Available online at www.sciencerepository.org

Science Repository

Review Article

The Place of Surgery in Thyroidal Autoimmune Conditions

***Avgoustou Constantinos*[1*] *and Avgoustou Eirini*[2]**

[1]*Surgical Department, General Hospital of Nea Ionia Constantopoulion - Patission "Aghia Olga", Athens, Greece*
[2]*Pathological Department, General Hospital of Athens "G. Gennimatas", Athens, Greece*

ARTICLE INFO

Article history:
Received: 4 February, 2021
Accepted: 19 February, 2021
Published: 6 March, 2021

Keywords:
Autoimmune thyroid disease
Hashimoto's thyroiditis
Graves' disease
total thyroidectomy

ABSTRACT

The two most common autoimmune conditions of the thyroid gland, Hashimoto's thyroiditis (HT) and Graves' disease (GD) are the frequent causes of inflammation of the thyroid, with major consequences in the function of the organ, which is substantially disturbed in the prolonged disease. Although medical treatment is always the primary and mostly the unique consideration for the treatment of both diseases, there are certain indications that make surgery inevitable and essential to their management.

Introduction

The two major and most common autoimmune conditions of the thyroid gland, the chronic lymphocytic thyroiditis or Hashimoto's thyroiditis (HT) and the toxic diffuse goiter or Graves' disease (GD), can be treated either medically in most cases or surgically in certain symptomatic situations.

HT- the most common cause of hypothyroidism (20% in patients with HT) - starts with infiltration of lymphocytic cells causing atrophy of follicular cells, and it is characterized by the presence of specific antithyroid antibodies and the TSH stimulation blocking antibody (TSBAb) [1]. GD – the most common cause of hyperthyroidism (in 80% of hyperthyroid patients) – is characterized by the presence of thyrotropin receptor antibodies (TRAb), which stimulate TSH receptors to synthesize excessive thyroxin [2]. In developed countries, approximately 50 people per 100000 are diagnosed for each disease every year, with women being affected in a much higher incidence compared to men. Both diseases are diagnosed clinically, biochemically, and radiographically. Symptoms and signs consistent with overt hypothyroidism or subclinical/overt hyperthyroidism may present in HT and GD, respectively. Enlarged goiter may or may not be the case, but the gland is usually firm or tender in HT and "spongy" in GD; prolonged GD cases are accompanied by exophthalmos/ocular dysmotility.

Laboratory workup reveals elevated TSH value, decreased T4, and pronounced presence of antibodies to thyroid peroxidase (anti-TPO) and thyroglobulin (anti-TG), as well as TSBAb, in HT cases; GD cases have undetectable TSH (screening tests), high T3/free T4, presence of anti-TRAb, and also frequently detectable antibodies anti-TPO and, less commonly, anti-TG. Ultrasonography may indicate diffuse or nodular type in HT cases, heterogeneity, hypervascularity and enlargement in GD cases. Thyroid scan shows rather homogenously increased radioactive iodine uptake in GD cases; it can be used in differential diagnosis from toxic multinodular goiter and toxic adenoma. Finally, fine needle aspiration biopsy (FNAB) cytology-histology has a place for nodules of both diseases, especially in HT. Thus, suspicious nodules require biopsy, although it can be challenging to distinguish HT in particular from Hürthle cell changes, papillary thyroid carcinoma (PTC), follicular neoplasm or thyroid lymphoma. Importantly, HT patients have an approximately 80 times higher risk of developing coexistent thyroid lymphoma, while patients with PTC (and its follicular variant) have associated HT in a percentage up to 43%, and patients with nodular HT have up to 58% increased risk of developing a higher stage PTC at diagnosis [1]. The close relationship between HT and PTC lends credency to the hypothesis that autoimmune thyroiditis is a predisposing

[*]*Correspondence to: Avgoustou Constantinos, General Surgeon, Director of Surgery, Surgical Department, General Hospital of Nea Ionia Constantopoulion – Patission "Aghia Olga", Ploutarchou Street, 13, Gerakas Attikis, 15344, Athens, Greece; Tel: +306977218339; E-mail: avgoustouk@yahoo.gr*

http://dx.doi.org/10.31487/j.SCR.2021.03.04

factor to the development of thyroid carcinoma (genetic predisposition? pathobiological link through the expression of p63 protein?).

As far as treatment is concerned, medical therapy for HT associated with hypothyroidism (thyroxin supplementation) or for GD (antithyroid drugs: ATDs, radioactive iodine: RAI) consists of the first-line and basic treatment. However, medically induced hormonal changes with the thyroid gland in situ carry long-term risks, while clear contraindications to each medical treatment may also exist or appear in the course of the disease, or medical treatments may fail in the long term. Besides, proper medical treatment as preparation before any surgical treatment is essential for both HT (i.e. correction of hypothyroidism) and GD (i.e. restoring euthyroid state for 6-7 weeks using ATDs and beta-blockers or assuring an urgent preparation of 7 days using combination of corticosteroids, sodium iopanoate, and if possible, propylthiouracil and methimazole). Medical treatment is not the major concern of this report.

