

PLASTIC **EYE** SURGERY ASSOCIATES, PLLC

James R. Patrinely, MD, FACS | Charles N.S. Soparkar, MD, PHD, FACS

3730 Kirby Drive, Suite 900, Houston, TX 77098

Telephone (713) 795-0705 / FAX (713) 807-0630

TO OUR PATIENTS:

Enclosed are a number of comments that we hope will help you to better understand thyroid disease and its various treatments. Thyroid eye disease can be very distressing for the person who has it, because of discomfort, altered appearance, and the uncertainty of whether the disease will progress to a vision compromising state.

We believe that you are the person who is most in tune with your body and disease. Therefore, the more you know about your disease, the more accurate an observer you will be, and the more you will be able to assist us in helping you.

Some of the things you read here can be frightening. This literature is written for patients with a wide range of disease, and much of this material may not apply to your situation. The most important thing for you to remember is that thyroid eye disease is treatable - all you have to do is be aware of changes in your eyes or vision and discuss them with your physician(s) in a timely fashion.

Most sincerely,

James R. Patrinely, M.D., F.A.C.S.

Charles N.S. Soparkar, M.D., Ph.D., F.A.C.S.

THYROID OPHTHALMOPATHY

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 ophthalmopathy may cause the eyes to bulge forward and the lids to become swollen, red, or retracted. This disease occurs four times more commonly in females, and although any age group may be affected, it is more frequent among middle-aged individuals. Remember, 10% of all women by the age of 55 years have some thyroid abnormality, and 20% of these people will have clinically significant thyroid ophthalmopathy.

ASSOCIATION WITH THYROID ABNORMALITIES

Thyroid ophthalmopathy 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. Somewhere between six and ten percent of patients with thyroid abnormalities may develop thyroid ophthalmopathy. Sixty to seventy per cent of patients develop ophthalmopathy during or after an episode of hyperthyroidism (the remainder may have normal or low thyroid levels). **Although thyroid ophthalmopathy is associated with disease of the thyroid gland, the**

two conditions (thyroid ophthalmopathy and thyroid gland disorder) evolve, progress, and respond to treatment independently.

CAUSE OF THE DISEASE

The cause of thyroid ophthalmopathy is still unknown; however, it is probably due to a disorder of the body's immune system, resulting in an attack on normal body tissues. Other similar inflammatory diseases include rheumatoid arthritis, lupus erythematosus, and certain types of diabetes. In thyroid ophthalmopathy, the tissues attacked by the immune cells are the muscles, fat, and tear glands surrounding the eyeballs. As a result the following symptoms and signs may occur:

SYMPTOMS AND SIGNS

1. EYEBALL PROPTOSIS

Swelling of the soft tissues around the eye may cause the eyes to protrude (proptosis). There are 6 muscles that move your eye. Four of these, the inferior rectus, superior rectus, lateral rectus and medial rectus, are most frequently involved. These muscles originate behind the eye at the peak of the eye socket and attach to the eye just behind the cornea (the clear portion of the eye overlying the colored part of the eye). The muscles cannot be seen on the surface as they are covered by a thin layer of tissue (the conjunctiva) but may become visible as the blood vessels over their anterior portion become very prominent. The immune system singles out the fibroblasts, support cells within the muscles causing the muscles to enlarge. With muscle enlargement the globe (eyeball) is pushed forward leading to the characteristic "stare." Proptosis

frequently occurs asymmetrically, with one eye being more prominent than the other; but generally, both eyes are involved to some degree. As the muscles get larger, 3 things can happen. The eyeball gets pushed forward, the muscles themselves become stiff (the eye may not move normally), and the muscles may press on the optic nerve.

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 exposure and rapid tear evaporation with foreign body sensation, aching, burning and excessive reflex tearing. Severe cases may be complicated by breakdown of the surface of the eye (corneal ulcer).

