AADI in Rwanda

(Aurolab Aqueous Drainage Implant)

Piet Noë

Rwanda Charity Eye Hospital

Rwanda Charity
EYE HOSPITAL

Glaucoma (POAG)

- 2nd cause of blindness in Africa (after cataract)
- Treatment is surgical (because low therapy adherence)
- Surgery is mostly Trabeculectomy with Mitomycine C
- BUT….

Relatively low success rate of Trabeculectomy in African eyes.

J Glaucoma. 2024 Oct 2. doi: 10.1097/IJG.0000000000002503. Online ahead of print.

Outcomes of Trabeculectomy and Predictors of Success in Patients of African Ancestry with Primary Open Angle Glaucoma

Anusha Mamidipaka [1], Amy Shi [1], Victoria Addis [1], Jocelyn He [1 2], Roy Lee [1 3], Isabel Di Rosa [1 3], Rebecca Salowe [1 3], Gui-Shuang Ying [1 2], Joan O'Brien [1 3]

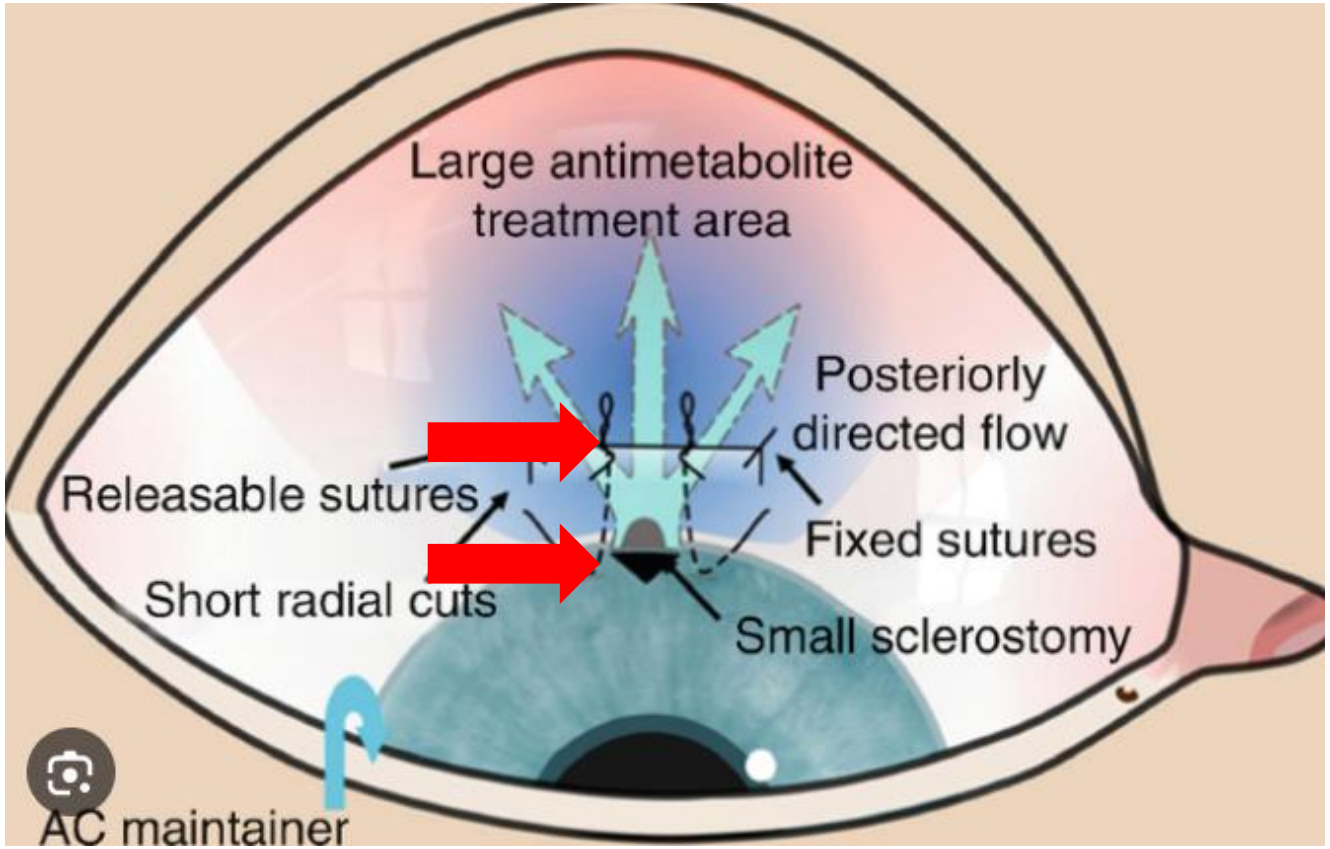
Affiliations + expand

PMID: 39352254 DOI: 10.1097/IJG.0000000000002503

- Retrospective study in USA
- Afro-Americans
- 63 eyes, POAG
- Only 46% success rate of Trabeculectomy
- Frequent complications

Why do trabeculectomies fail ?

- Early failure:
  - Internal occlusion by iris, vitreous
  - External fibrosis (scarring flap, scarring sclera to conjunctiva)
- Late failure:
  - External fibrosis
  - Leaks / infection



Risk factors for trabeculectomy failure

- Prior trabeculectomy failure
- Prior conjunctival surgery (SICS, ECCE)
- Young patients
- No use of antimetabolites
  - But antimetabolites can cause thin, ischemic blebs, leaks and infection
- African Ethnicity?

Review

Differences in the Surgical Outcomes of Glaucoma Surgery in Patients of African Caribbean Descent

A. M. Nagar, P. Maghsoudlou, R. Wormald, K. Barton, P. Hysi & K. S. Lim

Pages 1567-1577 | Received 10 Jun 2022, Accepted 14 Sep 2022, Published online: 19 Oct 2022

Cite this article https://doi.org/10.1080/02713683.2022.2126859 Check for updates

- People from African Carribean descent : higher prevalence of glaucoma than in people from European descent
- Review of 76 studies
- Outcomes of trabeculectomy poorer than in patients of European descent
- Outcomes of GDD are NOT poorer than in patients of European descent

Glaucoma Drainage Devices (GDD)

Prevent 2 problems with Trabeculectomies:

1. Prevent closure of fistula diverting aqueous out of the eye: via silicone tube
2. Prevent failure of bleb due to conjunctival scarring: external plate maintains the potential space, capsule





Glaucoma drainage Devices

Non valved implants

- Molteno
- Baerveldt Implant (250 & 350 mm2)
- AADI (250 & 350 mm2)





Valved Implants

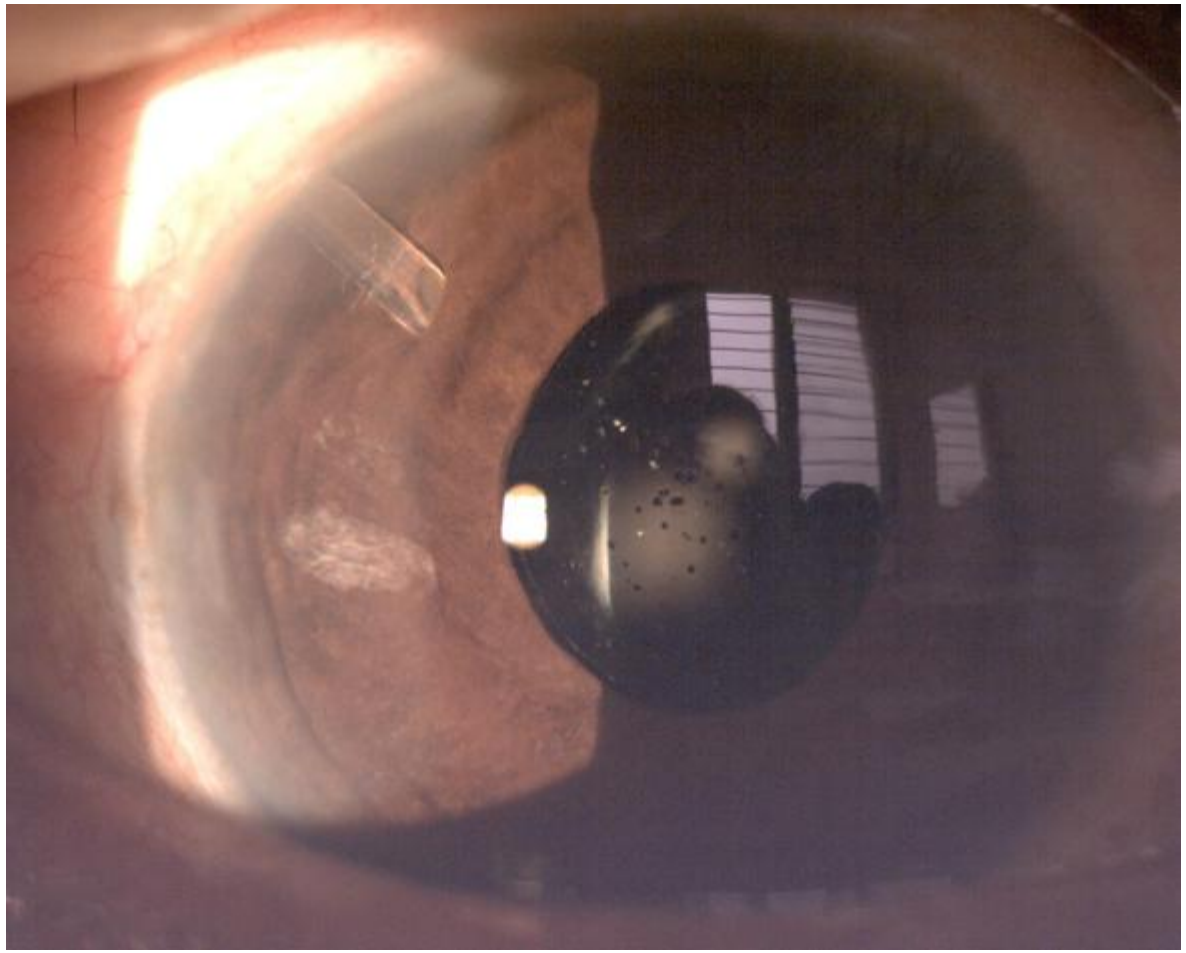
- Ahmed Glaucoma Valve

Non-valved Glaucoma Drainage Devices

- Require temporary occlusion of the tube to prevent early hypotony
  - **Ligation** of the tube with absorbable suture (vicryl 7-0 , or 6- 0 – dissolve after 4-6 weeks)
  - **Internal occlusion** of the tube with nylon or prolene 3-0 suture. This suture is extended subconjunctivally to a remote site – can be removed later.
  - (filling of tube and anterior chamber with Healon 5)

