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Thyroidectomy Profile of Patients with Thyroid Disease Admitted to King Abdulaziz University Hospital between 2003 and 2011

Saad Al-Muhayawi
Department of Otolaryngology Surgery, Faculty of Medicine,
King Abdulaziz University, Jeddah, Saudi Arabia

Abstract: Modern medicine has succeeded in treating many diseases, some of which like thyroid disease, require surgical or medical intervention or both. To reach a solution, you need to know the problem. The current study aimed to identify thyroidectomy profiles of patients with thyroid diseases who were admitted to King Abdulaziz University Hospital (KAUH) in Jeddah, Saudi Arabia. Researchers used a retrospective method to identify 353 patients who were admitted to the hospital between 2003 and 2011. Most of the patients were classified as euthyroid and had no clinical manifestations, except for a neck mass. About 60% of the cases were benign. More than two thirds of the patients with thyroid disease underwent thyroid surgery. Forty four underwent total thyroidectomy and 28 underwent both subtotal thyroidectomy and hemi-thyroidectomy. The most common indication for surgery was suspicion of malignancy, followed by compression symptoms and cosmetic reasons. Around 30% of the patients received postoperative radioiodine treatment. About 62% of the patients experienced complications following the surgery. These included hematoma, infection, hypocalcemia, stridor/hoarseness and recurrent laryngeal nerve palsy. Female gender and older age were risk factors with females in the fourth decade at greatest risk. The results should aid the management of patients with thyroid diseases and raise general awareness.

Key words: Thyroidectomy, thyroid disease, KAU, hematoma, Saudi Arabia

INTRODUCTION

The thyroid is an internal secretion gland and a unique site of several common diseases which can be managed medically or surgically or using a combination of both (Accetta *et al*., 2011). The ultimate aim is to identify patients who would benefit from early aggressive treatment while avoiding unnecessary investigation and surgery in the majority of patients who have a benign nodule (Wong and Ahuja, 2005). Thyroidectomy operation should be performed by experienced surgeons in multidisciplinary teams who have been trained specifically in thyroid cancer surgery and who have operated on large numbers of thyroid cancer patients including primary cancers as well as reoperative cases. Patients undergoing operations for thyroid nodules should undergo Fine-Needle Aspiration Cytology FNAC to avoid completion thyroidectomy due to postoperative incidental detection of thyroid carcinoma. The aim of an intraoperative frozen section is similar but its value in detecting minimally invasive follicular cancer or a follicular variant of papillary thyroid cancer is very limited (Mazzaferri and Jhiang, 1994; Esnaola *et al*., 2001; Hay *et al*., 1993, 1998; Hundahl *et al*., 2000; Machens *et al*., 2005). Compartment-oriented microdissection of lymph nodes should be performed in cases of preoperatively suspected and/or intraoperatively proven lymph node metastases (Ito *et al*., 2004). The rationale for this surgical approach is based on evidence that radical primary surgery has a favorable impact on survival in high-risk patients and on the recurrence rate in low-risk patients (Machens *et al*., 2002; Scheumann *et al*., 1994; Tisell *et al*., 1996). The indication for surgery depends not only on local resectability but also on the individual patient's condition (Pacini *et al*., 2006). The current study aimed to identify the clinical profile of thyroidectomy among patients with thyroid diseases admitted to the King Abdulaziz University Hospital KAUH in Jeddah, Saudi Arabia. The results should help medical personal manage patients with thyroid disease and raise general awareness.

MATERIALS AND METHODS

A retrospective study conducted at KAUH identified 353 patients who were admitted between 2003 and 2011. Data were obtained from the hospital's medical records after receiving ethical approvalfrom KAUH. The inclusion criteria were any patient with thyroid disease who had thyroid cancer, a simple goiter, a multinodular goiter,

Grave's disease, Hashimoto's thyroiditis, subacute thyroiditis or a solitary toxic adenoma. Patients' files with inadequate data were excluded from the study. Patients with concomitant parathyroid disease were also excluded. The records listed the patients' gender, nationality, age, family history of thyroid disease, presence or absence of an autoimmune disease, history of radiation, earlier adioiodine treatment, smoking history, pregnancy at presentation, earlier neck trauma, clinical presentation and thyroid status at presentation (obtained from Thyroid Functional Test (TFT) levels). The results of any laboratory and radiological investigations of the thyroid including Ultrasound US were also documented. Suggestive features of malignancy on the US are the absence of a halo sign, hypoechogenicity, heterogenisity, an irregular margin, fine calcifications and extraglandular extension. The patients were further classified according to whether they had undergone surgery. For those who had surgery, additional data were collected on the indication for and the type of surgery, postradioiodine treatment and surgical complications if present.

