LPI for Narrow Angles

The other type of laser, laser peripheral iridotomy, LPI. You can see here in this image that there's a tiny little hole right here. There's like a hole in the iris, which is the colored part of the eye.

This is a laser hole, and this is used for angle closure glaucoma. So not the open angle, but the closed angle version. Or if someone is at risk for closed angle, there's something called narrow angles where their drainage system is narrow.

Glaucoma Series Introduction

We want to make sure that they don't develop angle closure. So they have this procedure done. It's done in the office. It doesn't take long. There are potential complications, but your doctor will talk to you about them and hopefully that doesn't happen.

But I can say that it is typically a very, very effective procedure. Welcome to the IQ Podcast. I'm Dr. Rani Banik, here to help you boost your IQ with powerful insights that connect your eyes, your brain, and your whole body wellness.

Hi there and welcome back to the IQ Podcast, where you can gain insights into your eye health, your brain health, and your overall wellness to help you raise your IQ.

I'm your host, Dr. Ronni Banek, America's integrative ophthalmologist. And this month in January, we've been doing a series on glaucoma. So in part one of my series, we talked about what glaucoma is, what are the types, and who is at risk.

Part two, we talked about testing for glaucoma. Now today, part three, we're going to be talking about treatment for glaucoma and focusing first on the medical and surgical treatments for glaucoma.

Then next week, you don't want to miss this one, part four of my glaucoma series, we're going to be talking about holistic complementary approaches to glaucoma, including nutrition, supplements and botanicals, lifestyle and mindset.

So be sure to tune in next week as well.

Medications as First-Line Treatment

But today, again, we're talking about medical and surgical, the traditional ophthalmologic approaches to glaucoma care. So let's get started. Discover Nourish, The Core of Ageless by Dr.

Rani. It's more than a multivitamin, it's nature's wisdom in a capsule. I'm Dr. Rani, the creator of Ageless Eyes. Nourish isn't just a supplement, it's a commitment to your vitality.

Elevate your well-being with Nourish, a premium eye health supplement with the full range of B vitamins, mineral chelates, antioxidants, unique tocatrinols, plus potent plant-derived compounds backed by science to support your eyes.

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Embrace a healthier you, an ageless you, a bridge to the vitality your body craves, while supporting your precious vision. Visit our website to experience Nourish, your essential partner for thriving and wellness.

Nourish. Elevate your life with eyes that see the world anew. Part three, glaucoma treatments, medical and surgical approaches. So let's get started with first medications.

So medications are really the first line treatment for glaucoma. And in terms of medications, the options are either eye drops and or pills. And the goal of most of these treatments is to help to lower the eye pressure.

And we think that by lowering the eye pressure, we're protecting the optic nerve. And of course, in many cases of glaucoma, the eye pressure is high, so we want to get it into a normal range.

But even in cases in which the eye pressure is not that high, for example, in cases of normal tension glaucoma or NTG, it's still important to try to lower the eye pressure as much as possible to try to protect the nerve and blood flow to the nerve.

Glaucoma Drop Classes and Side Effects

Now when we talk about treatments for glaucoma most of the drops and other medications they do tend to also affect the autonomic nervous system and they can also have multiple systemic side effects and some of these side effects tend to be a little bit more pronounced in the elderly and we'll go through what some of them are.

So this is a nice a beautiful picture of the various color-coded drops that we have in our glaucoma armamentarium. So you can see that we're going, you know, basically almost the entire rainbow of colors, red, orange, yellow, blue, green.

There's a purple there as well. And of course, there are some other colors, including pink, which is more of a steroid drop. But let's go through what some of the classes of glaucoma medications are in terms of what these drops are doing.

Now, there are quite a few drops on the market and I'm not going to go through them each individually by name, but I do want to just touch upon them in terms of their category.

The first category that was introduced for glaucoma were the cholinergic agents. And what these agents tend to do is they tend to make the pupil size small and pull the iris away from the trabecular meshwork and open up the trabecular meshwork.

If you remember from my initial episode, part one, the trabecular meshwork is the part of the eye through which the fluid drains, through which the aqueous fluid drains out.

