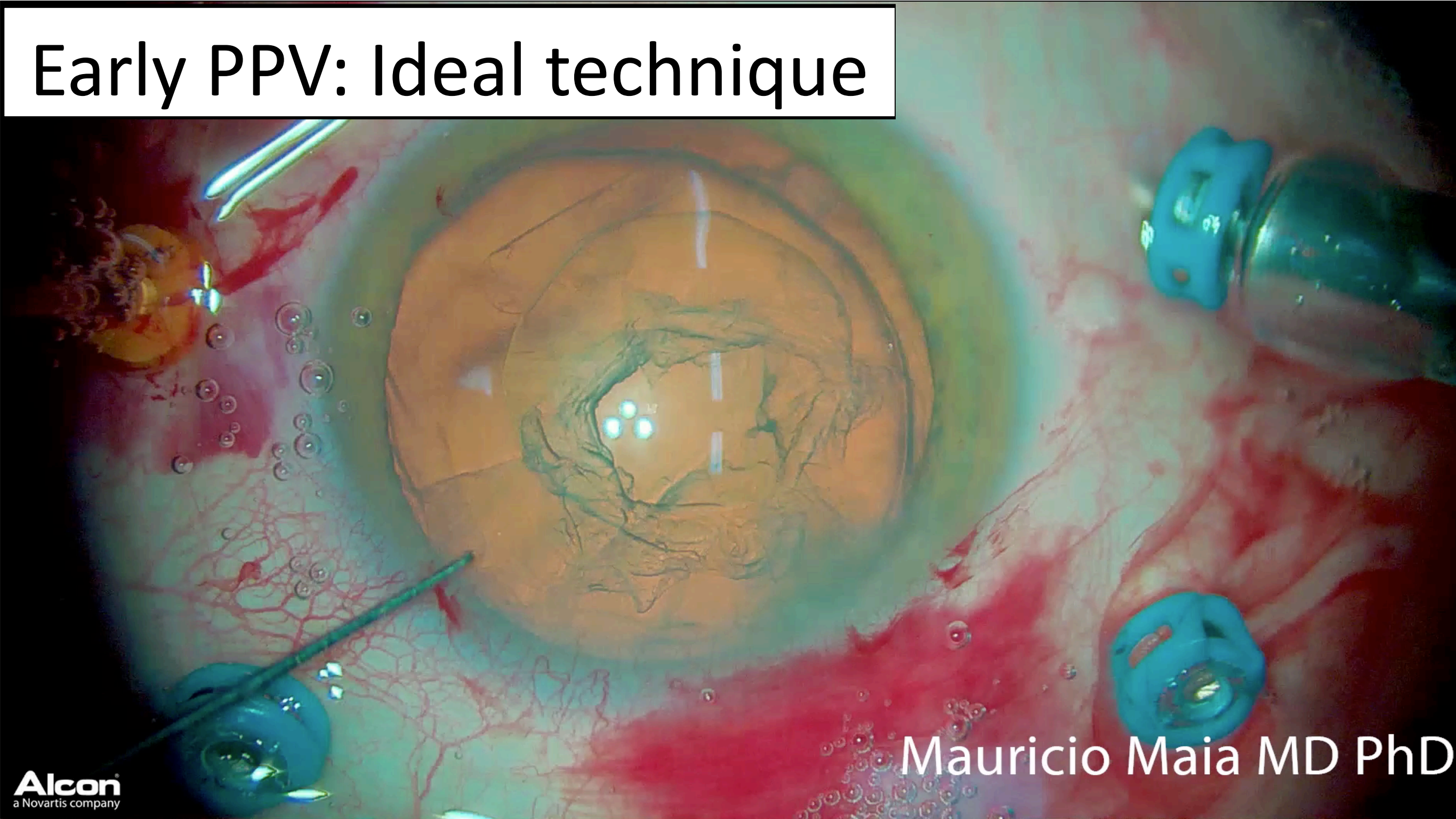
Surgical techniques

- Preoperative Bevacizumab
- Bimanual chandelier-assisted technique
 - Fibrovascular membranes dissection

Preoperative Bevacizumab

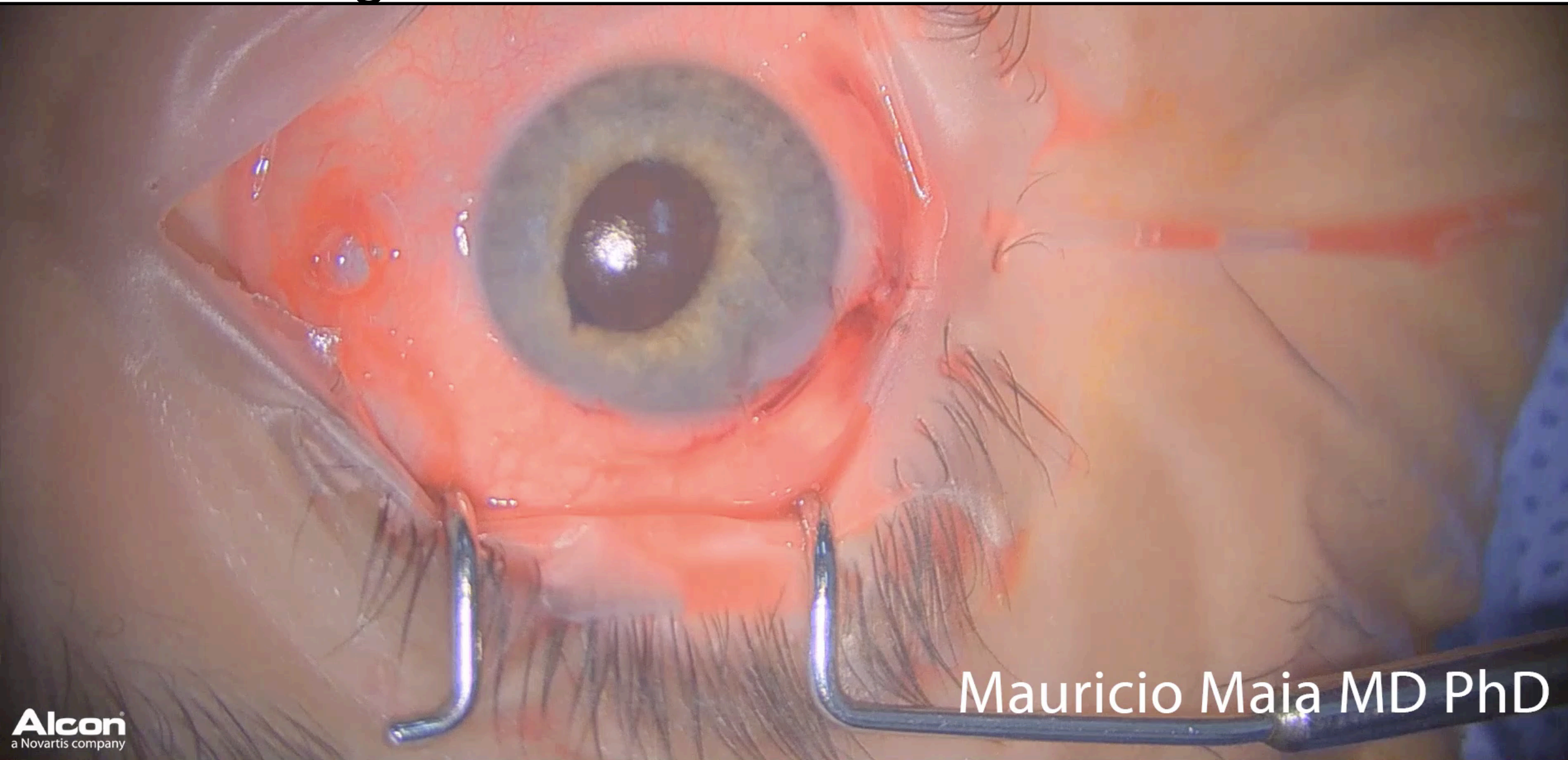
- **When?**
 - 3 to 5 days before the surgery
- **Benefits:**
 - **Intraoperative:**
 - Reduced risk of intraoperative bleeding
 - Improved surgical visual field visualization
 - Reduced use of endodiathermy

