The Correlation Between Clinical Prediagnosis and Pathology Results in the Diagnosis of Neck Masses

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Abstract The importance of clinical assessment and its contribution to the diagnosis of neck masses was investigated in patients presenting with a neck mass. In our study, we collected the medical history of a total of 127 patients, including 66 males and 61 females, who presented with a neck mass. Physical exams, endoscopic examinations, laboratory tests, a variety of imaging studies, and fine-needle aspiration biopsies were performed. The relationship between age, duration and location of the neck mass, FNAB results, and definitive histopathological diagnosis were investigated as well as the correlation between the consensus diagnosis reached after the evaluation of the medical history, physical examination and imaging studies, and definitive histopathological diagnosis. A strong and positive relationship ($p < 0.01$) was found between patients' ages and the definitive diagnosis established by histopathological examination. There was no statistically significant relationship ($p > 0.05$) between the duration and location of the neck mass and definitive diagnosis established by histopathological examination. And no statistically significant relationship ($p > 0.05$) was found between FNAB results and definitive histopathological diagnosis. Although no statistically significant relationship was found between the characteristics of neck masses and

age, duration and location of masses and FNAB results, there was a statistically significant correlation between the pre-diagnosis estimated by ENT specialists and definitive diagnosis established by histopathological examination. A strong and positive relationship ($p < 0.01$) was found between clinical pre-diagnosis and definitive diagnosis established by histopathological examination. In patients presenting with a neck mass, the diagnosis should be made based on the medical history, physical examination, radiologic imaging and FNAB results, treatment decisions should be based on those findings.

Keywords Neck mass · Prediagnosis · Histopathological diagnosis

Introduction

Encountering patients with a neck lump is not uncommon in routine ENT practice. The complex anatomy of the neck region causes problems in differential diagnosis. [1].

The patient's age, and location, size and duration of the mass are important for diagnosis and give important clues in differential diagnosis. The most important question is whether it is a malignant or benign mass. The patient's age is the most important factor, and the risk of malignancy becomes greater with increasing age. [2].

Neck masses can be categorized as congenital, inflammatory and neoplastic. [1, 3] Congenital and neoplastic masses are more common in developed countries, whereas inflammatory masses are encountered more frequently in underdeveloped and developing countries. [3, 4].

When evaluating neck masses, the duration, size, location, growth rate and mobility of the mass are examined along with criteria such as fever, pain and sensitivity. The

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posterior triangle masses carry a much higher risk of malignancy than anterior triangle masses. [5].

Taking into consideration clinical findings, a radiological imaging algorithm should be determined. For this purpose, imaging techniques such as ultrasonography, computed tomography, magnetic resonance imaging, angiography and scintigraphy can be used. [6, 7].

In patients with a neck mass, the examination of the nasal cavity, nasopharynx, oral cavity, oropharynx, hypopharynx and larynx, and endoscopic examination of the digestive system, if deemed necessary, should be done carefully. In addition, a histopathological examination of a biopsy taken from suspected areas should be performed. [1].

Fine needle aspiration biopsy (FNAB) is performed to assist in the diagnosis of a neck mass if necessary.

The definitive diagnosis of mass in the neck is made by histopathological evaluation of incisional and excisional biopsy specimens.

In our study, the relationship between age, duration and location of neck masses, FNAB results and definitive histopathological diagnosis, and the correlation between clinical diagnosis based on medical history findings, physical examination and imaging studies and definitive histopathological diagnosis were investigated.

Materials and Methods

A total of 127 patients, including 66 males and 61 females, who presented to our Ear, Nose and Throat clinic with a neck mass, were included in the study.

A detailed medical history was taken from the patients.

The patients were divided into three groups according to the duration of mass: (1) 3 month history of a neck mass (2) 3–6 month history of a neck mass (3) a neck mass that has been present for more than 6 months.

Physical examinations were performed, and findings were recorded. Neck masses were classified according to their anatomical location as the anterior compartment, posterior compartment, both the anterior compartment and the posterior compartments, the middle line, the parotid region, and the supraclavicular region.

Endoscopic nasal, nasopharyngeal, pharyngeal, and laryngeal examinations were performed. Routine laboratory analyses were performed. Neck ultrasonography was performed in all patients.