Non-valved implants - advantages

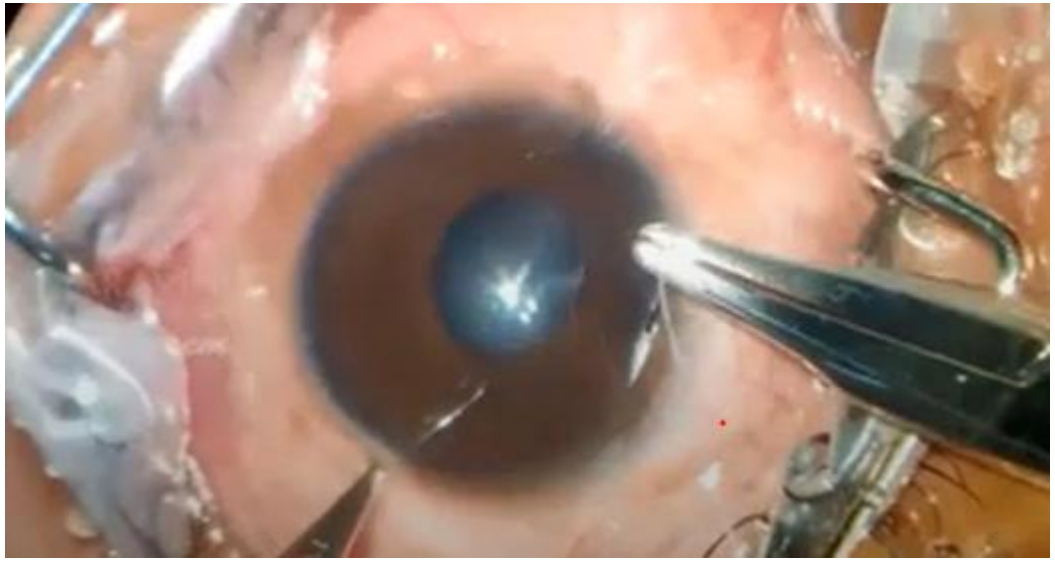
- Larger surface area in current designs
  - IOP-lowering is +- proportional to the explant surface area
- Bleb is not exposed to early postoperative inflammatory mediators
  - Possibly thinner, more permeable blebs
- Better long-term IOP lowering



Technique : Conjunctival traction suture

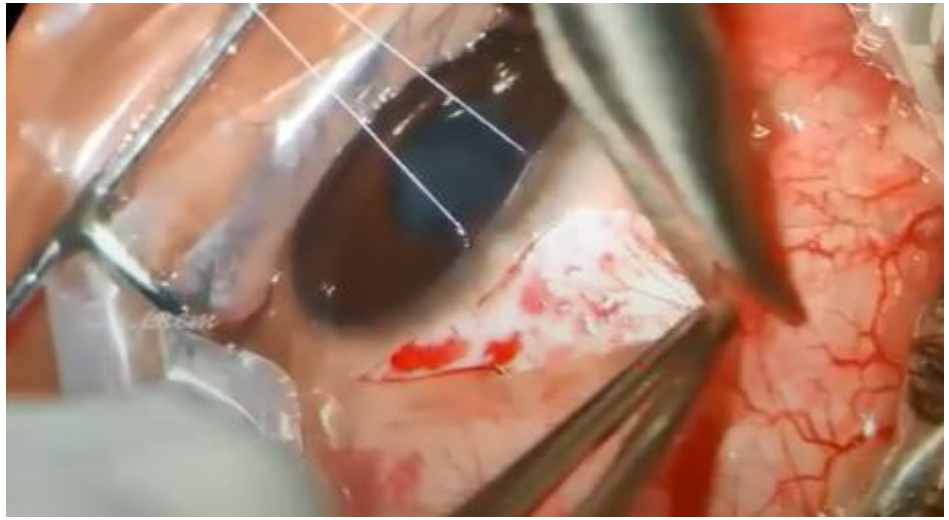
Most surgeons use a corneal traction suture (8-0 vicryl) to have a good exposure of the area

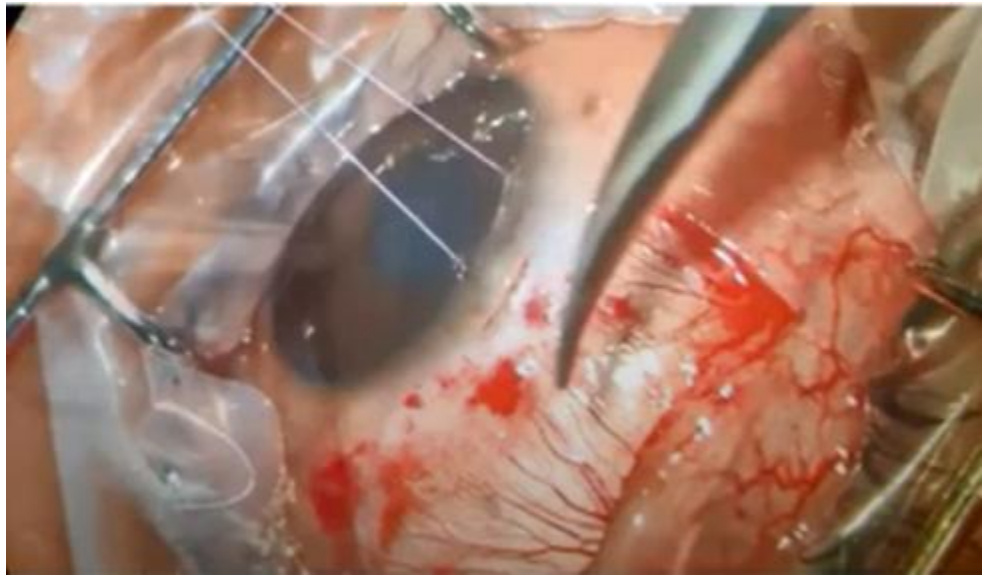
We do not use a corneal traction suture , but 4-0 silk suture around superior rectus muscle



Conjunctival peritomy

- Fornix based
  (open conjunctiva at limbus)
- Limbal based
  (open conjunctiva in Fornix)





Isolation of recti muscles

- The adhesions / tenon should be removed from superior rectus and lateral rectus
- Wings of the plate should be between sclera and muscle – remove tenon





Prepare the implant

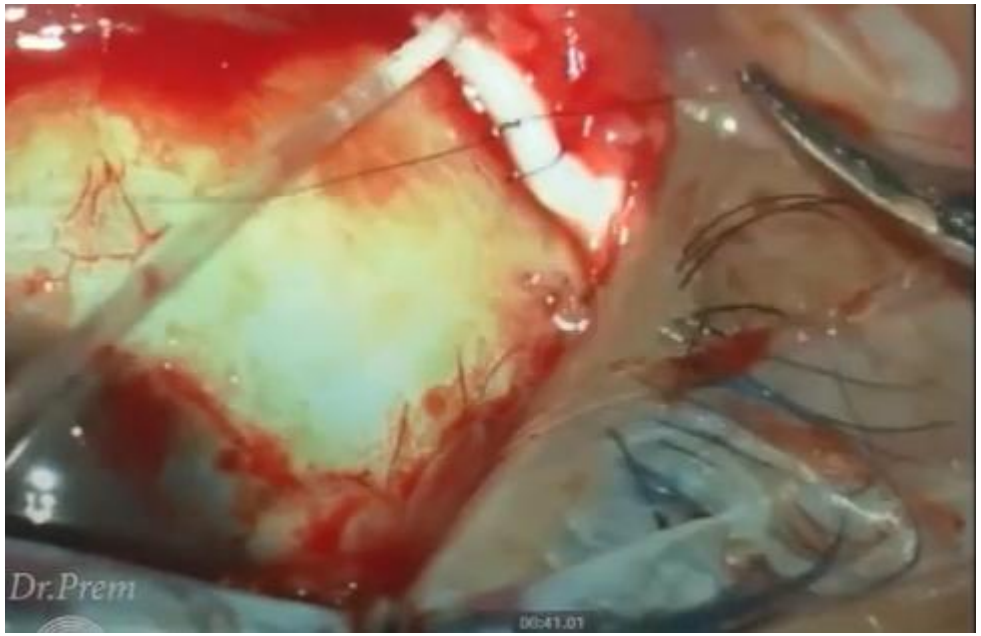
- Flush the tube: Patent?
- Put Prolene 3-0 or 4-0 suture inside
- Vicryl 7-0 or 6-0 around the tube
- Flush again: Closed?





Anchoring of the plate

- 8-10 mm from limbus
- 2 sutures : 8-0 nylon



Cut the tube

- Bevel up
- 2 – 3 mm in AC

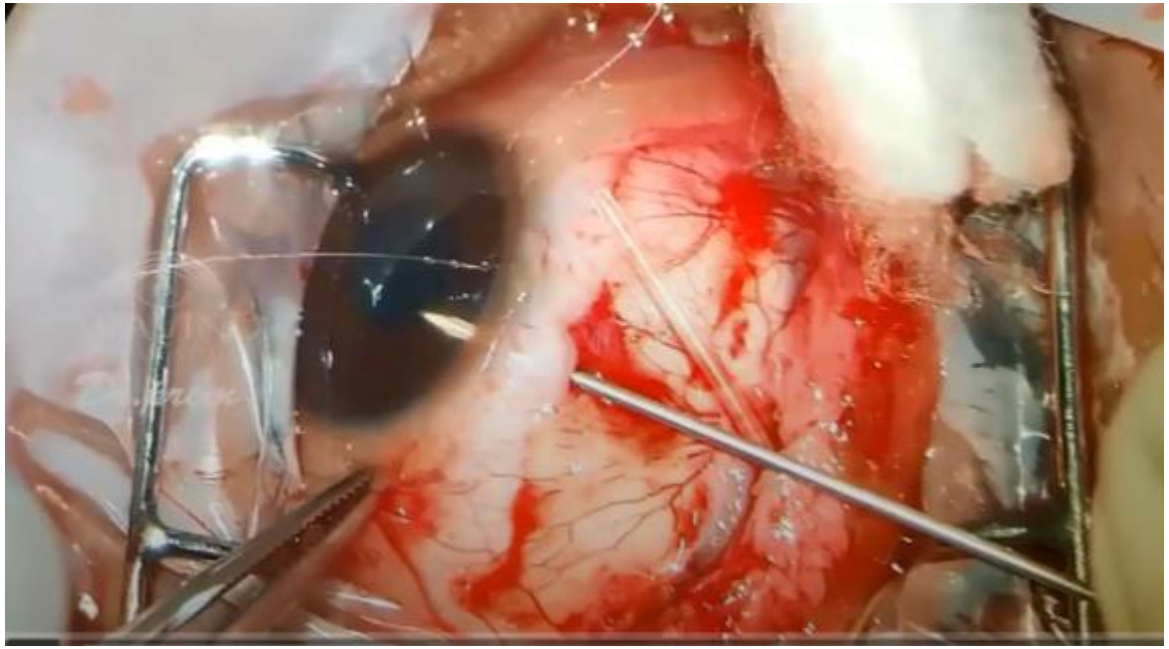
- If you put tube in sulcus or vitreous cavity: bevel down

