

THYROID EYE DISEASE

A General Overview

INTRODUCTION

Thyroid Eye Disease, thyroid ophthalmopathy, thyroid orbitopathy, and endocrine orbitopathy are all names, which describe a disorder resulting from inflammation of muscles and fat within the bone box (orbit) surrounding the eyes. Thyroid Eye Disease may cause the eyes to bulge forward and the lids to become swollen, red, or retracted. This disease occurs roughly 5 times more commonly in females, and although any age group may be affected, it is more frequent among middle-aged individuals. Remember, at least 10% of all women by age 55 years have some thyroid abnormality, and 30% of these people will have clinically significant Thyroid Eye Disease.

ASSOCIATION WITH THYROID ABNORMALITIES

Thyroid Eye Disease is typically associated with disorders of the thyroid gland, which is located in front of the lower throat. This gland produces thyroxine, a hormone that affects appetite, metabolism, heart rate, and body temperature among other things. Symptoms associated with abnormally high levels of thyroxine (hyperthyroidism) include hunger, weight loss, nervousness, anxiety, tremors, perspiration, hair loss, premature hair graying, white spots in the skin, menstrual irregularity, and rapid pulse. Low thyroxine levels (hypothyroidism) may cause cold intolerance, fatigue, weight gain, depression, and facial puffiness. Roughly 30% of people with autoimmune thyroid abnormalities may develop Thyroid Eye Disease. Sixty to seventy per cent of people develop Thyroid Eye Disease during or after an episode of hyperthyroidism (the remainder may have normal or low thyroid levels). ***Although Thyroid Eye Disease is associated with disease of the thyroid gland, the two conditions (Thyroid Eye Disease and thyroid gland disorder) evolve, progress, and respond to treatment independently.***

CAUSE OF THE DISEASE

Thyroid Eye Disease is due to a disorder of the body's immune system, resulting in an attack on normal body tissues, so called auto-immune disorder. Other commonly known auto-immune disease includes rheumatoid arthritis, lupus erythematosus, and certain types of diabetes. In Thyroid Eye Disease, the tissues attacked by the immune cells are the muscles that move the eye, fat that fills the eye socket and acts as the shock absorber for the eye, and numerous specific tear glands surrounding the eyes. As a result, the following symptoms and signs may occur.

SYMPTOMS AND SIGNS

1. EYEBALL PROPTOSIS

Swelling of the tissues around the eye may cause the eyes to bulge forward (proptosis). There are 6 muscles that move your eye. These muscles originate deep behind the eye at the base of the brow and run forward to and attach to the eye just behind the cornea. The muscles cannot be seen on the surface as they are covered by a thin layer of tissue. The immune system attacks fibroblast support cells within the muscles causing the muscles to enlarge. With muscle enlargement the eye is pushed forward leading to the characteristic "stare." Proptosis frequently occurs unevenly, with one eye being more affected than the other; even though both eyes are always involved to some degree. As the muscles get larger, 3 things can happen. The eyeball gets pushed forward, the muscles themselves become scarred and stiff preventing normal eye movement, and the muscles may squeeze on the optic nerve, the major nerve that connects the eye to the brain.

2. EYELID RETRACTION

Inflammation and scarring of the muscles that pull open the eyelids may leave them abnormally open, causing a wide "stare". This may be exaggerated by the proptosis of the eyes. In some cases, the eyelids may be so retracted that they don't completely close, even during sleep.

3. DECREASED TEAR PRODUCTION

The tear glands may become inflamed or scarred, decreasing tear production.

4. DRY EYES OR EXCESSIVE TEARING

Prominence of the eyes, eyelid retraction, and/or decreased tear production may lead to drying out of the eyes with a gritty, sand sensation, aching, burning or paradoxical excessive tearing. Severe cases may be complicated by a breakdown of the surface of the eye (corneal ulcer).

5. SOFT TISSUE SIGNS

Swelling behind the eyes may cause redness and swelling of the eyelids and conjunctiva (the mucous lining of the eye). The swollen conjunctiva may look like a bubble or a blister on the surface of the eye. We strongly advise against the use of eye drops that "take the red out." Such medications can cause very serious problems. If you have questions about what is a good tear drop, visit <http://plasticeyesurgery.com/patient-resources/patient-education/> and read Mastering Tear Supplements.

