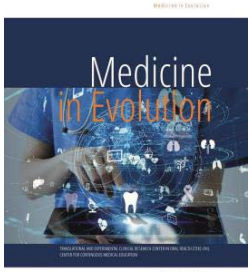
The importance of clinical examination in determining the benignity or malignancy of parotid tumors



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Abstract

Parotid tumors are a common disease in the population not only as a primary disease but also in association with other diseases. There are a number of clinical signs and symptoms that may direct the examiner to a potential diagnosis of a benign or malignant tumor. The study is retrospective and consists in analysing the cases of parotid tumors treated during a year in the Maxillofacial Department. Clinical signs and symptoms that may indicate the malignancy or benign nature of the tumor were analysed and compared with the histopathological result obtained after surgical removal of the tumor. The aim is to determine the degree of correlation between the clinical signs and the type of tumor. Although the final diagnosis is determined by histopathological examination, clinical examination of any tumor is essential because it may lead to certain investigations and to the establishment of a specific treatment plan.

Keywords: Parotid tumor, clinical examination, benign, malignant

INTRODUCTION

The parotid gland is the largest of the major salivary glands, including the submandibular and sublingual glands. It is located in the retromandibular fossa. [1] It has superficial and deep lobes, separated by the facial nerve. The facial nerve and its branches pass through the parotid gland. [2] The superficial lobe lies lateral to the facial nerve and overlies the lateral surface of the masseter muscle. The deep lobe lies medial to the facial nerve and is situated between the mastoid process of the temporal bone and the mandibular ramus. [1]

The prevalence of parotid tumors is 70-85% compared to other major salivary glands. Most parotid tumors are well-defined and palpable mases and are located in the superficial lobe. 80% of these tumors are benign but parotid glands still account for almost half of all malignant salivary gland tumors. The incidence is estimated at 0.5 to 3.0 per 100,000 per year, accounting for about 5% of all head and neck malignancies. [3-6]

The latest World Health Organization (WHO) classification has attempted to simplify the classification but there are still more than 30 types of salivary gland tumors. [7] Malignant tumors of the parotid gland are represented by mucoepidermoid carcinoma, adenoid cystic carcinoma, acinic cell carcinoma, polymorphous adenocarcinoma, squamous cell carcinoma, lymphomas. Carcinomas can further be classified as high grade, low grade, or mixed. Benign tumors are mainly represented by pleomorphic adenoma followed by Warthin tumor. [8]

Fine-needle aspiration biopsy (FNA) is the primary diagnostic tool for parotid gland lesions. The role of FNA in the diagnosis of benign and malignant parotid tumor has some controversy regarding aspiration technique, adequacy of the specimen, cytological expertise, and limitations of the interpretation. For example, false-positive results can occur and lead to misdiagnosis of malignant lesions.

Regarding the imaging investigations, the ultrasound scan can provide information about the site, size and the presence of any significant cervical lymphadenopathy. It can be combined with FNA, which improves the accuracy rate. Also, ultrasound scan can distinguish malignant from benign disease in many situations. Computed tomography (CT) and magnetic resonance imaging (MRI) are other imaging investigations that can be used. MRI scanning of a parotid tumor is useful in the assessment and delineation of anatomical structures, extension into the deep lobe, and relation to the facial nerve. [9] However, if the result of paraclinical tests are at variance with other findings, then clinical judgment should prevail.

Pain, overlying skin ulceration, facial nerve palsy, adherence to deep planes, rapid growth in size or local lymph nodes swelling are clinical signs of malignancy. Medical history is important in patients with parotid lumps, as infectious, autoimmune or inflammatory processes may appear as neoplasms.

Aim and objectives

The aim of the study is to establish the importance of clinical signs in differentiating the benign or malignant character of a parotid tumor and to determine how much we can rely on the clinical examination when evaluating such a lesion.

MATERIAL AND METHODS

The present paper consists in a retrospective analysis of patients hospitalized in the Department of Maxillofacial Surgery Timisoara during a pre-pandemic year (2019). For the selection of patients, the database of the Timisoara Municipal Emergency Clinical Hospital, Maxillofacial Surgery Department was analysed.

