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SUBMANDIBULAR TRIANGLE MASSES

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Abstract

Objective—To analyze the demographic data of a large case series operated due to submandibular triangle mass over 10 years and review of the literature.

Materials and Methods—The charts of patients who underwent surgical intervention for submandibular triangle mass between January 2000 and November 2010, were reviewed. The medical history, age, sex, duration of symptoms, clinical presentation, preoperative investigations and histopathologic diagnosis were reviewed.

Results—The study included 66 subjects; 12 patients (18.2%) with submandibular sialolithiasis, 18 patients (27.2%) with sialadenitis, 10 patients with lymphadenitis (15.1%) and 26 patients (39.3%) with tumors. Of the tumors, 23% was malignant and 77% was benign. Benign tumors of submandibular gland compromised 22.7% and malign tumors of submandibular gland compromised 3% of all submandibular mass. The most common benign tumor was pleomorphic adenoma. The most frequent histopathologic diagnoses of submandibular masses were originated from submandibular gland and these compromised 71.2% of all submandibular mass pathologies. The main symptom was a painless mass. Ultrasonography was the most common preoperative diagnostic procedure. Fine-needle aspiration biopsy (FNAB) was performed in 26 patients. A clear diagnosis couldn't be provided in 3 (12%) patients.

Conclusion—Infectious conditions and benign tumors are more frequent than malign tumors in submandibular region. The histopathologic diagnoses are mainly consisted of submandibular sialadenitis, sialolithiasis, pleomorphic adenoma and lymphadenitis. Ultrasonography is the first

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option of radiologic evaluation. FNAB is a very useful and usually sufficient diagnostic procedure for histopathologic diagnosis. Excisional biopsy can be performed when the FNAB is failed.

Keywords

Submandibular triangle; submandibular mass

Introduction

Submandibular or submaxillary triangle is below the mandible and mylohyoid muscle, bordered medially by the anterior belly of the digastric muscle, posteriorly by the posterior border of the submandibular gland, and reaching inferiorly to the level of the hyoid bone. The submandibular space consists mainly of fat tissue, the submandibular gland and lymph nodes which drain the lymph from lower gums, mouth floor, tongue, fauces and tonsils. Also, there are important structures in the submandibular region such as facial and lingual arteries, the facial (anterior facial) vein, marginal mandibular nerve, the hypoglossal, lingual and glossopharyngeal nerves (1).

Submandibular triangle is a clinically important area in head and neck surgery practice and patients can present with isolated submandibular mass. The differential diagnoses of a submandibular mass include salivary gland pathologies, lymph node diseases, soft tissue problems, vascular and neuronal pathologies. The most common submandibular gland pathologies are consists of sialadenitis, sialolithiasis, benign tumors and carcinomas (2).

The aim of this study is to analyze the demographic data of a large case series operated due to submandibular mass over 10 years and review of the literature to lead physicians in the clinical evaluation of submandibular triangle masses.

Materials and Methods

The charts of adult patients who underwent surgical intervention for a submandibular mass at Gulhane Military Medical School, Department of Otolaryngology, Head and Neck Surgery, between January 2000 and November 2010, were reviewed. Inclusion criteria were a previous diagnosis of submandibular mass, a history of surgical intervention for this diagnosis and preoperative and postoperative adequate information. Exclusion criteria included subjects who have submandibular surgery for a different diagnosis except than submandibular mass or as a part of a larger resection and subjects who don't have adequate follow-up data. The medical history, age, sex, duration of symptoms, clinical presentation, preoperative investigations and histopathologic diagnosis were reviewed, retrospectively. Gulhane Military Medical School Ethic Committee approved the study.

Results

The study included 66 subjects who had a surgical intervention for submandibular mass lesion. Of these, 15 were females and 51 were males. The mean age was 37.05 years (range 9-81 years). Table 1 shows the histopathologic diagnoses and demographic data of subjects; there were 12 patients (18.2%) with submandibular sialolithiasis, 18 patients (27.2%) with sialadenitis, 10 patients with lymphadenitis (15.1%) and 26 patients (39.3%) with tumors. Of the tumors at submandibular region, 23% was malignant and 77% was benign. Most of the benign tumors were originated from submandibular gland. Benign tumors of submandibular gland compromised 22.7% of all submandibular mass and malign tumors of submandibular gland compromised 3% all submandibular mass. (Table 2) The most common benign tumor was pleomorphic adenoma. The most frequent histopathologic diagnoses of submandibular mass were originated from submandibular pathologies and

these compromised 71.2% of all submandibular mass pathologies. The main symptom was a painless mass. The average duration time of symptoms was 3-48 months.