5. SOFT TISSUE SIGNS

Poor venous drainage resulting from swollen orbital tissues may cause redness and swelling of the eyelids and conjunctiva (the mucous lining of the eye). In severe cases, the swollen conjunctiva may hang over the edge of the lids looking like a bubble or a blister on the surface of the eye. We strongly advise

against the use of over-the-counter ophthalmic decongestants - eyedrops that "take the red out." Such medications can cause very serious problems.

6. GLAUCOMA

Some patients will develop glaucoma, which is increased pressure inside the eye. 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. The inferior rectus muscle (located beneath the eye) tends to be more often affected than others. When it becomes stiff, the globe cannot move up normally. This often results in double vision with one image seen on top of the other. 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 visual signals from the eye to the brain. Early symptoms include fading of colors and graying of vision. Permanent visual loss may occur if this complication is not recognized and promptly treated. This severe loss of vision fortunately, occurs only in about 5% of the patients with thyroid orbitopathy and may be reversible if the pressure on the optic nerve is relieved.

COURSE OF THE DISEASE – ACTIVE & INACTIVE PHASES

Thyroid ophthalmopathy typically has an active, inflammatory phase lasting 6-24 months (rarely as long as 3-5 years). After the inflammation has died down, individuals may be left with any of a number of structural changes, which might require treatment. Recurrences of the active phase are very uncommon (less than 1% of people). Unfortunately, we have 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 the 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 complications such as vision loss or major eyelid or eye swelling and redness.

We are still unable to predict accurately which complications a particular individual will develop. Patients 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 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 ophthalmopathy has clearly been demonstrated, especially in women. **All patients who smoke and have thyroid disease, should make a particularly strong effort to stop**

smoking. Ask your physician for help. Stress is also associated with exacerbation 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 is confirmed by ultrasound and 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.

Also, blood and urine tests are used to monitor the activity of the thyroid gland and the inflammatory process. In addition, nuclear medicine scans of the thyroid gland may be ordered by your endocrinologist or primary care physician.

TREATMENT OF ACTIVE PHASE

I. THYROID GLAND MODULATION

The Endocrinologist may prescribe various medications to suppress or augment the 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 the patient's general well being, they do not appear to directly influence the course of eye disease in most patients.

2. EYE MEDICATIONS

Mild exposure symptoms, dry eyes, and even excessive tearing can often be relieved with lubricating teardrops and ointments.

3. SALT RESTRICTION AND HEAD ELEVATION

Swelling symptoms may be decreased by cutting down on salt in your diet 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 conjunctiva 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 these medications, they do so rapidly (within 3 to 14 days). In cases of optic nerve compression, these medicines may be used in addition to radiation therapy or surgery. Because some of these medications have potentially serious side effects, they are not used in mild cases of thyroid ophthalmopathy.

5. RADIATION THERAPY

X-ray therapy has been shown to reduce inflammation and is offered in cases of thyroid orbitopathy complicated by moderate to severe soft tissue signs, optic nerve compression, and in some cases, a progressive muscle scarring with ocular misalignment (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 threatened compression of the optic nerve with visual loss. In these people, the last resort to salvage vision is orbital decompression, which consists of enlarging the eye socket by opening up some of the sinuses behind the eye, thus relieving the pressure on the optic nerve. This procedure is more commonly used to allow the eye to settle back in cases of extreme protrusion, but a number of special variations on this procedure may be used to prevent blindness.

TREATMENT IN THE INACTIVE PHASE

After you have passed into the inactive phase of your thyroid eye disease, you may wish to consider a number of procedures to recapture some of your 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 and orbital soft tissues. 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 misalignment of the eyes.

2. MUSCLE ALIGNMENT SURGERY

Covering one eye immediately relieves double vision. It does not matter which

eye is covered. It may be possible to optically realign eyes with the use of prisms either applied to glasses or ground into lenses, although this may not be effective until things stabilize. 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. If we operate on a patient who is undergoing progressive change, we may correct them now but have things change within the next few months. Often multiple muscle operations are necessary. It is sometimes 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. Surgery can straighten eyes to allow single vision in straight gaze and down gaze. This procedure is often delayed for six or more months after the active stage has died out to be sure that no further progression in muscle scarring is occurring. Muscle alignment is usually performed after completion of anti-inflammatory medications, X-ray therapy, or orbital decompression. Nationally, this complication occurs on average 33% of the time. Using advanced techniques, we see this complication roughly 5% of the time and are often able to predict which patients will have this problem. In selected individuals, we are able to perform a surgery called "Small Bone Decompression" and have not had a single case of eye misalignment with this technique.

