Graves Disease: A Patient Story

About four months ago, Sally decided to visit her GP for a check up. She noticed that she had lost a few kilos, was feeling sluggish in the mornings, and just didn't have her usual amount of energy.

Sally's doctor asked if there was a history of thyroid problems in her family. There was, on both sides, but up until now her thyroid was fine. She had it checked last February, and her thyroid hormone levels were within the normal range. This time, however, her thyroid levels had come back very high and Sally's doctor recommended that she see an endocrinologist as soon as possible. Sally's doctor diagnosed her with hyperthyroidism and suspected the cause was Graves Disease.

Sally left her doctor's office and did what most people would do; she went online and Googled "Graves Disease." She learned that Graves' disease is an autoimmune disorder that results in the overproduction of thyroid hormones. Graves' disease is caused by a malfunction in the body's disease-fighting immune system, although the exact reason why this happens is still unknown. One normal immune system response is the production of antibodies designed to target a specific virus, bacterium or other foreign substance. In Graves' disease — for reasons that aren't well understood — the body produces an antibody to one part of the cells in the thyroid gland, a hormone-producing gland in the neck.

Normally, thyroid function is regulated by a hormone released by a tiny gland at the base of the brain (pituitary gland). The antibody associated with Graves' disease — thyrotropin receptor antibody (TRAb) — acts like the regulatory pituitary hormone. That means that TRAb overrides the normal regulation of the thyroid, causing an overproduction of thyroid hormones (hyperthyroidism). Although a number of disorders may result in hyperthyroidism, Graves' disease is a common cause.

Signs and Symptoms

Because thyroid hormones affect a number of different body systems, the signs and symptoms associated with Graves' disease can be wide-ranging and significantly influence one's overall well-being. Although Graves' disease may affect anyone, it's more common among women and before the age of 40.

Common signs and symptoms of Graves' disease include:

- Weight loss without dieting
- Trouble sleeping
- Fatigue or muscle weakness
- Anxiety and irritability
- A fine tremor of hands or fingers
- Heat sensitivity or increase in perspiration
- Rapid or irregular heartbeat (palpitations)
- Enlargement of thyroid gland (goiter)
- Lighter or less frequent menstrual periods
- Erectile dysfunction or reduced libido
- Frequent bowel movements
- Bulging eyes (Graves' ophthalmopathy)
- Thick, red skin usually on the shins or tops of the feet (Graves' dermopathy)

About 30 percent of people with Graves' disease show some signs and symptoms of a condition known as Graves' ophthalmopathy. In Graves' ophthalmopathy, inflammation and other immune system events affect muscles and other tissues around your eyes. The resulting signs and symptoms may include:

- Bulging eyes (exophthalmos)
- Gritty sensation in the eyes
- Pressure or pain in the eyes
- Puffy or retracted eyelids
- Reddened or inflamed eyes
- Light sensitivity
- Double vision
- Vision loss

Testing and Diagnosis

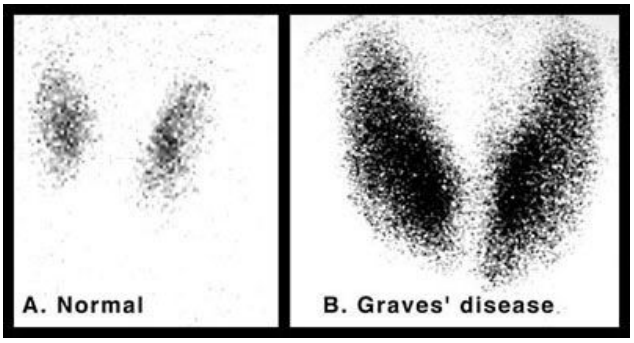
Sally went to visit an endocrinologist, who performed the following tests:

Physical exam - Sally's doctor checked her neck to see if her thyroid gland was enlarged. Because Graves' disease increases your metabolism, her doctor also checked her pulse and blood pressure and look for signs of tremor (e.g. in the hands or fingers).

Blood test - Sally's doctor ordered blood tests to determine her levels of thyroid-stimulating hormone (TSH), the pituitary hormone that normally stimulates the thyroid gland, as well as levels of thyroid hormones. People with Graves' disease usually have lower than

normal levels of TSH and higher levels of thyroid hormones.

