

## Investigation of the Frequency of Histopathological Types of Malignant Thyroid Tumors Operated on in Imam Khomeini Hospital, Tehran: a 5-Year Experience

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### Abstract:

**Introduction & Objective:** Thyroid cancer affects individuals of any gender and age. Also, its various pathologies have different prognoses and responses to different treatments in addition to age and gender-specific distribution. Therefore, this study was conducted with the aim of investigating the frequency of histopathology of surgically operated malignant thyroid masses and its relationship with age and gender.

**Materials & Methods:** This cross-sectional study was conducted on patients with malignant thyroid masses who underwent surgery at Imam Khomeini Hospital in Tehran between 1991 and 1996. Patients who were diagnosed with malignant thyroid lesions according to the pathology report were included in the study. Also, patients with a history of surgery, previous thyroid malignancy, and incomplete medical information were excluded from the study. Finally, the clinical symptoms, age, and gender of the patients were collected and recorded along with the frequency of the type of thyroid histopathology.

**Results:** In this study, 75 patients (46 women and 29 men) were included in the study. Most of the patients (26%) were 60 years and older and only two patients were under 20 years old. The most common symptoms were neck mass, dysphagia, dysphonia, shortness of breath, and weight loss, respectively. Papillary carcinoma was the most common (55%) and metastasis was the least (7%) histopathology of malignant thyroid masses.

**Conclusions:** The present study showed that in line with previous studies, the prevalence of thyroid cancer is higher in women and the elderly. Also, papillary carcinoma is the most common pathology of malignant thyroid masses.

*Key Words: Thyroid Cancer, Neck Mass, Papillary Carcinoma*

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## Background and Objective

Malignant thyroid pathology is of considerable importance within the field of oncology, chiefly due to its increasing global prevalence.<sup>1</sup> A thorough understanding of the age and gender distribution of these tumors is vital for effective clinical planning and public health initiatives.<sup>2</sup> Specifically, insights into these demographics can inform healthcare professionals regarding risk factors, facilitate diagnosis, and enhance management strategies.

Age is a critical determinant in the development of thyroid malignancies, with existing studies<sup>3,4</sup> indicating bimodal age distribution. The initial peak typically occurs among younger individuals, while a subsequent peak is observed in older populations. Although the underlying mechanisms that drive these age-related patterns remain under investigation, they underscore the necessity for comprehensive screening and awareness campaigns targeted toward both younger and older demographics.<sup>5</sup>

Additionally, the gender distribution of thyroid malignancies is noteworthy, as women are disproportionately affected compared to men, exhibiting a female-to-male ratio of approximately 3:1.<sup>6</sup> This gender disparity suggests potential hormonal influences, such as estrogen, in the proliferation of thyroid tumors.<sup>7</sup> Moreover, the prevalence of thyroid malignancies has been progressively increasing over recent years.<sup>8</sup> This upward trend can be attributed to various factors, including advancements in diagnostic and monitoring techniques, heightened awareness among healthcare providers, and potential environmental influences.<sup>9</sup>

By examining the prevalence, age, and gender of malignant thyroid pathology, researchers and healthcare practitioners can gain valuable insights into the epidemiological landscape of these tumors. Such information is crucial for facilitating timely interventions and the

implementation of targeted therapeutic approaches.<sup>10</sup>

Furthermore, it aids in identifying high-risk populations, guiding preventive measures, and ultimately improving patient outcomes.

This study aims to investigate the frequency of various histopathological types of malignant tumors, as well as corresponding age and gender distribution, among patients undergoing surgical removal of thyroid masses at Imam Khomeini Hospital in Tehran over a five-year period.

## Materials and Methods

This retrospective cross-sectional study focused on patients diagnosed with malignant thyroid tumors who underwent surgical intervention at Imam Khomeini Hospital in Tehran from 1990 to 1994. The criteria for participation in the study were as follows: 1. A definitive diagnosis of malignant thyroid tumors confirmed through pathological examination; 2. Patients aged 18 years or older; 3. Completeness of medical records. Conversely, patients were excluded based on the criteria: 1. Incomplete clinical records; 2. Pathological findings indicative of benign thyroid lesions; 3. Presence of concurrent malignancies; 4. A history of prior thyroid surgery.