Statistical analysis: The Statistical Package for the Social Sciences (SPSS), Version 18 was used for statistical analysis. The qualitative data are presented in the form of numbers and percentages. A χ^2-test was used to determine the significance of the qualitative data and Yates correction was used when the expected cell frequency was less than 5. The quantitative data were expressed as the mean and standard deviation.

RESULTS AND DISCUSSION

The study included 353 patients, 140 (39.7%) of whom were Saudis and 213 (60.3%) of whom were non-Saudi. There were 292 females (82.7%) and 61 (17.3%) males and the mean age was 40.74 years. Most of the patients presented in a euthyroid state (n = 229, 64.9%), followed by a hyperthyroid state (n = 67, 19%) and a hypothyroid state (n = 57, 16.1%). The disease was classified according to type. Benign disease was present in 219 (62%) of the patients and malignant disease was present in 134 (38%). Of the malignancies detected, 80 (22.7%) were papillary carcinomas, 32 (9.1%) were follicular carcinomas, four (1.1%) were medullary carcinomas and two (0.6%) were anaplastic. Graves's disease was present in 36 (10.2%) of the patients.

The most common risk factor for thyroid disease was a positive family history (n = 55, 16.6%), especially disease in a first degree relative (n = 48, 13.7%). The 18 (5.1%) of the patients were smokers and 3 (0.8%) had a history of neck radiation. More than 50 (15.3%) of the patients had an associated autoimmune disease with diabetes type 1 the most common (n = 21, 5.9%) followed by rheumatoid arthritis (n = 17, 4.8%). Injury or trauma to the neck was present in 2 (0.6%) patients and 18 (5.1%) of the females were pregnant.

Regarding the clinical presentation of thyroid disease, most of the patients presented with a neck mass (n = 297, 84.1%) which was interpreted as dyspnea in 84 (23.8%) and dysphagia in 73 (20.7%) patients. Signs and symptoms of hyperthyroidism presented as palpitation in 64 (18.1%) patients, unintentional weight loss in 49 (13.9%) patients, heat intolerance in 45 (12.7%) patients, anxiety in 41 (11.6%) patients, tremor in 32 (9.1%) patients, exophalmos in 15 (4.2%) patients and diarrhea in 14 (4%) patients. Hypothyroidism presented as unintentional weight gain in 23 (6.5%) patients, cold intolerance in 23 (6.5%) patients, constipation in 21 (5.9%) patients and depression in 7 (2%) patients. Other presentations of different types of thyroid diseases included hoarseness in 44 (12.5%) patients, fatigue in 34 (9.6%) patients, irregular menstrual periods in 23 (6.5%) patients, alopecia in 19 (5.4%) patients, excessive sweating in 19 (5.4%) patients, insomnia in 15 (4.2%) patients, blurred vision in 10 (2.8%) patients and heavy menstrual periods in 4 (1.1%) patients.

Around 42 (11.9%) of the patients showed a metastatic presentation. The most common site for metastasis was the lymph nodes (n = 27, 7.6%) with the neck (n = 25, 7.1%) the most frequent site of involvement, followed by the supraclavicular (n = 4, 1.1%), the jugular (n = 3, 0.8%) and the axillary (n = 1, 0.3%). The next most common sites of lymph node metastasis were the bones (n = 9, 2.5%), the breasts (n = 4, 1.2%) and the lungs (n = 2, 0.6%).

One hundred fifty six of 275 patients had a normal level of Thyroid Stimulating Hormone TSH. T3 and T4 were high in 110 of 232 patients and 47 of 274 patients and low in 14 of 353 patients and 40 of 274 patients. The calcium level was normal in 80 patients and low in 70 of 161 patients. The thymoglobulin blood test results were normal in 47 of 92 patients (Fig. 1). The Thyroid

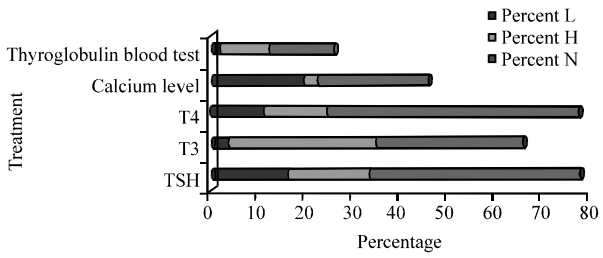

Fig. 1: Investigation

Stimulating Immunoglobulin (TSI) was positive in five of 11 patients and the thyroid peroxidase enzyme TPO was positive in 15 of 40 patients.

