

## Chapter 51

# SURGICAL THERAPY FOR THYROTOXICOSIS

*Part of "Chapter 51 - TREATMENT OF THYROTOXICOSIS"*

Subtotal thyroidectomy is the oldest form of therapy for thyrotoxicosis. Although the Nobel Prize was awarded to Kocher in 1909 for his innovations in thyroid surgery, it was not until the introduction of iodide, and later antithyroid drugs, as preparation for surgery that the risks of surgery for patients with thyrotoxicosis became acceptable. Although surgery represented the only form of therapy for many decades, nowadays it is performed only in special circumstances: children, adolescents, and pregnant women who are allergic to or noncompliant with antithyroid drugs, patients with large goiters or severe ophthalmopathy (290), and patients who prefer destructive therapy but are apprehensive about radioiodine therapy (291).

Subtotal thyroidectomy usually is defined as removal of most of the thyroid gland, leaving a few grams of the posterior side of each lobe (292). Although the mortality of subtotal thyroidectomy now is close to zero (292,293,294), two worrisome complications of surgery can occur, albeit rarely (1%–2%), even in the most expert hands: recurrent laryngeal nerve damage and hypoparathyroidism. Either can result in lifelong disability. Other complications, all rare, are transient hypocalcemia, postoperative bleeding, wound infection, and formation of keloids or otherwise unsightly scars. Although the skill of the surgeon is of paramount importance in avoiding perioperative morbidity (295), the number of surgeons experienced in performing subtotal thyroidectomy has decreased as other therapies increasingly dominate the treatment of thyrotoxicosis.

Hypothyroidism occurs in the first year after surgery in 12% to 80% of patients (291,296,297), with late-onset hypothyroidism in an additional 1% to 3% per year (296), possibly reflecting the natural history of Graves' disease. The development of hypothyroidism depends on a number of factors, most importantly the size of the thyroid remnant, but also the presence of antithyroid antibodies, perhaps reflecting autoimmune destruction of the remnant (298), and the duration of follow-up. In addition, 5% to 15% of patients have recurrent thyrotoxicosis (292,293,299,300). It is more common in patients who before treatment have high serum TSHR-Ab concentrations (301) and severe eye involvement (302); such patients should therefore have a total rather than a subtotal thyroidectomy. The recurrences may develop many years after surgery; in one study, 43% developed more than 5 years after surgery (303). Radioiodine is the treatment of choice for patients who have recurrent thyrotoxicosis after subtotal thyroidectomy.

Preoperative treatment has changed in recent years. Although an antithyroid drug in combination with iodide was standard therapy for several decades, many now recommend a  $\beta$ -adrenergic antagonist drug, with or without iodide (188,297,304). The latter regimen allows surgery to be performed sooner rather than later because it has been customary to give the antithyroid drug until the patient is euthyroid, which may take 4 to 6 weeks, and then give iodide for 10 to 14 more days before surgery. The propranolol (or similar drug) regimens consist of treatment for several weeks with doses sufficient to lower the resting

pulse rate to less than 80 beats/min, then surgery or administration of iodide for 10 to 14 days and then surgery. Patients treated with propranolol are not clinically or biochemically euthyroid when they undergo surgery, even if they are also treated with iodide (305), and may still have high serum T<sub>4</sub> concentrations and require continued propranolol therapy postoperatively. Furthermore, patients treated in this way have more postoperative problems (e.g., fever and tachycardia), especially those with severe thyrotoxicosis (304,305,306). Therefore, unless surgery must be performed quickly for some reason, it seems wiser to treat patients who are to undergo surgery in the traditional manner with an antithyroid drug and then iodide. If surgery must be performed

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urgently, preparation for 5 days with a  $\beta$ -adrenergic antagonist (propranolol 40 mg every 6 hours), high-dose glucocorticoids (betamethasone 0.5 mg every 6 hours), and sodium iopanoate (500 mg every 6 hours) has been reported to be safe and effective (202).

The addition of iodide (one to three drops of SSKI daily) to the traditional antithyroid drug regimen 10 days before surgery is controversial because of the lack of convincing evidence that it decreases blood loss during surgery (187), despite studies demonstrating a decrease in thyroid blood flow (186,307). Nevertheless, it is a commonly recommended practice (292). Even if it does not affect blood loss, its antithyroid action is helpful.

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