Neck Masses: Retrospective Analysis of 981 Cases

Boyun Kitleleri: 981 Vakanın Retrospektif Analizi

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ABSTRACT Objective: The purpose of this study was to determine and discuss the diagnostic distribution, clinical behaviors and histopathological features of neck masses of patients who were followed-up in our department. **Material and Methods:** A total number of 981 patients with neck masses, who attended the Department of Ear-Nose-Throat in Dicle University Medical School, between 1992 and 2010, were analyzed retrospectively. **Results:** Among the 981 cases, 485 (49.5%) had a mass with neoplastic origin, whereas 383 (39%) had inflammatory and 113 (11.5%) had congenital neck masses. Approximately 69% of the neoplastic masses were malignant and 31% were benign in nature. The mean ages were 28.26±7.69 and 11.45±4.08 years in patients with inflammatory and congenital masses, respectively. The mean age of the patients diagnosed with benign neck masses was 35.5±5.80 years while the mean age of the patients with malignant masses was 49.22±11.68 years. **Conclusion:** Neoplastic masses seem to be the most frequent cause of neck masses. Neck masses, especially in adults should be considered malignant until proven to be benign. In addition, biopsy specimens should not be obtained before a detailed ear, nose and throat examination of the patient.

Key Words: Head and neck neoplasms; neck; pathology; biopsy

ÖZET Amaç: Kliniğimizde boyun kitlesi nedeniyle teşhis veya tedavi amaçlı takip edilen hastalarda, bu kitlelerin dağılımı, klinik davranışları ve histopatolojik özelliklerini belirlemek ve tartışmak amaçlandı. **Gereç ve Yöntemler:** Dicle Üniversitesi Tıp Fakültesi Kulak Burun Boğaz Hastalıkları Anabilim Dalı'nda, 1992 ile 2010 yılları arasında boyun kitlesi nedeniyle takip edilen 981 hasta geriye dönük olarak analiz edildi. **Bulgular:** Toplam 981 olguda, kitlelerin 485 (%49,5)'inde neoplastik, 383 (%39)'ünde yangısal ve 113 (%11,5)'ünde konjenital neden belirlendi. Neoplastik kitlelerin yaklaşık %69'u kötü huylu, geri kalan %31'i iyi huylu karakterde bulundu. Kitlesi yangısal kökenli olan hastalarda yaş ortalaması 28,26±7,69, konjenital olanlarda ise 11,45±4,08 bulundu. Neoplastik kitlelerden iyi huylu olanlarda yaş ortalaması 35,5±5,80, kötü huylu olanlarda ise 49,22±11,68 idi. **Sonuç:** Çalışmamızda, neoplastik kitleler boyun kitlelerinin en sık sebebi olarak bulunmuştur. Özellikle erişkinlerde görülen boyun kitleleri, iyi huylu olduğu ispat edilene kadar kötü huylu kabul edilmelidir. Bunun yanında, detaylı bir kulak, burun, boğaz muayenesi yapılmadan hiçbir kitleye biyopsi uygulanmamalıdır.

Anahtar Kelimeler: Baş ve boyun tümörleri; boyun; patoloji; biyopsi

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Neck is the region, bounded by ramus and corpus of mandible in its anterior and lateral borders, and by mastoid bone apex and occipital protuberance in its posterior and by clavicula in its inferior borders bilaterally. Neck masses (NMs) usually create complicated problems that are often encountered by primary care physicians and family doctors

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in the primary care setting and cause common interest among various medical disciplines. NMs should be investigated meticulously due to their proximity to some vital organs such as blood vessels and nerves located in the neck.

The definitive etiologic diagnosis of NMs is challenging due to their multifactorial nature. In general, NMs are classified into three main groups including congenital, inflammatory and neoplastic masses.[1] According to some previous reports, in the pediatric and young adult population (under 21), cysts and malformations secondary to infections and congenital causes account for almost 85% of the NMs. Excluding benign thyroid masses, 80% of the NMs in adults were reported to be neoplastic. The rate increases up to 90% after the fifth decade of life. Moreover, in adults 70% of all neoplastic NMs were reported to be malignant in nature. Only a quarter of malignant masses were primary malignancy whereas the remaining were metastatic masses.[2,3]

The probability of malignancy should be the top consideration of a physician when a patient presents with signs of NM. Therefore, etiology of the NM should be immediately clarified by using all available clinical and laboratory methods for an appropriate and early treatment. When performing incisional or excisional biopsies, a detailed head and neck examination is suggested to prevent any possible negative impact on the quality of life of the patient and the chance for a successful treatment.