Early PPV: Ideal technique



Mauricio Maia MD PhD

Complications of early PPV: Residual vitreous and neovascular glaucoma

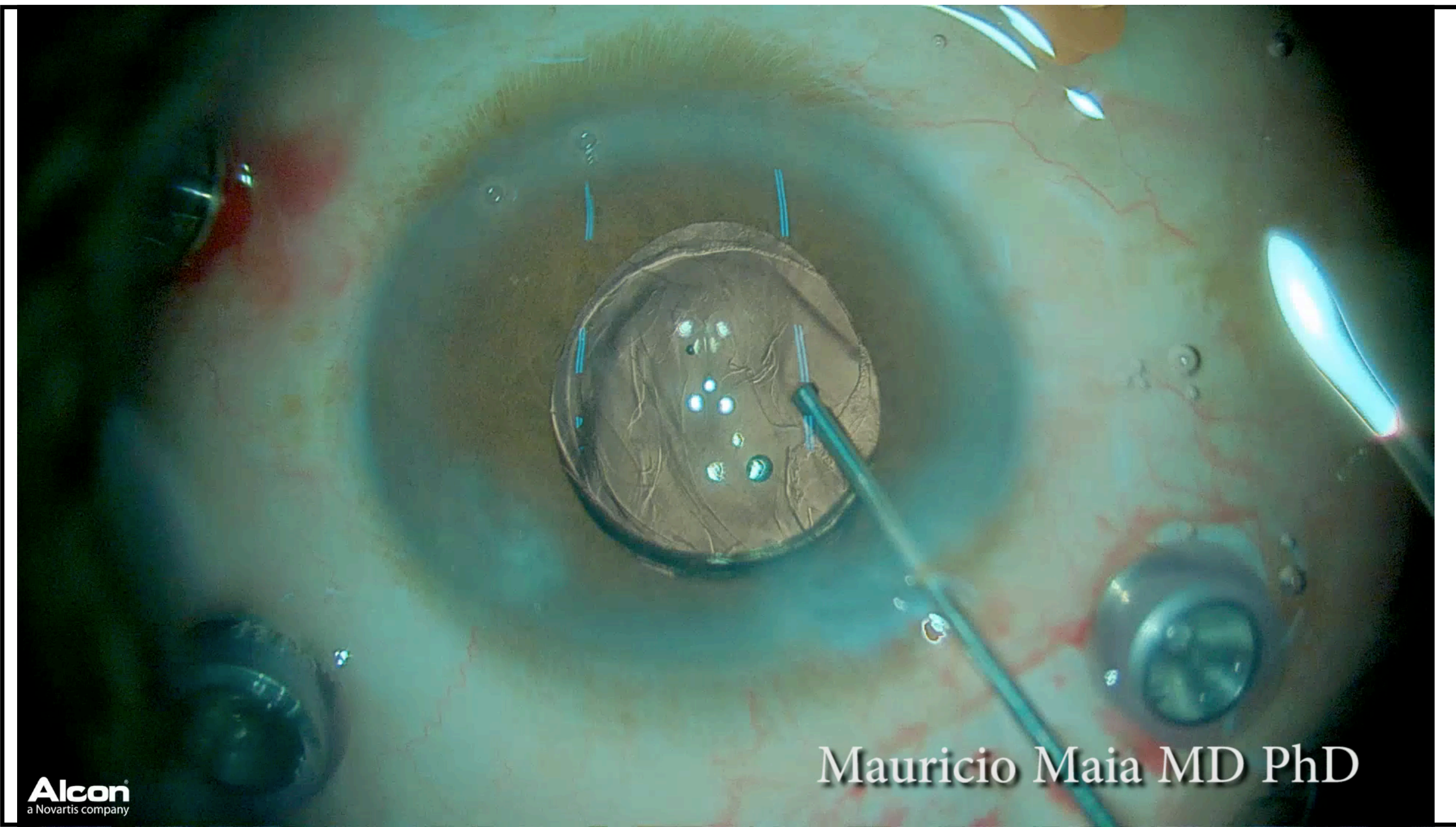


Mauricio Maia MD PhD

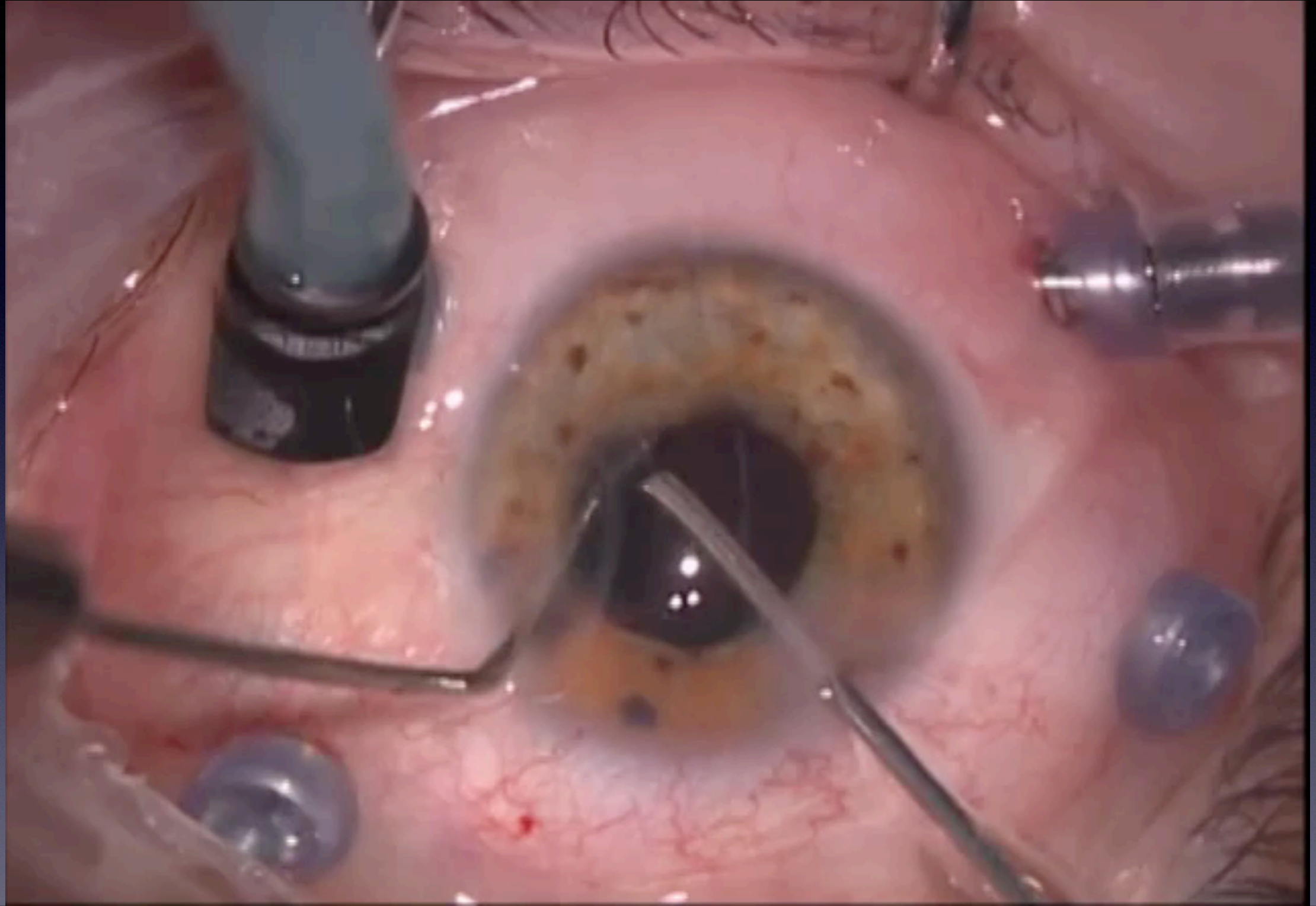
Early PPV in PDR Take Home Messages II

