

## Original Article



# Evaluation of Cervical Masses and Its Causes in Patients Referred to the ENT Clinic of Tabriz University of Medical Sciences

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## ABSTRACT

**Introduction:** Statistical study of neck masses and their evaluation and treatment methods have received much attention in journals and reference books. However, due to differences in the range of diseases and diagnostic-therapeutic facilities between different countries, it is necessary to achieve differential diagnoses of neck masses in Iran through regional studies.

**Material and Methods:** This study was a cross-sectional study that was conducted during 2018-2019 with the participation of 203 patients referred to the ENT clinics of Tabriz University of Medical Sciences. Patients with suspected neck masses underwent sampling and imaging after examination and their results were reported.

**Results:** In neoplastic lesions, the most involvement was in the jugulodysgastric lymphatic chain. In non-neoplastic lesions, the most common site of involvement was the anterior-middle part of the neck. In both sexes, the most common site of neck mass was in the jugulodigastric lymphatic chain, with a prevalence of 20% in men and 22% in women, respectively, with the difference that the percentage of neoplastic lesions in the area in both males and females was 36.86%, respectively and 55%.

**Conclusion:** A complete and frequent clinical examination is necessary in adults who are in their fourth decade of life. FNA is the best method after the examination if the cause of the mass is not known. After eliminating the inflammatory causes, SCC is the most common pathology in men and tuberculosis in women, which is often seen in the jugulodigastric lymph chain and posterior triangle of the neck, respectively.

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## Introduction

Cervical masses are any swelling or enlargement of the structures in our area between the mandible and the clavicle that may be caused by subcutaneous fat, vascular structures, nerves, or saliva. Other masses are due to the development of primary tumors [1]. They occur (cervical adenopathy), which is mainly seen in tumors of the upper gastrointestinal tract. In 5% of cases of metastatic cervical tumors, the initial location is clinically unknown. Many cervical masses are benign in children, with approximately 50% of children under 2 years of age having palpable lymph nodes in the neck. More than 25% of pediatric tumors are found in the head and neck area, and about 2% of these tumors are malignant [2]. In children, inflammatory causes of cervical masses are more common than other causes, followed by congenital causes [3]. Neoplastic causes are less common, but in adults, any cervical mass should be considered malignant unless proven otherwise [4]. Smoking, alcohol and a history of radiation are effective in the development of neck cancers. In the United States, cervical cancers account for about 3 percent of new cancers and about 2 percent of cancer deaths. The disease is more common in developing countries and its annual prevalence is more than 500,000 worldwide [5]. The incidence of head and neck cancers increases with age and most patients are over 50 years old [6].

Cervical masses are one of the relatively common complaints of patients referred to the ENT clinic and usually include 10 to 15% of complaints, which in addition to making the patient anxious, sometimes a problem for the medical staff [7]. It is considered diagnostic and includes a wide range of differential diagnoses due to local, metastatic or systemic diseases. Step-by-step evaluation, along with attention to detail in the history and thorough clinical examination, is the most useful way to limit the diagnoses and take the best path to the final diagnosis [8]. Attention to points such as age, sex, duration and course of the disease, total lesion, consistency, adhesion during a history and complete physical examination are the

diagnostic keys and in the next steps, use of laboratory paraclinical tests, imaging, fine needle aspiration, endoscopy and finally, a biopsy confirms the definitive diagnosis. What is important in neck masses is the negative lymphatic drainage of the head and neck area and the specific pattern of the spread of infections and malignancies in this area in discovering the primary cause of most neck masses [9]. The main complaint of many clients of clinics and otolaryngology associations is feeling or seeing a lump in the neck. Because this limited area is home to a large variety of arteries, nerves, muscles, and viscera, guessing the initial location and diagnosis of cervical masses is often difficult. In addition, most often the presence of a neck mass is the first or only manifestation of diseases whose initial location may be the head, neck or even further away. Therefore, by examining these masses, a latent disease can be discovered that may be inflammatory, infectious or malignant [10].

The discovery of a gland or lymph node as a cervical mass is associated with additional diagnostic problems because primary or metastatic malignancies must be distinguished before any invasive or therapeutic diagnosis. Then, based on that, he laid other diagnostic measures or treatment plan to prevent wasting time and money. Statistical study of neck masses and their evaluation and treatment methods have received much attention in journals and reference books. However, due to differences in the range of diseases and diagnostic-therapeutic facilities between different countries, it is necessary to achieve differential diagnoses of neck masses in Iran through regional studies.

