

# **Efficacy Of Vitrectomy, Endolaser And Antivascular Growth Factors In The Management Of Neovascular Glaucoma**

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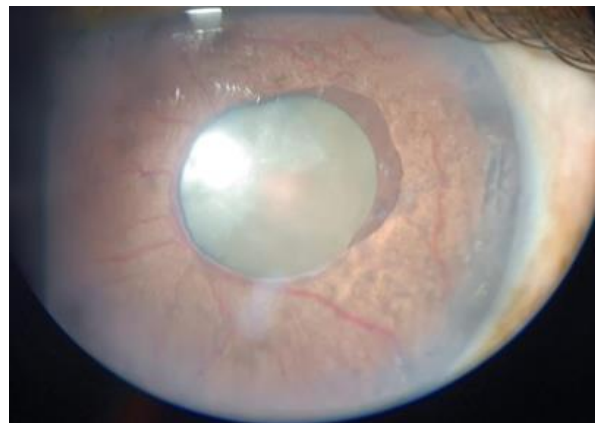
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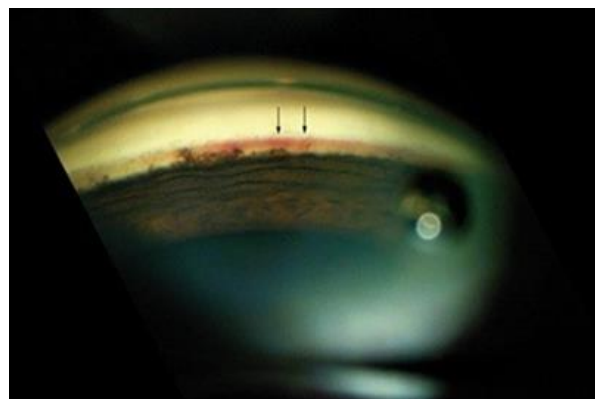
## **I. Introduction**

- Neovascular glaucoma (NVG) is secondary glaucoma characterized by appearance of new vessels over the iris and proliferation of fibrovascular tissue in the anterior chamber angle<sup>1</sup>.
- Common causes are central retinal vein occlusion, proliferative diabetic retinopathy, and ocular ischemic syndrome.

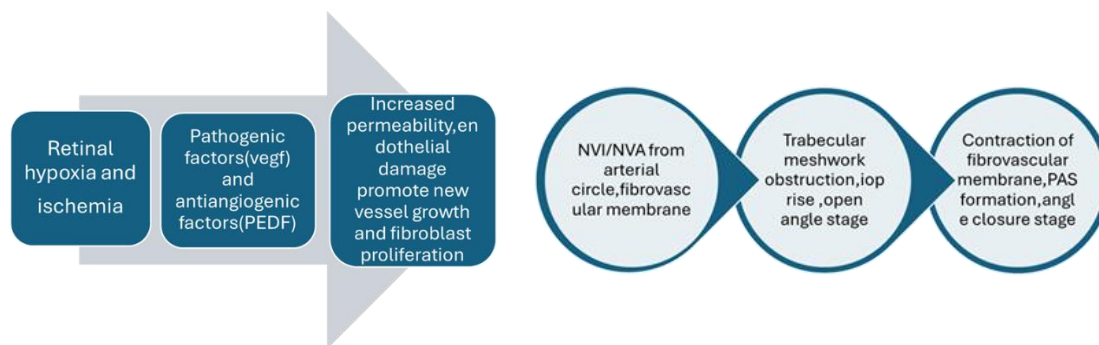
The current rise in the prevalence of NVG is partly related to increase in people with diabetes



**Fig1a**



**Fig 1b**



## II. Aim And Objectives

- Aim: to assess the safety and efficacy of vitrectomy, endolaser and anti-vascular endothelial growth factors in the management of neovascular glaucoma.
- Objective:
  - To assess
  - Iop, regression of nvi
  - Bcva
  - Visual analog pain scale during the 3 month follow up period

### Methodology

- Source of data: retina out patient department, sankara eye hospital, Guntur
- Study period: 1 year
- Study design: prospective interventional study
- Sample size: 13
- $N = z_{\alpha/2} s / d$
- Where  $z_{\alpha} = 1.96$  at 95% confidence level  $s =$  standard deviation and  $d =$  relative precision = 10% of mean (90% power)
- Chi square test was used for qualitative data.

A statistical package spss 24.0 version

### Inclusion criteria

- Nvi or nva(weiss and gold grading system)
- Iop > 21 mmhg
- Bcva: pl negative to 6/18
- 18 years and older

### Exclusion criteria

- Patient who had severe systemic disease and could not tolerate surgery.
- Patients who underwent antiglaucoma surgery.
- Patients with bcva :6/12 to 6/6
- Patient not willing to participate in the study.