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 sur-

gery can often improve the appearance of a proptotic (sticking out) eye and avoid the need for orbital decompressive surgery. Blepharoplasty (surgical removal of redundant thickened skin and fat bulges from the eyelids) may also be recommended. These operations are performed at least six months after the active inflammation has subsided and after any necessary muscle alignment has been completed.

FREQUENTLY ASKED QUESTIONS

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

In Graves' disease the thyroid gland is stimulated by the immune system to secrete too much hormone. This excess hormone results in nervousness, palpitations, weight loss, diarrhea, tremors, and a feeling of being hot all the time. Treatment is aimed at limiting the thyroid gland's ability to make thyroid hormone. This may be done with medications, surgery, or radioactive iodine; usually resulting in normalization of thyroid production (occasionally requiring thyroid replacement). This does not, however, affect the primary auto-immune process and the immune system may continue to target other tissues; in particular the extraocular muscles. Orbital symptoms may even worsen following treatment with radioactive iodine. The eye and orbit changes must be treated separately as outlined.

The steroids made my eyes much more comfortable. Can't I just continue taking them?

Steroid therapy may be effective in halting the inflammatory phase of thyroid orbitopathy and partially shrinking the muscle swelling. Steroid side effects are very com-

mon with continued treatment. If there are still problems with eye movements (double vision), exposure problems (irritation and foreign body sensation), or decreased vision then surgery should be considered.

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as these are the most important directions of sight. Surgery can straighten eyes to allow single vision in straight gaze and down gaze. This procedure is often delayed for six or more months after the active stage has died out to be sure that no further progression in muscle scarring is occurring. Muscle alignment is usually performed after completion of anti-inflammatory medications, X-ray therapy, or orbital decompression. Nationally, this complication occurs on average 33% of the time. Using advanced techniques, we see this complication roughly 5% of the time and are often able to predict which patients will have this problem. In selected individuals, we are able to perform a surgery called "Small Bone Decompression" and have not had a single case of eye misalignment with this technique.

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EYELID SURGERY FOR THYROID EYE DISEASE

The inflammation that occurs in thyroid eye disease can cause severe scarring of the muscles in the eyelids, resulting in eyelid retraction (the eyelids being pulled away from the eye) with possible development of severe corneal exposure (a vision-threatening problem). Many people will have exposure to the degree that causes their eyes to be chronically "gritty-feeling" and watery. In some people, however, dry spots may form on the surface of the eye causing exposure keratitis, which can lead to scarring or infection of the eye. Eyelid surgery can reduce eye exposure so that the eyelids are more adequately able to protect the eye. Before surgery, many people with this exposure situation will have the need to squint (usually unconsciously) in order to keep their eyes from drying.

Additionally, thyroid eye disease may cause extra fat tissue deposits making the eyelids appear swollen, puffy, and unsightly. Surgery can correct these problems as well.

UPPER EYELID SURGERY

To help with upper eyelid retraction, surgical loosening of the upper eyelid retractor muscles (levator and Mueller's muscle) and release of scar tissue in the muscles can allow the upper eyelids to lower to a more normal level in order to protect the eyes. At the same time that this is done, excessive fatty tissue and skin folds can be trimmed to improve appearance. Formulas are sometimes used during surgery to determine the required amount of loosening of the muscles, but significant differences exist between individuals in the amount of scarring that occurs. There are even differences between eyelids in the same person. Following surgery, there is almost always significant improvement, many times exactly the desired amount, but in some cases (about 10-15%) additional

"touch up" surgery is needed to get the eyelids as close as possible to the desired position.

