



## GRAVES' DISEASE & THYROID FOUNDATION

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### Graves' Ophthalmopathy & Radiation Therapy by Harvey Wolkov, M.D.

The ophthalmopathy or eye changes associated with thyroid disease are most often associated with the thyroid hyperfunction accompanying Graves' disease. However, it occasionally may occur in patients with Hashimoto's thyroiditis and even in patients without any known thyroid disease.

The severity of eye problems often times, does not parallel the clinical course of the thyroid disease or the laboratory findings associated with thyroid function. Some patients with severe thyroid disease have no eye involvement, whereas in others, eye changes develop while they have a normal functional thyroid. The eye changes may precede, accompany, or follow the thyrotoxic state. In a significant proportion of patients, the condition appears to be precipitated by both radioactive iodine treatment or surgical removal of the thyroid. There is no satisfactory method of predicting the outcome or

severity of the disease in an individual patient. Eye findings in younger individuals are usually limited to mild symptoms and proptosis or bulging of the eyeball. More severe ophthalmopathy may cause disabling symptoms or serious disability, but usually this occurs in persons over age 40.

The clinical findings of ophthalmopathy offer puzzling variations. They may be unilateral, bilateral, symmetric, or asymmetric. Occasionally, a unilateral ophthalmopathy precedes bilateral involvement. Clinical manifestations vary greatly in degree or number from patient to patient, and even in the same patient over time. They include proptosis, swelling of the periorbital tissues, redness of the eyes, impairment of eye movement, abrasions, and optic nerve damage.

Accompanying eye symptoms may include excessive eye tearing and sensitivity to light; burning, gritty, or

pulling sensations; double vision, pain because of abrasion, and loss of visual acuity. Severe eye involvement probably occurs in no more than 2% to 10% of patients with Graves' disease but is more frequent in older individuals.

In Graves' ophthalmopathy, the extraocular muscles bear the brunt of the disease, becoming enlarged, firm and rubbery, and resistant to passive stretching. The muscle volume may be increased 8 to 10 times normal size. This increased muscle volume causes forward displacement of the eyeball, resulting in proptosis.

Microscopically, the most dramatic changes seen are edema (swelling) and a marked inflammatory (lymphocytic) infiltrate. Occasionally, the inflammatory cells are distributed throughout the extraocular muscle. With time, scarring and shortening of the eye muscles may occur.

It is often unnecessary to prescribe any treatment for patients with mild eye problems, because frequently these problems resolve spontaneously over a period of several months. Symptoms such as increased sensitivity to light may be reduced by wearing tinted glasses. If burning of the eyes develops, eye drops can be very helpful. However, before your physician prescribes any local treatment, it is important to ascertain that there are no abrasions of the eye since the symptomatic relief afforded by local treatment may allow ulcerations to develop unnoticed.

Progression of eye symptoms to a more severe state generally is an indication for your physician to begin oral steroid treatment or radiotherapy. Prednisone in low doses is usually effective, however, it is usually necessary to continue the drug for many months in order to completely control the symptoms. Not infrequently, it proves difficult to remove a patient from steroid therapy without the recurrence of symptoms. When relapse occurs, reinstatement of higher-dose steroids is usually necessary. When intolerance to steroids develops, radiation therapy is often suggested. Radiation therapy involves the delivery of a high energy x-ray beam, generated by a linear

accelerator, directed at the eye muscles. A total of approximately 2000 cGy in ten treatments is usually given over a 2-week period. Both the left and right eye muscles are treated. If, during the treatment, a marked reduction in proptosis occurs, it may be necessary to readjust or realign the treatment field. A small tattoo mark is placed on the skin just lateral to each eye to mark the anterior limit of the field. It is important to have a thorough eye examination prior to starting radiotherapy. Since most of the patients with Graves' ophthalmopathy are over age 40, and many are over age 60, it is especially important to determine if a cataract is already present so that its influence in causing impairment of vision may be known beforehand. Cataract is not a contraindication to radiation therapy treatment, but one would not want any loss of vision occurring late in the follow-up period to be falsely ascribed to radiation therapy.

The radiation therapy program is well-tolerated by all patients. A transient moderate swelling around the tissues of the eye may be observed during the first week in some patients. In some instances, objective and subjective improvements occur during the two-week treatment period, usually continuing for weeks or months afterwards. In others,

improvement occurs more slowly and manifests only weeks or months after treatment is completed. The results obtained with radiation therapy, or the combination of radiotherapy and corrective eye surgery is very effective in reversing or arresting the progress of Graves' ophthalmopathy. The treatment has been especially effective in those with soft tissue signs and visual acuity loss. It tends to result in reduced intraocular tension (pressure within the eye), avoids the side effects of steroid therapy, and relapses after initial improvement have been rare. Orbital radiotherapy can result in improvement in signs and symptoms of Graves' ophthalmopathy in the majority of patients. For the remainder of patients, the disease manifestations can be stabilized to allow functional surgical correction.

*Used with permission of the author Harvey B. Wolkov, M.D., Director, Radiation Oncology Center, Sutter Community Hospitals, Sacramento, California and Associate Clinical Professor of Surgery, University of California at Davis*

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