



Evaluation of thyroid cancer metastases in relation to cervical lymph nodes in patients referred to ENT specialist in Imam Khomeini Hospital, Iran during 2013 to 2016

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Abstract: Thyroid cancer is the most common endocrine malignancy. Lymph node metastasis is common in patients with papillary thyroid carcinoma, especially in children and young adults and can be sued during admission. Aim of this study is to evaluate the incidence of thyroid cancer metastases to cervical lymph nodes in patients referred to an ear, nose and throat specialist Imam Khomeini in Iran in 2013 to 2014. All patients who were hospitalized and undergoing thyroid surgery at a medical center of Imam Khomeini Hospital (RA) in Ahvaz from early in April 2013 to end of March 2016 and the thyroid cancer diagnosis was confirmed according to the pathology samples for them. Pathology samples were collected through existing records in the archives of Imam Khomeini Hospital (RA) of Ahvaz Jundishapur University. The information contained in the records includes age, gender, types of thyroid cancer, history of thyroidectomy keeping with the nodules, presence of metastasis and its sites on the basis of information contained in the records. analysis was performed by using SPSS 16 software. the frequency related to papillary cancer with 23 patients (59%) and medullary cancer with 6 patients (15.4%) and follicular and anaplastic cancers each one with 3 patients (7.7%). 20 patients (51.3%) were diagnosed with metastatic thyroid cancer. Most metastasis was related to lymph metastasis in 11 patients (28.2%) and the lowest metastasis was lung metastasis in 2 patients (5.1%) and 19 patients (48.7%) had no metastasis and 7 patients had metastasis to several organs. 24 patients (61.4 %) had thyroid nodules. 9 patients (23.1%) cold nodules with calcification and 10 patients (25.6%) cold nodules without calcification and 1 patient (2.6%) with hot nodules have been reported. From the present study, it is concluded that papillary cancer had the highest frequency and it is suggested to conduct specific study in this field and also carry out a study on pathologic assessment of lymph nodes isolated for checking the hidden metastases.

Key words: thyroid cancer; metastases; cervical lymph nodes; ENT

Introduction

Today, cancer is considered as one of the greatest problems in all communities and dedicates the bulk of power and cost of the healthcare organizations to itself (1-3). Thyroid cancer is the most common endocrine malignancy (4) and forms 21% of all cancers (5). The incidence of thyroid cancer has increased faster than any other cancers in recent years and increased incidence has been observed in both genders and in all races. The incidence of thyroid cancer in the world has reached from 1.3 percent thousand for women and 4.6 percent thousand for men in 1935 to 3.16 percent thousand women and 5.6 percent thousand men in 2008 (6). According to Iran Cancer Institute statistics, thyroid cancer constitutes 1.8% of all cancers and 76.1% of endocrine cancers. The average age of Iranian patients was 43 years and female to male ratio was 1.8 to 1 (7). Thyroid cancer in Iran is the seventh most common cancer in women and the fourteenth in men and the eleventh most common cancer in both genders (8). Thyroid cancer creates

a wide range of clinical protests, including cancer with high distinction and good prognosis to an undifferentiated anaplastic cancer which often occurs in older people and has a poor prognosis (9). Various other factors are involved in prognosis differences that includes histologic pattern, tumor Stage, age at diagnosis (people aged 20-45 years have the best prognosis), gender (men are worse than women) and delay more than a year in initial surgery since thyroid nodule detection (10-11). Also among the different types of it, papillary thyroid carcinoma occurs as a single nodule; then it spreads via the lymphatics within thyroid gland and reaches to lymph nodes under the capsule and adjacent of the thyroid capsule that 80 percent of children and 20 percent of adults refer with palpable lymph nodes and tumors may give metastasis to lung and bone (12). Most thyroid cancer patients referred with a palpable swelling in the neck and evaluation begins with a combination of history, physical examination and FNAB (13). Pathologically, thyroid cancer is divided into