And if that drain is blocked or clogged, if it's not open fully, then it can cause high eye pressure. So that's what these agents were made to do. and they tend to have a green cap.

So the classic one is pylocarpia and it has a green cap, but there can be side effects. The common side effects of these agents are headache, sometimes a browache, blurred vision.

Rarely, it can cause retinal tear or detachment, but that's pretty rare. Now, since that initial class was introduced for glaucoma, we've had quite a few other classes introduced, including the beta blockers.

Now, beta blockers work on beta 1 and beta 2 receptors, and they help to decrease production of aqueous fluid. And there are quite a few on the market.

As what you can see here, there's a lot of different names. And again, I'm not going to go into what the names are, but usually these tend to be first or second line agents.

They usually dose either once a day or twice a day. By the way, the previous class of coal energy agents, they are usually dosed four times a day, typically four times a day.

But this class is usually once or twice a day. And because they are beta blockers, they can affect other beta receptors in the body, including the heart as well as the lungs.

And so they can cause a shortness of breath. They can cause changes in heart rhythms or slowing of the heart rate. So they may not be ideal for a lot of patients, particularly people with cardiac disease or pre-existing asthma, et cetera.

So definitely talk to your doctor if you have any of those pre-existing conditions, or they'll probably ask you first before they decide to put you on a beta blocker.

By the way, beta blockers tend to have a yellow cap. Next, we have carbonic anhydrase inhibitors, and this class decreases the amount of fluid produced by the ciliary body, decreases aqueous production.

And by doing that, we think that we can decrease the eye pressure as well. Topical drugs are typically dosed two or three times a day. They have an orange cap.

And when they're given in drop form, it's pretty rare to get side effects, but sometimes they can cause condition called metabolic acidosis, which can lead to shortness of breath, fatigue, sometimes tingling, a metallic taste in the mouth, nausea.

And so it's pretty rare to get those side effects in drop form, but it can happen. The next class, table four, is the alpha agonist quantidine derivatives.

Now, alpha agonists are typically used for blood pressure, like quantidine, but there are topical forms of this. And this class of medication can either decrease production of aqueous fluid, but also increase the outflow of fluid from the eye.

So it kind of has a dual benefit. There are a couple of agents out there on the market. These tend to have a purple cap. And you can see here that yes, they can cause side effects as well.

I will also add that alpha agonists tend to have a slightly higher risk of allergy. So ocular allergy where people can have like a lot of like redness around the lids or like scaling of their skin or eczema type reactions can happen from alpha agonist drops.

And also these are contraindicated in children under the age of two because it can cause slowed breathing. There have even been reports of death in young children from using these alpha agonists.

Moving on, prostaglandin analogs. These drugs actually first came out when I was in my training. So this is dating back to like 1999 is I think when the first prostaglandin analog came out, which is Latanoprost, also known as Xalatan.

It's probably the most commonly used glaucoma drop on the market. And this increases outflow or drainage of fluid from the eye. It's typically dosed once a day at bedtime.

Its main side effects could be redness of the eyes, allergy as well.

Punctal Occlusion and Oral Medications

And as a benefit, I guess a possible benefit, it actually increases lash growth so people can get nice, long, luxurious lashes from using these drops.

There are quite a few on the market. And then there's the latest class is the Rho kinase inhibitor. And this also

helps to decrease outflow through the trabecular mesh work.

Rho presa is the one agent that is approved. It's got a similar profile to the prostaglandin analogs in terms of their side effects, of its side effects.

Now, here's the eye drop cap color chart, and it goes through, again, the whole colors in the rainbow of these drops. By the way, the white is not a glaucoma drop, it's just an anesthetic.

And some of the over-the-counter drops can also have a white cap, so they're not necessarily used for glaucoma. And the reds are also not used for glaucoma.

Those are dilating drops. That's what we use for dilation of the pupil during an eye exam. Now, because people can have side effects that can affect heart rate or breathing, et cetera, typically we recommend to prevent some of those side effects, we recommend something called punctal occlusion.

So to prevent the drop from getting absorbed from the eye into the rest of the body, into the bloodstream, we do something called punctal occlusion where we recommend to patients that they do this, which is basically you put the drop in, you take your fingers and you block right here, which is where The ducts are that drain into the nose and then into the rest of the body that where it can get absorbed.

