ANTI-VEGF THERAPY AS A GAME CHANGER

Before Anti-VEGF therapy, 50% of patients treated with radiation eye plaques lost most of their vision. However, in 2007, Dr. Finger was first to find that injections of anti-VEGF medications prevent or delay radiation retina damage and prolong vision for years. Dr. Finger says: “I was amazed after treating my first patient with radiation optic nerve damage. Instead of watching the vision deteriorate, it returned to 20/20, and the swelling and hemorrhages cleared.”

Over the next 15 years, Dr. Finger learned more about anti-VEGF treatment of intraocular radiation damage. He discovered that early treatment meant greater preservation of the retina and optic nerve as well as patient vision. However, he also found that periodic intraocular injections of anti-VEGF drugs merely suppressed the damage and that like diabetes, hypertension and heart disease, patients had to be treated continuously in order to keep their vision. In addition, as years of vision preservation went by, most patients needed increased doses or more frequent injections to keep their disease suppressed. Lastly, whenever patients stopped therapy (due to poor compliance or choice), the radiation damage typically progressed faster and good vision was permanently lost.

Anti-Vascular Endothelial Growth Factor Bevacizumab (Avastin) for Radiation Retinopathy. Finger PT, Chin K.

Archives of Ophthalmology June 2007;125(6):751-756.

Radiation retinopathy is treatable with anti-vascular endothelial growth factor bevacizumab (Avastin). Finger PT. International Journal of Radiation Oncology Biology Physics 2008;70(4):974-7.

Intravitreal anti-VEGF therapy for macular radiation retinopathy: A 10-year study. Finger PT, Chin KJ, Semenova EA European Journal of Ophthalmology 2016 Jan-Feb:26(1):60-66.

Hypochlorous acid antiseptic washout improves patient comfort after intravitreal injection: A patient reported outcomes study. Fam A. Finger PT, Tomar AS, Garg G, Chin KJ. Indian Journal of Ophthalmology 2020 68(11):2439-2444.

Research Supported by The Eye Cancer Foundation, Inc. (https://eyecancercure.com)

F.A.Q.

WHO NEEDS ANTI-VEGF TREATMENT?

Dr. Finger determines which patients will need injections by checking the radiation dose they received to their macula and optic nerve at their time of their tumor treatment. In that, Dr. Finger showed that early intervention can delay or prevent irreversible radiation damage and bring patient's vision back.

WHAT IS THE "BEST" ANTI-VEGF DRUG?

Some patients respond better to certain drugs, others require “high-dose” treatments, and others need supplementary steroid injections. Every case is unique, so treatment must be tailored for each patient. But, in general, Dr. Finger has found that more or more-frequent medication multiple drug therapy may be required over time.

WHAT IF I LIVE FAR AWAY FROM MY EYE CANCER SPECIALIST?

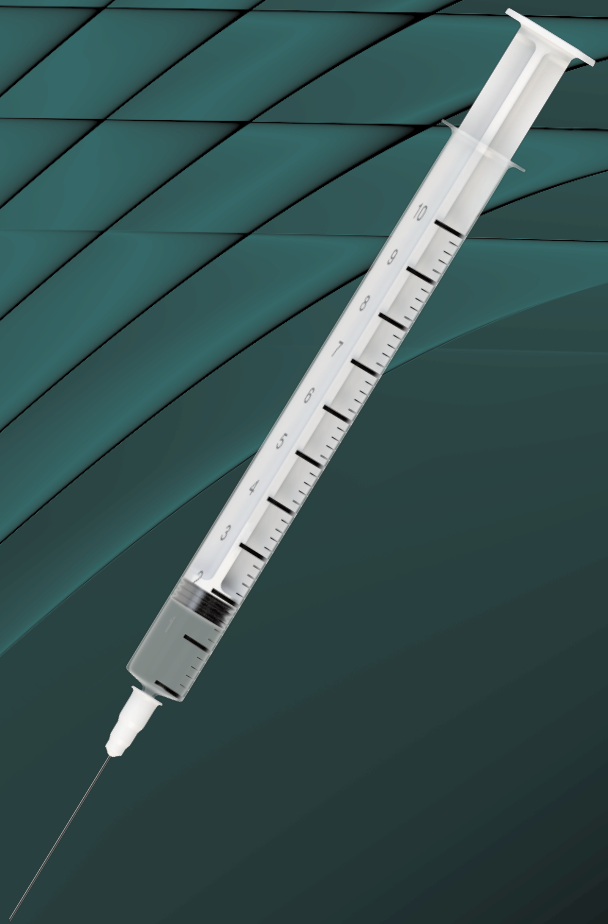
Patients who live far away or cannot travel are typically co-managed by their local retinal specialist. While most retina specialists offer injections, many don’t have experience treating radiation retina damage. So you may have to return to The New York Eye Cancer Center every 4-6 months for reevaluation.