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several categories, based on prevalence including papillary cancer, follicular cancer, medullary cancer, anaplastic cancer and Hurthle cell cancer. It should be noted that papillary and follicular cancers are often treatable and their prognosis is desirable in patients whose disease is diagnosed in early stages. In contrast, anaplastic thyroid cancer, a type of invasive cancer that gives an inappropriate response to treatment and has a poor prognosis (14). Lymph node metastasis is common in patients with papillary thyroid carcinoma, especially in children and young adults and can be sued during admission. Unlike papillary cancers, cervical lymphadenopathy is rare in patients with follicular carcinoma during the first visit (about 0.5 percent). The risk for metastasis to regional nodes is 25% in patients with Hurthle cell carcinoma, in patients with medullary thyroid carcinoma often with cervical mass which may be associated with palpable cervical lymphadenopathy is (15-20%). Lymph nodes at presentation are palpable in patients with anaplastic thyroid carcinoma and there may be evidence of distant metastasis (13). Given that a similar study has not ever been conducted in the city of Ahvaz, this study can somewhat help us to identify high-risk groups and aid medical doctors for early diagnosis and treatment and the treatment type of this malignancy.

Material and Methods

After permission from the Ethics Committee of the University, the descriptive epidemiologic study was performed on all patients who were hospitalized and undergoing thyroid surgery at a medical center of Imam Khomeini Hospital (RA) in Ahvaz from early in April 2013 to end of March 2016 and the thyroid cancer diagnosis was confirmed according to the pathology samples for them. Pathology samples were collected through existing records in the archives of Imam Khomeini Hospital (RA) of Ahvaz Jundishapur University. The information contained in the records includes age, gender, types of thyroid cancer, history of thyroidectomy keeping with the nodules, presence of metastasis and its sites on the basis of information contained in the records. Patients who had incomplete records or records with pathological information were excluded from the study to examine the unavailability. Finally, after completion of the study and collection of desired form, general information Tables of the study were set out to do the required statistical analysis, and we initially described the intended variables by using descriptive statistical methods such as frequency distribution Tables, graphs and numerical indicators to the analysis. Then in order to determine the relationship between the qualitative and quantitative variables, we used t test and chi-square test (X^2) respectively. Significance

level for the above tests were taken 0.05 and analysis was performed by using SPSS 16 software.

Results

Thyroid gland tumors include 2.5% of all malignancies and are the most common malignancy of endocrine gland, but they are generally uncommon. In this study, the purpose is a cross sectional analysis of patients who were admitted with a diagnosis of thyroid malignancy. Age, gender, histopathology cancer types, history of thyroidectomy, thyroidectomy type, presence of metastasis, site of metastasis, FNAB report, presence of cysts, neck dissection were evaluated. In this study, 39 patients with thyroid cancer diagnosis have been evaluated that the following results were obtained (Table 1).

Table 1: Patient Characterization

| Variable | Sub | Frequency | Percent |
|--------------------------|--------------|-----------|---------|
| Gender | MAN | 8 | 20.5 |
| | FEMALE | 31 | 79.5 |
| | PTC | 23 | 59.0 |
| Type of Cancer | FTC | 3 | 7.7 |
| | MTC | 6 | 15.4 |
| | ATC | 3 | 7.7 |
| | UNKNOWN | 4 | 10.3 |
| | TOTAL | 20 | 51.3 |
| | SUB TOTAL | 3 | 7.7 |
| TTE | RIGHT LOBE | 8 | 20.5 |
| | LEFT LOBE | 7 | 17.9 |
| | 5.00 | 1 | 2.6 |
| Thiroidectomy Metastasis | YES | 38 | 97.4 |
| | YES | 20 | 51.3 |
| Wmtc | LYMPH | 11 | 28.2 |
| | LUNG | 2 | 5.1 |
| | MULTI ORGAN | 7 | 17.9 |
| Nodul | NO | 19 | 48.7 |
| | YES | 24 | 61.5 |
| Nodulsc | COLD+CA | 9 | 23.1 |
| | COLD-CA | 10 | 25.6 |
| | NO SCAN | 19 | 48.7 |
| Chemo Hupoca | HOT | 1 | 2.6 |
| | YES | 6 | 15.4 |
| | YES | 6 | 15.4 |
| | DYSPHAGIA | 1 | 2.6 |
| Sing | HOURS NES | 2 | 5.1 |
| | DYSPNEA | 7 | 17.9 |
| | WITHOUT | 10 | 25.6 |
| | THYROMEGALY | 14 | 35.9 |
| | MORE | 3 | 7.7 |
| Cyst | HYPOCASIGN | 2 | 5.1 |
| | YES | 6 | 15.4 |
| | RND | 14 | 35.9 |
| Neckdisec | CENTERAL | 4 | 10.3 |
| | NECKDISECTIN | 3 | 7.7 |
| | SELECTIVE ND | 3 | 7.7 |
| | NO ND | 18 | 46.2 |
| | RND | 14 | 35.9 |

Age frequency:

The minimum age of patients was 13 years and the oldest patient was 77 years old. Most frequency of patients was in the age group 20-40 years, with 18 patients (46.1 percent). The average age was 15.5 ± 42.7 .