If you block from here, the drop then stays in your eye. Typically, we recommend punctal occlusion for about two minutes after installation of the drops.

You put your drops in and then you take your finger and you press not too hard, but right here in the corner. You're not pressing on the eye itself, you're pressing on the inner portion of the eyelids right here to block the lacrimal system.

Now there are some oral medications or IV medications that can be used for glaucoma as well. These are not first line by any means, but they can help to lower the eye pressure through various mechanisms.

The ones that are listed in the table, glycerin and osmatrol or mannitol are given as emergency medications for angle closure glaucoma. And this is something I talked about in part one of my series, angle closure glaucoma.

and is given again typically in an emergency setting. The other two drops listed below with the bullets, Diamox and Methazolamide, are carbonic and hydrous inhibitors.

When Drops Aren't Enough

I talked about them as drop form, but they can also be given as oral form, and they help to decrease the amount of fluid produced by the ciliary body to help to lower the eye pressure.

These can have side effects as well, similar to the drops, but more likely to happen because it's an oral agent. So tingling is very common, tingling in the fingers, the toes, the face.

Sometimes people have a metallic taste in their mouth, shortness of breath, fatigue. These are some side effects. But typically people are on very low doses, so it's unlikely to give some of those side effects that can happen at higher doses of these medications.

Now, let's say there's a patient and I've had unfortunately patients I've taken care of where they're on drops, they're on maximal drops because they're on multiple drops to control their eye pressure, but their pressure either isn't well controlled or the glaucoma continues to progress and people continue to have visual field loss or cupping.

What do we do for these patients? Well, first of all, I should have mentioned this earlier, but with the drops, The target for effective therapy is usually a 30% decrease in eye pressure.

Laser Treatments for Glaucoma

Let's say, I'll give you an example, someone's pressure is 30, then the target would be to get their pressure down to about 20 or so. So a 30% decrease in the eye pressure using medications.

Now, if that's not able to be done, we use multiple medications. And if that doesn't work, then we go to the next level of therapy, which are these procedures.

And I've broken them down into two categories. So on the left are lasers, selective laser trabeculoplasty and laser peripheral iridotomy. And I'll show you what those look like.

On the right are surgical procedures, which means a trip to the operating room. So the lasers can be done in the office. But the surgical procedures are done in the operating room under anesthesia.

And I'll go through what they are and I'll show you pictures of what they look like. So selective laser trabeculoplasty, this is a very common treatment that's done in the office to try to improve outflow of fluid from the front of the eye, to improve flow through the trabecular meshwork.

And basically with a laser and a lens, it's done under just topical anesthetic at a microscope attached to a laser. But basically your doctor will create laser holes in the trabecular meshwork to improve outflow through the trabecular meshwork.

And typically, it's done not 360 degrees. Again, it can be done 360, but typically, they will do 180 degrees first, see how the pressure responds, and if necessary, we can do the other 180 degrees done in one eye at a time.

So sometimes patients have to come back multiple times because if they're getting one eye done, then they come back to get the other eye done. Then maybe after a few months, if it's not effective, then we do the other 180 degrees in one eye and then the other eye.

And this can be repeated, but this is a very popular second line treatment if the medications are not effective. Next, the other type of laser, laser peripheral iridotomy, LPI.

You can see here in this image that there's a tiny little hole right here. There's like a hole in the iris, which is the colored part of the eye.

Minimally Invasive Glaucoma Surgery

This is a laser hole, and this is used for angle closure glaucoma. So not the open angle, but the closed angle version or if someone is at risk for closed angle.

There's something called narrow angles where their drainage system is narrow. We want to make sure that they don't develop angle closure so they have this procedure done.

It's done in the office. It doesn't take long. There are potential complications but your doctor will talk to you about them and hopefully that doesn't happen.

But I can say that it is typically a very, very effective procedure. Actually, my mother had this done. She had narrow angles and she had laser peripheral iridotomies done in both eyes.

Typically, a painless procedure, really low complication rate, and it can really prevent an attack of angle closures. It can be very, very effective at preventing optic nerve damage in the future.