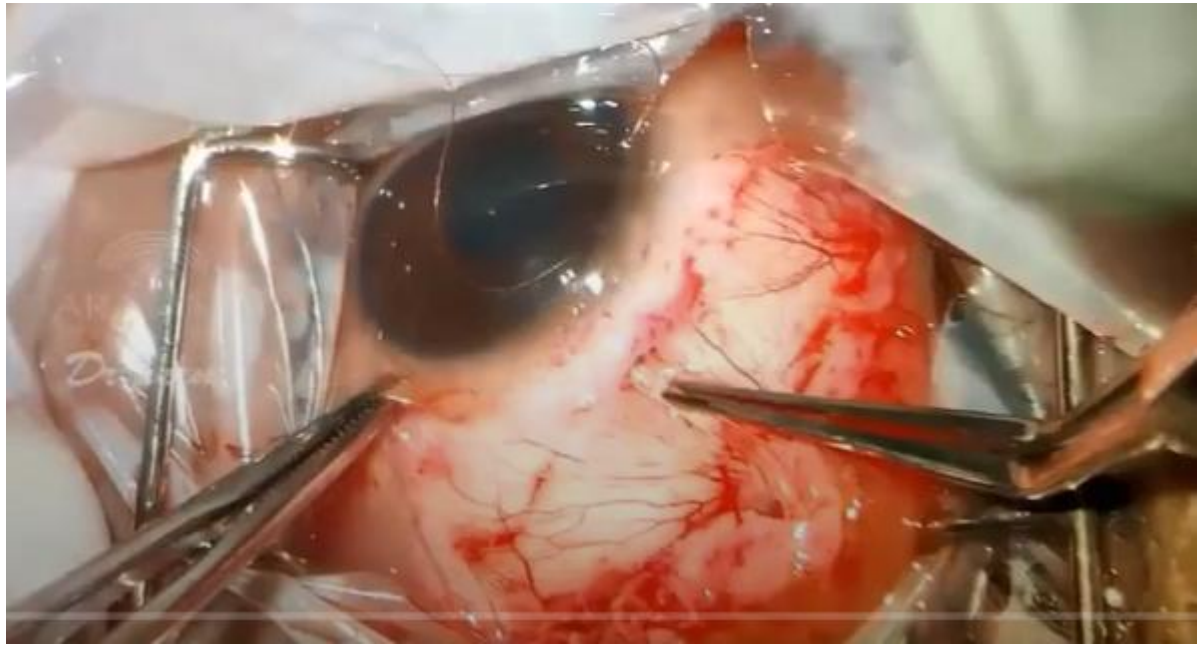


Tube entry

- 2 mm from limbus if tube is placed in AC
- 4 mm from limbus if tube is placed in vitreous cavity
- 23G needle

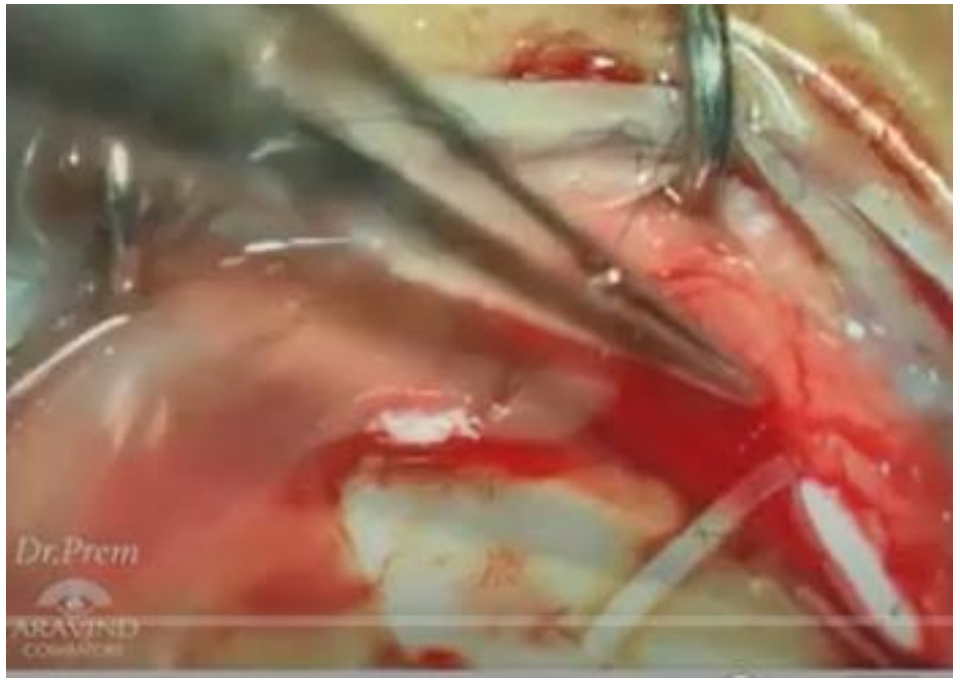
- Easier in AC – maintainer is used





Anchoring the tube

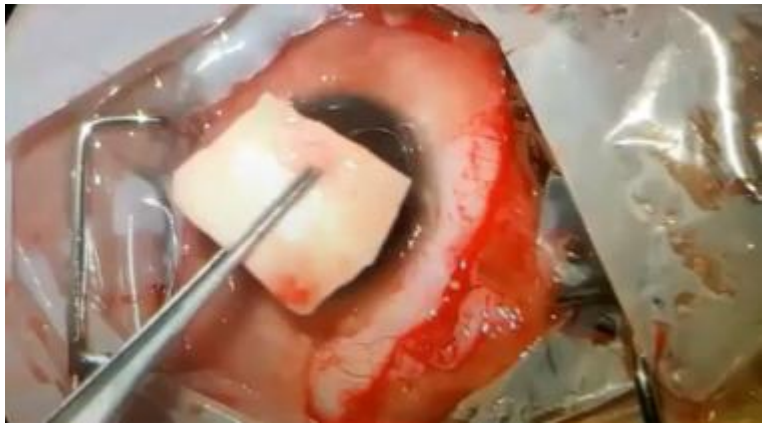
- With nylon 8-0
- Venting slits in the tube (will reduce IOP in the first weeks) with 8-0 nylon needle

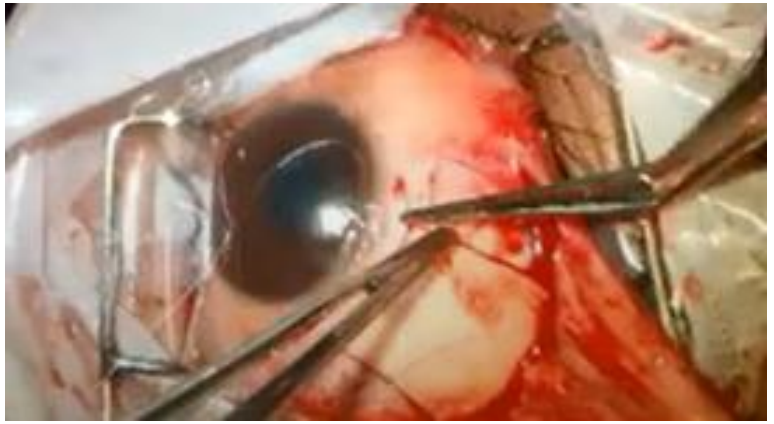


Patch graft on top of the tube

- With vicryl 8-0
- Is also possible without patch graft: with scleral flap / tunnel