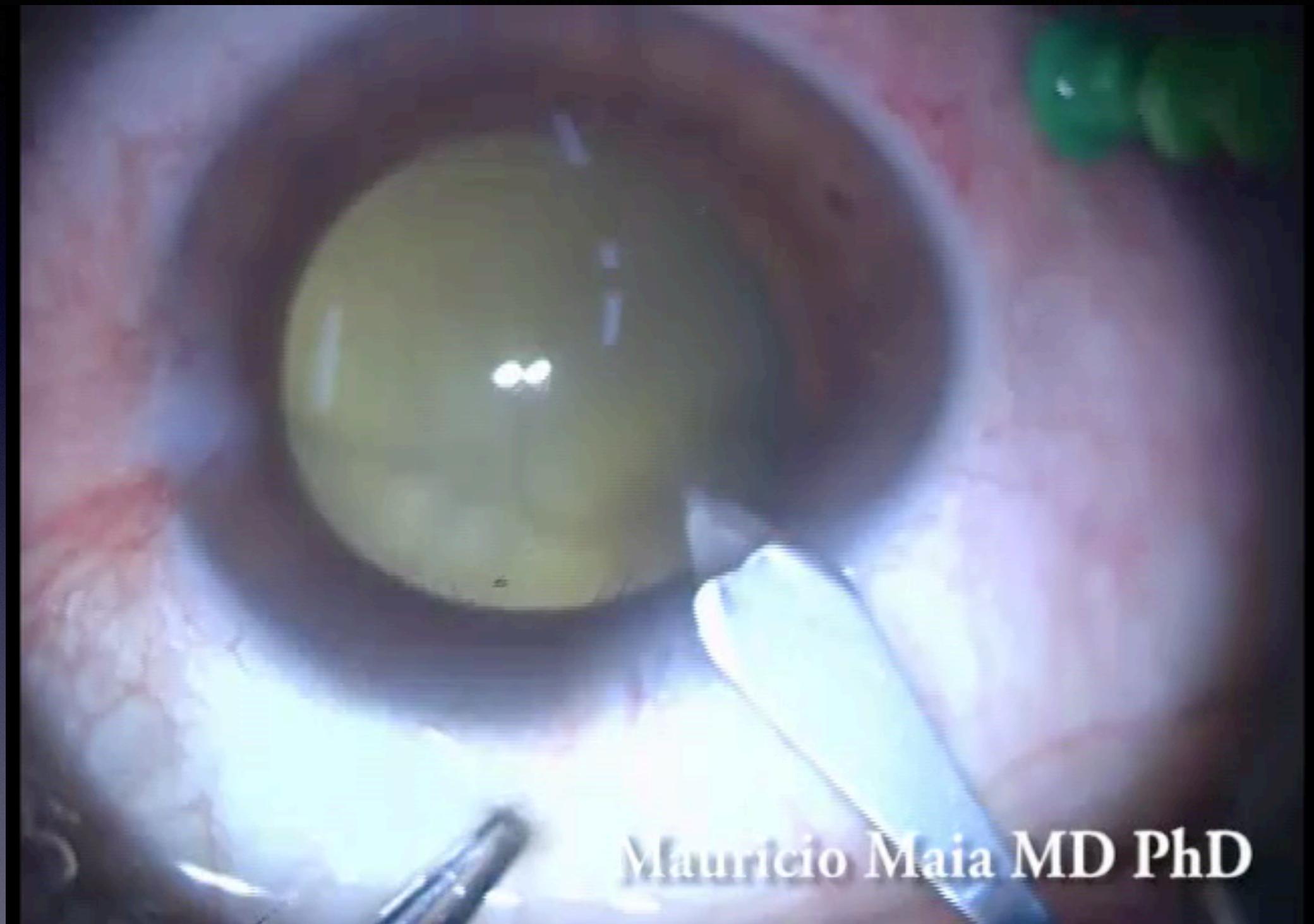
- **Decrease risks of future complications in selected eyes; however, complications may occur**
- **Preoperative Bevacizumab**
 - 3 to 5 days before the surgery 1,25mg
 - Reduced intraoperative bleeding
 - Helpful to facilitate PPV