LOWER EYELID SURGERY

The same puffiness and retraction that occurs in the upper eyelids can also develop in the lower eyelids, so that the lower eyelids are pulled downwards exposing the white portion of the eye. With this situation, an unhealthy exposure of the eye can also occur. Surgical procedures can improve the protection of the eye and the appearance of the lower eyelid. With lower eyelid surgery, the scarred muscle can be loosened and at the same time extra skin folding and fat can be trimmed, as in the upper eyelid. To be able to reposition the edge of the lower eyelid upward, the outside tendon in the lower eyelid must be tightened and a spacer material may be inserted within the eyelid. This type of procedure will allow the eyelid to resume a more normal, natural position, protect the eye, and provide marked improvement in overall appearance.

PROBLEMS INVOLVED WITH EYELID SURGERY FOR THYROID PATIENTS

1. BRUISING AND SWELLING

There is usually more bruising and swelling with surgery for thyroid eye problems than the standard "baggy eyelid operation" (blepharoplasty), because in thyroid disease the arterial and venous supplies to eyes are increased. Thus, the tissues tend to swell more. Also, the surgery is more involved. In some situations low dose cortisone medication may be used to reduce the amount of tissue reaction following surgery. Ice packs and head-of-bed elevation help to control bruising and swelling.

2. POST-OPERATIVE STIFFNESS OF THE EYELIDS

Even though the eyelids are improved in position so that they can protect the eye and obtain a more normal appearance, stiffness incurred by the scar tissue may persist to some degree, as it is impossible to remove every bit of scar tissue imposed by the thyroid problem,

3. ANESTHESIA DURING SURGERY

If a person is having one set of eyelids corrected (usually the upper eyelids) the procedure can frequently be performed entirely with local anesthesia and deep sedation as an outpatient. If upper and lower eyelids are operated at the same time, this much longer procedure may infrequently require general anesthesia.

4. POST-OPERATIVE CARE

A person will be ambulatory after eyelid surgery, although application of ice packs and topical medications will be necessary. Sutures will be removed one week after surgery, and a 4 - 6 week checkup will be scheduled.

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LIVING WITH GRAVES' DISEASE

Many people ask "what can I do about my Graves' disease?" When one feels helpless and powerless, a sense of hopelessness sets in. Although your Graves' disease will not go away, there are many things that you can do to have a greater mastery of your life. What you eat, what you do, what you think, and what you know - all these things effect your health and sense of well-being.

MEDICAL CARE

Your thyroid medication is essential. This is a replacement for the normal amount of thyroid hormone that your body once manufactured. When your thyroid was overactive, there was too much of the hormone circulating. That is the cause of symptoms such as insomnia, anxiety, jitters, heat intolerance, fatigue, heart racing, and weight loss.

If your thyroid was surgically removed or deactivated by radioactive iodine treatments, your body's supply of thyroid hormone (thyroxine) was decreased. Periodic blood tests determine your level of thyroxine. This level reflects a combination of the hormone produced by your body as well as an identical substance, which is provided by your medication. If your blood level of thyroxine is too high, you will begin to experience similar symptoms as described above with an over-active thyroid. If the blood level of the hormone is too low, you will experience hypothyroid symptoms: slow heart rate, hair and nail changes, dry skin, sensitivity to cold, joint pains, hoarseness, weight gain, loss of appetite, difficulty concentrating, depression, constipation, muscle weakness, muscle cramps, and puffy eyes. If you begin to feel any of these symptoms, contact your doctor.

If you are having some of the symptoms described above, a simple blood test will clarify if your medication needs adjusting.

If your blood levels are satisfactory, there may be other medications that will take care of your symptoms. Complaining of symptoms is not "bothering" your doctor; it is helping him / her to help you. NEVER ADJUST YOUR MEDICATIONS WITHOUT THE HELP OF YOUR DOCTOR; however, the remainder of your care is up to you.

NUTRITION

There are a number of nutritional concepts that you need to keep in mind when you plan your meals. Weight control is often a problem for people with Graves' disease. Your thyroid controls metabolism, and you may have a tendency to gain weight. Eating to reduce caloric intake while maintaining high nutrition requires more effort than you may have been accustomed to when your thyroid hormone level and metabolism were elevated. Focus on fresh fruits and vegetables - these will give you the most vitamins and minerals for your efforts and offer the balance you need in your diet.