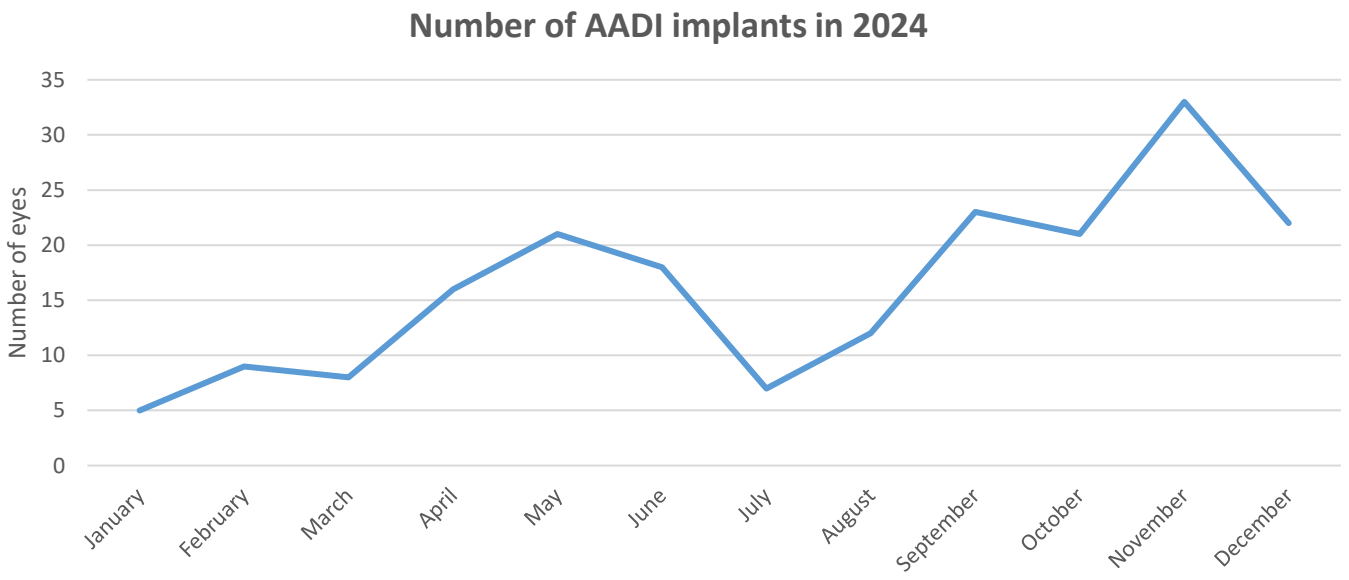
Suture conjunctiva

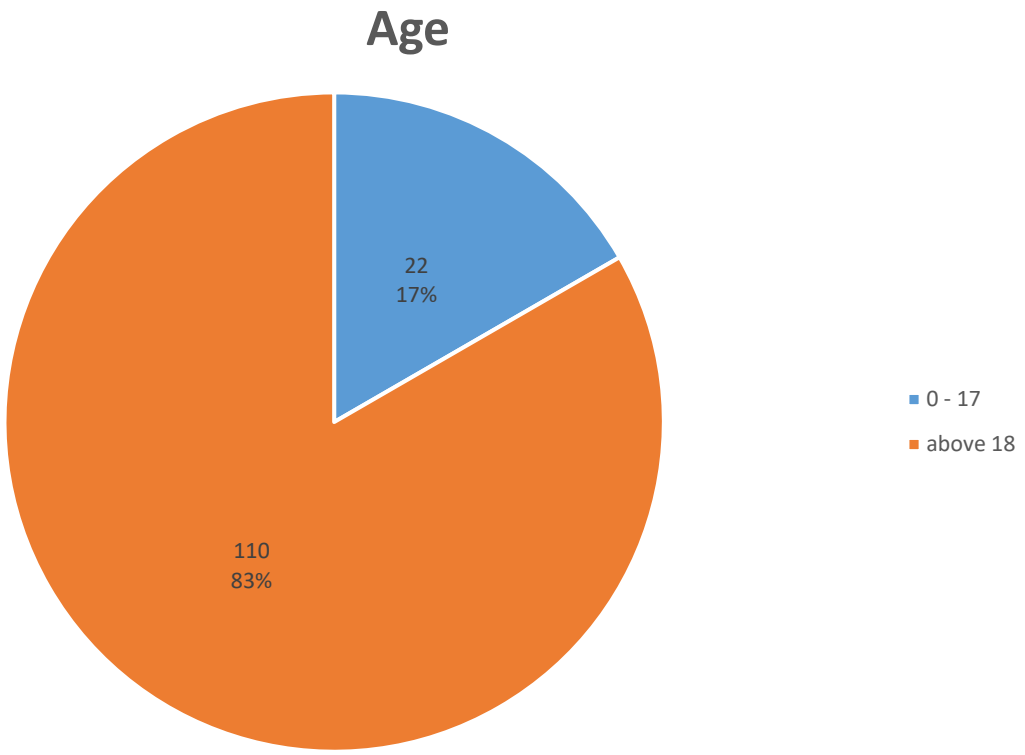
- With vicryl 8-0

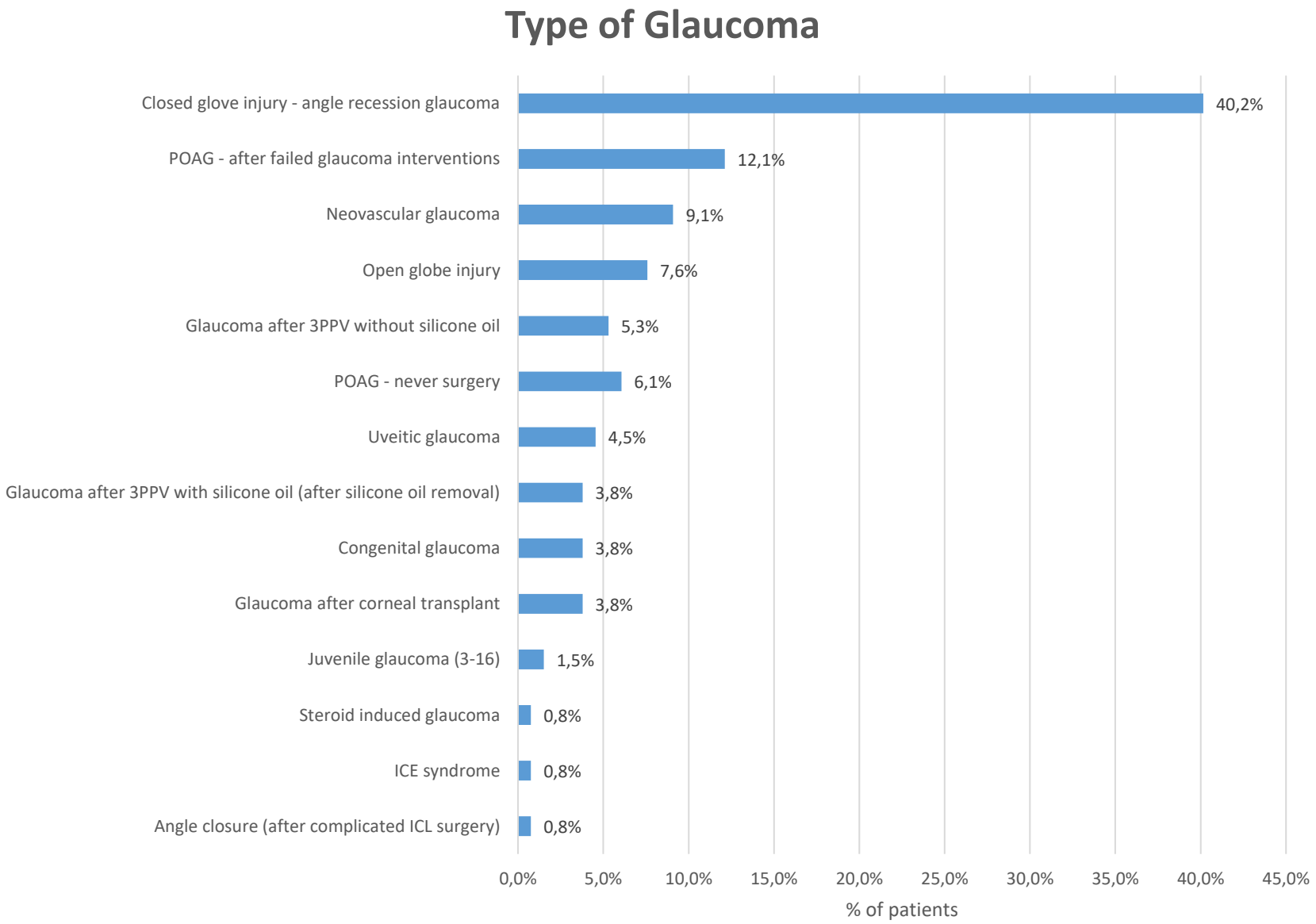


At Rwanda Chariy Eye Hospital

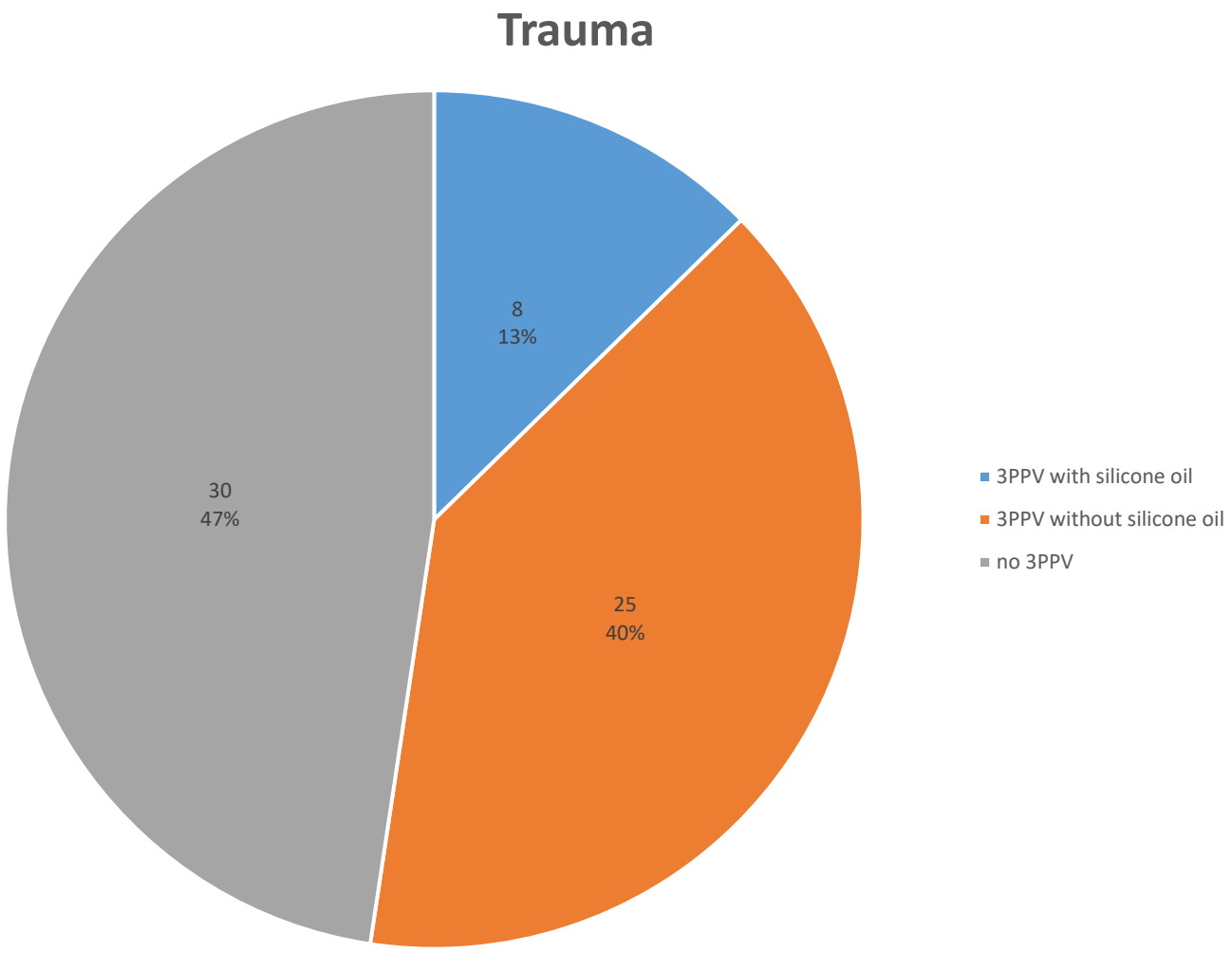
- In 2024 : 195 AADI implants (between 5 and 33 per month)
- AADI implants between 1/1/2024 and 31/10/2024: 132 AADIs