## Material and Methods

**Study design:** In a cross-sectional study during 2018 to 2019, all patients who complained of cervical mass on an outpatient basis in the ENT clinic of Tabriz University of Medical Sciences or with the same complaint were admitted to the ENT department of the hospital. Could be examined within two years. In this study, 203 patients were enrolled by census sampling method.

**Inclusion / Exclusion Criteria:** The presence of neck mass was clinically assessable in different areas of the neck and the exclusion criteria were the absence of clinically assessable neck mass in different areas of the neck and the lack of referral to the clinic until the final diagnosis. Patients with abscess diagnosis were also included in the exclusion criteria.

**Methodology:** All patients were examined by specialized ENT assistants and the required information obtained from the examination and history, which included demographic and specialized variables, was collected. All patients who had a neck mass associated with a known organ of the head and neck after paraclinical examinations such as necessary tests and imaging (graphic) first underwent FNA and finally excisional biopsy, and patients who had a neck mass (mainly lymphadenopathy) without a clear connection With the mentioned organs, they underwent FNA after performing paraclinical examinations and relevant radiological modalities, and if the primary origin was determined during the evaluations, they underwent excisional biopsy. If the initial examination failed to detect the original origin, the patient underwent panendoscopy. If a lesion was observed, a biopsy was performed, and if the result was negative, a blind biopsy was performed of the tonsils, base of the tongue, nasopharynx, and hypopharynx. Finally, all undiagnosed patients underwent an emergency biopsy of the mass. Samples prepared by the

pathologist were examined. Required information including age, sex, duration of mass, size and location of the mass, accompanying symptoms and paraclinical tests for each patient were recorded separately in the questionnaire. Pathology of lesions was classified into two groups: neoplastic and non-neoplastic lesions and patients were compared in two different groups in terms of variables.

**Statistical analysis:** Data collected with SPSS software (version 21). Appropriate descriptive-analytical tests (one-way analysis of variance and independent t-test) were analyzed.

**Ethical considerations:** After obtaining the code of ethics from the ethics committee of Tabriz University of Medical Sciences (IR.TBZMED.REC.1399.944), the objectives of the study were explained to patients and informed consent was obtained from all of them. Patients were not charged for the costs of testing and imaging.

## Results

110 patients were male and the rest were female. The mean age of male participants was  $43.48 \pm 5.85$  and in female participants was  $41.95 \pm 5.14$  years ( $P = 0.593$ ). Definitive diagnosis based on biopsy result in 197 patients showed the presence of 7 different types of pathology with different prevalence in men and women and according to age (Tables 1 and 2).

**Table 1** Frequency distribution of 7 common pathologies in patients by gender

Sex	Squamous cell carcinoma	Tuberculosis	Multinodular adenoma of thyroid	Papillary carcinoma of thyroid	Follicular adenoma of thyroid	Nonhodgkin lymphoma	Thyro glossal cyst
Male	40 (36.3%)	3 (2.27%)	8 (7.27%)	2 (1.81%)	2 (1.81%)	2 (1.81%)	6 (5.45%)
Female	14 (12.7%)	17 (15.45%)	3 (2.27%)	7 (6.36%)	6 (5.45%)	6 (5.45%)	2 (1.81%)

**Table 2** Frequency distribution of 7 common pathologies in patients by age

Sex	Squamous cell carcinoma	Tuberculosis	Multinodular adenoma of thyroid	Papillary carcinoma of thyroid	Follicular adenoma of thyroid	Nonhodgkin lymphoma	Thyro glossal cyst
Age	24.23±7.10	20.55±12.48	26.59±5.62	28.33±14.40	23.59±4.85	24.11±5.85	37.45±3.62
Max	73	81	55	59	66	68	57
Min	21	18	23	24	20	18	30

The distribution of frequency and distribution of lesions among different age groups by type of pathology (neoplastic and non-neoplastic) is shown in Table 3. The most common site of lesion in the age group of less than 15 years is in the middle anterior part of the neck and jugulodigastric lymphatic chain, in the age group

of 15 to 40 years in the middle anterior part of the neck and jugulodigastric lymphatic chain, and finally in the age group 40 years and above. It was the middle of the neck. The distribution of neoplastic and non-neoplastic lesions by sex is also shown in Table 3.

