

Surgical treatment for Graves' disease

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Background

Graves' disease (GD) is the most common cause of hyperthyroidism. It accounts for 60 to 80% of all cases of hyperthyroidism and has a female preponderance.¹ Approximately 3% of women and 0.5% of men are at risk of GD in their lifetime.² It is caused by the presence of auto-antibodies against the thyroid-stimulating hormone receptor (TSHR) leading to hyperplasia and hypertrophy of the thyroid follicles, resulting in manifestations of hyperthyroidism, ophthalmopathy, and dermopathy.¹ GD is mostly diagnosed clinically. In addition to elevated levels of free T4, triiodothyronine, and suppressed TSHR levels, patients tend to have a symmetrically enlarged goitre with or without ophthalmopathy. In patients with less typical manifestations, the presence of elevated TSHR auto-antibodies (TRAb) and diffuse radioactive iodine uptake may aid in the diagnosis.^{1,3}

Anti-thyroid medications, radioactive iodine, and surgery are common treatment modalities for GD. Nonetheless, the optimal treatment remains controversial and the choice varies between different institutions and countries. A survey focusing on clinical practice patterns in different parts of the world reported that radioactive iodine was the preferred treatment in North America, with over half of patients taking it as first-line treatment, while anti-thyroid medication was the preferred first-line treatment in most parts of Europe and Asia.^{4,5} In Hong Kong, GD patients are often initially managed with anti-thyroid medication for up to 18-20 months. When the disease relapses or the patient could no longer tolerate anti-thyroid medication, radioactive iodine or surgery is offered.⁶

In certain clinical circumstances, surgery is the preferred first-line treatment for GD. Examples include those hoping to become pregnant within 6 months and those suspected

of having suspicious or malignant thyroid nodules or local compressive symptoms.^{2,3,6,7} Incidental thyroid carcinoma in the thyroid specimen is not uncommon with an incidence of 4-10%.⁸⁻¹⁰ Surgery enables a rapid resolution of hyperthyroidism, while anti-thyroid medications and radioactive iodine may take up to 6-12 weeks.¹

Some patients with GD have extrathyroidal manifestations. Graves' ophthalmopathy is one of the most clinically apparent manifestations and affects approximately 25% of all patients with GD.² It may worsen diplopia and optic neuropathy.¹ Some consider its presence an indication for surgery because radioactive iodine tends to worsen its severity at least initially. Surgery enables a gradual decrease in serum TRAb, while radioiodine iodine tends to cause an initial surge of TRAb.¹¹ Randomized controlled trials and systemic reviews suggest a higher risk of new-onset or further worsening of pre-existing Graves' ophthalmopathy after radioactive iodine.¹²⁻¹⁴ Therefore, prophylactic corticosteroid is often given before the administration of radioactive iodine.¹⁴

Surgery for Graves' disease

Subtotal thyroidectomy were widely advocated and practiced until the 1990s.³ For subtotal thyroidectomy, a large thyroid remnant (up to 10g) is usually left on one or both sides of the thyroid bed with an aim to maintain euthyroidism without the need for thyroxine replacement. Nonetheless, euthyroidism is usually not achievable in the long term for most patients. In a meta-analysis of western populations, only 60% of patients who underwent subtotal thyroidectomy achieved euthyroidism after a mean follow-up of 5.6 years.⁸ For Asians, 72% of patients who underwent subtotal thyroidectomy required thyroxine replacement eventually.^{15,16} Therefore, total thyroidectomy is usually the preferred choice, because it is associated with almost no chance of disease relapse and is comparable with subtotal

thyroidectomy in terms of morbidities when performed in experienced hands. One study even reported less blood loss in total thyroidectomy.¹⁵ The rate of permanent recurrent laryngeal nerve palsy is comparable in total and subtotal thyroidectomy.^{8-10,17,18} The major drawback of total thyroidectomy is the slightly higher risk of postoperative temporary and permanent hypoparathyroidism.^{6,9} As a result, both the updated American Thyroid Association and the American Association of Clinical Endocrinologists recommend total or near-total thyroidectomy (<2g remnant) as the surgery of choice for GD.¹⁹ In our hospital, since the adoption of total over subtotal thyroidectomy in 2000, the rate of complications has remained acceptably low.⁶ In addition, total thyroidectomy decreases the rates of failure

and recurrence and complications associated with re-operation. It is considered a cost-effective treatment when medical treatment fails.²⁰

Conclusions

In Hong Kong, surgery or thyroidectomy is usually reserved for patients with a GD relapse following 18 months or longer prescription of anti-thyroid medications. It is recommended as first-line treatment when a rapid resolution of thyrotoxic symptoms is desired, in those with suspected thyroid malignancy, or in the presence of local compressive symptoms. Total thyroidectomy is preferred over partial or subtotal thyroidectomy.

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