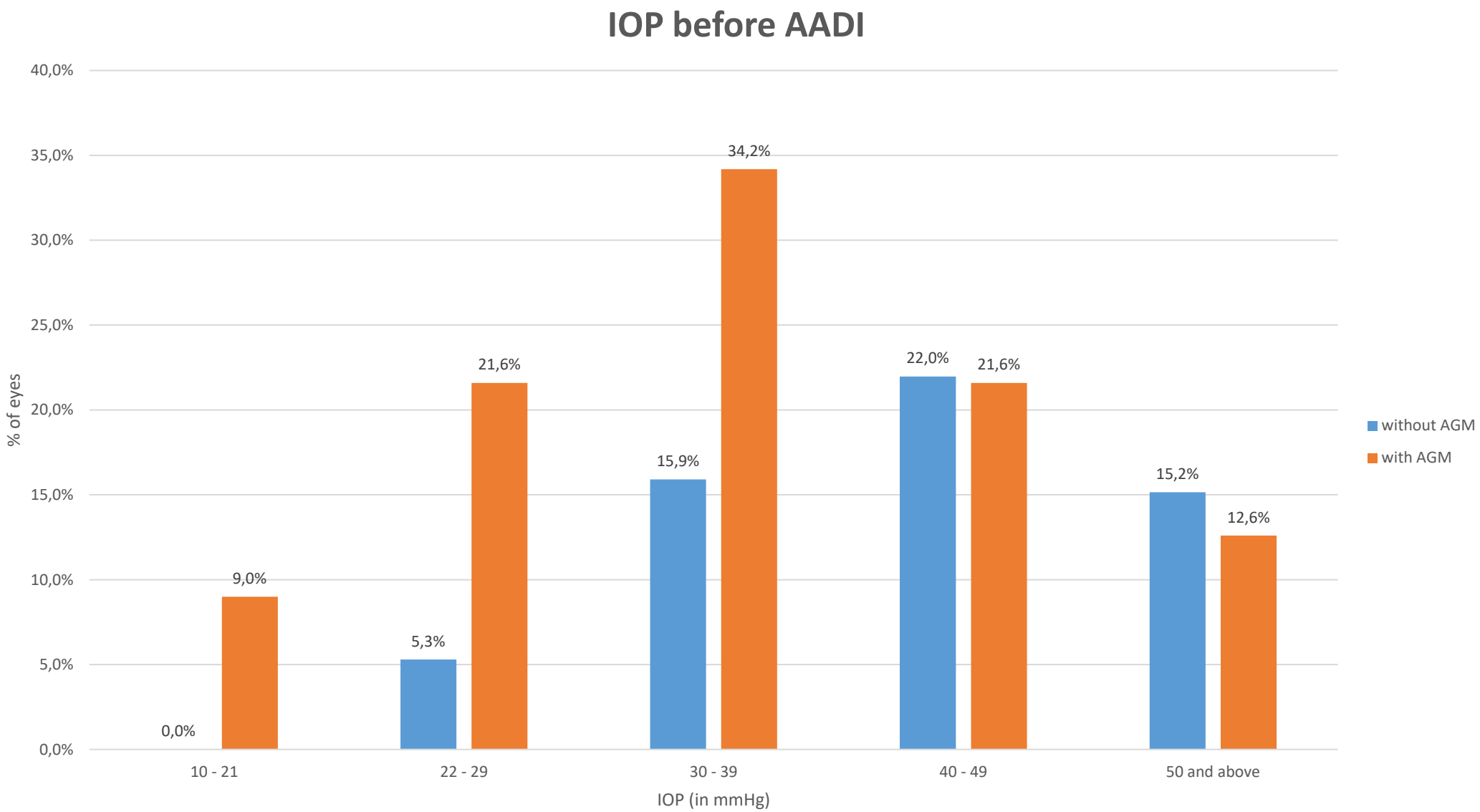



Age
22
17%
110
83%
0 - 17
above 18

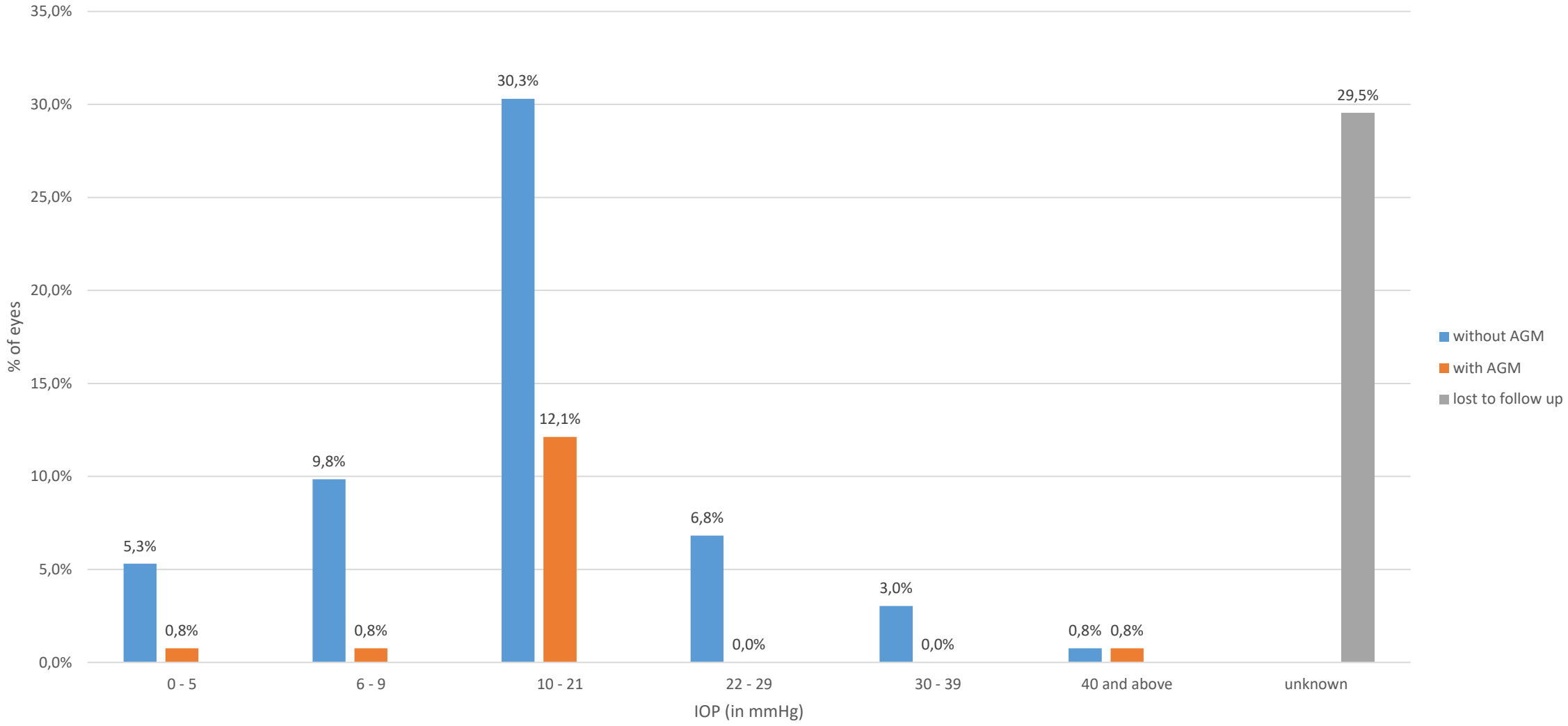

Type of Glaucoma
Closed glove injury - angle recession glaucoma
40,2%
POAG - after failed glaucoma interventions
12,1%
Neovascular glaucoma
9,1%
Open globe injury
7,6%
Glaucoma after 3PPV without silicone oil
5,3%
POAG - never surgery
6,1%
Uveitic glaucoma
4,5%
Glaucoma after 3PPV with silicone oil (after silicone oil removal)
3,8%
Congenital glaucoma
3,8%
Glaucoma after corneal transplant
3,8%
Juvenile glaucoma (3-16)
1,5%
Steroid induced glaucoma
0,8%
ICE syndrome
0,8%
Angle closure (after complicated ICL surgery)
0,8%
0,0%
5,0%
10,0%
15,0%
20,0%
25,0%
30,0%
35,0%
40,0%
45,0%
% of patients