6. GLAUCOMA

Some patients will develop glaucoma, which is increased pressure inside the eye that is so great, it damages the optic nerve. This condition is generally not painful, but if unrecognized and untreated it can cause slowly progressive vision loss.

7. DOUBLE VISION

Inflammation and scarring of the muscles that move the eyes may lead to impaired eye movement. In mild cases, one might feel a pulling sensation when moving the eyes. With more advanced disease, double vision may occur when looking in certain directions. In some cases, eye movement can be very restricted and the eyes may become obviously misaligned with constant double vision.

8. OPTIC NERVE COMPRESSION

Severe swelling of the tissues near the back of the eye may press on the optic nerve, the cable transmitting vision from the eye to the brain. Early symptoms include perceived fading of colors. That is, reds and blues may not appear as vibrant or intense. Permanent visual loss may occur if this complication is not recognized and promptly treated. Again, severe loss of vision is rare and may be reversible if the pressure on the optic nerve is quickly treated.

COURSE OF THE DISEASE – ACTIVE & INACTIVE PHASES

Thyroid Eye Disease typically has an active, inflammatory phase lasting an average of 1 ½ years (rarely as long as 5 years). After the inflammation has died down, individuals may be left with any of a number of changes, which might require treatment. Recurrences of the active phase are uncommon (about 5% of people). Unfortunately, there is no test to tell when a person has passed from the "active" phase to the "inactive" phase, and we rely on your and our powers of observation. We assume that if your eyes have not changed in appearance or function for 6 months, then you have entered the "inactive phase".

Every person's Thyroid Eye Disease follows a unique course. Some people may have minimal symptoms or signs and others may have a sudden onset of severe problems such as vision loss or major eyelid or eye swelling and redness.

We are still unable to predict accurately which problems a particular individual will develop. People must therefore be followed on a regular basis during the active phase of their disease. Any additional signs and symptoms should be reported immediately, in case specific treatment is needed. ***A concerned telephone call or email to your physician is never "a bother," but a smart and responsible action.***

SMOKING AND STRESS

An association between smoking and increased severity of Thyroid Eye Disease has clearly been demonstrated, especially in women. ***People who smoke and have thyroid disease, should make a particularly strong effort to stop smoking.*** Ask your primary care doctor for help. Stress is also associated with worsening of Thyroid Eye Disease. ***Stress reduction techniques may be very beneficial.***

DIAGNOSIS AND INVESTIGATIONS

Thyroid Eye Disease is diagnosed by the clinical features described above. It may be confirmed by CT scan showing the enlarged muscles around the eyes. Other tests may be ordered to document visual function and eye movements. Photographs, for example, document the appearance of the eyes to judge progression over time.

It is essential to understand that Thyroid Eye Disease is currently a diagnosis made by clinical observations. Certain eyelid signs are characteristic. Blood tests may help to confirm the diagnosis, but even in the most severe cases of Thyroid Eye Disease, all blood tests may be completely normal.

TREATMENT OF ACTIVE PHASE

1. THYROID GLAND MODULATION

The Endocrinologist may prescribe medications to alter your thyroid hormone level. A radioactive iodine drink or thyroid removal surgery may be offered to destroy portions of an overactive thyroid gland. Although these treatments are very important for general well being, they do not appear to directly influence the course of Thyroid Eye Disease in most people.

2. EYE MEDICATIONS

Dry eyes and subsequent reflex excessive tearing can often be relieved with lubricating teardrops and ointments alone. Drops may help glaucoma.

3. SALT RESTRICTION AND HEAD ELEVATION

Swelling symptoms may be decreased by cutting down on salt and alcohol, and elevating the head of your bed by placing bricks under the feet at the head of the bed.