Sodium (salt), a preservative in almost all canned and frozen foods; may contribute to swelling. Since swelling is frequently a problem for patients with Graves' disease, you may now need to be more aware of your salt intake.

For reasons unknown, people with Graves' disease sometimes develop problems with an elevated cholesterol. Therefore, you may have to be more aware of your fat intake. Fish and chicken will be better for you than excessive amounts of pork and beef. Limit rich sauces and cheeses. Have your cholesterol checked.

Learn about nutrition. There are many resources. Both the American Heart Association and the American Diabetes Association have excellent nutritional food plans, as do Weight Watchers, your local

hospital dieticians, and registered dietician consultants. FAD DIETS ARE NOT HEALTHY -- AVOID THEM. Adopt a change in your lifestyle, not another diet.

EXERCISE

You will feel better if you develop a regular exercise program. Even regular walking is beneficial. Exercise strengthens your heart and improves circulation and muscle tone, which are needed to keep your cardiovascular system functioning well.

Studies show that exercise reduces appetite and increases your energy level. Concentrate on activities you already know how to do, as well as learning new ones. Have a variety of physical activities to avoid boredom and the limitations of weather. WALKING continues to be the most overall beneficial activity; and it is available for everyone! If you can't walk, bike, swim, or ROCK! Vigorous rocking in a stable rocking chair uses all the muscles in the body! Exercise with a friend. This increases the enjoyment of and dedication to your exercise program.

RELAXATION

Learning to relax refers to reducing the muscular tension in order to increase effective circulation, as well as mental calmness. It is not only an "attitude" but a learnable skill. Relaxation is more than just "getting away". It is a positive and satisfying experience and gives peace of mind. It is well documented that Graves' disease is also a stress-related illness; that is, stress makes it worse. The "stress" is often the result of the fast-paced action-packed lifestyle that we all lead.

Relaxation may take many forms: learning new things, exercising, gardening, walking in the woods, creative activities, soft lighting, soft music, a bubble bath, a good book. If you are interested in mental exercises to create peace of mind and a

relaxed body, there are many to choose from. You may prefer the systematic tensing and letting go of specific muscle groups (progressive muscle relaxation), or you might like imagining beautiful scenes. There is considerable research being done on the efficacy of mental imagery (visualization) and its effect on the immune system. Yoga, Tai Chi, and different forms of meditation are all ways to practice relaxation. Consult your local bookstore for more information and ideas.

Relaxation exercises should be practiced daily. When you discover your favorite activities, plan to devote at least one half hour each day to them. If you think you don't have the time, remember that the half-hour that you spend relaxing may well increase your overall daily productivity. You have to make a personal commitment to yourself. The National Institute of Mental Health says: "Finding effective techniques for relaxation is not merely a pastime for the idle rich. It is essential for everyone's physical and mental well-being."

SUPPORT SYSTEM

A support system may be defined as those caring, available people in your life who will listen, tell it like it is, and allow you to reciprocate in a caring, sharing dialogue. It is important that people in your support system be available, that is, living near you. Long-distance friends are good to have, but they do not substitute for a support system near at hand. Listening is important. Many times you do not need advice, you just need to say what you are thinking and feeling out loud and have those thoughts and feelings acknowledged. You need to discuss things, not necessarily have problems solved.

Support groups provide the essential ingredient that is needed for everyone that has to live with a disorder: HOPE and a SENSE OF HUMOR! If you are interested in joining a local thyroid support group, we can point you in the right direction.

PLASTIC **EYE** SURGERY ASSOCIATES, PLLC

James R. Patrinely, MD, FACS | Charles N.S. Soparkar, MD, PHD, FACS | Robert N. Tower, MD

3730 Kirby Drive, Suite 900, Houston, TX 77098

Telephone (713) 795-0705 / FAX (713) 807-0630

ORBITAL DECOMPRESSION FOR THYROID EYE DISEASE

Once the "active" inflammatory phase of thyroid eye disease has subsided, an individual may be left with structural changes, such as eye protrusion, eyelid retraction, and in some cases, double vision. Luckily, there are corrective procedures that can be performed to address these problems.