An ultrasound of the thyroid gland was performed in about two third of the participants. It showed a solitary nodule in 30.9% of cases and multiple nodules in 32.3% of cases. In the majority of the cases (40.8%), the largest nodule was <3 cm. Calcifications were present in 7.6% of cases. A thyroid biopsy FNAC was done in 186 (52.7%) of 353 patients. The results were as follows: benign in 98 (27.8%) patients, follicular in 29 (8.2%) patients, papillary in 25 (7.1%) patients, suspicious in 19 (5.4%) patients, malignant in 8 (2.3%) patients and inadequate in seven (2%) patients. The 151 (39.3%) patients underwent a thyroid scan. The results revealed cold nodules in 69 (19.5%) patients, normal nodules in 43 (12.2%) patients and hot nodules in 29 (8.2%) patients. There were 271 (76.8%) frozen section biopsies. The 137 (38.8%) of the biopsies were benign. Papillary carcinomas were present in 74 (21%) biopsies, follicular carcinomas were present in 30 (8.5%), suspicious results were present in 12 (3.4%) and lymphomas were present in 7 (2%). About 6 (1.7%) of the biopsies were inadequate and malignancy was present in 5 (1.4%) cases.

The 271 (76.8%) patients underwent thyroid surgery 118 (43.5%) underwent total thyroidectomy, 77 (28.4%) underwent subtotal thyroidectomy and 76 (28%) underwent hemithyroidectomy. The most common indication for surgery was suspicion of malignancy which was present in 95 (35.1%) cases, followed by confirmed malignancy (n = 79, 29.2%), compression symptoms (n = 66, 24.4%) and cosmetic reasons (n = 31, 11.4%). About 82 (23.2%) of the patients received postoperative radioiodine treatment. The 44 (12.5%) patients experienced complications following surgery including hematoma, infection, hypocalcemia, stridor/hoarseness and recurrent laryngeal nerve palsy (Fig. 2).

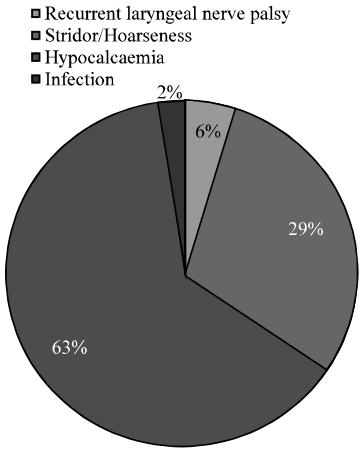

Fig. 2: Surgical complications

Demographic data: There was a female predominance (n = 292, 82.7%). Males accounted for 61 (17.3%) of the study sample and the mean age was 40.74 years. In common with the current study, studies in the US and in Romania, Brazil and Ireland also showed that there were significantly more females than males with combined subclinical and clinical thyroid diseases and a mean age of 43-50 years old (Accetta *et al*., 2011; Catana *et al*., 2012).

Clinical presentation: The TSH was measured with a chemiluminescence immunometric assay (Nichols Institute Diagnostics, San Juan Capistrano, CA). The reported TSH ranges were 0.39-4.6 mu L^{-1} for normal patients, >4.6 mU L^{-1} for patients with hyperthyroidism and <0.39 mU L^{-1} for those with hypothyroidism (Gunter *et al*., 1996). Most of the patients in the current study were classified as euthyroid (n = 229, 64.9%). Total 297 (84.1%) patients had a neck mass. Of the 56 patients who underwent TSH testing had a normal level of TSH. Although, of limited value, patients usually have a baseline thyroid function test with normal TSH have a high risk of malignancy (Wong and Ahuja, 2005). Metastatic cancer of the thyroid gland is infrequent and some studies have shown that the incidence with a known primary is 2-17% (Ahuja *et al*., 1994). In the current study, around 42 (11.9%) of the patients showed a metastatic presentation with the lymph nodes in the neck the most common site (n = 27, 7.6%).

Types of diseases: Most thyroid nodules are benign and usually occur in conjunction with multinodular changes. Clinical examination is poor at detecting small thyroid nodules, highlighted by the fact that approximately 70% of normal thyroid glands contain nodules of <1 cm when examined sonographically (Brander *et al*., 1991; Ezzat *et al*., 1994; Hopkins and Reading, 1995; Clark *et al*., 1995; Mazzaferri, 1993). The current study found a similar finding.