The preoperative imaging was performed in all cases. Ultrasonography was the most common preoperative diagnostic procedure which was performed to all patients. Fine-needle aspiration biopsy (FNAB) was performed in 26 patients. A clear diagnosis couldn't be provided in 3 (12%) patients (insufficient material or nondiagnostic). Of the all FNAB, 23 (88 %) samples provided clear diagnosis. 18 (78%) patients had correct diagnoses which were confirmed with excisional biopsy. FNABs which were performed in 10 pleomorphic adenoma patients had the accurate diagnosis in 7 (70%) patients. The other three FNABs were misinterpreted as malign.

Discussion

The submandibular triangle masses are common presenting complaints in the adult outpatient settings of Otolaryngology, Head and Neck Surgery Clinics. Many different diseases should be considered when a patient presents with a swelling in the submandibular area. Lymphadenopathy of various origins, sialadenitis, and neoplastic enlargements are the most important issues for differential diagnosis.

Submandibular triangle masses may arise from infections and granulomatous diseases. Infections of oral cavity and upper airway breathing system are the most common causes for submandibular nodal enlargements. Although, tuberculosis, sarcoidosis, and other granulomatous diseases are less frequent, they can cause submandibular nodal enlargements, too. In this study, rate of nodal enlargements was 15.1% (n=10) in all of the submandibular mass. Non-granulomatous lymphadenopathy was detected in 4 subjects and granulomatous lymphadenopathy was detected in 6 subjects.

Submandibular salivary gland is one of the most important structures in submandibular triangle. Also, submandibular salivary gland pathologies are very common reasons of submandibular masses. Submandibular gland pathologies can be divided into two groups as neoplastic and non-neoplastic disease. The most common non-neoplastic submandibular gland pathologies are sialadenitis and sialolithiasis (9). The most common neoplastic diseases among submandibular gland pathologies are pleomorphic adenoma, mucoepidermoid carcinoma and adenoid cystic carcinoma (7,10). The rate of submandibular pathologies among submandibular masses was 72.1 % in this study. The rate of submandibular sialadenitis and sialolithiasis was 27.2% and 18.2% respectively. The submandibular gland tumors compromised 25.7% of all the submandibular masses in this study. Tumors of the submandibular gland are rare and this fact is reflected in the relative absence of reports of large series of patients in the literature (7). The prevalence of malignancy in a submandibular gland tumor is variable in the literature. In the present study, two of submandibular gland tumors were malignant. Other tumors were benign and all of benign tumors were pleomorphic adenoma. In some series the prevalence of malign tumor varies from 40 % to 60. This rate is less in western population (4,7). It was reported that the prevalence of malign tumor of submandibular neoplasms was %20 in a study which was performed in Turkish population (14). We found that prevalence of malign tumors was low, too. Further studies are needed which include large series of submandibular masses and submandibular gland tumors.

Ultrasonography is a common investigation tool which is used in the evaluation of submandibular masses. A mass in the submandibular area may be malignant, and the radiological studies should include the cervical lymph nodes. Lymphadenopathies may be caused by inflammation, but may also be due to lymphoma or a metastatic squamous cell

carcinoma of head and neck. If a malignancy is suspected, further radiological evaluation such as Computerized Tomography (CT) and Magnetic Resonance Imaging (MRI) should be performed. Also, the level of pathologic lymph nodes can be evaluated by these radiological tools. In this study, ultrasonography was performed to all of the patients. CT and MR were performed only on 7 patients (11 %) who have a high suspicion of malignancy.

Non-neoplastic lesions may resemble neoplastic lesions both clinically and pathologically. Therefore, it is very important to differentiate these non-neoplastic lesions from the neoplastic ones. The definite diagnosis can be made by histopathologic evaluation of surgical material (8). FNAB in the evaluation of submandibular mass has a significant role in preoperative diagnosis and the treatment of patients (3). But, the predictive value of FNAB is low (6). Surgical and/or medical treatment methods should not be based on the FNAB results only. FNAB provided 78% correct diagnosis which are confirmed with excisional biopsy in the present study, similar to the previous studies (4,5, 12).

