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SOLITARY THYROID NODULE: THE RISK OF CANCER AND THE EXTENT OF SURGICAL THERAPY

G. A. Khairy, FRCS, MS, Assistant Professor and Consultant General Surgeon, College of Medicine and King Khalid University Hospital, P.O. Box 7805 Riyadh 11472, Saudi Arabia

SOLITARY THYROID NODULE: THE RISK OF CANCER AND THE EXTENT OF SURGICAL THERAPY

G. A. KHAIRY

ABSTRACT

Objectives: To study the incidence of thyroid malignancy in patients with solitary thyroid nodule presenting to surgical clinics and assessing the extent of the surgical therapy offered.

Design: Cross-sectional study.

Setting: King Khalid University Hospital, Riyadh, Saudi Arabia.

Subjects: The surgical and histological data of 172 patients with solitary thyroid nodules who underwent surgery were reviewed. All patients had clinical evaluation, laboratory and radiological work up and most of them had fine needle aspiration biopsies performed. The extent of surgery and the final histological diagnosis was reviewed. The different surgical options included: lobectomy \pm isthmusectomy, subtotal thyroidectomy, near total thyroidectomy and total thyroidectomy. Those patients with solitary thyroid nodules who had non-surgical therapy were not included in the study.

Results: Thirteen point nine percent of patients were found to have malignancy on final paraffin section, most of them were papillary type. Fifty nine per cent of patients underwent lobectomy \pm isthmusectomy. All patients who developed recurrence after surgery had only lobectomy as their initial surgical therapy.

Conclusion: The incidence of malignancy in our series is 14% which is comparable to previous reported results. Our patients with thyroid carcinoma who underwent more extensive surgery were better off regarding recurrence.

INTRODUCTION

The solitary thyroid nodule is defined as a palpably discrete swelling within an apparently normal gland(1). The physician and patient alike are typically concerned about the possibility of thyroid cancer. Although the prevalence of nodular goitre is relatively high even in iodine sufficient areas, the incidence of cancer is considered low(1,2). Even in children, although an uncommon clinical entity, solitary thyroid nodule requires a thorough assessment because of the increased incidence of thyroid carcinoma in the population(3).

Fine Needle Aspiration Biopsy (FNAB) is the most important advance in the management of thyroid nodules in the past two decades(1,2,4). The treatment of patients with nodular disease of the thyroid has been the focus of many controversies over the years. Significant improvements have been made in the diagnosis and treatment of these patients, but some questions remain unresolved(3).

MATERIALS AND METHODS

The surgical and histological data of 172 patients with solitary thyroid nodules who underwent surgery at King Khalid University Hospital from January 1990 to December

1997 were reviewed. These were 142 females and 30 males with ages ranging from 15-70 years. All patients had clinical evaluation, laboratory and radiological work up. Most of them had fine needle aspiration biopsies performed. The extent of surgery and the final histological diagnoses were reviewed. The different surgical options included lobectomy \pm isthmusectomy, subtotal thyroidectomy (where more than 1gm of tissue was left on either side), near total thyroidectomy (complete removal of one lobe leaving 1gm or less of the other lobe) and total thyroidectomy (removal of the entire thyroid gland). Those patients with solitary thyroid nodules who had non-surgical therapy (e.g. Levothyroxine therapy, cyst aspiration, observation) were not included in the study.

RESULTS

Most of the patients 105(61%) had lobectomy \pm isthmusectomy. Twenty four of the 172 patients (13.9%) with solitary thyroid nodules were found to have malignancy on final paraffin section (Table 1). Of the 24 patients with malignant lesions, 22 had papillary carcinoma, one had follicular carcinoma and one a mixed papillary follicular lesion.

The surgical procedures performed for those with papillary carcinoma were mainly lobectomy with isthmusectomy 13/22 (59%) followed by total thyroidectomy 7/22 (31.8%) (Table 2). Three of our

carcinoma patients who underwent surgery developed recurrence, all of them had lobectomy as their initial surgical procedure, which gives a recurrence rate following lobectomy of 3/13 (23%). Non of the patients who underwent more extensive surgery developed recurrence.

Table 1

Final histological diagnosis of 172 patients with solitary thyroid nodules

Histological diagnosis	No. of patients	(%)
Nodular hyperplasia	63	36.6
Adenoma	53	30.8
Malignant	24	14
Others	32	18.6
Total	172	100

Table 2

Extent of surgery for 22 patients with papillary thyroid carcinoma

Type of surgery	No. of patients
Lobectomy	13
Subtotal thyroidectomy	1
Near total thyroidectomy	1
Total thyroidectomy	7
Total	22

DISCUSSION

A single or multiple thyroid nodules represent a common and important clinical entity(5,6). The frequency of thyroid nodules, about half of which are single on physical examination, increases throughout life(7-9). In the large Framingham database, it has been estimated that the life time risk for developing a thyroid nodule is between 5% and 10%. In this study population, 4.2% of the patients had a thyroid nodule, and females were afflicted four times as frequently as males(5). Of nodules removed surgically an estimated 8 to 17 percent are carcinomas(10-12). The incidence of malignancy in our study was 13.9% which is comparable to previously published works.