Imaging studies: Imaging, especially high-resolution ultrasound is very helpful in differentiating a malignant nodule from a more common benign thyroid nodule. Ultrasound has obvious advantages compared with other imaging modalities, such as its ability to be combined with Fine-Needle Aspiration Cytology (FNAC) to increase the diagnostic accuracy and to identify a malignant nodule against a background nodular goiter, the incidence of which varies between 1 and 3% (25). Ultrasound of the

thyroid glands showed a solitary nodule in 30.9% of patients and multiple nodules in 32.3% of patients. FNAC was performed for 186 (52.7%) of patients. It showed a benign nodule in 98 (53%) cases, a follicular nodule in 29 (8.2%) cases, a papillary nodule in 25 (7.1%) cases, a suspicious nodule in 19 (5.4%) cases, a malignant nodule in 8 (2.3%) cases and inadequate results in 7 (2%) cases.

Surgical indication: The mortality rate for thyroidectomy today is extremely low (Shore and Waghorn, 2011). Failure to respond to medical therapy is the main reason for surgery. Such failure represented 58 (92%) cases in a study done in 2012 (Cashman *et al*., 2012). At the hospital, 64.3% of the patients underwent surgery because of suspicion of malignancy or to confirm malignancy. The remainder (n = 94, 27.5%) underwent surgery due to compression symptoms or for cosmetic reasons (e.g., to remove a very large thyroid gland).

Types of surgery: Thyroid surgery is usually performed using one of these procedures: total (or near total) thyroidectomy, thyroid lobectomy and isthmusectomy or isthmusectomy alone. The 60 (95%) patients in an earlier current study underwent total thyroidectomy and three (5%) underwent partial thyroidectomy (Cashman *et al*., 2012). In the current study, 271 (76.8%) patients underwent thyroid surgery out of 353 patients. Of these, 118 (43.5%) underwent total thyroidectomy, 77 (28.4%) underwent subtotal thyroidectomy and 76 (28%) underwent hemithyroidectomy.

Operative and postoperative complications: Operative and postoperative complications are extremely low. With few exceptions, it is possible to choose whichever form of treatment-surgical or medical is most effective for each patient (Avenia *et al*., 2009). Postoperative infection rates are very low, considering this procedure in well vascularized area (Colcock, 1971). According to a study of over 2,636 patients, the most common complication is hypocalcemia with an incident rate of around 28% in all the patients (Lee *et al*., 2010). The incidence of other complications such as Recurrent Laryngeal Nerve (RLN) palsy and Horner's syndrome was reported to be no >0.1%. Another study showed that serious complications, such as Laryngeal nerve palsy, depended on the size of the primary tumor and that permanent paralysis was rare (2%) when the patient was treated by an experienced surgeon (Thomusch *et al*., 2001). In the study, 44 (12.5%) patients experienced complications following surgery. Hypocalcemia was the most common complication, affecting 28 (10%) patients. Hypocalcemia is extremely low compared with that reported in other studies.

Postoperative management: Thyroid ablation refers to the postsurgical administration of 131-I which is intended to destroy any thyroid residue in the thyroid bed (Yousem and Scheff, 1996; Samaan *et al*., 1992; Mazzaferri *et al*., 1994). Most patients with a differentiated thyroid nodule, especially those with thyroid cancer are treated with 131-I after thyroidectomy (Cooper *et al*., 2009; Pacini *et al*., 2006). Such treatment may decrease the recurrence rate and possibly the mortality rate (Samaan *et al*., 1992; Mazzaferri and Jhiang, 1995; Sawka *et al*., 2004). The 82 (23%) of the patients in the current study who had high risk of recurrent disease received radioiodine treatment.

CONCLUSION

Researchers found that the disease was most common in females and that it was most frequent in the fourth decade. Most of the patients were classified as euthyroid and they presented with a neck mass, even those with a benign disease which represented 60% of the sample. The most frequent risk factor for thyroid diseases was a positive family history (70%), mainly in first-degree relatives. Other risk factors were auto-immune diseases such as diabetes type I, Hashimoto's thyroiditis, Inflammatory Bowel Disease (IBD) and Rheumatoid Arthritis (RA). Around 11% of the patients showed a metastatic presentation, and the most common sites were lymph nodes. Around 78% of the patients had normal TSH level. Only 57% had a high TSH level. An ultrasound of the thyroid gland was done in about two third of the patients. The thyroid scans showed a cold nodule in around half of the sample. An FNA was performed in about half of the patients and the results were consistent with a benign lesion in half of those.

LIMITATIONS

As this study was retrospective, the main limitation was missing data. The Phoenix System only includes data up to 2003. As it did not include all the necessary information, additional data were obtained from a review of the KAUH archives. In addition, the actual management of the patient depends on the treating physician and not all the patients had undergone the same range of tests Finally, data were not collected from different centers or hospitals.

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