In the present study, the rate of malign tumors was 9% and benign tumors were 30.3%. Rate of malign tumors is lower than the literature (2,4,7,10,13). The mean age of patients with malignant tumor was 44.9 ± 18.9 years, while the mean age was 32.4 ± 18.2 years in patients with benign tumors. Therefore, patients who present with submandibular mass and older than 40 years should be examined carefully and should be investigated for risk of malignancy. The submandibular area is also one of sites for metastatic tumors which are especially originated from head and neck region and also from other sites. Therefore a detailed careful head and neck examination is necessary if a submandibular mass exists (7). In this study, the metastatic tumor rate was 4.5%.

If a mass is exists in the submandibular triangle, first, a careful questioning, physical and endoscopic examination should be performed. For radiologic evaluation, ultrasonography should be preferred in the first step. If the suspicion of an infection is high, an antibiotherapy and anti-inflammatory therapy should begin while eliminating a submandibular mass. If the medical therapy doesn't provide a clinical and radiologic improvement, then histopathological investigation should be done for the risk of malignancy. For submandibular masses, FNAB is performed in the first step of histopathological evaluation. If the repeated FNABs fail, excisional biopsy is performed. The facial vessels and three important nerves - the hypoglossal and the lingual on the medial aspect and the marginal mandibular branch of the facial nerve superficially- are intimately related to the submandibular gland. Injury of these structures can result morbidity (8). This should be kept in mind and patients are needed to be informed, in the decision of excisional biopsy and surgical therapy.

Conclusion

In this study, the demographic data of patients who present with submandibular mass and the clinical evaluation of submandibular mass were discussed. Infectious conditions and benign tumors were much more frequent than malign tumors in the submandibular region. The histopathologic diagnoses were mainly consisted of submandibular sialadenitis, sialolithiasis, pleomorphic adenoma of submandibular gland and lymphadenitis. Malignancy at submandibular region was diagnosed in patients older 40s and it should be kept in mind in evaluation. A detailed medical history and physical and endoscopic examination, radiologic and histopathologic evaluation are the main procedures in the differential diagnosis. Ultrasonography is the first option in radiologic evaluation. CT and MRI are further radiologic evaluation methods. FNAB is a very useful and usually sufficient diagnostic

procedure for histopathologic diagnosis. Excisional biopsy can be performed when the FNAB is failed.

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Table 1

The demographic data and histopathologic diagnosis of patients who have submandibular mass lesions

Histopathology	Number of patients	Mean age (year)	%
Benign tumors	20 (M:18, F:2)	32.4	30.3
Pleomorphic adenoma	15		
Dermoid cyst	1		
Lymphangioma	1		
Lypoma	1		
Plexiform neurofibroma	1		
Infantile fibromatosis	1		
Malign tumors	6 (M:4, F:2)	44.9	9
Adenoid cystic CA	1		
Malign mixed tumor	1		
Lymphoma	1		
Metastatic CA	3		
Lymphadenitis	10 (M:8, F:2)	30.4	15.1
Non granulomatous	4		
Granulomatous	6		
Tuberculosis	1		
Idiopathic	2		
Rosai-Dorfman Disease	1		
Toxoplasmosis	2		
Sialadenitis	18 (M:14, F:4)	38.2	27.2
Sialolithiasis	12 (M:8, F:4)	39	18.2
All submandibular mass	66 (M :51 F:15)	37.05	

M: male, F: female, CA: carcinoma.

Table 2

The origins of the masses in the submandibular area.

Origin of the mass	Number of patients	Mean age (year)	%
Submandibular Gland	47	37.1	71.2
Tumors	17		
Sialadenitis	18		
Sialolithiasis	12		
Lymphoid System	15	33.6	22.7
Lymphadenitis	10		
Tumors	2		
Metastatic CA	3		
Other tissues	4	29.2	6
Lypoma	1		
Dermoid cyst	1		
Plexiform neurofibroma	1		
Infantile fibromatosis	1		
All submandibular mass	66	37.05	

CA: Carcinoma.