4. ANTI-INFLAMMATORY MEDICATIONS

Moderate to severe inflammation and redness of the eyelids and eyes may be treated with corticosteroids or other immune-modulating drugs. Some people respond to these medications, but others do not. If a person is going to respond to anti-inflammatory medications, they do so rapidly. In cases of optic nerve compression, these medicines may be used in addition to radiation or surgery. Since these medications have potentially serious side effects, they are not used in mild cases.

5. RADIATION THERAPY

X-ray therapy to the area around the eyes has been shown to reduce inflammation and is offered severe cases. (RADIATION THERAPY IS **NOT** PERFORMED ON DIABETICS, AND IT IS USED ONLY WITH EXTREME CAUTION IN PREGNANT WOMEN). Mrs. Bush (prior First lady) had this treatment.

6. ORBITAL DECOMPRESSION

Despite the effectiveness of medications, radiotherapy, or a combination of both, there are some people who continue to have bulging eyes or even optic nerve compression with visual loss. In these people, *orbital decompression* is often offered.

TREATMENT IN THE INACTIVE PHASE

After a person has passed into the inactive phase of Thyroid Eye Disease, a number of procedures may be considered to recapture normal eye function and normal appearance.

1. ORBITAL DECOMPRESSION SURGERY

The orbital space may be enlarged by surgical removal of one or more of the bone walls surrounding the eyes or of the extra fat behind the eyes. This surgery is performed for certain cases of severe, cosmetically troubling proptosis and eye exposure or vision-threatening nerve compression. Orbital decompression may be complicated by double vision. Although we have performed 5,000 orbital decompressions, each person's is tailored to their specific needs. Different procedures carry different risks, which are always discerned on an individual basis.

2. MUSCLE ALIGNMENT SURGERY

Covering one eye should immediately relieve the type of double vision seen in Thyroid Eye Disease. It does not matter which eye is covered. It may be possible to realign the eyes and relieve double with the use of prisms either applied to glasses or ground into lenses. When double vision cannot be corrected with prisms, eye muscle surgery may be necessary. In most cases, physicians choose to wait until the double vision is stable before operating. Operating on a person whose eyes are changing may require repeat surgery. Sometimes it is not possible to completely remove double vision, but the goal is to remove double vision looking straight ahead and in reading position, as these are the most important directions of sight.

3. COSMETIC EYELID SURGERY

The upper eyelid may be lowered or the lower eyelid may be raised in cases of eyelid retraction with "stare". Eyelid surgery can often improve the appearance of a bulging eye and avoid the need for orbital decompression surgery. Blepharoplasty (surgical removal of redundant skin and fat bulges from the eyelids) may also be desired. These operations are performed after the active inflammation has subsided and after any necessary muscle alignment has been completed.

FREQUENTLY ASKED QUESTIONS

Q: The doctors tell me they fixed my thyroid and that it is now normal. Why are my eyes acting up?

A: The thyroid gland and the eyes are independently affected by one or more autoimmune antibodies circulating in the blood. The eyes don't cause the thyroid troubles, and the thyroid doesn't cause eye problems. Correcting thyroid hormone levels has very little, if any, impact on the Thyroid Eye Disease in most people.

Q: I've been told I have both Grave's Disease and Hashimoto's Disease, which do I really have?

A: Many people and physicians use the terms Grave's Disease and Hashimoto's Disease incorrectly. Typically, physicians use the term Grave's Disease to mean a hyperthyroid condition and Hashimoto's to mean a hypothyroid condition. Both are caused by autoimmune antibodies, some of which stimulate the thyroid causing hyperthyroidism and some of which inhibit the thyroid causing hypothyroidism. Still, many people can have multiple autoimmune antibodies, we prefer the term autoimmune thyroid disorder to encompass all of these conditions.

Q: Steroids made my eyes much more comfortable. Can't I just continue taking them?

A: Steroid therapy may be effective in masking the inflammatory phase of Thyroid Eye Disease and partially shrinking the muscle swelling; however, the side effects from steroids are very common with continued treatment and other long term treatments or surgeries should be considered.

Q: Why can't you fix my eyelids now?

A: Eyelid surgery is the last step in reconstruction after a person is in the inactive phase of the disease, because orbital surgery may change eye muscle movement, and eye muscle surgery may alter eyelid position.