Yoga therapy for Glaucoma caused by Ocular Hypertension
By Paula Schirrmacher 2015

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Introduction

Most activities in our daily life are based on our eyesight - whether we walk down a street, read the newspaper or the expressions in the faces around us. This leads us to the conclusion that we can capture the whole universe with this one sense. We don't believe what we haven't seen! Even though, this conclusion might be wrong, just imagine the fear in ones heart if the angle of vision is slowly getting smaller and smaller. And one day it might get totally dark around you...

Glaucoma, the "silent thief of sight", is the second-leading cause of blindness and affects one in 200 people aged 50 and younger. In higher age and several ethnics the risk even increases. And all these people feel helpless – their doctor tells them that they don’t know a cure for the disease and strong medications and surgeries can only prevent or slow down aggravation. The common opinion on Glaucoma is that there is nothing to do for the patient himself – no lifestyle, nutrition changes or work on his stress level. He is no longer responsible for his own health. But real research on the effect of lifestyle and especially stress level on the eye pressure (which causes Glaucoma in most of the cases) never took place. What if the eye pressure is just like the blood pressure: very sensitive to stress and lifestyle and only a lack of research makes the Glaucoma patients feel so helpless? Such questions begin to rise in the glaucoma community and even though no broad research can prove yet the effect of a Yoga therapy on eye pressure, several individual observations give big hope.
1. Scientific background

Glaucoma doesn't describe one disease but it is a group of ocular (eye) disorders that result in a damage of the optic nerve. Even though the underlying cause is still unclear, it is often associated with an increased fluid pressure in the eye (intraocular pressure).

To understand how intraocular pressure works let's have a look on the structure of the eye:

The process of seeing starts with the light passing through the cornea. Then, the expansion of the pupil decides how much light enters the eyeball, where it gets focused by the lens. The vitreous gel, a clear mass, keeps the eye in its round shape and fills the eyeball. The focused light passes through it until it reaches the back of the eye, where it gets detected by the retina, a light-sensitive tissue. The optic nerve connects the retina with the brain and transports the given information.

But there is one more very important part of the eye: A fluid is produced to nourish the tissues in the eye chambers, to take away the metabolism waste products and to return them to the blood circulation. To maintain a round shape of the eye, the pressure of this fluid must stay at a certain level, which is the result of the balance between production and drainage.
The fluid leaves the chamber at the open angle where the cornea and iris meet. High eye pressure (ocular hypertension) is always a result of a too slow drainage whereas the fluid production stays constant. The exact reason for the reduced passage through the meshwork drain is not yet understood by science - as the drainage angle stays "open" in an Open-Angle Glaucoma, which is the most common type of Glaucoma.

The range of the values of intraocular pressure is relatively wide as the tolerance to pressure is individual. That is why boundary values are difficult to set, but a constant abnormal high pressure (above 21 mmHg) of the fluid in the eye might affect the eye nerve which leads to a loss of eye sight that is called Glaucoma.

1.1 Different Types and their Symptoms

There are several types of Glaucoma with very different symptoms and causes. Basically, every eye disease with a damage of the eye nerve is called Glaucoma. The four major forms will be presented in this chapter.

The most common one is the Open-Angle Glaucoma, where the angle between iris and cornea is as wide as it should be. It accounts for at least 90% of all glaucoma cases and develops slowly and is a lifelong condition.

The loss of eye sight comes in most of the cases barely notable from the edges, slowly reducing the angle of sight. An impression of the effect of the "silent thief of sight" is given in the pictures below.
In case of a **Closed-Angle Glaucoma** blocked drainage canals result in a sudden rise in intraocular pressure. The closed angle between iris and cornea is a medical emergency and symptoms are

- Hazy or blurred vision
- The appearance of rainbow-colored circles around bright lights
- Severe eye and head pain
- Nausea or vomiting (accompanying severe eye pain)
- Sudden sight loss

In **Normal-Tension Glaucoma** the optic nerve is damaged even though the eye pressure is not very high. We still don’t know why some people’s optic nerves are damaged even though they have normal pressure levels. The loss of sight occurs very slowly as in the Open-Angle Glaucoma so the loss of sight, which is the only symptom, can be barely noticed by the patient.

**Congenital Glaucoma** occurs in babies when there is incorrect or incomplete development of the eye's drainage canals during the prenatal period. This is a rare condition that may be inherited.