Patients were selected through convenience sampling, and all individuals who underwent thyroid surgery at Imam Khomeini Hospital during the five-year study period were included based on predetermined inclusion and exclusion criteria. Initially, we collected demographic information pertaining to the patients, including clinical symptoms, age, and gender, utilizing a pre-designed checklist derived from their medical records. Subsequently, we documented the frequency of various types of malignant pathologies and presented the data in terms of frequency and percentage, categorized by clinical symptoms, age, and gender.

## Findings

Out of 80 patient files reviewed, 75 met the inclusion and exclusion criteria for this study. The demographic composition consisted of 46 women (61%) and 29 men (39%). Among the

histopathological findings, papillary carcinoma was the most prevalent, occurring in 55% of the cases, while metastasis was the least common entity, accounting for 7% (see Figure 1).

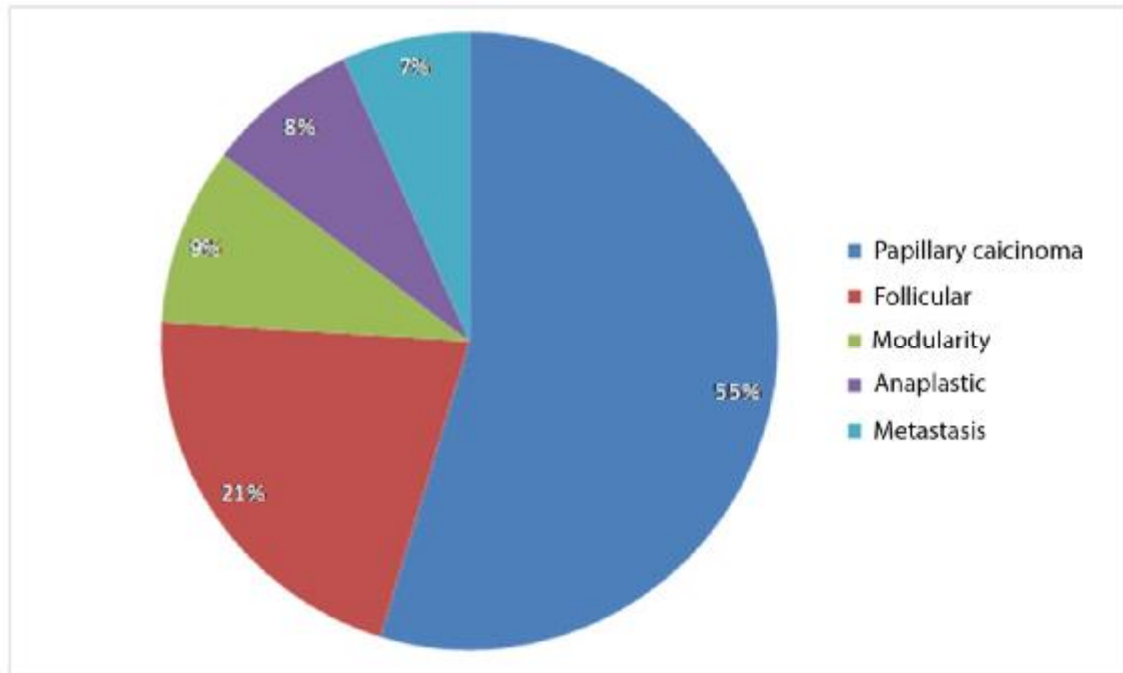


Chart 1- General frequency of histopathology of malignant thyroid masses

Table 1- Frequency of pathology of malignant thyroid masses according to gender

gender	Pathology				
	number (percentage)				
	Papillary	Follicular	Modularity	Anaplastic	Metastasis*
female	23(56)	12(26)	3(43)	3(50)	5(100)
male	18(44)	4(25)	4(57)	3(50)	-

\* Breast origin

As presented in Table 1, papillary carcinoma was the predominant pathology observed in both women (23 patients, 56%) and men (18 patients, 44%). For analytical purposes, patients were categorized into five age groups based on the type of pathology: 2 patients (3%) were under 20 years of age, 7 patients

(9%) were aged 20 to 29 years, 14 patients (19%) were aged 30 to 39 years, 18 patients (24%) were aged 40 to 49 years, 14 patients (19%) were aged 50 to 59 years, and 20 patients (26%) were over 60 years old (see Table 2).