Diagnostic possibilities in cases of thyroid nodules are adenoma, carcinoma, cyst and unrecognised nodules of a multinodular colloid goitre(13). Other rare causes of solitary nodules include inflammatory thyroid lesions and developmental abnormalities such as dermoid cyst, teratoma etc.

Abnormalities of thyroid function are virtually always associated with benign disease(14) although most benign and almost all malignant thyroid nodules give normal TFT. Hence, normal results are not helpful in distinguishing a benign from a malignant nodule, and

such testing probably should not be performed routinely in patients with clinically normal thyroid function(15). Similarly, normal results of serum thyroid anti bodies cannot differentiate benign from malignant disease in solitary thyroid nodules(16). However, elevation of the serum calcitonin level in patients with a family history of medullary carcinoma or MEN II is nearly pathognomic of such a tumour(15).

Ultrasound can differentiate between solid and cystic lesions but unfortunately, there are no sonographic criteria at present that reliably distinguish benign from malignant nodules(13). A particularly important part of the diagnostic laboratory evaluation is to determine whether the thyroid nodule is hypofunctioning or hyperfunctioning. This is obtained by performing a thyroid scan. Thyroid cancers occur almost exclusively in hypofunctioning (cold) nodules that fail to trap iodine, whereas they rarely, if ever occur in autonomous hyperfunctioning (hot) nodules(14). However, like the thyroid function tests, the functional status of a nodule on nuclear scan cannot be used to accurately differentiate benign from malignant disease(15).

Fine needle aspiration is the diagnostic procedure of choice in solitary thyroid nodules because it is safe, inexpensive and leads to a better selection of patients for surgery than any other test(13,17). The success of fine needle aspiration biopsy depends on the experience of the person performing the procedure and of the cytopathologist interpreting the cells obtained. One study(18) reported only a 6.4% rate of inadequate samples when biopsy was performed by an experienced operator, versus a 32.4% rate when done by someone, less experienced, however, it was not done for some of our patients, and those which were performed were done by different groups of people (endocrinologists, surgeons and pathologists). If FNA was done routinely and by experts and lesions with positive or suspicious cytology were resected, the number of patients undergoing surgery would be less and hence the incidence of cancer would be higher(13).

The main indications for surgery are malignant or suspicious cytologic features and symptoms due to the nodule itself. Significant controversy exists regarding the extent of the surgical procedure in case of malignancy. Most authors advocate total thyroidectomy for differentiated thyroid carcinoma(19-23). It facilitates detection of recurrence and allows for more effective treatment of recurrent and metastatic disease with radioactive iodine. However, in a recent study, Wanebo and his colleagues after reviewing 347 cases with well differentiated thyroid cancer concluded that total thyroidectomy in high risk patients with differentiated thyroid cancer (those containing follicular histology, vascular invasion, or extra capsular extension) showed no benefit over partial thyroidectomy(24). If lymph nodes are found at surgery, then local excision without a radical neck dissection is performed. If the thyroid nodule is benign by fine needle aspiration biopsy, then

treatment is either expectant observation or levothyroxine therapy(1). The effect of the latter on the size of the thyroid nodule is still controversial(25,26).

The surgical therapy for our patients was done by different surgeons, so different approaches and extent of excisions for the same pathology (papillary carcinoma) was observed. This was also noted in the recently published data on the proposed management of 233 respondents to a questionnaire on how they would manage a young lady with a solitary thyroid nodule assumed to have papillary carcinoma(27). The variations included: those who preferred near total/total thyroidectomy (86%). Those preferring lobectomy (5%) and those preferring a lobectomy ± isthmusectomy (9%). Our series showed relatively poor results following lobectomy (recurrence rate of 23%) as compared to more extensive surgery. Similar observations have been published before(28). Some authorities recommend subtotal thyroidectomy or lesser procedures for patient with low-risk thyroid cancer because the prognosis is good for those patients, however, there have been no prospective studies that have attempted to define optimal surgical therapy(29). In a rural hospital, lobectomy and isthmusectomy was the main type of surgery with good results(30). Some retrospective studies have suggested comparable survival rates in patients treated with simple lobectomy and more extensive procedures(31-33).

In conclusion incidence of malignancy in our series is 14% which is comparable to previous reported results. Our patients with differentiated thyroid carcinoma who underwent more extensive surgery were better off regarding recurrence. More extensive thyroidectomy allows for more adequate follow-up and facilitates treatment of recurrence if it occurs.

We recommended that more prospective studies are needed to determine the exact therapeutic impact of different options of thyroidectomies on thyroid tumour recurrence rate and survival.

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