**3- ANTI VEGF BEFORE PPV AND
COMPLEX EYES**



Mauricio Maia MD PhD





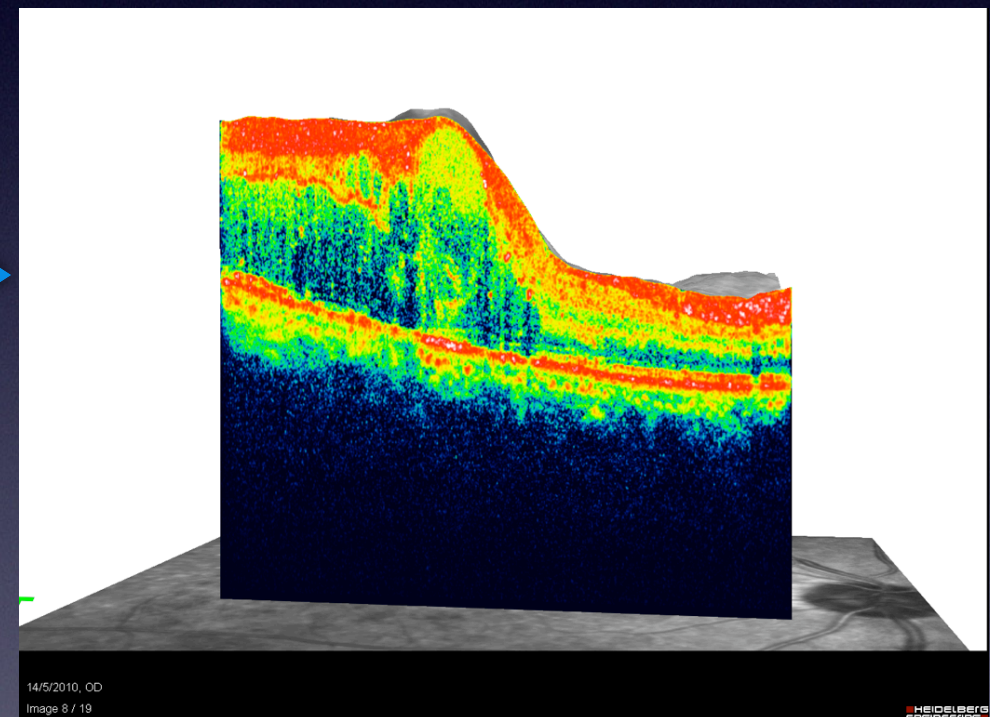
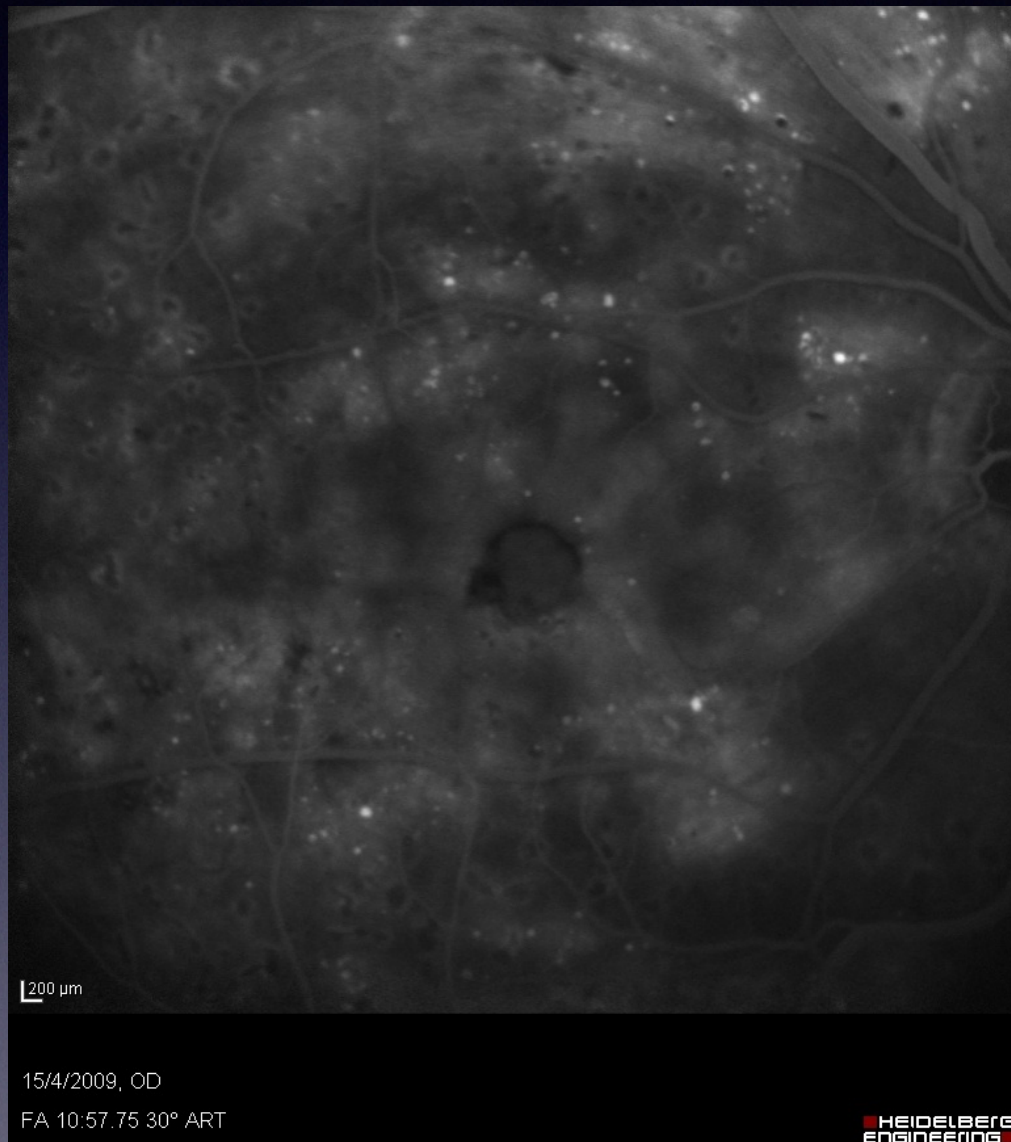
Arevalo JF, Maia M, Wu L, Flynn Jr H, Pieramici D, Avery R, Farah ME Tractional retinal detachment after intravitreal Avastin injection in PDR. BJO 2008