The ideal therapeutic agent for these two thyroidopathies should offer: (1) prompt and permanent control of disease manifestations; (2) restoration of euthyroid state and easy maintenance of it; (3) treatment of coexistent/accidental malignancy; (4) avoidance of significant side effects/induced reactions, and even preclusion of future oncogenesis; (5) safe and effective treatment of certain circumstances; (6) minimal morbidity with no mortality; and (7) reasonable cost. All, or nearly all, goals mentioned above are gained after the total removal of the diseased thyroid gland, namely performing a total thyroidectomy (TT). The common indications for TT for HT are: (1) confirmed malignancy or presence of highly suspicious nodule; (2) compressive symptoms (20% of patients- with or without gland enlargement) and cervical pain; and (3) inability to regulate thyroid function medically. Importantly, once malignancy is confirmed in patients with HT, TT is recommended for the high risk of multicentricity (13.5-44% of cases), difficulty in accurate imaging, and low accuracy of FNAB surveillance. Notably, the (central) cervical lymph-node invasion has a reported rate of 10.8-49% in cases of HT associated with PTC, and thus, a therapeutic (central compartment) node dissection is generally recommended as a complement to the TT in patients with clinically node-positive PTC [1].

The common indications for TT for GD are: (1) severe progression of Graves' ophthalmopathy (both ATDs and RAI may aggravate the eye disease); (2) medical treatment relapse; (3) inability to tolerate ATDs or RAI treatment (i.e. pregnant women who have failed ATD therapy in whom RAI is contraindicated, elderly in whom RAI can precipitate acute reactions resulting in respiratory distress); (4) compressive symptoms due to gland enlargement, coexistent secondary substernal goiter either compressive or not; (5) confirmed malignancy or presence of indeterminant nodules (up to 20% malignancy risk in cold nodules); and rarely, (6) juvenile hyperthyroidism or coexisting hyperparathyroidism. Furthermore, surgery avoids the potential complications of ATDs and RAI, as well as the toxicity of steroids. Surgery may not only stabilize but even improve the eye disease (in 75% of cases); it removes completely the abnormal thyroid antigens that are the stimulus for damage to the extraocular muscles and the optic nerve. In addition, radiation therapy carries an increased risk of developing benign thyroid tumors and transformation to more aggressive cancers in young patients. It is also emphasized for the secondary substernal goiters, that, since a long history of having a large multinodular goiter precludes neither future hyperfunction and malignancy, nor complications such as tracheal and esophageal compression, surgery is always recommended [2].

A difficult TT and longer operative times may be anticipated because of the presence of the dense fibrotic changes and firm adhesions (HT) or the hypervascularity and tissue friability (GD). A thorough discussion of the pros and cons weighed against the severity of symptoms and the medical treatments used so far should precede any schedule for operative intervention. However, the major concern is that surgery should be performed by a well-trained and experienced thyroid surgeon at a high-volume center. The most important surgical risks of TT in patients of both diseases correlate with surgical experience, and they are similar: (1) recurrent laryngeal nerve injury, 0.8-5% in HT, 0-4% in GD; (2) transient hypoparathyroidism, 20-40% in both diseases (symptoms of hypocalcaemia in GD cases may not occur for several days), permanent hypoparathyroidism at less than 2% in GD; (3) postoperative hematoma with devastating consequences, less than 2% in GD.

Following TT, nearly all patients of both diseases have complete or substantial relief of symptoms. There is a special need after surgery to evaluate transient hypocalcaemia through laboratory testing, and properly treat cases with symptoms. With TT, ATDs are stopped immediately, whereas beta-blocking drugs usually may be tapered off during the first two weeks after surgery in GD patients rendered euthyroid before surgery. The total removal of the thyroid gland facilitates the life-long thyroid hormone replacement to a physiologic steady-state and the disease surveillance. Unless there is evidence or high suspicion for malignancy, the thyroxin replacement should be started the day after surgery (HT patients, GD patients well-blocked before surgery) or once the patient becomes euthyroid (GD); alternatively, waiting for the final histology, a T3 preparation may be administered initially.

Conclusion

Surgery, namely total thyroidectomy, is safe and effective as an option for the treatment of certain cases of Hashimoto's thyroiditis or Graves' disease under specific indications.

Conflicts of Interest

None.

REFERENCES

1. Avgoustou C, Avgoustou E (2017) Coexistence of Hashimoto's thyroiditis and papillary thyroid carcinoma. *Hellenic J Surg* 89: 73-78.
2. Elfenbein DM, Schneider DF, Havlena J, Chen H, Sippel RS (2015) Clinical and socioeconomic factors influence treatment decisions in Graves' disease. *Ann Surg Oncol* 22: 1196-1199. [Crossref]