In most people the build-up of tissue and swelling behind the eye is not severe enough to damage the optic nerve, but it may cause a striking forward protrusion of the eye (proptosis/exophthalmos) which in itself is a distressing situation, not only from the standpoint of exposure of the eye, but also because of the disfigurement that it produces.

Fortunately, orbital decompression can often address proptosis. With orbital decompression, the eye socket is enlarged to accommodate the extra tissue that the thyroid disease has deposited behind the eye. This allows the eye to settle back into a more normal position.

Around the orbit (the bone socket in which the eyeball sits) there are a number of sinus cavities that can be used to surgically expand the orbit. The sinus below the eye is called the maxillary sinus, and the sinus toward the nose is called the ethmoidal sinus. A maxillary-ethmoidal decompression is the most frequently used procedure for accommodating the extra tissues behind the eye. However, in some cases, the outside wall of the orbit (lateral wall) can also be removed; and finally, orbital roof, frontal sinus, or sphenoid sinus surgery may be helpful. Most people, however, require only a two wall maxillary-ethmoidal decompression.

We have perfected a new technique called "Small Bone Decompression" that is now commonly used in patients with only moderate proptosis. This technique provides outstanding results with much faster recovery and minimal risks.

The method used to perform most orbital decompressions requires only a very small incision in the skin on the outside corner of the eye, and this incision heals very well into the normal laugh lines around the eye. Using magnification, specific portions of the orbit bones are carefully removed, allowing communication between the orbit and the nearby sinuses. There is a nerve of sensation that runs through the bone underneath the orbit. This nerve provides sensation to the cheek, the lip, and some of the upper teeth on that side. Great care is taken to nibble the bone away from this nerve so that the nerve is preserved. Despite extreme caution, and the use of microsurgical techniques, some numbness almost always occurs.

REHABILITATIVE ORBITAL DECOMPRESSION

However, in more than 90% of cases, this numbness is only temporary. Additional hidden incisions inside the nose may also be used to more safely approach the very deep portions of the orbit and sinuses. After the bones of the sinuses are removed, the tissues which have built up behind the eye (usually fatty tissue or fat infiltrated eye muscles) are permitted to expand into the newly created spaces. In most cases, if the orbital tissues are soft, an immediate effect will be noted with the settling of the eye into a more normal position. In some cases, however, time is required for final settling to take effect. In fact, most people will observe a progressive effect for up to 12-24 months. Tiny absorbable stitches are placed on the inside of the eyelid and in the small incision of the skin at the outside corner of the eye. After surgery, ice compresses are used continuously along with medications to minimize swelling. Antibiotics are also given.

RESULTS

The average amount of retroplacement of the eye (moving of the eye backwards to a more normal position), is about 4-5mm with the maxillary-ethmoidal decompression.

ANESTHESIA

Orbital decompression is performed under general anesthesia, and patients may expect to remain in the hospital for 0-1 days after surgery. Once at home, patients may need assistance during initial recovery. Any non-absorbable sutures are removed one week postoperatively. A 4-6 weeks check-up may also be needed.

ADDITIONAL FACTORS AND RISKS YOU SHOULD KNOW ABOUT

I. DOUBLE VISION

Some patients who undergo decompression already have some double vision. In most patients, orbital decompression does not adversely alter the pattern of double vision; however, in some people the double vision is helped and in some people it may be made worse. Nationally, the average risk for double vision after orbital decompression is about 33%. In our hands, the risk is 5-8% for standard decompression techniques and approaches 0% for "Small Bone Decompression" technique. Treatment of double vision, should it occur, might require prism glasses, further orbital surgery or eye muscle surgery.