The purpose of this study was to determine the diagnostic distribution and the clinical and histopathological features of the NMs of patients who were treated in the Department of Ear-Nose-Throat (ENT) in a university hospital and to discuss the results in the light of the relevant literature. We believe that the present large-scale study will contribute to the knowledge on NMs in a Turkish population and we hope that it will guide clinicians in the management of NMs.

MATERIAL AND METHODS

A total number of 981 patients (342 females, 639 males) attending the Otorhinolaryngology department of the Dicle University Medical School between 1992-2010 with an NM that could not be diagnosed through routine diagnostic methods and required histopathological examinations for definitive diagnosis were reviewed retrospectively using medical records. The medical history, physical and ENT examinations, routine endoscopies, laboratory findings, chest radiography, ultrasonography, computed tomography and magnetic resonance imaging (MRI) findings of all patients were recorded using medical charts.

The records revealed that patients with infectious NMs underwent laboratory tests to rule out various specific infections and excisional biopsy if required; they were treated with antibiotics for two weeks. Masses with the likelihood of congenital origin were excised using an appropriate surgical technique and were sent for histopathological examination. For neoplastic masses with known primary site, the final histopathologic diagnoses were clarified with biopsy sampling of the primary site. The appropriate treatment modality (surgery, chemotherapy, radiotherapy or their combinations) was chosen according to the results of the pathological examination. Patients with metastatic masses with unknown primary site underwent haematological, radiological and scintigraphic examinations, panendoscopic examination of the upper respiratory system and the digestive tract and biopsy specimens were obtained from suspected sites. An excisional biopsy from the mobile masses and an incisional biopsy from immobile masses were performed shortly before the planned surgical treatment in patients where the primary site could not be found despite the above-mentioned investigations. Biopsy specimens were examined histopathologically under light microscopy. Patients who were diagnosed with non-surgical methods (such as fine-needle aspiration) and who had non-metastatic thyroid gland-derived tumors were excluded from the study.

RESULTS

The medical records of 981 patients with NMs were reviewed. Among them, NMs of 485 (49.5%) patients were neoplastic, 383 (39%) were inflam- ma-

tory, and 113 (11.5%) were congenital in origin. Approximately 69% of the neoplastic masses were malignant and 31% were benign in nature. The overall mean age was 34±56 years and the mean ages of the patients with infalmmatory and congenital NMs were 28.26±7.69 and 11.45±4.08 years. The mean age of the patients diagnosed with benign NMs was 35.5±5.80 years, whereas it was 49.22±11.68 years in patients with malignant NMs ($p<0.001$). The diagnoses of 981 cases and their percentages were shown in Table 1.

Squamous cell carcinoma (46.7%) was the most common lesion among the malignant NMs. The most common benign tumor was pleomorphic adenoma (31.12%) while lipoma (25.82%) was the second most frequent one in the present study (Tables 2 and 3).

Inflammatory lymphadenopathy (41.46%) was the most common lesion among the inflammatory NMs whereas epidermoid cyst (26.54%) was the most common among congenital NMs (Tables 4 and 5). A comparison of studies from Turkey on NMs was provided in Table 6.

DISCUSSION

Careful differential diagnosis of NMs is indispensable due to the wide variety of their etiologies. Definitive diagnosis can only be confirmed through histopathological examination. Etiologic factors of the NMs may vary among countries due to socioeconomic and developmental factors. While the most common cause of NMs are inflammatory lesions in developing countries, congenital and tumor masses of the neck are the leading causes in developed countries.[1,13]

According to Koç et al., more than half of the NMs were neoplastic in origin.[6] In another report, neoplastic NMs constituted the most important group, especially in the elderly population.[14] The malignancy rate in tumoral NMs was reported between 33 and 64% in several studies.[12,15,16] In the present study, the rate of neoplastic NMs was 49.5%; 334 (68.9%) cases had malignant NMs,

TABLE 1: Classification and distribution of neck masses.

Case	Number	Rate (%)
Neoplastic masses	485	49.5
Inflammatory masses	383	39.0
Congenital masses	113	11.5
Total	981	100

TABLE 2: Malignant tumoral neck masses.