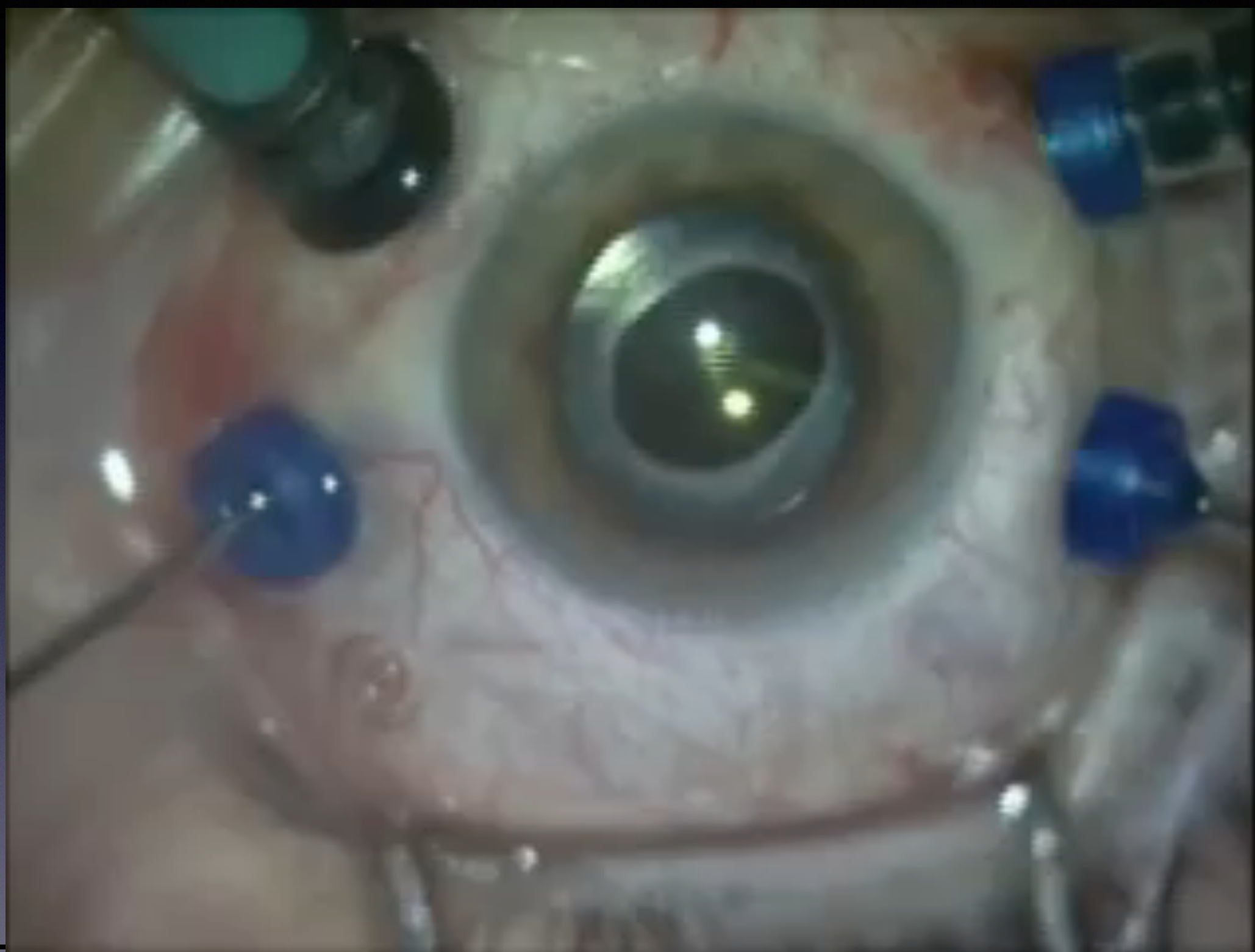
ANTI-VEGF BEFORE COMPLEX PDR Sx- Take-home messages III

- 1- 1,25 mg of bevacizumab 1-3 days before surgery
- 2-Decrease 45% tears and 39% bleeding
- 3-Better BCVA in bevacizumab group
- 4-Silicon oil in single eyes or bleeding aqt optic disc
- 5- 1,25 mg of bevacizumab at end of sx if neovessels