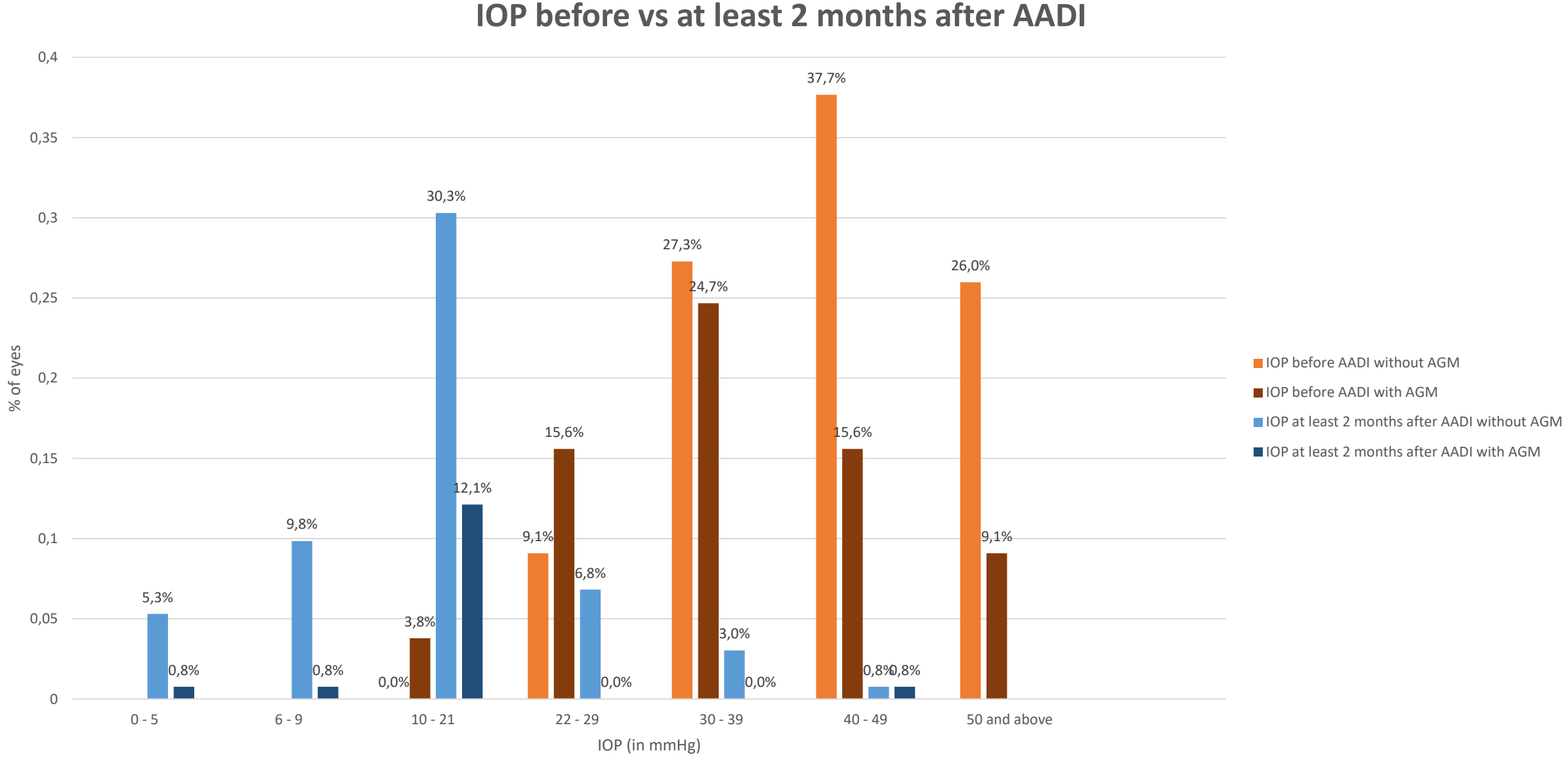

SKOL
MALT

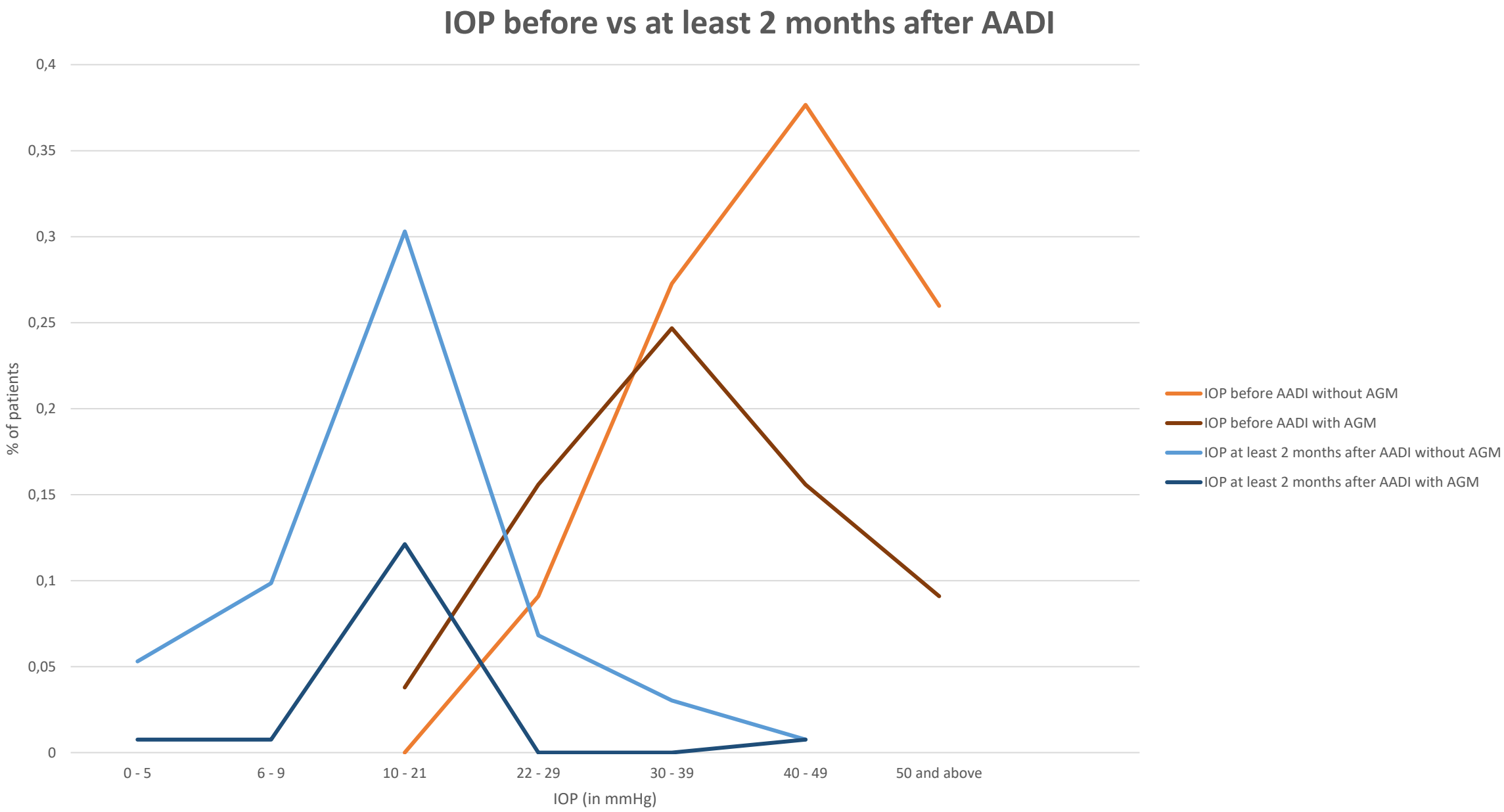

Trauma
8
13%
25
40%
30
47%
3PPV with silicone oil
3PPV without silicone oil
no 3PPV


IOP before AADI
40,0%
35,0%
30,0%
25,0%
20,0%
15,0%
10,0%
5,0%
0,0%
% of eyes
0,0%
9,0%
5,3%
21,6%
15,9%
34,2%
22,0%
21,6%
15,2%
12,6%
10 - 21
22 - 29
30 - 39
40 - 49
50 and above
IOP (in mmHg)
without AGM
with AGM

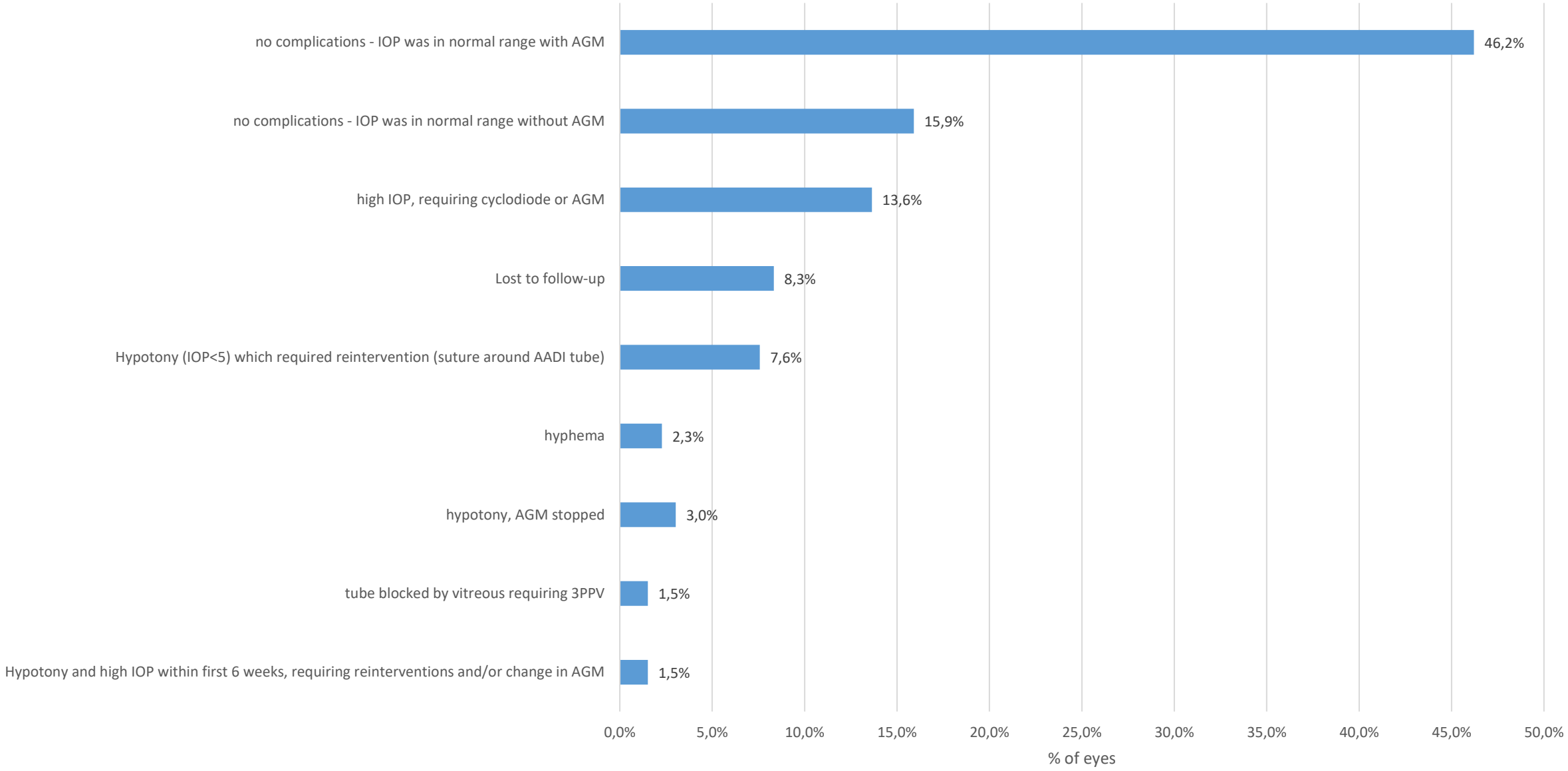
IOP at least 2 months after AADI



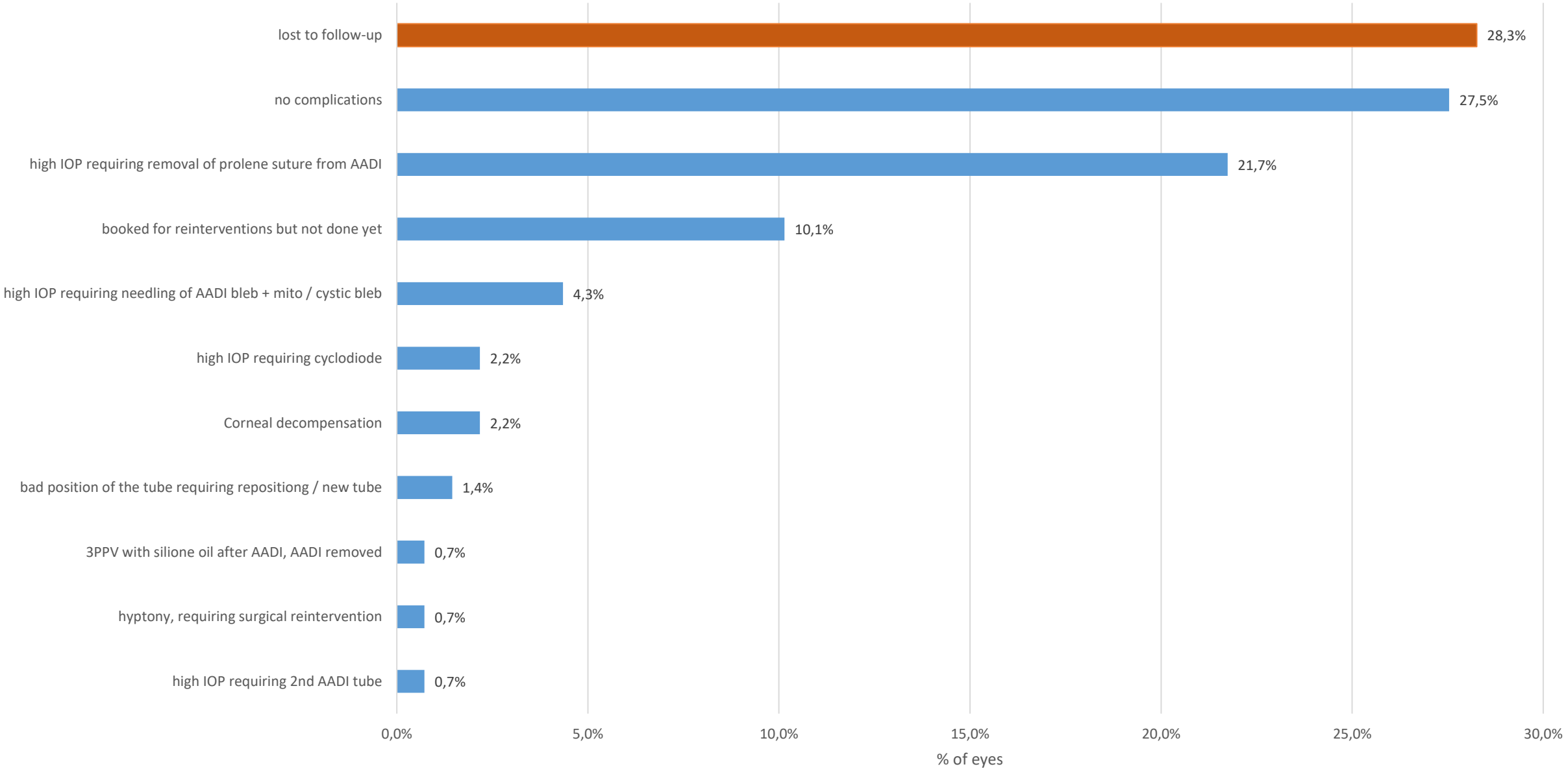

IOP before vs at least 2 months after AADI
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
% of eyes
5,3%
0,8%
9,8%
0,8%
0,0%
3,8%
30,3%
12,1%
9,1%
15,6%
6,8%
0,0%
27,3%
24,7%
3,0%
0,0%
37,7%
15,6%
0,8%
0,8%
26,0%
9,1%
0 - 5
6 - 9
10 - 21
22 - 29
30 - 39
40 - 49
50 and above
IOP (in mmHg)
IOP before AADI without AGM
IOP before AADI with AGM
IOP at least 2 months after AADI without AGM
IOP at least 2 months after AADI with AGM