Case	Number	Rate (%)
Squamous Cell Carcinoma	156	46.70
Lymphoma	93	27.84
Adenocystic Carcinoma	20	5.98
Undifferentiated Carcinoma	14	4.19
Basal Cell Carcinoma	13	3.89
Papillary Carcinoma Metastasis	8	2.39
Adenocarcinoma	7	2.09
Malignant Epithelial Tumor Metastasis	6	1.79
Mucoepidermoid Carcinoma	6	1.79
Small Round Cell Tumor	3	0.89
Hurtle Cell Carcinoma Metastasis	3	0.89
Clear Cell Carcinoma	1	0.29
Malignant Fibrous Histiocytosis	1	0.29
Embryonal Rhabdomyosarcoma	1	0.29
Malignant Mesenchymal Tumor	1	0.29
Malignant mixed tumor	1	0.29

TABLE 3: Benign tumoral neck masses.

Case	Number	Rate (%)
Pleomorphic Adenoma	47	31.12
Lipoma	39	25.82
Neurofibroma	12	7.94
Monomorphic Adenoma	11	7.28
Schwannoma	8	5.29
Sialoadenosis	8	5.29
Leiomyoma	5	3.31
Whartin Tumor	5	3.31
Carotid Body Tumor	4	2.64
Benign Fibrous Histiocytosis	3	1.98
Ectopic Thyroid	2	1.32
Glomus Vagale	2	1.32
Trichoepithelioma	1	0.66
Benign Lymphoepithelial Lesion	1	0.66
Ganglioneuroblastoma	1	0.66
Pilomatrixoma	1	0.66
Laryngocele	1	0.66

TABLE 4: Inflammatory neck masses.

Case	Number	Rate (%)
Infectious Lymphadenopathy	187	48.82
Tuberculous Lymphadenopathy	83	21.67
Reactive lymphadenopathy	51	13.31
Chronic Sialadenitis	38	9.92
Foreign Body Huge Cell Granuloma	20	5.22
Kikuchi Disease	2	0.52
Cat Scratch Disease	1	0.26
Hydatid Cyst	1	0.26

TABLE 5: Congenital neck masses.

Case	Number	Rate (%)
Epidermoid Cyst	30	26.54
Branchial Cleft Cyst	25	22.12
Thyroglossal Ductus Cyst	23	20.35
Lymphangioma	20	17.69
Hemangioma	10	8.84
Dermoid Cyst	5	4.42

whereas 151 (31.1%) had a benign NM. The relatively higher mean age of the patients may account for the high rate of malignant tumoral NMs observed in the present study. We suggest that any NM, especially in older patients, should be assumed malignant until reaching a definitive diagnosis. In contrast, slow growing, mobile and painless masses of the neck existing for a long time may usually be considered benign.

Malignant tumors originating from the tonsillary fossa, hypopharynx, tongue base and nasopharynx often lead to cervical metastases that may not be easily recognized during the physical examination.[17] Therefore, a detailed examination has a vital importance especially in metastatic and unknown primary neoplasms. The head and neck area should be examined in detail for the primary tumor region. Both excisional and incisional biopsies should be done very carefully since tumor may have the potential to metastasize to the skin or surrounding tissues which may consequently decrease the chance of the patients for a better treatment.

Among the 383 patients with inflammatory NMs, 155 (41.46%) had inflammatory lymph node enlargment. NMs that have recently appeared, are sensitive and warm with hyperemia usually suggest an infection. Our treatment principle of the NMs of infectious origin involves an excisional biopsy, if possible, in cases where the masses persists or progresses despite receiving broad-spectrum antimicrobial therapy for at least fifteen days. Otherwise incisional biopsy is performed. The excisional biopsy procedure of infectious NMs should include removal of the entire mass as well as the fistula and skin necrosis caused by the mass.

Many studies in our country reported an increase in the frequency of cervical tuberculosis (tbc) lymphadenitis. Göçmen et al. detected tbc lymphadenitis in 14 of 112 (12.5%) NMs.[18] Tuberculos lympadenitis was present in 57 out of 409 (14%) NMs in the study by Cincik et al., in 19 out of 115

TABLE 6: Comparison of reports related to neck masses.