WHAT ARE THE POSSIBLE COMPLICATIONS?

As with any procedure, there are a few risks involved. A transient rise in IOP is expected. Infection is possible, though uncommon, occurring in about 1 in 3,000 patients. Even rarer complications include retinal detachment, cataract intraocular inflammation, and systemic toxicity.

Dr. Finger's ANTI-VEGF

TREATMENTS & TECHNIQUES



The New York Eye Cancer Center

www.eyecancer.com

115 East 61st Street, Fifth Floor
New York, NY 10065
212-832-8170

Dr. Finger's
Intravitreal Injection Routine

Pre-Operative Checklist

1. *Eye examination with IOP check.*
2. *Pre-medicate with ocular hypotensive agent if needed.*
3. *Dialate the pupil*
4. *Check for suppression of radiation maculopathy. Typically macular or optic disc OCT measurements and photographs for progression or regression of radiation maculopathy or optic neuropathy (e.g. retinal hemorrhages and/or cotton-wool spots).*
5. *Determine the type and dose of anti-VEGF drug.*

Prep: 3 Drops and a Spray

6. *Administer 1 drop of Tetravisc anesthetic*
   wait 7 minutes.
7. *Then, 1 drop of Betadyne 5% followed by Avenova spray washout for prophylaxis.*
8. *Tape top of patient mask*
9. *Clean or glove surgical hands.*

Wait 30 Seconds & Eye Preparation

10. *No speculum unless needed.*
11. *Two finger retraction of eye lids.*
12. *Patient looks up and to the left or right.*
13. *Inferonasal or Inferotemporal injection site.*
14. *The doctor stands to the patient's side*

Injection Technique

15. *Injection at 3.5 mm from limbus.*
16. *Angled (see figure) to avoid lens and create a self-sealing incision.*
17. *Expect amaurosis if you give high dose volumes.*

Post-Operative Care

18. *Check optic nerve circulation*
19. *Check intraocular pressure as needed.*
20. *AC-TAP only if amaurosis persists greater than 2 minutes.*
21. *If AC-TAPs are needed for each injection obtain glaucoma consultation*
22. *Instruct patient call you for symptoms of ocular pain, change in vision.*

NYECC Guidelines Summary

We rarely use subconjunctival injections of anesthetic. Eliminating them both decreased pain and subconjunctial hemorrhages and improved injection spot placement.

We Use:

-1 drop of thick (viscous) lidociaine numbing drops, and wait 7 minutes for effectiveness.

-**1 drop of betadine 5%** followed by Avenova spray washout **before injection** as it reducecs late ocular irritation as well asl maintaines prophylaxis after injection.

- Gauge needles reduce the pain during injection.

- Avoid wire-speculums as they cause corneal abrasions, particularly in topically anesthetized or naturally dry eyes.

- For patients with glaucoma or high IOP, ocular hypotensive medications are prescribed to lower the IOP before injection.

The Self-Sealing Incision

In order to maximize the effectiveness of anti-VEGF treatment, Dr. Finger introduced the concept of ANGLED self-sealing needle punctures. Many specialists inject the eye using an orthogonal (straight-in) technique. However, doing this raises the intraocular pressure and forces some of the drug to come right back out. Finger's angled method also increases the eye pressure, but uses that pressure to seal the hole, keeping the drug from coming out. These self-sealing incisions close a potential portal of entry for infection.

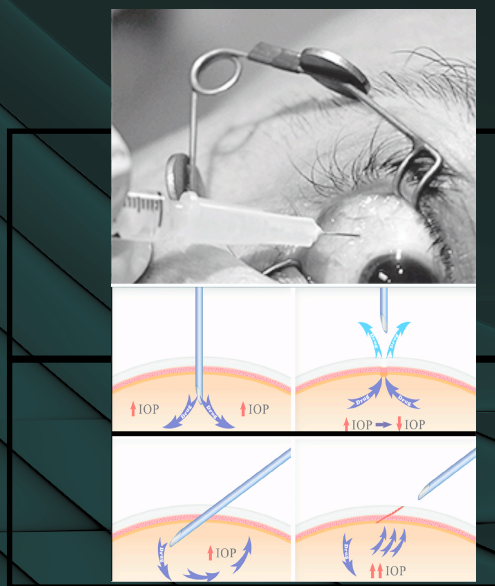


Figure:
Top: an angled incision results in a self-sealing incision, keeping medication in the eye and pathogens out of the eye.
Bottom: a simple perpendicular puncture allows some medication of exit and a 30 gauge hole in the eye wall.