IOP before vs at least 2 months after AADI
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
% of patients
0 - 5
6 - 9
10 - 21
22 - 29
30 - 39
40 - 49
50 and above
IOP (in mmHg)
IOP before AADI without AGM
IOP before AADI with AGM
IOP at least 2 months after AADI without AGM
IOP at least 2 months after AADI with AGM

Complications within the first 6 weeks after AADI



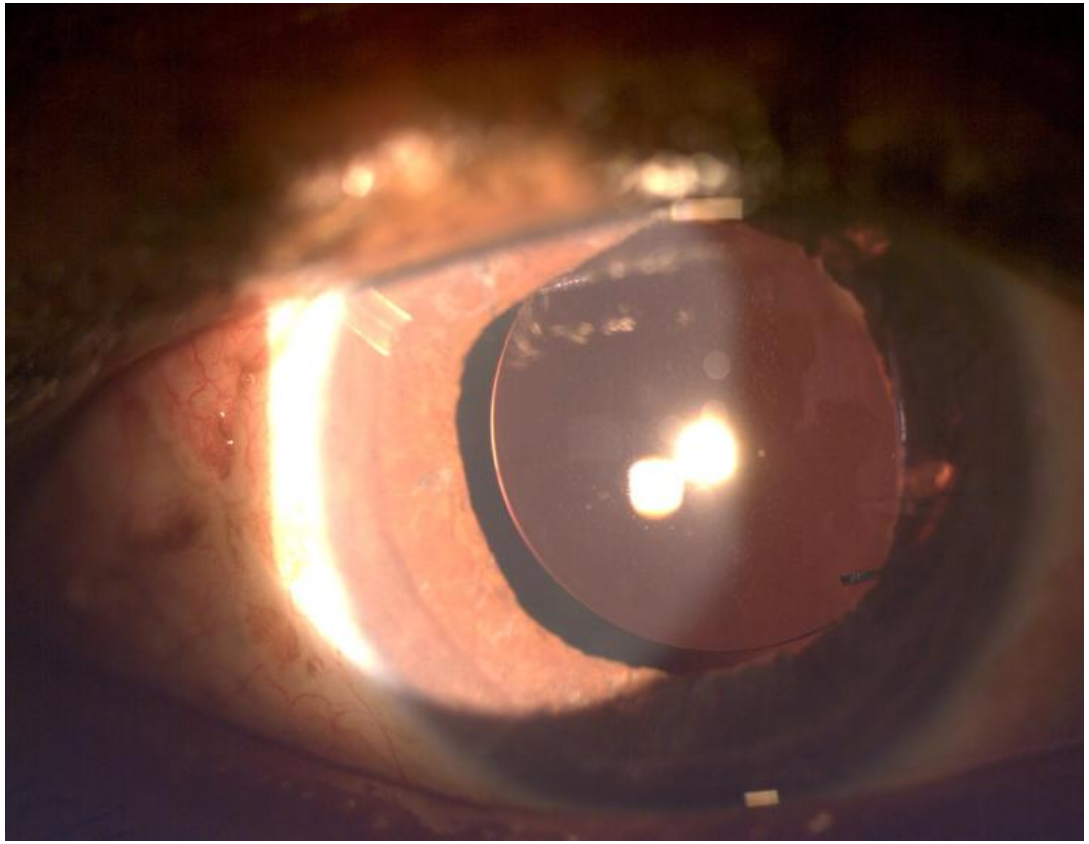
Complications more than 6 weeks after AADI




When AADI was performed, the eye was
70,0%
60,0%
50,0%
40,0%
30,0%
20,0%
10,0%
0,0%
% of eyes
31,1%
62,9%
6,1%
phakic
pseudophakic
aphakic

Combined surgeries

- AADI + Phaco
- AADI + 3ppv (NOT with Silicone oil) / Lensectomy
- AADI + 3ppv / silicone oil removal
- AADI + SF IOL (Yamane technique)
- AADI 1 week after PKP



Remarks

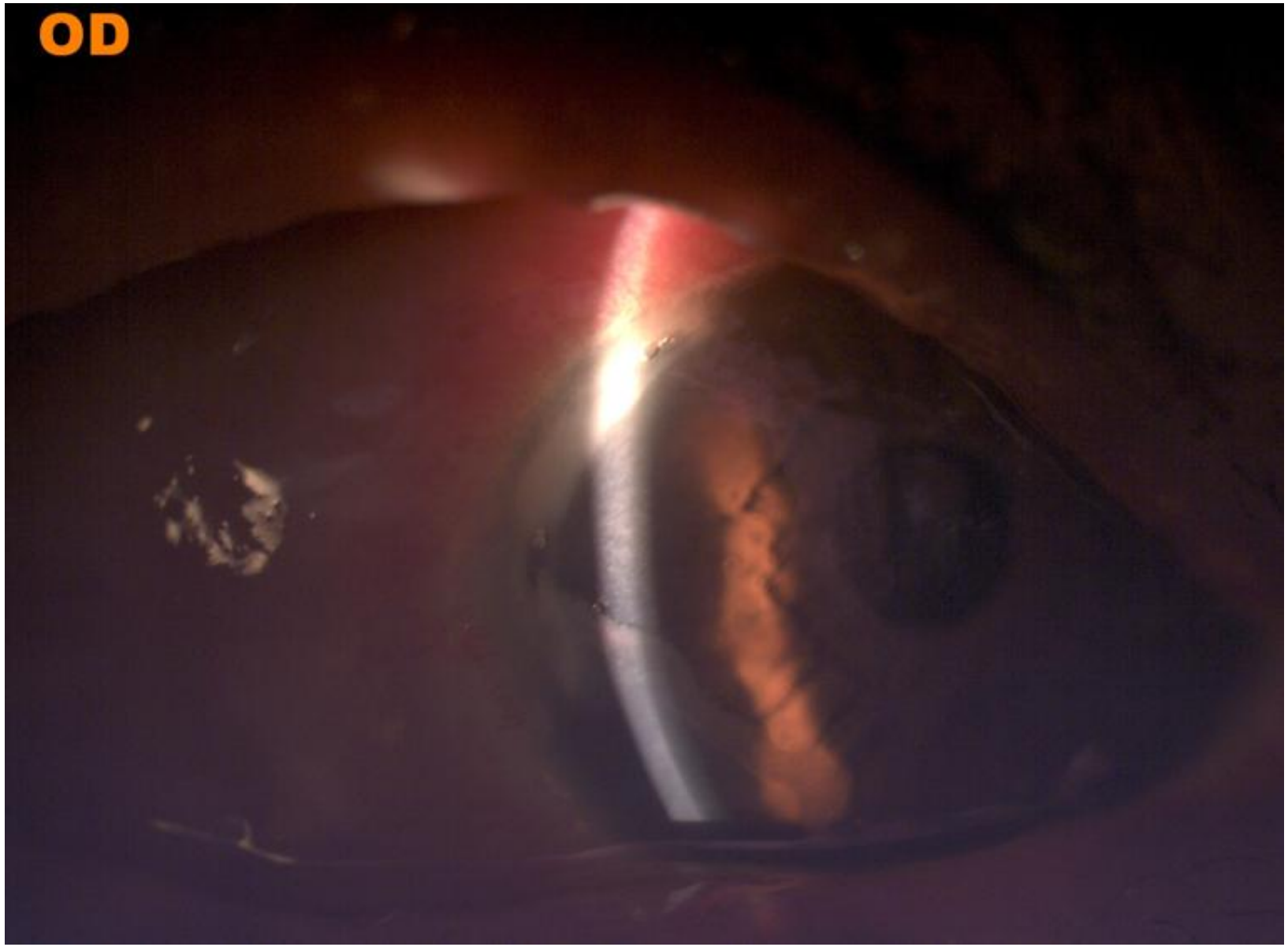
- Glaucoma caused by trauma (closed and open globe injury) is the 1st indication for AADI
- Failed trabs are 2nd indications for AADI
  - (No second trabeculectomy after failed trabeculectomy)
- Many patients lost for follow-up
- Promising results for AADI, but very few AADIs are being implanted in Africa
- Less follow-up necessary than Trab
- PTVT study in African patients should be done to see whether we should start doing AADI as first surgery in POAG
- Thanks to Dr J.G. Bollemeijer who came in 2020 to teach us to implant AADI!!!