4- Vitrectomy in DME

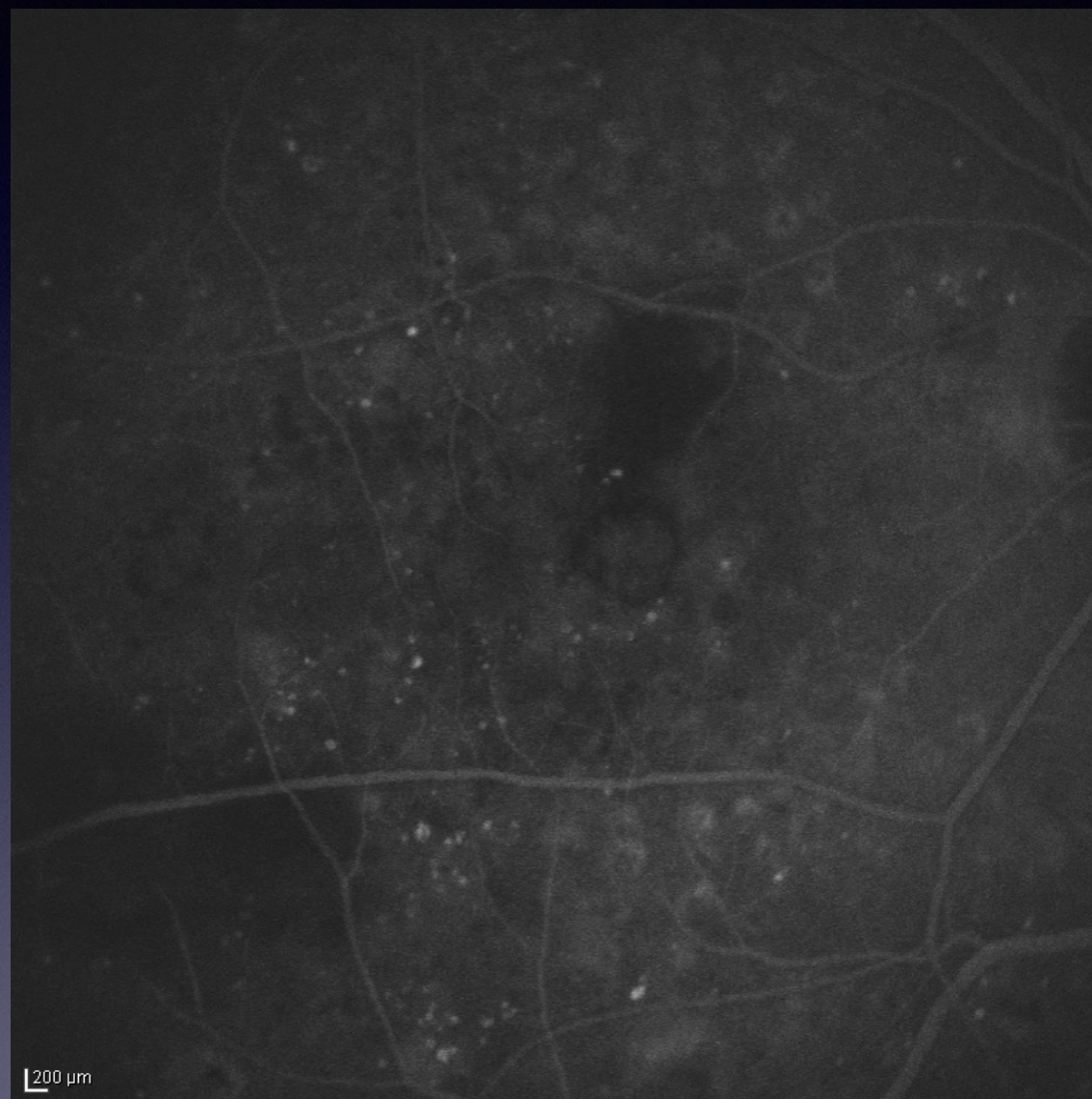
Diabetic Macular Edema





Fluorescein Angiogram + OCT

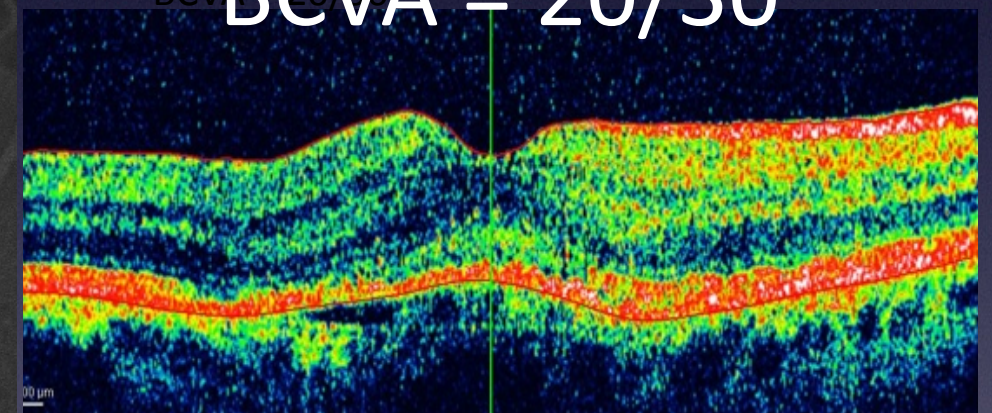
After Surgical Treatment



23/11/2010, OD
FA 5:07.92 30°

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BCVA = 20/30

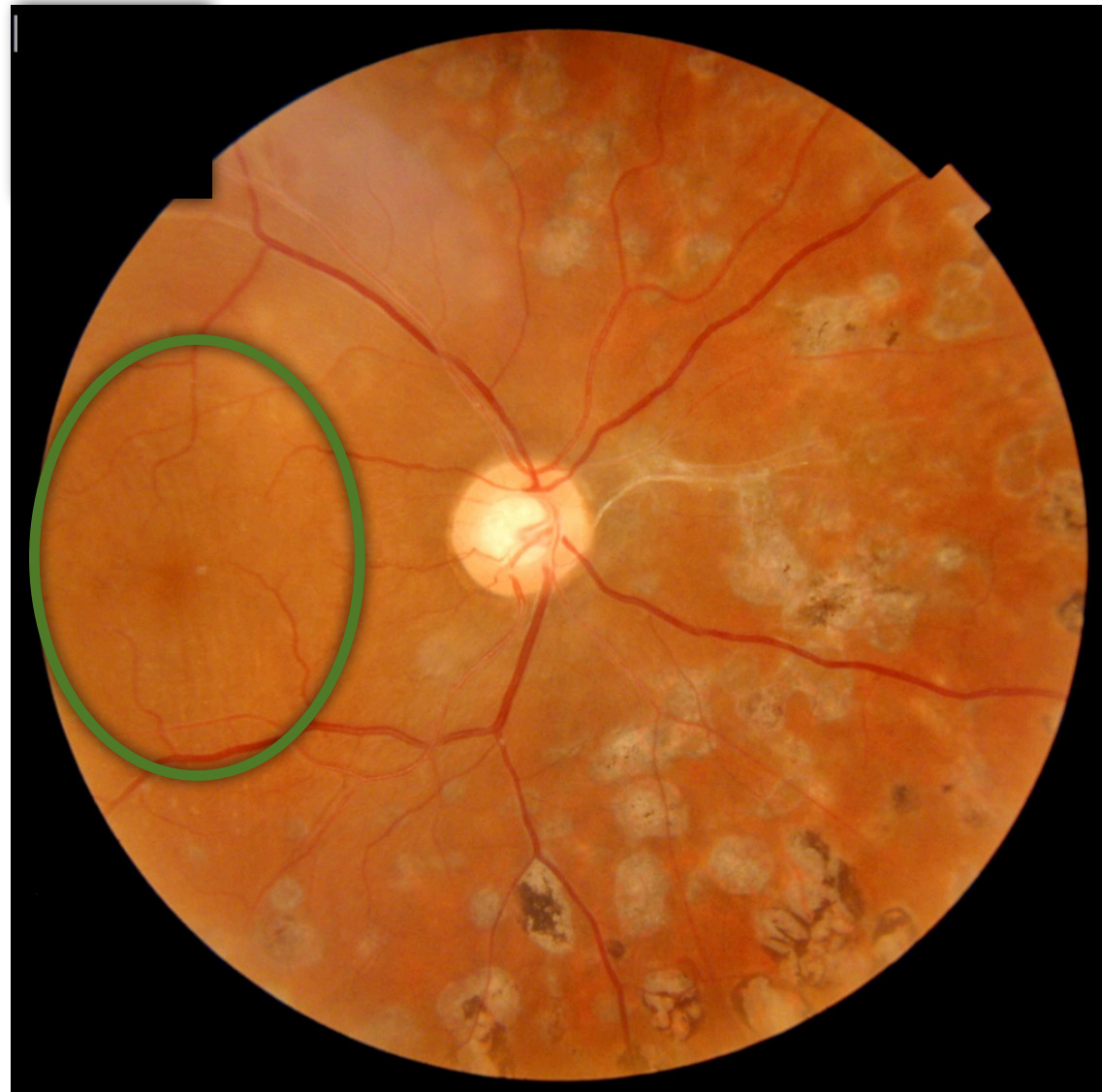


BCVAOD = 20/30 (3 weeks)
12 months follow up

OCT-A - Fundus Photograph in PDR OD

Intense ILM thickness

BCVA=20/60



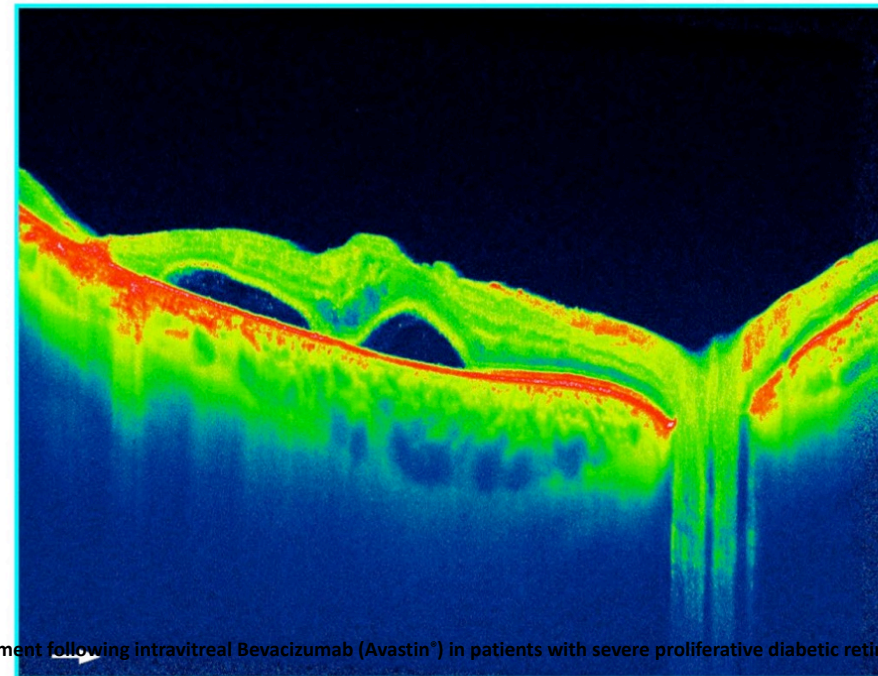
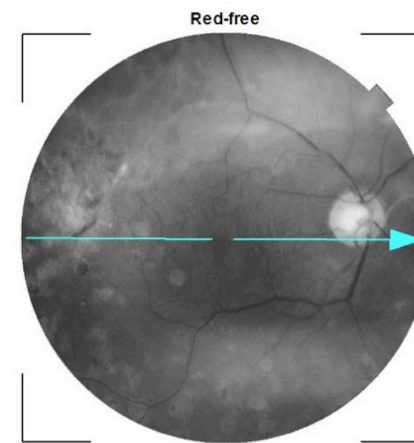
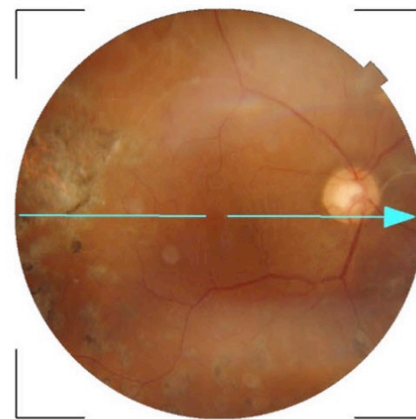
OCT-A in PDR AO after surgery

BCVA=20/60

Line Report
ID : 43935
Triton plus (Ver.10.07)
Print Date : 20/01/2017
TOPCON
Ethnicity :
Gender : Male
DOB : 24/04/1974 Age : 42
Technician : Ort. Sirley Barchi