**Table 3** Frequency distribution of lesions at different ages based on pathology in male and female patients

Variable	Pathology Type	N (%)
Age	0-15 Years	Neoplastic 2 (1.81%)
		Non-neoplastic 26 (23.63%)
	16-40 Years	Neoplastic 20 (18.18%)
		Non-neoplastic 47 (42.72%)
	>40 Years	Neoplastic 70 (63.63%)
		Non-neoplastic 34 (30.90%)
Sex	Male	Neoplastic 59 (53.63%)
		Non-neoplastic 49 (44.54%)
	Female	Neoplastic 33 (30%)
		Non-neoplastic 58 (52.72%)

In general, the most common sites of neck masses were medial anterior neck and jugulodigastric lymphadenopathy, respectively. In neoplastic lesions, the most involvement was in the jugulodysgastric lymphatic chain. In non-neoplastic lesions, the most common site of involvement was the anterior-middle part of the neck. In both sexes, the most common site of neck mass was in the jugulodigastric lymphatic chain, with a prevalence of 20% in men and 22% in women, respectively, with the difference that the percentage of neoplastic lesions in the area in both males and females was 36.86%, respectively and 55%. The results showed that the most common manifestations of cervical mass in men are lymphatic and jugulodigastric chain, middle anterior neck, middle jugular lymphatic chain and posterior lymphatic chain, respectively, and in women, medial anterior part of cervical lymph node, circular jugular ligament, circular jugular Was. The results showed that there was a significant relationship between gender and neoplastic lesion based on Causquare test, ie men were more likely to have neoplastic neck mass than women.

## Discussion

When examining a disease with a neck mass, the first issue that should be considered by the

physician is the patient's age group. Inflammatory masses are more common in children under 15 years of age and young adults (16 to 40 years old) than massive or developmental masses, and neoplasms are less common. Raised are neoplasms [11].

In the present study, in three age groups, the prevalence of non-neoplastic lesions decreased and the prevalence of neoplastic lesions increased, respectively, and this significant difference was reported. The most common developmental mass in the pediatric age group was thyroglossal cyst and in the adult and young adult age groups, the most common pathology in neoplastic masses was SCC, metastatic and lymphoma, respectively. In this study, the most common pathology. Thyroglossal cyst was present in the pediatric group, but the most common neoplastic pathology was in the SCC adult age group and the prevalence of lymphoma in the adult adult age group was lower than the published statistics in the articles [12-15].

The second point that is very important in the evaluation of cervical masses is the location of the lesion, especially in developmental-congenital masses that usually appear in a fixed place. In addition, the location of the mass is also important in determining the prognosis [16]. The spread of head and neck tumors as

infections follows specific lymphatic pathways, and the site of metastatic mass is the primary diagnostic key. In this study, thyroid masses, thyroglossal cyst in the midline of the neck, tuberculosis were more common in the posterior triangle of the neck and SCC metastatic masses were more common in the anterior triangle of the neck. Attention to the location of neck masses in other pathologies did not seem valuable due to the low volume of samples [17].

The findings of the present study showed that no significant relationship was found between the location of the lesion and the type of pathology of the lesion based on whether it was neoplastic or non-neoplastic. In 50 to 67% of malignant cervical lymphadenopathies, a primary tumor can be identified with a thorough clinical examination of the head and neck area. Attention to the involved lymphatic chain is a guide to diagnosing the primary lesion. For example, nasopharyngeal lesions of the posterior cervical region, lesions of the tonsils, and anterior lymph nodes of the neck are involved. Some studies suggest a high prevalence of malignancy in posterior triangular masses of the neck. Other studies have suggested a higher risk of malignancy in supraclavicular masses [18-22].

In the present study, comparing the pathology of the lesion with the primary focus in 184 cases where the primary focus was identified or the neck lesion was the primary lesion, no significant relationship was found between the two variables, although the low sample size limits the possibility of such an inference. The firm consistency and adhesion of the mass to adjacent tissues increases the likelihood of malignancy and neoplasticity of the neck lesion. In our study, there was a significant relationship between masses with firm consistency and adhesion to surrounding tissues and neoplasticity of the lesion.

### Limitations

One of the limitations of the research is that the sample under study is not representative. Due to the low sample size, repeating the study with more patients will pave the way for more definite results.

### Conclusion

Neck pretend. Except for some infectious masses, they often undergo therapeutic or diagnostic surgery. The main issue in adopting treatment and diagnostic methods is its cost-effectiveness. In children, a biopsy is appropriate when there is progressive growth, a distinct, asymmetrical mass, supraclavicular replacement, associated symptoms such as fever, hepatosplenomegaly, or a fixed mass over 3 cm. In the young to middle-aged age group, a biopsy is acceptable if a complete clinical examination and specific tests do not provide more information due to the low prevalence of mucosal carcinoma in this age group under 40 years. A complete and frequent clinical examination is necessary in adults who are in their fourth decade of life. FNA is the best method after the examination if the cause of the mass is not known. After eliminating the inflammatory causes, SCC is the most common pathology in men and tuberculosis in women, which is often seen in the jugulodigastric lymph chain and posterior triangle of the neck, respectively.

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