Author	Date	Case number (n)	Inflammatory neck masses (n)-(%)	Congenital neck masses (n)-(%)	Neoplastic neck masses (n)-(%)
Erdem et al.[4]	1989	218	109 (50)	36 (16,2)	69 (31.6)
Sütbeyaz et al.[5]	1994	475	198 (41.7)	143 (30.1)	134 (28.2)
Koç et al.[6]	1995	330	109 (33)	48 (14.5)	169 (51.3)
Esmer et al.[7]	1995	226	173 (35.1)	94 (19.1)	173 (28.2)
Şapçı et al.[8]	1999	116	36 (31)	30 (25.8)	50 (43.1)
Cıncık et al.[9]	2003	408	219 (53.7)	74 (18.1)	115 (28.2)
Yıldırım et al.[10]	2006	420	189 (45)	44 (10.4)	187 (44.5)
Uysal et al.[11]	2009	481	230 (47.8)	48 (9.9)	203 (42.2)
Kırış et al.[12]	2011	201	98 (48.7)	36 (17.9)	67 (33.3)
Present Study	*2011*	*981*	*383 (39)*	*113 (11.5)*	*485 (49.5)*

(16.4%) in the study by Koç et al. and in 101 of 481 (21%) in the study by Uysal et al.[9,11,19] They concluded that tbc lymphadenitis was the most common cause of NMs among inflammatory cases. On the other hand, Kırış et al. reported tbc lympadenitis as the second most common cause of NMs after reactive lymphadenitis.[12] Tbc lymphadenitis was detected in 187 of the 981 cases (19.06%), which were confirmed by histopathological examination in the present study. Consistent with the results of previous studies tbc lymphadenitis was among the major causes of NMs in the present study. This high rate of tbc lympadenitis suggests that our region is still an endemic area for tbc. Therefore, tbc lymphadenitis should be considered in the differential diagnosis of patients presenting with NMs.

In the pediatric patient group, unlike adults, a highly accurate diagnosis can be made with physical examination and radiological investigations as well as a good medical history.[1,18] Inflammatory masses resulting from the relatively higher frequency of upper respiratory tract infections in children are the most common causes of NMs at that age group.[20] Only patients with inflammatory masses who underwent excisional biopsies for the diagnosis and treatment were included in the present study. The patients whose masses showed regression with medical treatment were not included. Congenital causes constituted the second most common reason for the development of NMs following the inflammatory ones. Epidemoid cysts, branchial cleft cysts and thyroglossal duct cysts were the most common masses in patients with congenital NMs.[12,21-24]

In addition, two patients with Kikuchi disease (Necrotizing Histiocytic Lymphadenitis) were recorded. Kikuchi disease is a disease of unknown etiology presenting with cervical lymphadenopathy.[25,26] Typically, it is a rare lymphadenitis, which results in unilateral lymphadenopathy in young adults. Although it was recorded in two male patients in this study, it is more common in females. The disease often heals without treatment, however it should be noted that sometimes it might be confused with tbc lymphadenitis, lymphoma, and malignancies that may lead to inappropriate diagnosis and treatment.[26]

As a result, any NM, especially in the elderly population should be managed with caution since a considerable number of them may be malignant in nature. The etiology should be elucidated with the help of clinical, radiological and laboratory investigations for an appropriate treatment as soon as possible.