Fixation : OD(R) Macula
Scan : Line(12.0mm - 1024)

OD(R)

TopQ Image Quality: 86 mode: Fine(2.0.7)
Capture Date: 20/01/2017



PACORES. Tractional retinal detachment following intravitreal Bevacizumab (Avastin®) in patients with severe proliferative diabetic retinopathy. British Journal of Ophthalmology, v.92, p.213-216, 2008.

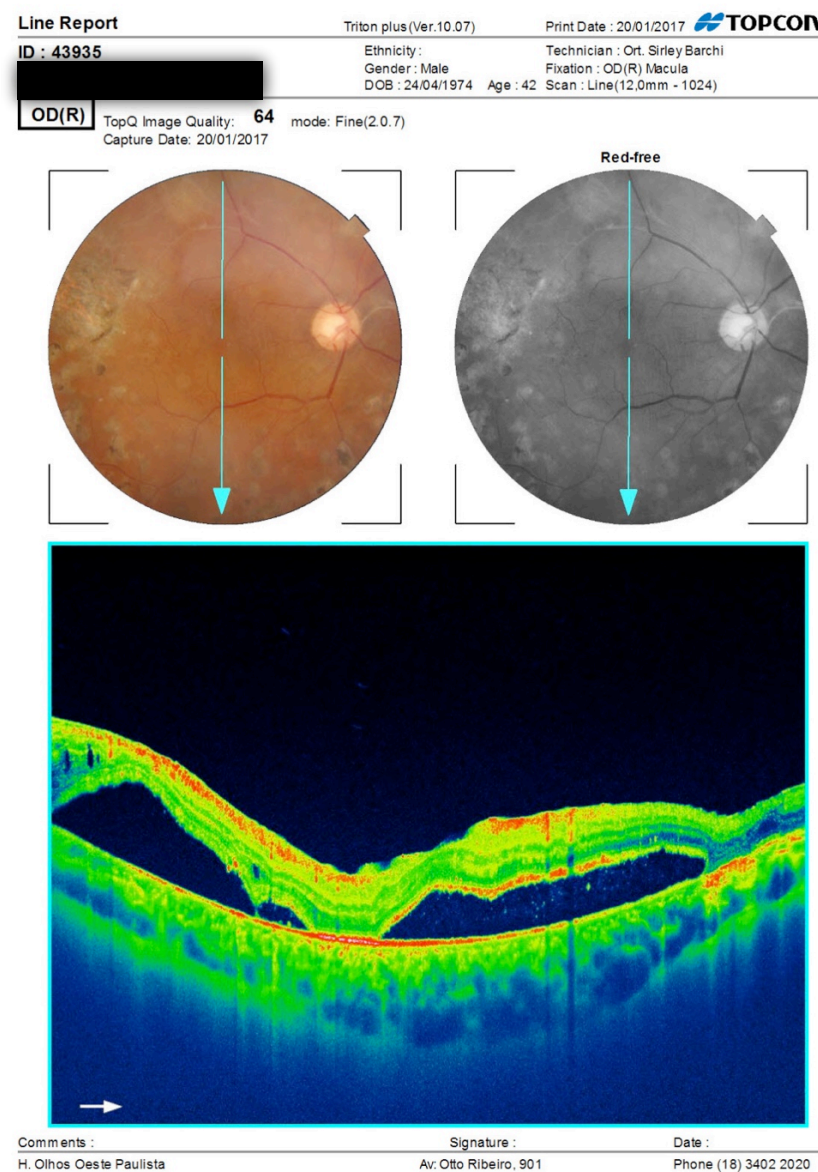
Comments :
H. Olhos Oeste Paulista

Signature :
Av. Otto Ribeiro, 901

Date :
Phone (18) 3402 2020

OCT-A - OCT in PDR after surgery

BCVA 1 week after Ozurdex=CF 3 meters



PACORES. Tractional retinal detachment following intravitreal Bevacizumab (Avastin®) in patients with severe proliferative diabetic retinopathy. British Journal of Ophthalmology, v.92, p.213-216, 2008.