Gender frequency:

Among the 39 patients evaluated, 31 patients (79.5 %) were female and 8 patients (20.5%) were male (Figure 1).

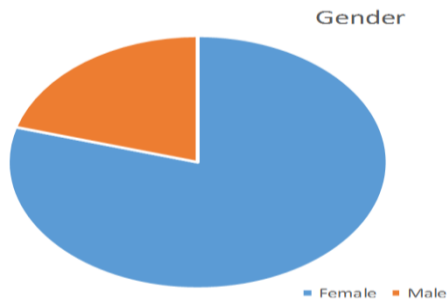


Figure 1: Gender Status

Frequency of cancer types:

In a survey conducted, types of cancer have been as follows: frequency related to papillary cancer with 23 patients (59%) and medullary cancer with 6 patients (15.4%) and follicular and anaplastic cancers each one with 3 patients (7.7%) that papillary cancer had the highest frequency (Figure 2).

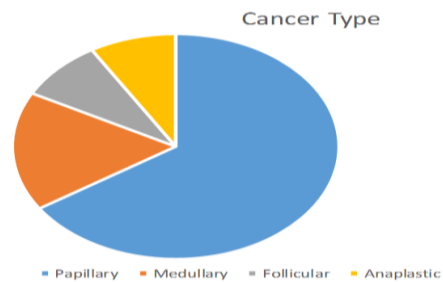


Figure 2: Cancer Type Frequency

Frequency of thyroidectomy history:

Of the 39 patients studied, 38 patients (97.4 percent) were under thyroidectomy and 1 patient (2.6%) did not have surgery which was due to lack of patient satisfaction to perform surgery.

Types of surgery frequency:

Of the 39 patients evaluated, 38 patients have undergone the thyroidectomy which 20 cases of them have undergone the total thyroidectomy surgery (51.3%) and 8 patients have undergone the right lobe thyroidectomy (20.5 percent) and 7 patients have undergone the left lobe thyroidectomy (17.9%) and 3 patients have undergone the subtotal thyroidectomy (7.7%) (Figure 3).

Frequency of metastases:

Of the 39 patients studied in the project conducted, 20 patients (51.3%) were diagnosed with metastatic thyroid cancer, and 19 patients (48.7%) were diagnosed with non-metastatic thyroid cancer (Figure 4).

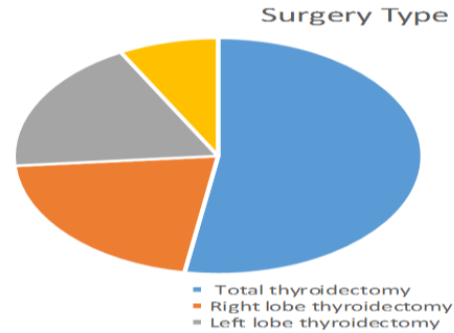


Figure 3: Surgery Type

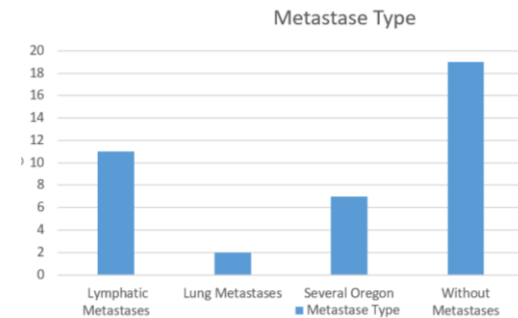


Figure 4: Metastases Type

Frequency of metastasis site:

Most metastasis was related to lymph metastasis in 11 patients (28.2%) and the lowest metastasis was lung metastasis in 2 patients (5.1%) and 19 patients (48.7%) had no metastasis and 7 patients had metastasis to several organs.