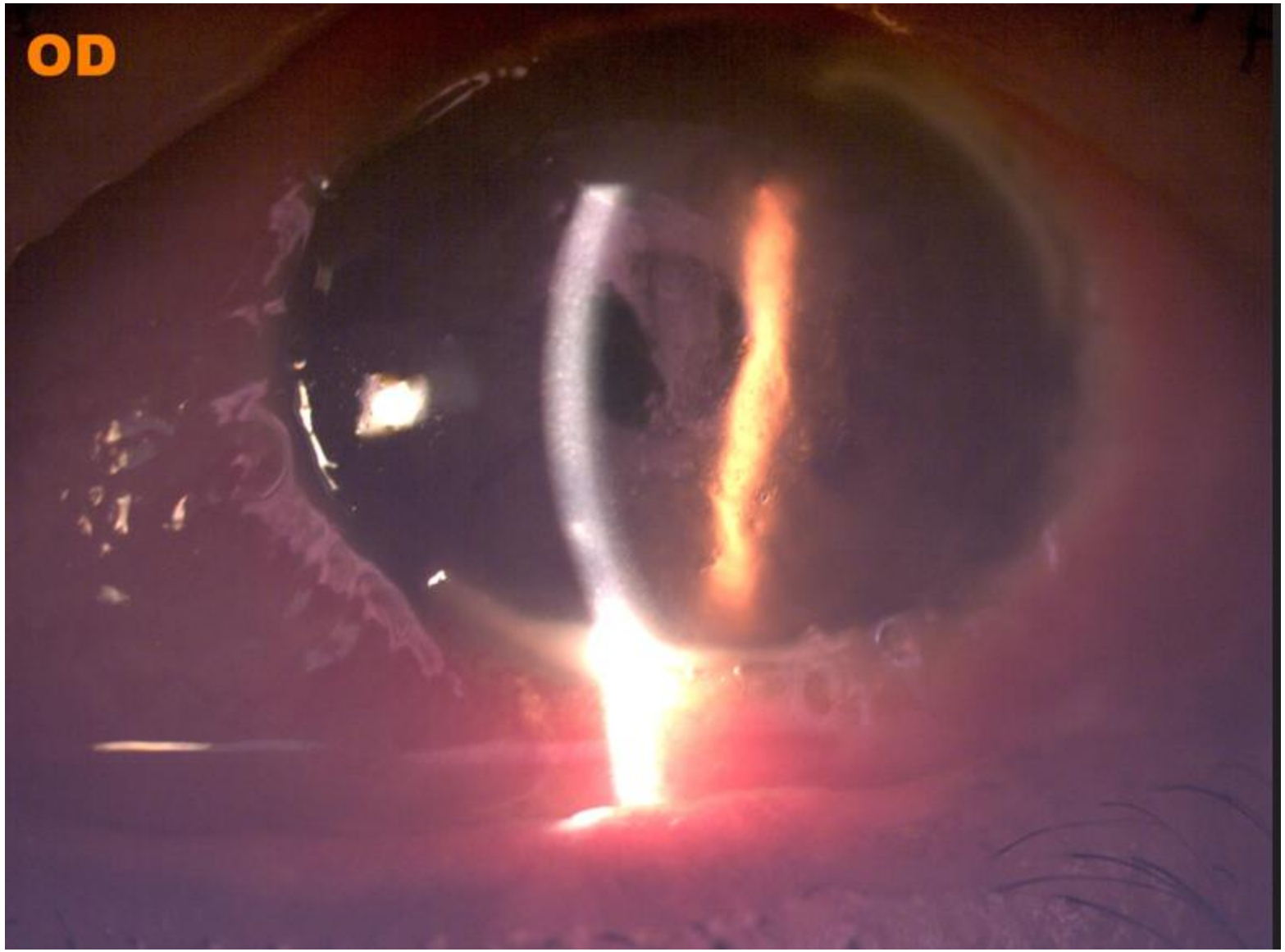
Diagnosis?

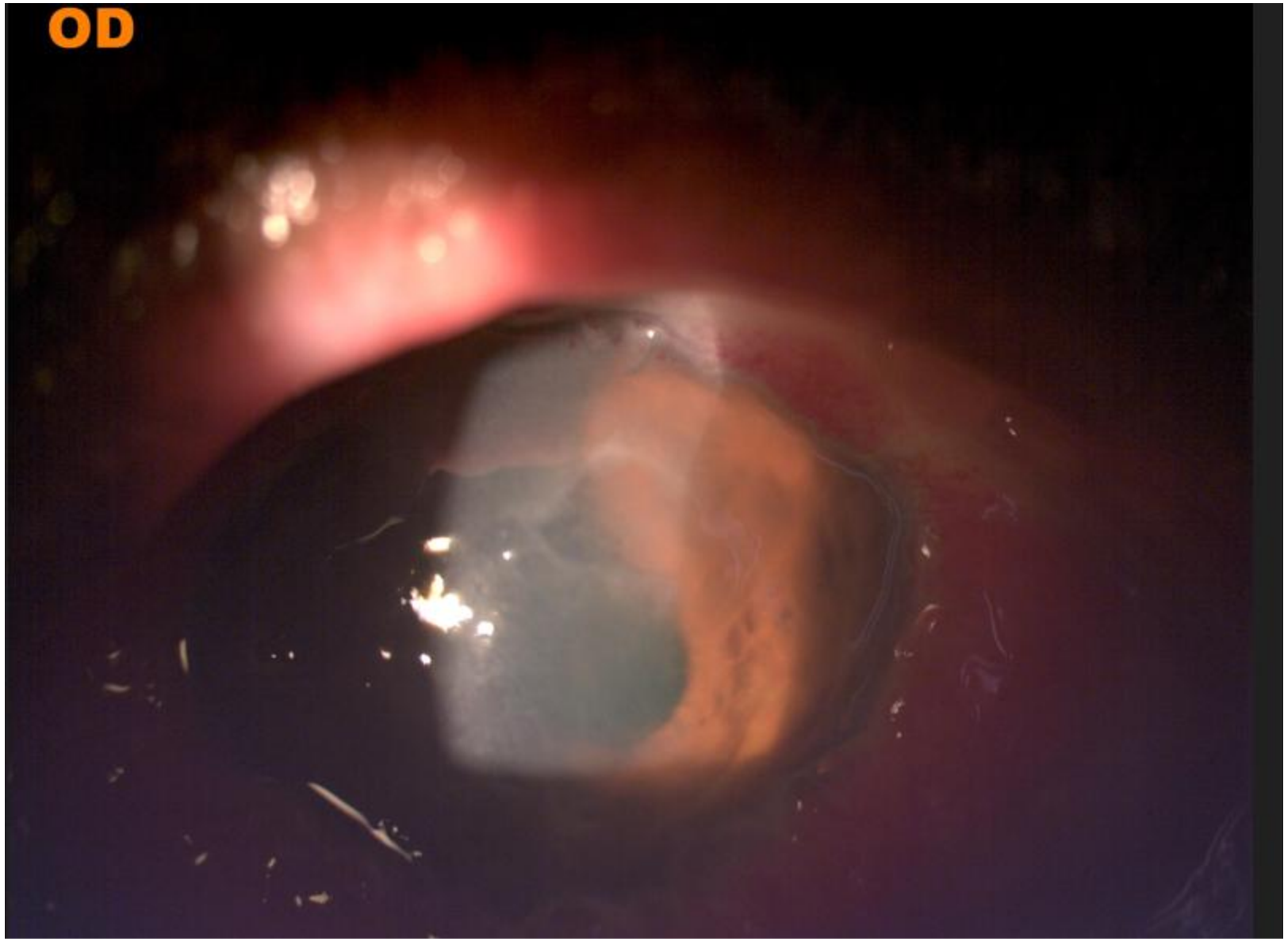


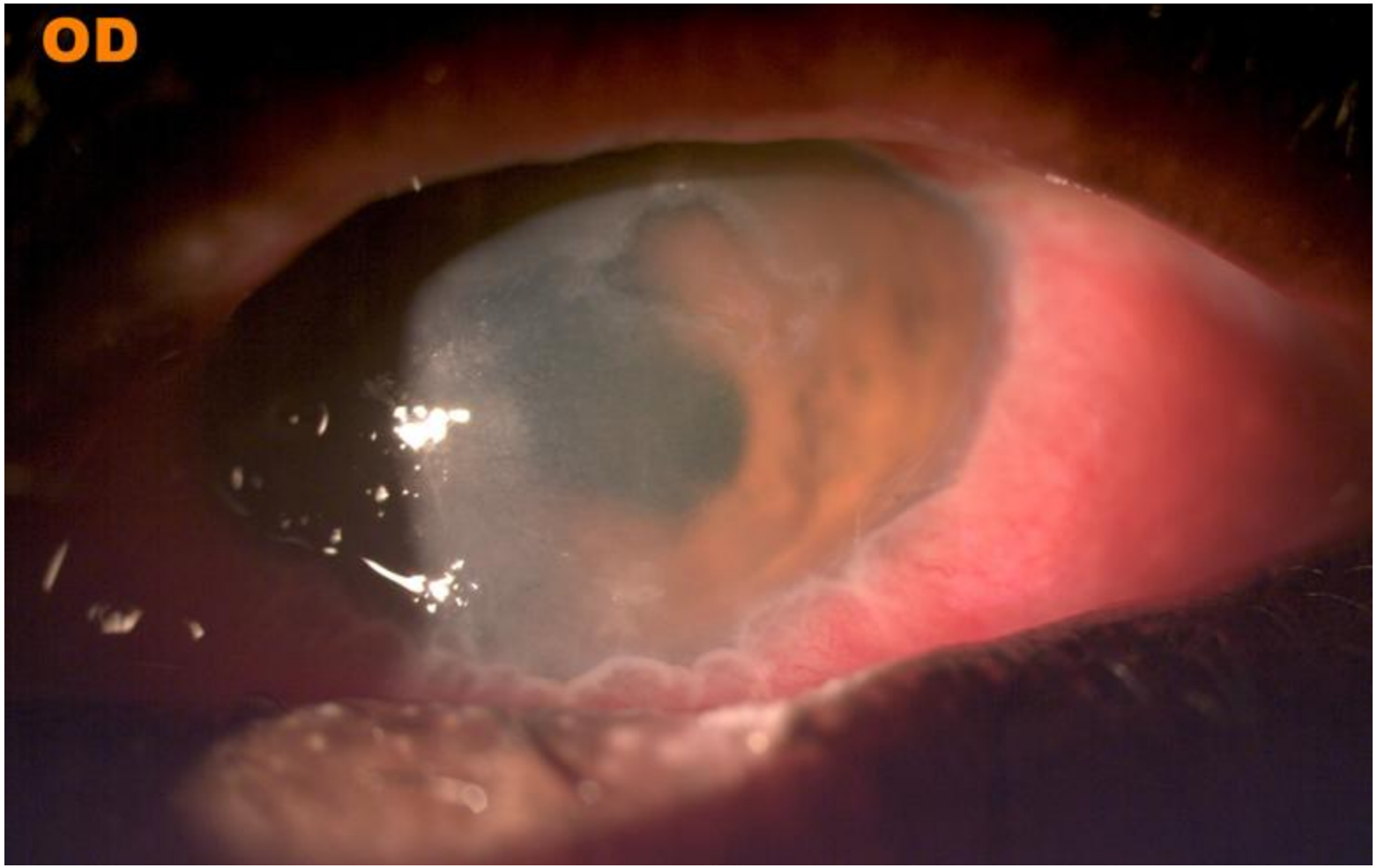



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Mpox!

Ophthalmic Manifestations of Mpox	Number of Patients	References	Country	Study Design
Vesicular rash in the periorbital and orbital areas	10	Ogoina et al., 2020 [24]	Nigeria	Case series
Conjunctivitis	1	Janseghers et al., 1984 [44]	Democratic Republic of the Congo	Case report
	68	Hughes et al., 2014 [43]	Democratic Republic of the Congo	Case series
	1	Meduri et al., 2022 [46]	Switzerland	Case report
	1	Mazzotta et al., 2022 [47]	Italy	Case report
	1	Benatti et al., 2022 [42]	Italy	Case report
	1	Foos et al., 2022 [45]	The USA	Case report
	2	Ci Ng et al., 2023 [55]	Singapore	Case series
Eyelid involvement	1	Janseghers et al., 1984 [44]	Democratic Republic of the Congo	Case report
	1	Benatti et al., 2022 [42]	Italy	Case report
	1	Foos et al., 2022 [45]	The USA	Case report
	1	Mazzotta et al., 2022 [47]	Italy	Case report
Corneal ulcerations	3	Ogoina et al., 2020 [24]	Nigeria	Case series
	1	Ci Ng et al., 2023 [55]	Singapore	Case series