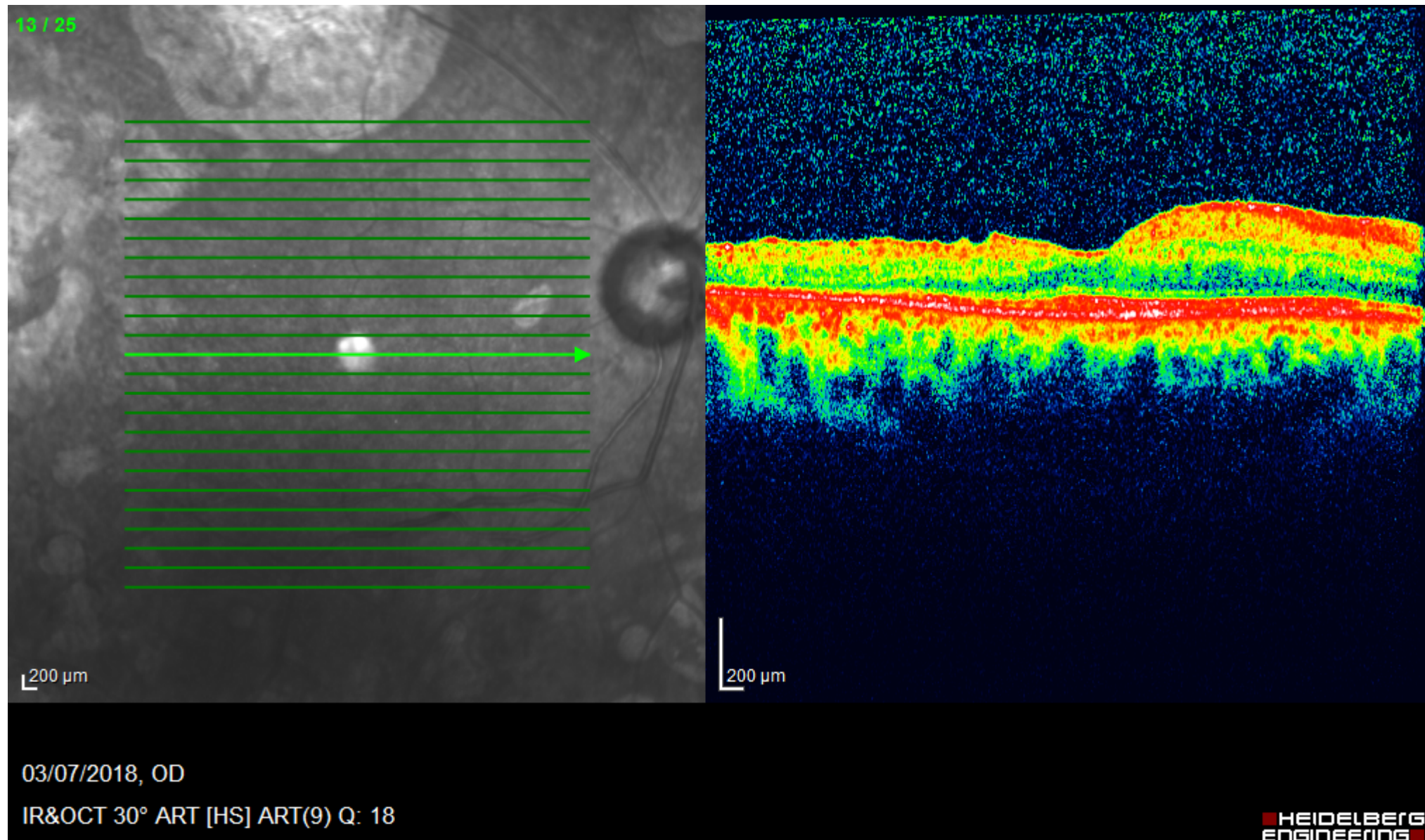
Surgery for thicker ILM and TRD

BCVA = CF 3 meters



IR and AF after PDR after surgery

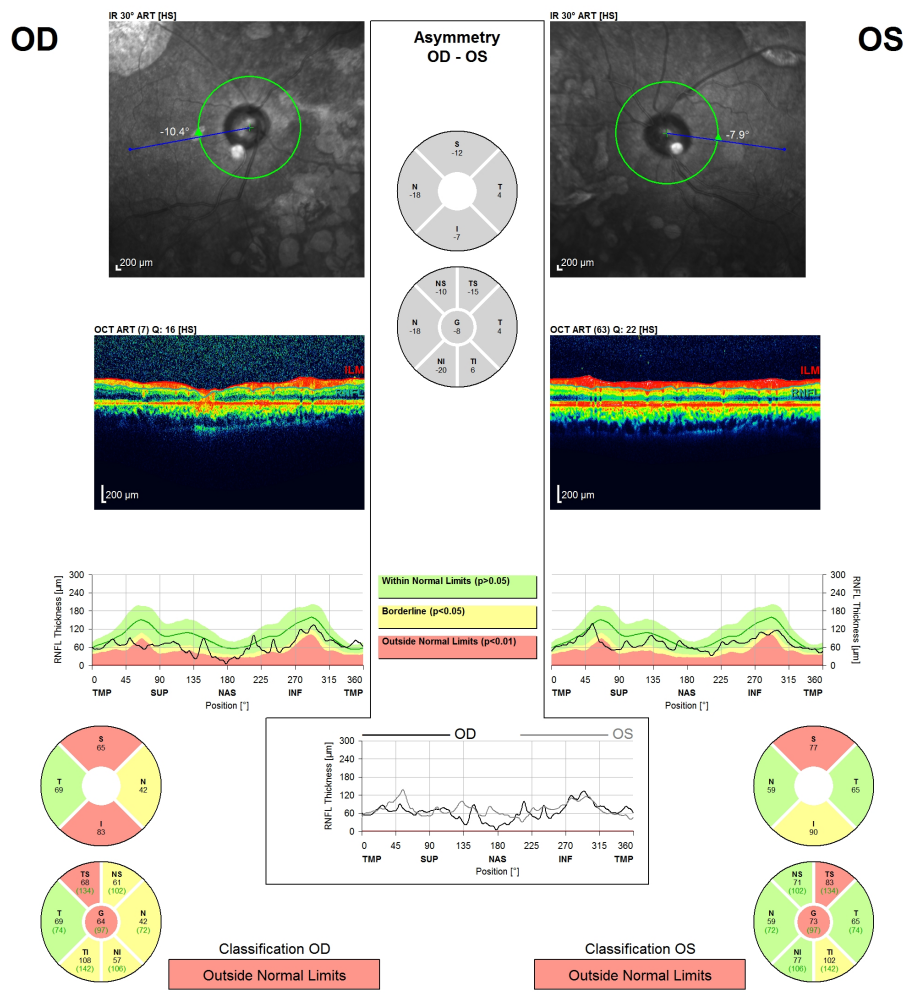
BCVA OD 1 month after surgery = 20/30



OCT from Optic Disc after in PDR after 2 surgeries

BCVA OD = 20/30

RNFL Single Exam Report OU		SPECTRALIS® Tracking Laser Tomography		HEIDELBERG ENGINEERING	
Patient:	Linhares, Rodrigo Cesar Baptista	DOB:	24/abr/1974	Sex:	M
Patient ID:	43935	Exam.:	03/jul/2018		
Diagnosis:	---	Comment:	---		



Notes:

Date: 10/04/2019 Signature:

Software Version: 6.3.4 www.HeidelbergEngineering.com RNFL Single Exam Report OU

Management of Diabetic Macular Edema

Take-home messages IV

- 1- Control of risk factors - systemic diseases
- 2-If macular edema persists, the gold-standard treatment is any anti-VEGF PRN guided by OCT + deferral laser (focal/grid)
- 3-Consider laser in specific cases
- 4-Consider steroids (dexamethasone) if pseudophakic non-responders, eyes already vitrectomized and CME in DME.
- 5-Pars plana vitrectomy (and possible ILM peeling) if evidence of traction. Care in eyes non-responders: “subclinical traction”

Obrigado

[mmaia@unifesp.br](mailto:mm Maia@unifesp.br)