Now, moving on to some of the surgeries, this has become very, very popular. This is a class of surgery called minimally invasive glaucoma surgery or MIGS, and there are multiple procedures that can be done.

I'm not exactly sure how many there are to date because every year there seems like more and more companies are coming out with their own MIGS procedures and devices.

But basically, the purpose of this is to make a small opening in the trabecular meshwork and put in a tiny little stent to keep the trabecular meshwork open to drain the fluid out.

And sometimes this MIG surgery is done on its own or sometimes it's done in conjunction with cataract surgery. So this is very common these days to have cataract surgery combined with a MIGS procedure and very low complication rate and it can prevent having to have other procedures done that have a higher complication rate.

but you may want to talk to your doctor about MIGs. These are just a few of the ones that are FDA approved. The istent, the zen gel stent, and the hydrous microstent are just some examples of MIGs procedures.

Trabeculectomy and Tube Shunt Surgery

The next glaucoma procedure is a little bit more complicated, both in its procedure, the actual steps of the procedure, but also in terms of complication rate afterwards.

This is called a trabeculectomy. where there's a drain created from the eye into the surface of the eye, which is the conjunctiva underneath the conjunctiva.

And it's a drain to let the fluid escape from the eye to lower the pressure. And you can see here with the eyelid lifted up, it's typically done in the upper part underneath the eyelid.

So it's covered by the eyelid, but it looks like a little bubble. And that's actually fluid that's draining out from the inside of the eye through the skin of the eye, the conjunctiva to the outside of the eye.

This is called a trabeculectomy. Now, this is the final type of procedure that's used. And typically in these patients who get this type of surgery, it's called a tube shunt surgery.

Patients usually have very advanced glaucoma or they're not doing well. And so this is an actual shunt that's placed underneath the surface of the eye, but there's actually a tube that's draining.

So it's a pretty significant amount of fluid that's draining out through a tube into or underneath the conjunctiva. And basically there's a very large plate that's placed here underneath the conjunctiva, kind of far back so you don't necessarily see it.

And then there's the tube that goes into the eye. And so there's like a conduit here through which the fluid is draining and then it's draining into the conjunctiva or underneath the conjunctiva.

And we can actually see the tube when we're looking and we're examining the patient, we can see the tube inside the eye itself and it looks like this.

So with that, that ends part three of my series on glaucoma. I covered a lot today in this short segment, both medications and surgeries, but hopefully you found this helpful.

I know it was a lot of information. If you have glaucoma, hopefully now things make a little bit more sense to you in terms of why treatments are used.

what is a target eye pressure, what the goal is of your surgeon, when we need to sometimes bump up the level of care of therapy from medications, topical medications like drops to pills to laser or to an actual surgery.

But definitely if you're in this stage where you may need to start a treatment, talk to your eye doctor and perhaps even see a glaucoma specialist because they're the ones best equipped to manage your care.

and really discuss what the pros and cons are of each therapy. There's no one size fits all. It's not that everyone gets put on a prostaglandin analog.

Closing Remarks and Next Episode Preview

We do start with that. Usually that's first line, but sometimes patients have very unique needs. They may have side effects. So we do tailor the therapy to each person individually.

So I hope this has been helpful. Again, if you're enjoying the series, please like and subscribe so you can get updates for whenever the next episodes are released.

That is the best way, really a free way to help support the podcast and doesn't cost you anything. So please just click that subscribe button. I really appreciate it.

And again, if you're enjoying this, if you know of anyone with glaucoma, please share the series with them so they can learn and empower themselves. And with that, I will close out the episode for today.

I look forward to seeing you all next week for our fourth and final episode on glaucoma. And we're going to be talking about diet and supplements, botanicals, lifestyle.

You do not want to miss this because this is information everyone needs to hear whether you have glaucoma or not. So I look forward to seeing you all next week.

In the meantime, take care and keep your IQ sharp. Thank you for tuning in to the IQ Podcast. I hope you enjoyed today's episode and learned something new to help you boost your IQ.

Leave us a review and share the podcast with your family and friends. Stay connected with me for more eye-opening insights on eye health, nutrition, and lifestyle.

Until next time, keep your vision clear and your IQ sharp.