2. MINIMAL SURGICAL EFFECT

Other than bone removal, the main condition that affects the swelling of the eye in orbital decompression is how "stiff" the tissue is which has built up behind the eye. Many people have very soft tissue, and this tissue will settle easily allowing a good retroplacement of the eye. In some people, however, the tissue is very stiff and scarred, and in these individuals, even though the surgery is performed correctly, the tissue simply will not move easily into the new spaces. In such situations, the effect of orbital decompression might be less than expected. Usually, it is difficult to determine before surgery what the consistency of the tissue behind the eye will be; however, in general, people who have good eye movements will have softer more pliable tissue behind the eye. In some patients, in which both eyes are operated, there may be some asymmetry in the final eye position (protrusion) before surgery. Most asymmetry, should it occur, can be compensated for with surgical adjustments of eyelid position. Rarely, further orbital surgery is helpful.

3. NUMBNESS OF THE LIPS AND GUMS

The sensory nerve, contained within the floor of the orbit, supplies feeling to the upper lip and gum, and most of the time a temporary numbness occurs in the lips and upper gums. This is nothing that is visible, but it can be somewhat of a nuisance, and in most cases, it dissipates within several months. In some people with severe protrusion of the eyes, the nerve may actually have to be removed in order to allow the eyes to settle completely. In these cases, there will be permanent numbness just below the eye and in the upper lip, gums, and maybe even teeth.

4. SEVERE BRUISING AND SWELLING

The operation takes place in an area that is very vascular with a large number of blood vessels, and it is imperative that a person undergoing orbital decompression take NO medication that would prevent blood clotting. Drugs containing aspirin or aspirin-like medication (many arthritis medications) should NOT be taken for 10 days before surgery. Many over-the-counter medications contain aspirin-derivatives. Please check with a physician about all your medications, including over-the-counter cold remedies and decongestants. People with hypertension should have their blood pressure controlled adequately before undergoing surgery. Severe bruising and swelling can impair a successful result and cause additional scar tissue to form. Excessive bleeding and swelling of an extremely severe nature could conceivably cause loss of vision.

5. LOSS OF VISION

We have not had a single patient who has lost any vision at all as a result of orbital decompression. However, any time there is surgery around the eye, especially in the orbit behind the eye, there is always a risk of vision loss.

6. SINUS BLOCKAGE

Orbital decompression is an operation that essentially borrows part of the sinuses to allow the eye to settle into a more normal position. Sinus decongestants are used before, during and after surgery to minimize sinus swelling and optimize sinus drainage. Patients who already have a tendency to develop sinus blockage may experience sinus obstruction after orbital decompression. These patients, and there is no reliable way to predict which patients, can develop sinus problems even years later. Therefore, in order to avoid such problems, a surgical sinus drainage procedure is performed at the time of orbital decompression using an endoscope (microscope) through the nose, in most cases.

7. NEED FOR ADDITIONAL EYELID SURGERY OR EYE MUSCLE SURGERY

After a patient has passed into the "inactive" phase of their thyroid eye disease, there are three groups of surgical reconstructive procedures which can be offered to reverse the destructive effects of this disease.

The first is orbital decompression. (1, 2, 3, or 4 wall decompression, with or without fat resection) when necessary. These procedures must be performed first, as changing the position of the eye may

alter the functions of the eye muscles and change the relative positions of the eyelids.

Second, in patients with double vision, adjustments can be made to the eye muscles after orbital rearrangement, but before any eyelid corrections.

Finally, many patients with thyroid eye disease have some degree of eye protrusion and eyelid retraction. After orbital decompression, the eye does settle backward and slightly downward so that there is often a marked improvement in the lower eyelid position. The upper eyelids, however, in most cases, continue to "hang up" and require surgery to loosen them. In general, eyelid surgery can be done as an outpatient under local-sedated anesthesia.

Thyroid eye disease and its treatments are very complicated, but it is important for you to understand as much as you can about your disease. If you have any further questions about thyroid eye disease, its treatment, or your options, please be sure to ask. We are also happy to supply the names of other experienced physicians if you desire another opinion. The more informed you are, the more you are able to make important decisions about your care, and the better you will feel about your disease and its treatment.