As the Types of Glaucoma are so different, this thesis will only work on the most common case, the Open-Angle Glaucoma.
1.2 Diagnosis

Early detection, through regular and complete eye exams, is the only way to protect your vision from damage caused by glaucoma as the symptoms are barely notable by the patient himself. A complete eye exam includes five common tests to detect glaucoma.

**Tonometry** measures the pressure within the eye. To numb the eye during the measurement, eye drops are used. Then a doctor or technician uses a device called a tonometer to measure the inner pressure of the eye. A small amount of pressure is applied to the eye by a tiny device or by a warm puff of air.

**Ophthalmoscopy** helps the doctor examine the optic nerve for glaucoma damage. Eye drops are used to dilate the pupil so that the doctor can see through the eye to examine the shape and color of the optic nerve. The doctor lights and magnifies the optic nerve. Damage can be noticed by its shape or color.

**Perimetry** is a visual field test that produces a map of the complete field of vision. This test will help to determine whether your vision has been affected by glaucoma. During this test, the patient looks straight ahead and indicates when a moving light passes his peripheral (or side) vision.

**Gonioscopy** helps determine whether the angle where the iris meets the cornea is open and wide or narrow and closed. During the exam, eye drops are used to numb the eye. A hand-held contact lens is gently placed on the eye. This contact lens has a mirror that shows the doctor if the angle between the iris and cornea is closed and blocked (a possible sign of angle-closure or acute glaucoma) or wide and open (a possible sign of open-angle, chronic glaucoma).

**Pachymetry** is a simple, painless test to measure the thickness of the cornea. A probe called a pachymeter is gently placed on the front of the eye (the cornea) to measure its thickness. Pachymetry can help your diagnosis, because corneal thickness has the potential to influence eye pressure readings. With this measurement, the doctor can better understand the level of ocular pressure.
1.3 Complications

If left untreated, Glaucoma will cause progressive vision loss, normally in these stages:

- Blind spots in the peripheral vision
- Tunnel vision
- Total blindness

1.4 Management through Yoga

Common medicine knows no cure for Glaucoma - it is treated by eye drops or surgeries to lower the intraocular pressure and slow down or stop the loss of sight. Damaged parts of the eye nerve cannot be recovered.

First researches are going on which find signs for a relation between intraocular pressure and stress or mental tension. A broader study by the London Institute of Ophthalmology shows that it is not a high intraocular pressure alone that raises the risk for Glaucoma, but a value created out of the intraocular pressure and the blood pressure. This leads to the conclusion that regular physical exercises lower the risk of Glaucoma by keeping this value low and maybe even the aggravation of a present Glaucoma can be prevented.

Now, it will be discussed how Yoga can show a way towards self healing for people suffering from a Glaucoma.

Learning Yoga means creating a connection with your body and your mind through your breath which raises self awareness and brings body and mind back to balance. While a regular asana practice provides physical exercises to lower the blood pressure and to help dealing with mental problems, pranayama and meditation work strongly against stress, high blood pressure and psychic tension. Yoga also knows
kryas and mudras that clean certain parts of the body and activates them. The kryas Trataka, Sutra Neti and Jala Neti work on Upana Vayu, which is related to the facial movements and Nasikagra Drishti and Shambhavi Mudra stimulate the Ajna Chakra between the eyebrows.

Nevertheless, Yoga provides some risks for people suffering from Glaucoma. As the intraocular pressure should not rise during the practice, all full inversions like Sarvangasana, Sirsasana, Pinca Mayurasana and Adho Mukha Vrikshasana need to be avoided. One should also be careful with all asanas that can elevate the pressure in the veins of the neck (as this can increase the intraocular pressure) as well as mild inversions (where the heart is higher than the head, but not the feet): Chakrasana, Dhanurasana, Halasana, Matsyasana, Adho Mukha Svanasana and others.

A recent study by the New York Glaucoma Research Institute shows that intraocular pressure rises immediately after getting into a mild inversion like Adho Mukha Svanasana and the baseline of the eye pressure stays slightly raised even 10 minutes after coming out of the position. In case of intraocular hypertension, this needs to be avoided, as rising the pressure of the eye affects the eye nerve immediately. This leads to the conclusion that people with an acute high intraocular pressure should not even perform these asanas for a short duration - for example within a flow like Surya Namaskara. In this case, variations need to be created.