### Procedure

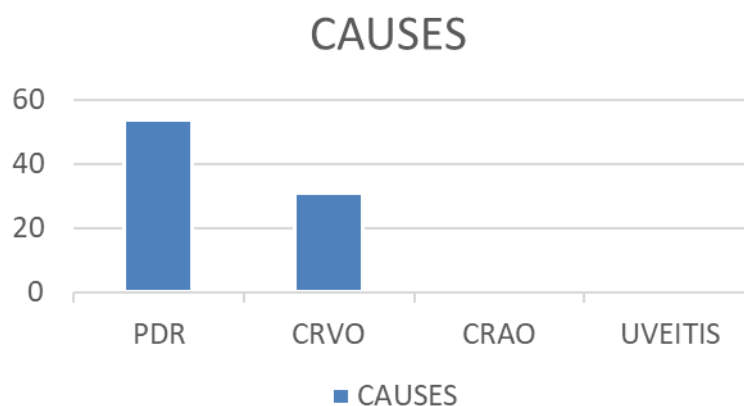
- Patients presented to opd, diagnosed with neovascular glaucoma and who satisfy the inclusion criteria were recruited for the study after taking written informed consent.
- Detailed history was taken regarding pain scoring by vaps ,iop by goldmann applanation tonometry and anterior and posterior segment examination were done.
- Patients underwent 25g, 3 port pars plana vitrectomy, endolaser photocoagulation along with antivegf.
- On subsequent follow up visits ,patients were given repeat antivegfs and also add on laser to those who needed and those with symptoms of severe pain and high iop were treated with cyclocryotherapy to prevent painful blind eye.
- All the patients were followed up for
  - Iop
  - Bcva
  - Visual analog pain scale (vaps-10),

- Number of glaucoma medications used were recorded at baseline, post op 1 week, 1 month and 3 months respectively

### III. Results

In our study We observed OD- 8(61.5%) cases and OS- 5(38.4%) cases Causes of NVG:

- 7- PDR (53.8%)
- 4- CRVO (30.7%)
- 1- CRAO (0.07%)
- 1- UVEITIS (0.07%)



- Mean reduction of IOP was observed from  $42.3 \pm 16.3$  mmHG to  $32.3 \pm 9.7$  mmHG
- Regression of NVI was noted in 6(54.5%) cases, no change was observed in 7(53.8%) cases VAPS-scoring showed complete reduction of pain in almost all cases from  $4.7 \pm 0.6$  to 0
- There was no change of BCVA observed in 7(53.8%) cases and marginal reduction of BCVA in 6(46.1%) cases Number of glaucoma medications were reduced from  $3.81 \pm 1.7$  to  $1.18 \pm 1.1$

### IV. Discussion

- In PIOTR STRAZLKOWSKI et al(2020)<sup>4</sup> described a retrospective analysis of seventy-seven eyes of 77 patients with NVG underlying conditions included retinal vein occlusion (41.6%), proliferative diabetic retinopathy (35.1%) central retinal artery occlusion (19.5%), and ocular ischemic syndrome (3.9%).
- Mean IOP decreased postoperatively from  $46.3 \pm 10.1$  mmHg to  $14.5 \pm 7.9$  mmHg,
- Glaucoma medication from  $4.7 \pm 1.3$  to  $1.8 \pm 1.8$  ( $p < 0.001$ ), VAPS from  $6.0 \pm 1.8$  to 0.
- BCVA remained unchanged.

In another study Chuan Sun et al described a retrospective analysis of Forty-six patients (52 eyes) with follow-up period at least 6 months found IOP on last follow-up ( $15.41 \pm 3.74$  mmHg, range 10–25 mmHg) was significantly lower than before treatment ( $39.67 \pm 10.47$  mmHg, range 23–64 mmHg) ( $t = 15.73$ ,  $P < 0.05$ ).

The visual acuity improved in 32 eyes (62%). In all the 32 eyes, the BCVA were 0.02 or better, and in 19 (37%) eyes, the BCVA were even 0.1 or better.

The BCVA remained unchanged in 17 eyes (33%), and were decreased in three eyes (6%).

In our study there was good control of pain and decreased number of glaucoma medications usage by the patient during post operative period after vitrectomy, there by decreasing the economic burden of the patients and less follow up period for the patient.

- Causes of NVG were mainly proliferative diabetic retinopathy ,retinal vascular occlusions and uveitis which were similar to previous studies.
- Limitation of our study is that we had relatively small sample size and less follow up period.

### V. Conclusion

- In this prospective interventional study, we observed there was almost good control of pain using VAPS.
- Marginal reduction of mean IOP, regressions of NVI, marginal reduction in usage of number of glaucoma medications.

- Thus vitrectomy along with antiVEGF can be a viable and promising procedure and can be considered as a primary modality in the management of neovascular glaucoma.

### **References**

- [1] Senthil S, Dada T, Das T, Kaushik S, Puthuran GV, Philip R, Rani PK, Rao H, Singla S, Vijaya L. Neovascular Glaucoma - A Review. *Indian J Ophthalmol*. 2021 Mar
- [2] Sun C, Zhang HS, Yan YJ, Zhao T, Li AH, Tang Y, Wang ZJ. Early Vitrectomy Combined With Pan Retinal Photocoagulation, Anti-Vascular Endothelial Growth Factor, And Gradual Cyclophotocoagulation For Treatment Of Neovascular Glaucoma. *Ching Med J* 2019
- [3] Dumbrăveanu L, Cuşnir V, Bobescu D. A Review Of Neovascular Glaucoma. Etiopathogenesis And Treatment. *Rom J Ophthalmol*. 2021 Oct-Dec
- [4] Strzalkowski P, Strzalkowska A, Göbel W, Loewen NA, Hillenkamp J. Combined Vitrectomy, Near-Confluent Panretinal Endolaser, Bevacizumab And Cyclophotocoagulation For Neovascular Glaucoma - A Retrospective Interventional Case Series. 2020 Oct
- [5] Kinoshita N, Ota A, Toyoda F, Yamagami H, Kakehashi A. Surgical Results Of Pars Plana Vitrectomy Combined With Pars Plana Lensectomy With Anterior Capsule Preservation, Endophotocoagulation, And Silicon Oil Tamponade For Neovascular Glaucoma. *Clin Ophthalmol*. 2011