Imaging techniques such as computed tomography, magnetic resonance imaging, angiography and scintigraphy were used for differential diagnosis in appropriate patients.

FNAB was performed if necessary.

As a result of these preliminary investigations, the masses were divided into three groups as benign, malign and indiscernible. Finally, definitive histopathological

diagnoses were made by excisional biopsy, and recorded. A potentially statistically significant correlation between the consensus diagnosis reached after the evaluation of age, duration and location of the mass and definitive diagnosis were investigated.

Statistical analysis of the data was performed using SPSS for Windows 11.5 package software. Pearson correlation analysis was used in the assessment. A p value of <0.05 was considered statistically significant.

Results

A total of 127 patients, including 66 males and 61 females, were enrolled in our study. The patients' ages ranged between 11 and 81 years (mean age 47.29 years). 30 (23.8 %) patients, 31 (24.6 %) patients and 65 (51.6 %) patients had a neck mass for less than 3 months, for 3–6 months and for more than 6 months, respectively. (Fig. 1).

The neck mass was located in the anterior compartment in 49 patients (38.6 %), in both the anterior and posterior compartment in 8 patients (6.3 %), in the midline in 10 patients (7.9 %), in the parotid region in 58 patients (45.7 %), and in the supraclavicular region in 2 patients (1.6 %) (Fig. 2).

Seventy-one of the patients underwent FNAB. The mass was benign in 41 patients (57.7 %), malignant in 18 patients (25.3 %), and both benign and malignant in 3 patients (4.2 %), and 9 patients had (12.6 %) nondiagnostic findings.

According to a clinical consensus diagnosis provided by ENT specialists, the mass was benign in 74 patients (58.2 %) and malignant in 29 patients (22.8 %), whereas the character of the mass could not be differentiated in 24 patients (18.9 %).

The definitive diagnosis of all patients was made by a histopathological examination of excisional biopsy specimens. Histopathological examination revealed that 100 (78.7 %) of the 127 specimens were benign and 27 (21.2 %) were malignant. When we look at the diagnoses made by histopathological examination 27 patients (21.3 %) had pleomorphic adenoma, 11 patients (8.6 %)

Fig. 1 Distribution by neck mass formation times

Fig. 2 Distribution by neck mass location

had chronic granulomatous disease, 9 patients (7.1 %) had Warthin's tumor, 7 patients (5.5 %) had lipoma, 6 patients (4.7 %) had thyroglossal duct cyst, 6 patients (4.7 %) had chronic sialoadenitis and sialolithiasis, 6 patients (4.7 %) had squamous cell carcinoma metastases, 5 patients (3.9 %) had reactive lymphadenopathy, 5 patients (3.9 %) had branchial cleft cyst, 5 patients (3.9 %) had hodgkin lymphoma, 4 patients (3.1 %) had non-hodgkin lymphoma, 4 patients (3.1 %) had lymphangioma, 3 patients (2.4 %) had dermoid cyst, 3 patients (2.4 %) basal cell adenoma, 2 patients had acinic cell carcinoma, 2 patients had papillary thyroid carcinoma metastases, 2 patients had benign

Table 1 Pathological diagnosis of the neck masses

The pathological diagnosis	Number of patients	Percent (%)
Pleomorphic adenoma	27	21.3
Chronic granulomatous disease	11	8.7
Warthin's tumor	9	7.1
Lipoma	7	5.5
Thyroglossal duct cyst	6	4.7
Chronic sialadenitis and sialolithiasis	6	4.7
Squamous cell carcinoma metastasis	6	4.7
Reactive lymphadenopathy	5	3.9
Branchial cleft cyst	5	3.9
Hodgkin lymphoma	5	3.9
Non-hodgkin lymphoma	4	3.1
Lymphangioma	4	3.1
Dermoid cyst	3	2.4
Basal cell adenoma	3	2.4
Acinic cell carcinoma	2	1.6
Papillary thyroid carcinoma metastasis	2	1.6
Benign lymphoepithelial cysts	2	1.6
Other	20	15.8
Total	127	

lymphoepithelial cyst, and 20 patients (22.8 %) had other diseases. (Table 1).