Also, some kryas like Kapalbhati and Vamana Dhouti as well as Bastrika Pranayama can create a lot of pressure in the head. They need to be avoided initially and in case of an acute high eye pressure even Brameri Pranayama should only be practiced carefully and for a shorter duration.

### 2.1 The Case

The focus of this thesis will be the special case of a 23 year old student. Let’s name him Finn. He is looking at you through thick glasses, the white of his eyes always slightly red, with a grey shadow on his view – barely notable. He is introverted and will talk to you only in a very calm and quiet voice. He is physically active and loves cycling, but his spinal rotation and hip opening is extremely limited for his age, which could be related to blocked emotions and a lack of work on his fears.
Since his early childhood, Finn wears glasses which became thicker every year, but the ocular hypertension was first noticed three years ago in a routine check. It came along with the huge lifestyle change of moving out of his mothers place and the beginning of his studies in a foreign city. As his studies didn’t progress the way he planned, exams began to put him under more and more stress. To work on his stress level, his worries about the health of his eyes and a general mental tension, he saw a psychologist regularly for over a year. Strong medicaments in the form of eye drops and two surgeries couldn’t lower his ocular hypertension which presses on his eye nerve. As he can’t measure his ocular pressure himself, he can’t be sure about the relation between his lifestyle and the pressure in his eyes. But the regular measurements of the ophthalmologist show that ocular pressure rises during the end of the semester when the exams put him under extreme stress.

2.2 The Therapy Sequence

While keeping the important facts of chapter 1.2 in the mind, an individual sequence can be designed according to Finns needs. The following program should be maintained for at least three weeks and includes a 30 min practice in the morning before breakfast and about 20 min practice before lunch and dinner. As Finn is already physically active, the focus of the therapy will not be on asanas but on pranayama, kryas and meditation to clean the body and work against the stress. Asanas will only be practiced in the morning. This will help to bring his body back to balance and to relief mental tensions like anxiety and blocked emotions by focusing on twisting and balancing positions. His day will start with activating Udana Vayu by Jala Neti and he will continue with Trataka:

- Eye movement vertical (5 times), horizontal (5 times), diagonal (5 times each direction) and round (5 times each direction)
- Palming and a short observation of the body reactions in between
Six rounds of a Surya Namaskara Variation (right and left) will follow, where he will bend his knees in Padahastasana so that his back is straight and parallel to the floor. He can gaze slightly front to make sure that his head stays above the heart level. To get the feeling of straightening and stretching the back without the inversion of Adho Mukha Svanasana, he will go to an active Adho Mukha Virasana. The other positions of Surya Namaskara can be performed as usual.

After these six rounds of Surya Namaskara, some balancing and twisting asanas follow:

- Garudhasana (5 breaths)
- Trikonasana Variation (5 breaths)
- Virabhadrasana B (5 breaths)
- Bhujangasana (5 breaths)
- Ardha Matsyendrasana (5 breaths)
- Savasana (3 min)

In the **afternoon and evening** Finn will learn dharana/dhyana. As he never practiced Yoga or Meditation before, the program will be very basic in the beginning and can be changed according to his efforts.

The following sequence should be practiced before lunch and before dinner and the Trataka krya should be added before the evening practice:

- Eye movement vertical (5 times), horizontal (5 times), diagonal (5 times each direction) and round (5 times each direction)
- Palming and a short observation of the body reactions in between

**Evening and afternoon:**

- Full Yogic Breathing (10 rounds)
- Brameri (if comfortable 5 rounds)
- Nadi Suddi without retention but observing the natural gap between inhalation and exhalation (10 rounds)
- Learning to apply Nasikagra Drishti and Shambhavi Mudra with closed eyes, so that there is no strain on the eye muscles (holding each one for 5 breaths)
Learning dharana by counting down from 108, if comfortable in coordination with the breath (start with 3 min and increase)

Note: The object of dharana should be changed to the Mantra So Ham as soon as counting down doesn’t create any difficulties anymore. So Ham-Meditation can be connected to Nasikagra Drishti and/or Shambhavi Mudra. If this is comfortable too, the object of concentration/meditation can switch to an animal or nature phenomenon which represents clarity and eyesight.

One object of concentration should be maintained for at least a week so that the concentration on the animal or nature phenomenon will be reached earliest in the third week.

Especially while dealing with extreme stress (for example during exam time) Yoga nidra is advised before sleeping.
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