Vein Occlusion Studies

BRVOS

Introduction: The BRVOS is a multi-center, randomized, controlled clinical trial designed to answer the following three questions:

1) Can argon laser prevent NV?
2) Can argon laser prevent VH?
3) Can argon laser improve VA with ME and VA >20/40?

BRVOS for Macular Edema (Am J Ophthalmol 1984: 98:271-282)

Eligibility:

1) BRVO 3 to 18 months.
2) VA 20/40 or worse.
3) Sufficient clearing of heme.
4) FA confirms leakage involving fovea (ME). NOT NONPERFUSION.
5) No foveal heme.

Major study design: Eyes randomized to treatment with grid argon laser vs controls who were followed. Study stopped after 18 months. Follow up available for 3.1 years.

Treatment: Patients followed every 2 to 4 months.
Argon laser grid pattern. Inside arcades and not closer than FAZ AG, 0.1 sec, 50 to 100 μ, medium white burn, one spot apart. Repeat if persistent edema and repeat FA identifies are of not treated leakage

Results:

Criteria Measured	Treatment Group	Controls
% gaining 2 lines	65%	37%
% having decrease in VA	12%	17%
<20/40 at 3.1 years	60%	34%
>20/200	12%	23%
Avg. VA	20/40 to 20/50	20/70
Avg. Line Gain	1.33	0.23

Conclusions: Treat ME in BRVO if above criteria met!

Argon laser for prevention of VH and NV (Arch Ophthalmol 1986: 104:34-41)

Eligibility:
1) BRVO 3 to 18 months.
2) Area of 5 DD of involvement.
3) Sufficient clearing of heme.
4) No diabetic retinopathy.
5) Absence of ocular disease.
6) Group with NV: Disc and/or peripheral NV.

Treatment: Scatter photocoagulation AG, 200 to 500μ, 2DD from center, medium white burn.
One burn width apart not inside 2 DD of FAZ.

Results: *Prevention of NV:* Outcome measure is NV.

	Treated	Controls
Percentage	12%	22%

Prevention of VH with NV present. Outcome measured is VH.

	Treated	Controls
Percentage	29%	61%

NB: 12% of nonperfused eyes had VH when tx'd before NV develops.
9% of nonperfused eyes had VH when tx'd after NV develops.

Conclusions: **Area > 5 disc diameters.**

1) Wait for clearing of heme for high quality FA.
2) Evaluate FA. If more than 5 DD of nonperfusion follow at 4 month intervals.
3) If NV develops than laser in involved quadrant according to protocol.

CRVOS (Ophthalmol 1995;102:1425-44, Arch ophthalmol 1993;111:1087-1095)

Introduction: The CRVOS is a multi-center, randomized, controlled clinical trial designed to answer the following three questions:

1) Does PRP prevent NVI (TC-INV/ANV) with ischemic CRVO?
2) Does macular grid pattern improve VA in CRVO?
3) Natural history of CVO?

Natural history:

Group	Conversion at 4 months
Perfused	16%
Indeterminate	83%

Group M (Macular edema)

There is no significant differences between treated and untreated patients at any follow up.

Group P (Perfused)

Non perfusion < 10DA

Group N (> 10 DA of non perfusion)

Eligibility:

1) CRVO
2) No NVI.
3) CRVO < 1 year. Intra retinal heme in 4 quads.
4) At least 10 DA of non perfusion.
5) VA > LP.
6) Good FA.

Basic study design: Eyes randomized to early treatment received PRP following protocol. Supplemental PC was applied if TC-INV/ANV developed after PRP. Eyes assigned to the no early treatment group were no treated unless TC-INV/ANV developed.

Treatment:

1) 1000-2000 spots
2) Beyond equator.

3) No closer than 2 DD of center.
4) 500 to 1000μ, 0.2 sec, moderate whitening.

Results:

Development of TC-INV/ANV

	Treated	Non treated
Development of TC-INV/ANV	20%	35%

NB. Not significant when adjusted for baseline imbalances.

Response to PRP

	Early Tx	No early Tx
Regression within 1 month	22%	56%

Major stats from CRVO Study

- Of total 714 eyes 117 (16%) developed INV/ANV
- group N or I 35% with INV
- group P (initial categorization) 10% with INV

  Risk factors for development of INV/ANV
  1) VA > 20/200
  2) 30 DA non perfusion
  3) Mod-severe venous tortuosity
  4) Retinal hemorrhage
  5) Duration less than 1 month

- Risk of fellow eye 0.9%/year of any vascular occlusion
- VA pretty much what you present with is what you end up with.

Conclusions: Basically if non perfused or indeterminate you have a high risk of developing NVI in first few months post CRVO. If NVI develops at any point then treat.