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Brief Communication

Extent of Surgery for Differentiated Thyroid Cancer: Recommended Guideline

Ganiyu A. Rahman

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Introduction

Cancer is a major public health problem in many parts of the world.[1] Thyroid cancer is one of the least deadly cancers. The 5-year survival rate for all thyroid cancer is about 97%. Thyroid cancer is different from many other adult cancers in that it is commonly diagnosed in young people. Nearly 2 of 3 cases are found in people between the age of 20 and 55.[2]

The age–and gender-adjusted incidence of thyroid cancer has increased faster than that of any other malignancy in recent years. The American cancer Society in recent estimate for thyroid cancer in the United States (2010) showed that about 44, 670 new cases of thyroid cancer will occur (33,930 in women and 10,740 in men). Thyroid cancer will cause about 1, 690 deaths (960 women and 730 men).[3]

Over the past three decades, the incidence of thyroid cancer (TC) has significantly increased worldwide, rising from a rate of 3.6 /100,000 in 1973 to 8.7/100,000 in 2002, without any change in the mortality rate.[4] The increase is almost exclusively due to a rise in papillary cancer rates, this being attributed to both environmental radiation and increased diagnostic scrutiny.[5] In areas which have not been afflicted by nuclear fallout, the annual incidence of TC ranges from 2.0 to 3.8/100,000 in women and from 1.2 to 2.6/100,000 in men.[6]

Significant differences in TC incidence have been reported among various regions, with Hawaii, the Philippines and Iceland presenting the greatest incidence worldwide. This phenomenon possibly suggests that common environmental influences in these regions may be responsible for the strikingly high rates.[7,8]

The aim of this communication is to highlight the guideline for surgical treatment of well differentiated thyroid cancer.

Classification and Pathology

Thyroid cancer can arise from epithelial and non-epithelial tissue. Thyroid follicular epithelial-derived cancers are: papillary, follicular and anaplastic. Other malignant diseases of the thyroid include medullary thyroid cancer, primary lymphoma, sarcomas and metastases to the thyroid gland.

Papillary and follicular cancers are considered differentiated cancer. Papillary carcinoma is more common but in population with low dietary iodine intake, follicular and anaplastic predominate.[9]

Surgical Treatment

As in the management of other cancers, once the diagnosis of differentiated thyroid cancer is established, several treatment options may be considered such as surgery, radioiodine therapy, external beam radiation and thyroid hormone suppression.

The treatment depends on the patient's age, the extent of the disease and the co-morbid conditions. Evidence-based guidelines published by the American Thyroid Association (ATA) in 2009 [10] for management of thyroid cancer provide recommendation for choice of therapy. This is in addition to those of National Comprehensive Cancer Network (NCCN),[11] and European consensus group (ECG).[12] Surgery is the main stay of treatment for differentiated thyroid cancer. This can be total thyroidectomy, near total thyroidectomy and unilateral lobectomy and isthmusectomy. Though the primary therapy for differentiated thyroid cancer is surgery, there is controversy about how much of thyroid tissue should be removed. It is difficult to conclude on optimal operation since there are no prospective randomized clinical trials.

The aim of surgery in differentiated thyroid carcinoma is to eradicate all tumour foci, cure the most number of patients, reduce recurrence and mortality rate and provide good quality life. Increasing body evidence suggests that most patients with differentiated thyroid cancer are best served by total (or near total) thyroidectomy, followed by radioiodine therapy for any remaining thyroid tissue and/ or microscopic foci.

Total thyroidectomy is complete removal of the thyroid gland while near total thyroidectomy is similar to total thyroidectomy with preservation of the posterior thyroid capsule of the lobe contralateral to the thyroid tumor. This is in contradistinction from unilateral lobectomy and isthmusectomy in which the contralateral lobe is left in-situ. It has been generally agreed that subtotal thyroidectomy in which several grams of thyroid tissue are preserved bilaterally, is adequate not just because of high recurrence rate but also because of high complication rate if subsequent surgery is required.[13,14,15]

Ganiyu A. Rahman ✉
Department of Surgery, College of Medicine, King Khalid University/ Asir Central Hospital, Abha, Kingdom of Saudi Arabia.
Email: garahman1@yahoo.com

Total thyroidectomy is recommended for most patients with thyroid cancer for the following reasons:

1. Foci of papillary cancer are found in both lobes in up to 36 to 85 percent.[16, 17, 18, 19]
2. Between 5 and 10 percent of recurrences of thyroid cancer are in the contralateral lobe.[20]
3. One-half of the patients who die from recurrent thyroid cancer die from complications of central neck recurrence.[19]
4. Radioiodine ablation of thyroid bed remnant and treatment of metastatic disease is facilitated by resection of as much thyroid tissue as possible.
5. The specificity of measurements of serum thyroglobulin as a tumor marker is facilitated by removal of nearly all normal thyroid tissue.
6. During follow up, ultrasonography (US) often identifies nonspecific abnormalities in the remaining contralateral lobe that is a source of concern to both the clinician and the patient. While only minorities of these US-detected abnormalities prove to be thyroid cancer, they usually lead to additional testing and often additional surgery.

The benefit of total or near total thyroidectomy is further supported by publication of results from the National Thyroid Cancer Treatment Cooperative Study Group (NTCTCG) in 2006.[21] Additional data from the 2009 NTCTCG showed a lower recurrence rate in patients with multifocal microscopic papillary cancer who had total or near total thyroidectomy.[22] Proponent of unilateral lobectomy and isthmusectomy argue in support of this procedure because of absence of a survival benefit with total thyroidectomy, [23] and fewer complications with unilateral surgery.[24]

With the current information it can be concluded that total thyroidectomy is recommended if primary tumor is 1.0cm in diameter or greater, there is extra thyroidal extension of tumor or there are metastases. It is also the operation of choice in all patients with thyroid cancer as a result of exposure to ionizing radiation of the head and neck.[25] Total thyroidectomy, however, requires the services of an experienced thyroid surgeon to minimize complications. If an experienced thyroid surgeon is not available, patient should be referred elsewhere or a near total thyroidectomy should be preferred. If the tumor is less than 1.0cm in diameter and confined to one lobe of the gland, unilateral lobectomy and isthmusectomy is acceptable because 30 year survival rate approaches 100 percent.[26]

Since papillary thyroid carcinoma commonly metastases to the cervical lymph nodes, neck dissection is part of the surgical treatment. The role of prophylactic neck dissection for well differentiated thyroid cancer remains controversial. It is however generally agreed that therapeutic neck dissection should be performed in patients with papillary thyroid cancer who have visibly involved nodes.[10,14] The lymph nodes can be palpated clinically; nonpalpable metastatic nodes in up to 20 percent of patients can be preoperatively diagnosed using ultrasound. This can be useful in taking a decision on the need for therapeutic neck dissection.

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