Frequency of keeping the thyroid nodules:

In the patients studied, 24 patients (61.4 %) had thyroid nodules and 15 patients (38.5%) did not have thyroid nodules.

Frequency of thyroid nodules types:

9 patients (23.1%) cold nodules with calcification and 10 patients (25.6%) cold nodules without calcification and 1 patient (2.6%) with hot nodules have been reported.

Frequency of iodine therapy history:

33 patients (84.6%) did not receive iodine therapy and 6 patients (15.4 %) received iodine therapy.

Frequency of hypocalcemia:

Of the studied patients, 6 cases (15.6%) had hypocalcemia symptoms.

Frequency of first symptom in the studied patients:

Of the 39 patients, 14 cases (35.9%) with thyromegaly complaints and 10 cases (25.6%) asymptomatic and 7 patients (17.9%) with dysphagia and 2 patients (5.1%) with hoarseness symptom and 3 patients (7.7%) with more than one symptom referred.

Prevalence of thyroid with cysts:

6 patients (15.4 percent) and the thyroid with cancer had thyroid cysts.

Frequency of keeping the thyroid cysts:

There was the keeping of thyroid cancer with thyroid cysts in 6 patients (15.4%).

Frequency of Neck dissection type:

Of the 39 patients, 18 patients (46.2%) had no neck dissection, 14 patients (35.9%) were under the Radical neck dissection, 4 patients (10.3%) were under the central neck dissection and 3 patients (7.7%) were under the selective neck dissection.

Frequency of metastasis to cervical lymph nodes:

In 39 patients under study, 11 patients (28.2%) had metastasis to cervical lymph nodes and 28 patients (71.8%) had no cervical metastases.

Frequency of involved zone:

Of the 39 patients under study, zone 2 involved in 3 cases (7.7%), zone 3 involved in 7 cases (17.9%), zone 4 involved in 1 case (2.6%), zone 5 involved in 1 case (2.6%), zone 6 involved in 3 cases (7.7%), no involvement in 19 cases (48.7%), and all of the zones were involved in 5 cases.

Discussion and Conclusion

As shown in the results, the highest frequency of patients was reported in the age group 20-40 years, with 18 cases (46.1%). The average age was 15.5 ± 42.7 which was consistent with the study at Tehran University, UAE, Singapore and Canada with an average age of 15.6 ± 50.2 , 14 ± 42 , 50.2 and 41 years, respectively. And in a study conducted by Dr. Abshirini at the center, 59.3% of patients were in the age range between 20-40 years of age which is similar to the present study. The only inconsistent report was study conducted by non-communicable Research Center of Tehran and reviewed Iran's total population by province separation with an average age of over 70 years (15-19). (79.5%) of patients were female and (20.5%) of patients were male and female to male ratio was 3.87 to 1, which is higher than the other studies, because this ratio was 1.5 to 1 in Tehran University study, 2.4 to 1 in a study conducted in the UAE, 2.33 to 1 in a study conducted in Singapore, and the female to male ratio was 3 to 1 in the study carried out by Dr. Abshirini *et al.*, at this center, and the female to male ratio was 2.5 to 1 in study conducted by non-communicable Research Center of Tehran and it was different in various provinces (15-19). In a survey conducted, types of cancers have been in this way: frequency related to papillary cancer (59%) and medullary cancer (15.4%) and follicular and anaplastic

cancers each ones (7.7%) that the papillary cancer had highest frequency. In study conducted in Tehran, papillary cancer (68.1%) and medullary cancer (9.6%) and follicular cancer (10.9%) and anaplastic cancer (10.6%), and papillary cancer (84%) and medullary cancer (0.6%) and follicular cancer (14%) and anaplastic cancer (1.4%) in study conducted in UAE, and papillary cancer (79%) and medullary cancer (9%) and follicular cancer (20%) and anaplastic cancer (3%) were consistent (20,8,9) in study done by Dr. Abshirini in this center. And papillary cancer was most prevalent in all of them. Also (97.4%) of patients have undergone thyroidectomy and (2.6%) did not have surgery which was due to lack of patient satisfaction to perform surgery. In similar studies, patients who had undergone surgery were enrolled in the study and this factor was not considered. In our study, 38 patients were undergone the thyroidectomy that (51.3%) of them were undergone the total thyroidectomy surgery and (20.5%) were undergone the right lobe thyroidectomy and (17.9%) were undergone the left lobe thyroidectomy and (7.7%) were undergone the subtotal thyroidectomy. In a study conducted in Singapore, 84% of patients underwent the total thyroidectomy and 16% underwent the lobectomy that the results were not consistent with each other (16). In our project, (51.3%) of patients had thyroid metastatic cancer. In the study jointly done in Sweden and Australia, 53% of patients suffered from metastatic cancer which is close to the present study (20). The frequency of metastases types in patients of this study was as follows:

In the present study, most metastasis (28.2%) was related to lymph metastasis and the lowest metastasis (5.1%) was lung metastasis. Also, (48.7%) had no metastasis and 7 patients had metastasis to several organs. In a study conducted in South Korea, 48.1% of patients had lymph node metastasis and 3.84% of patients had lung metastasis which is lower than the present study (21). In patients under study, (61.5%) had thyroid nodules and 87.5% nodules have been reported in the study conducted by Dr. Abshirini at the center which was consistent, but it was respectively 22.8% and 20% in a study done at Tehran University and a study conducted in the UAE that is not consistent (15, 17-18).

The frequency of thyroid nodules types in the study is as follows:

Nine patients (23.1%) had cold nodules with calcification and 10 patients (25.6%) cold nodules without calcification and 1 patient (2.6%) with hot nodules that 71.9% nodules have been reported in study conducted by Dr. Abshirini at the center which is consistent (15). Also in our study, (15.4%) had a history of iodine therapy that this finding has not been investigated in similar studies. Also, (15.6%) had symptoms of hypocalcemia during

hospitalization that 13.2% of patients experienced the temporary hypoxemia in a study conducted in Canada as well that is consistent. But in a study conducted in South Korea, 49% of temporary hypothyroidism was reported, which is not consistent (22, 19). (35.9%) of patients with thyromegaly complaints and (25.6%) asymptomatic and (17.9%) with dysphagia and (5.1%) with hoarseness symptom and (7.7%) of patients with more than one symptom referred. In a study conducted at Tehran University, 42.5% of patients had thyromegaly and 1.87% had hoarseness that findings are consistent (17). Also, there was thyroid cancer with thyroid cyst in (15.4%) of patients. This factor has not been reported and studied and in similar studies. In addition, (46.2%) of patients had no neck dissection, 14 patients (35.9%) were under the Radical neck dissection, 4 patients (10.3%) were under the central neck dissection and 3 patients (7.7%) were under the selective neck dissection. In a study conducted in Singapore, 22.5% were under the Radical neck dissection and 77.5% were under the central neck dissection which is not consistent and possibly patients were selected in higher levels of disease (16). The results have shown that (28.2%) had cervical lymph node metastases and 28 patients (71.8%) had no cervical metastases. In a study conducted in South Korea, 31% had metastatic lymph node which is consistent and 46.6% in a study conducted in China and 53% of patients had metastatic lymph nodes in a study conducted simultaneously in Sweden and Australia, and 42.7% had cervical metastases in another study conducted in Australia that is not consistent and this is probably due to the fact that hidden lymph nodes were also examined in these studies or patients have been studied on a higher stages of the disease (20,22-24).

Of the 39 patients under study, zone 2 involved in 3 cases (7.7%), zone 3 involved in 7 cases (17.9%), zone 4 involved in 1 case (2.6%), zone 5 involved in 1 case (2.6%), zone 6 involved in 3 cases (7.7%), no involvement in 19 cases (48.7%), and all of the zones were involved in 5 cases. In a study conducted in Singapore, zones 1 involved in 3.75% and zone 2 involved in 48.75%, zone 3 involved in 52.5% and zone 4 involved in 50%, and zone 5 involved in 28.7%. In a study conducted in South Korea, zone 6 involved in 15.9% and zone 5 involved in 13% and zones 1 involved in 3.7% and zones 2 and 3 involved in 88.2%. This is probably due to the fact that hidden lymph nodes were also examined in these studies or patients have been studied on a higher stage of the disease (16, 21). According to above findings and more reporting of thyroid nodules compared to other studies, it is suggested to conduct specific study in this field and also carry out a study on pathologic assessment of lymph nodes isolated for checking the hidden metastases.

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