Table 2- Frequency of histopathology of malignant thyroid tumors according to age range

age range	Pathology					total number (percentage)
	number (percentage)					
	Papillary	Follicular	Modularity	Anaplastic	Metastasis	
Under 20 years	2(5)	-	-	-	-	2(2)
20 to 29 years	4(10)	2(13)	1(14)	-	-	7(9)
30 to 39 years	7(17)	6(37)	-	1(17)	1(17)	15(20)
40 to 49 years	11(27)	4(25)	3(43)	-	-	18(24)
50 to 59 years	7(17)	-	2(29)	3(50)	3(50)	15(20)
More than 60 years	10(24)	4(25)	1(14)	2(33)	2(33)	19(25)

Notably, the majority of affected patients (26%) fell within the age group of 60 years and older, whereas only 2 patients were younger than 20 years. The reported clinical symptoms included a neck mass (observed in 70 patients, 93%), dysphagia (22 patients, 29%), dysphonia (15 patients, 20%), dyspnea (28 patients, 37%), and weight loss (13 patients, 17%).

### Discussion and Conclusion

The objective of this study was to examine the prevalence of malignant thyroid tumors and their associated age and gender characteristics over a five-year period among patients at Imam Khomeini Hospital in Tehran. The

findings regarding the frequency of different histopathological types of malignant thyroid tumors are consistent with existing literature. Previous studies have consistently identified papillary carcinoma as the most common histopathological type among malignant thyroid tumors,<sup>11,12</sup> which typically exhibits less invasive behavior and a more favorable prognosis in comparison to other forms of thyroid carcinoma.<sup>13</sup>

Numerous population-based studies have investigated the incidence and distribution of histopathological types of thyroid cancers. For instance, a study conducted by Davies and Welch, which analyzed patient data from 1973

to 2002, reported that papillary carcinoma is the most prevalent subtype, accounting for approximately 80% of all thyroid malignancies.<sup>14</sup> This observation is further substantiated by a comprehensive meta-analysis conducted by LiVolsi and Baloch, which reviewed over 26,000 cases of thyroid malignancies and found that papillary carcinoma constitutes nearly 85% of all thyroid carcinomas.

Conversely, our study identified metastasis as the least common histopathological type, occurring in only 7% of cases. This finding is consistent with existing literature, as metastatic thyroid tumors typically represent a minority among thyroid malignancies.<sup>16</sup> These metastatic tumors often originate from other primary sites, such as the breast, lungs, or kidneys, prior to spreading to the thyroid gland.<sup>17,18</sup>

Notably, in our study, metastasis was observed exclusively in female patients with breast cancer, corroborating findings from previous studies.

In terms of age distribution, our research revealed a higher proportion of affected patients in the 50 to 59 age group, closely followed by those over 60 years of age. This pattern is consistent with the increased susceptibility of older individuals to thyroid malignancies, underscoring age as a significant risk factor.<sup>19</sup> Our findings align with previous

studies that emphasize the relationship between age and the development of thyroid cancer.<sup>20,21</sup>

However, we also observed a relatively low incidence of malignant thyroid tumors among younger individuals, with only two patients under the age of 20. This trend has been supported by earlier research, including a study by Siegel et al.<sup>22</sup>, which analyzed patient data from 200 to 2016 and reported a gradual increase in thyroid cancer incidence with age, peaking among individuals aged 60 to 64.

It is important to acknowledge several limitations of the present study. Firstly, data were collected from a single hospital, which may introduce selection bias and limit the generalizability of the findings to the broader population in Tehran or other regions. Secondly, the relatively small sample size constrains the statistical power and applicability of the results. Future studies conducted on a larger scale and across multiple centers are necessary to validate these findings and enhance their relevance.

In summary, our study reinforces previous evidence by demonstrating that papillary carcinoma is the most common histopathological type of malignant thyroid tumors. Furthermore, the age and gender distribution observed in our research closely aligns with established findings within the literature.

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