REFERENCES

1. Yalçın Ş. [Neck masses]. Çelik O, editör. Kulak Burun Boğaz Hastalıkları ve Baş Boyun Cerrahisi. 1. Baskı. İstanbul: Turgut Yayıncılık; 2002. p.860-89.
2. Lindberg R. Distribution of cervical lymph node metastases from squamous cell carcinoma of the upper respiratory and digestive tracts. Cancer 1972;29(6):1446-9.
3. Tinel Ziya Erkan Ü. [Thirty cases of thyroglossal and branchial fistula cases and their results that were intervened in our clinic between years of 1965-75]. Milli Türk ORL Bült 1976; 1(3):31-4.
4. Erdem M, Cemiloğlu R, Şahin İ. [Analysis of 218 cases with neck masses]. Türk Otolarengoloji Arşivi 1989;27(1):243-5.
5. Sütbeyaz Y, Özbay S, Selimoğlu E, Öztürk A, Şirin S. [Analysis of 475 cases with neck masses]. KBB İhtisas Dergisi 1994;2(2):162-5.
6. Koç C, Akyol MU, Özdem C. [Neck masses]. Ankara Tıp Mecmuası 1995;48(2):243-52.
7. Esmer N, Yılmaz O, Saatçi M, Berçin S, Aydın Ö. [Diagnostic problems of the neck masses]. KBB ve Baş Boyun Cerrahisi Dergisi 1995; 3(1):42-5.
8. Şapçı T, Bozkurt Z, Akbulut UG. [Analysis of neck masses]. KBB ve Baş Boyun Cerrahisi Dergisi 1999;7(2):143-6.
9. Cıncık H, Sağlam Ö, Poyrazoğlu E, Güngör A, Candan H. [Our approach to neck masses]. KBB Postası 2003;13(3):112-6.
10. Yıldırım M, Oktay MF, Topçu İ, Meriç F. [Neck masses: retrospective analysis of 420 cases]. Dicle Tıp Dergisi 2006;33(4):210-4.
11. Uysal İÖ, Altuntaş EE, Güler C, Tuncer E. [Retrospective analysis of the epidemiological data of the patients with neck masses followed for 19 years]. KBB-Forum 2010;9(2):30-4.
12. Özkırış M, Kala M [Histopathological examination of patients operated on for a neck mass: 4-year follow-up results]. Türk Patoloji Dergisi 2011;27(2):134-7.
13. McGuirt WF. Differantial diagnosis of neck masses. In: Cummings CW, Fredrickson JM, Harker LA, Krause CJ, Richardson MA, Schuller DE, eds. Otolaryngology Head and Neck Surgery. 3th ed. St Louis Missouri: Mosby; 1998. p.1686-99.
14. Rowicki T, Pietniczka-Załeska M, Dabrowska-Bień J. [Differential daignosis and treatment of neck masses. A study based on observation in Otolaryngology Department of Miedzyleski Specialistic Hospital in Warsaw]. Otolaryngol Pol 2009;63(5):414-8.
15. Batsakis JG. Tumors of the head and neck. Clinical and Pathological Considerations. 2nd ed. Baltimore: Williams and Wilcons; 1999. p.313-33.

16. Tuna EÜ, Arıkan OK, Koç C, Özdem C. [Evaluation of neck masses according to localization]. Kulak Burun Boğaz İhtisas Dergisi 2001, 8(6): 475-8.
17. Spiro RH, Alfonso AE, Farr HW, Strong EW. Cervical node metastasis from epidermoid carcinomas of the oral cavity and oropharynx. A critical assesment of current staging. Am J Surg 1974;128(4):562-7.
18. Göçmen H, Gürel T, Özeri C, Samim E, Eryılmaz A. [The diagnostic value of fine needle aspiration at head and neck masses]. Türk Otolarengoloji Arşivi 1992;30(3): 249-54.
19. Koç A, Tutkun A, Batman Ç, Özagar A, Üneri C, Şehitoğlu MA. [Neck masses in our department]. KBB Bülteni 1997;14(2):10-2.
20. Gujar S, Gandhi D, Mukherji SK. Pediatric head and neck masses. Top Magn Reson Imaging 2004;15(2):95-101.
21. Al-Khateeb TH, Al Zoubi F. Congenital neck masses: a descriptive retrospective study of 252 cases. J Oral Maxillofac Surg 2007; 65(11):2242-7.
22. Tracy TF Jr, Muratore CS. Management of common head and neck masses. Semin Pediatr Surg 2007;16(1):3-13.
23. Güven A, Demirbağ S, Türk E, Çalışkan B, Atabek C, Sürer İ, et al. [Congenital cysts and fistulas of the neck in children: 10 years experience]. Türkiye Çocuk Hast Derg 2009;3(2):21-7.
24. Görür K, Talas DU, Ozcan C. An unusual presentation of neck dermoid cyst. Eur Arch Otorhinolaryngol 2005;262(4):353-5.
25. Toure G, Roucayrol M, Meningaud JP. Kikuchi-Fujimato disease: histiocytic necrotising lymphadenitis. Rev Stomatol Chir Maxillofac 2004;105(6):342-4.
26. Ada M, Kaytaz A, Korkut N, Devranoğlu İ, Yağız C, Sunar O, et al. [Kikuchi disease]. Türk Otolarengoloji Arşivi 1995;33(1):57-9.