Radioactive iodine uptake - Your body needs iodine to make thyroid hormones. By giving Sally a small amount of radioactive iodine and later measuring the amount of it in her thyroid gland with a specialized scanning camera, her doctor could determine the rate at which her thyroid gland takes up iodine. The amount of radioactive iodine taken up by the thyroid gland helps determine if Graves' disease or another condition is the cause of the hyperthyroidism. This test may be combined with a radioactive iodine scan to show a visual image of the uptake pattern.



Other testing options include:

Ultrasound - Ultrasound uses high-frequency sound waves to produce images of structures inside the body. Ultrasound can show if the thyroid gland is enlarged, and is most useful in people who can't undergo radioactive iodine uptake, such as pregnant women.

Imaging tests - If the diagnosis of Graves' ophthalmopathy isn't clear from a clinical assessment, your doctor may order an imaging test, such as CT scan, a specialized X-ray technology that produces thin cross-sectional images. Magnetic resonance imaging (MRI), which uses magnetic fields and radio waves to create either cross-sectional or 3-D images, may also be used.

Treatment

Sally's tests confirmed her diagnosis of Grave's disease. The treatment goals for Graves' disease are to inhibit the production of thyroid hormones and to block the effect of the hormones on the body. Some treatments include:

Radioactive iodine therapy - With this therapy, you take radioactive iodine, or radioiodine, by mouth. Because the thyroid needs iodine to produce hormones, the radioiodine goes into the thyroid cells and the radioactivity destroys the overactive thyroid cells over time. This causes your thyroid gland to shrink, and symptoms lessen gradually, usually over several weeks to several months. Radioiodine therapy may increase your risk of new or worsened symptoms of Graves' ophthalmopathy. This side effect is usually mild and temporary, but the therapy may not be recommended if you already have moderate to severe eye problems. Other side effects may include tenderness in the neck and a temporary increase in thyroid hormones. Radioiodine therapy isn't used for treating pregnant or nursing women. Because this treatment causes thyroid activity to decline, you'll likely need treatment later to supply your body with normal amounts of thyroid hormones.

Anti-thyroid medications - Anti-thyroid medications interfere with the thyroid's use of iodine to produce hormones. These prescription medications include propylthiouracil and methimazole (Tapazole). Anti-thyroid drugs may also be used before or after radioiodine therapy as a supplemental treatment. Side effects of both drugs include rash, joint pain, liver failure or a decrease in disease-fighting white blood cells. Methimazole isn't used to treat pregnant women in the first trimester because of the slight risk of birth defects. Therefore, propylthiouracil is the preferred anti-thyroid drug during the first trimester for pregnant women.

Beta blockers - These medications don't inhibit the production of thyroid hormones, but they do block the effect of hormones on the body. They may provide fairly rapid relief of irregular heartbeats, tremors, anxiety or irritability, heat intolerance, sweating, diarrhea, and muscle weakness. Beta blockers include: Propranolol (Inderal), Atenolol (Tenormin), Metoprolol (Lopressor, Toprol-XL), and Nadolol (Corgard). Beta blockers aren't often prescribed for people with asthma, because the drugs may trigger an asthma attack. These drugs may also complicate management of diabetes.

Surgery - Surgery to remove all or part of your thyroid (thyroidectomy or subtotal thyroidectomy) is also an option for the treatment of Graves' disease. After the surgery, you'll likely need treatment to supply your body with normal amounts of thyroid hormones. Risks of this surgery include potential damage to your vocal cords and the tiny glands located adjacent to your thyroid gland (parathyroid glands). Your parathyroid glands produce a hormone that controls the level of calcium in your blood. Complications are rare under the care of a surgeon experienced in thyroid surgery.

Sally chose to keep her thyroid intact, and opted for the anti-thyroid medication option. Since initiating her treatment, her thyroid's hormone secretion has gradually began to drop. Sally return has returned to her endocrinologist for regular checkups every six months, and her TSH levels have remained steady at around 1 μU/ml (well within the normal range of 0.3 to 3 μU/ml).