A strong and positive relationship was found between the patients' ages and definitive histopathological diagnosis. ($p < 0.01$).

No statistically significant relationship was found between the duration of mass and definitive histopathological diagnosis. ($p > 0.05$).

No statistically significant relationship was found between the location of mass and definitive histopathological diagnosis. ($p > 0.05$).

No statistically significant relationship was found between FNAB results and definitive histopathological diagnosis. ($p > 0.05$).

Although no statistically significant relationship was found between duration, location and characteristics of the neck mass, FNAB results and definitive histopathological diagnosis, there was a statistically significant correlation between the clinical pre-diagnosis considered by ENT specialists and definitive histopathological diagnosis. A strong and positive relationship was found between clinical pre-diagnosis and definitive histopathological diagnosis. ($p < 0.01$).

Discussion

Factors causing neck masses include many conditions, such as congenital developmental abnormalities, toxic, endocrine and infectious/inflammatory causes, trauma, and systemic diseases. It is important to know whether the mass is cancerous. A detailed medical history of a patient with a neck mass provides important clues for diagnosis.

In Bhattacharyya's [8] study, advanced age and location of the mass were reported as important parameters.

In the study of Uysal et al. [9], including 481 cases, while the mean age was 50.4 ± 19.6 among those with a malignant mass, the mean age of those with a benign mass was 36.8 ± 17 .

In a study conducted by Yildirim et al. including 420 patients with neck masses, mean age was 48.44 ± 20.14 in malignant cases, whereas in benign cases mean age was 36.5 ± 11.66 .

Patients with neck masses were distributed as inflammatory (45 %), neoplastic (44.5 %), and congenital (10.4 %). A total of 39.5 % of neoplastic masses were benign, and 60.4 % of them were malignant in nature. [3].

In our study, mean age was 57.3 in cases with a malignant mass, whereas mean age was 44.6 in benign cases. A strong and positive relationship ($p < 0.01$) was found between the patients' ages and definitive histopathological diagnosis. The risk of malignancy increases by age. In our study, it was observed that 78.7 % (100) neck masses were benign and 21.2 % (27) were malignant.

In a study conducted by Giglio et al. [10], while an inflammatory etiology was considered for masses existing for 7 days, it was indicated that a neoplastic etiology for masses existing for 7 months and a congenital etiology for masses existing for 7 years should be considered.

In our study, there were 30 patients (23.8 %), 31 patients (24.6 %) and 65 patients (51.6 %) with a neck mass for 3 months, for 3–6 months and for more than 6 months, respectively. No statistically significant difference ($p > 0.05$) was found between the duration of mass and definitive histopathological diagnosis.

In a study conducted by Schelkun et al. [11], 110 of the 213 patients with head and neck masses who underwent FNAB, underwent surgery and histopathological diagnosis was established. A total of 40.3 % of patients had a mass with malignant cytology and 45.1 % had a mass with benign cytology, whereas 14.6 % were undiagnosed. In this study, the percentage of false negative results was 2.3 % and the percentage of false positive results was 0.5 %.

A total of 71 patients underwent FNAB. The neck masses were benign in 41 patients (57.7 %), malignant in 18 patients (25.3 %) and both benign and malignant in 3 patients (4.2 %), and 9 patients had (12.6 %) non-diagnostic findings. The percentage of false negative results was 3.39 % and the percentage of false positive results was 5.08 %.

There was no statistically significant relationship ($p > 0.05$) between FNAB results and definitive histopathological diagnosis.

A careful clinical evaluation can suggest the etiology of a neck mass. No study was found in the existing literature describing the relationship between clinical pre-diagnosis and definitive histopathological diagnosis.

Although no statistically significant relationship was found between duration, location and characteristics of the neck mass, FNAB results and definitive histopathological diagnosis, there was a statistically significant correlation

between the clinical pre-diagnosis considered by ENT specialists and definitive histopathological diagnosis.

In conclusion, it is possible to correctly predict definitive diagnosis with an evaluation of a detailed medical history, physical examination, laboratory studies, radiologic findings, and FNAB results, and treatment should be planned accordingly.

Conflict of Interest None.

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