Patient selection was performed using parotid tumor-specific diagnostic codes. After selecting the patients, the observation sheets were identified and analysed. A database was created in Microsoft Excel that contained the name, sex, age, primary diagnosis, clinical signs specific to parotid tumors, number of days of hospitalization, postoperative histopathological diagnosis, and benign or malignant nature of the tumor established following postoperative histopathological diagnosis. We recorded 7 clinical signs that are associated with malignancy in parotid tumors: tumor growth, consistency, ulceration of the covering skin, the presence of skin vascular pattern, bone invasion, facial nerve palsy, local or regional lymphadenopathy (Figures 1, 2, 3, 4).

Statistical processing along with graphs was performed in SPSSv17 and Microsoft Excel. In the case of nominal variables, the frequency tables were drawn up together with the "pie" type graphs. The associations and comparisons between these types of variables were made with the Chi2 test. For the numerical variables, the descriptive statistics were calculated, normality tests were performed and histogram, boxplot and column graphs were made. Comparisons between numerical series were performed with the non-parametric Mann-Whitney test in the case of comparisons between 2 series of values with non-gaussian distribution or between 2 series of ordinal values.

RESULTS

After analysing the observation sheets, a group of 28 patients was obtained, 64.3% (18) being female and 35.7% (10) being male (Table 1). The postoperative histopathological diagnosis showed that 64.3% (18) of the patients had a benign tumor and 35.7% (10) had a malignant tumor (Table 2). Regarding tumor growth, 67.9% (19) showed a slow growth and 32.1% (9) showed a rapid growth (Table 3). Tumor consistency was hard in 21.4% (6) of cases and soft in 78.6% (22) of cases (Table 4). 3.6% (1) of the cases showed skin vascular pattern (Table 5). Also, 3.6% (1) of the cases presented facial nerve palsy (Table 6). Regarding the growth of lymph nodes, 7.1% (2) of the cases presented local lymphadenopathy (Table 7). None of the cases showed ulceration of the covering skin or bone invasion (clinically detectable).

Table 1. Sex distribution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	F	18	64,3	64,3	64,3
	M	10	35,7	35,7	100,0
	Total	28	100,0	100,0	

Table 2. Benign and malignant tumor distribution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Benign	18	64,3	64,3	64,3
	Malign	10	35,7	35,7	100,0
	Total	28	100,0	100,0	

Table 3. Tumor growth

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slow	19	67,9	67,9	67,9

	Rapid	9	32,1	32,1	100,0
	Total	28	100,0	100,0	

Table 4. Tumor consistency

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Hard	6	21,4	21,4	21,4
	Soft	22	78,6	78,6	100,0
	Total	28	100,0	100,0	

Table 5. The presence of skin vascular pattern

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Present	1	3,6	3,6	3,6
	Absent	27	96,4	96,4	100,0
	Total	28	100,0	100,0	

Table 6. Facial nerve palsy

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Present	1	3,6	3,6	3,6
	Absent	27	96,4	96,4	100,0
	Total	28	100,0	100,0	

Table 7. Local or regional lymphadenopathy

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Present	2	7,1	7,1	7,1
	Absent	26	92,9	92,9	100,0
	Total	28	100,0	100,0	

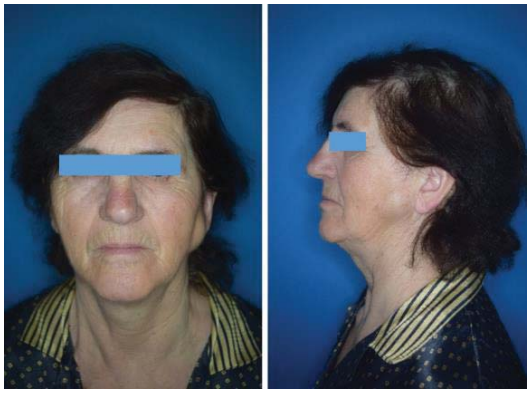

Figure 1. Left parotid tumor with slow growth and soft consistency

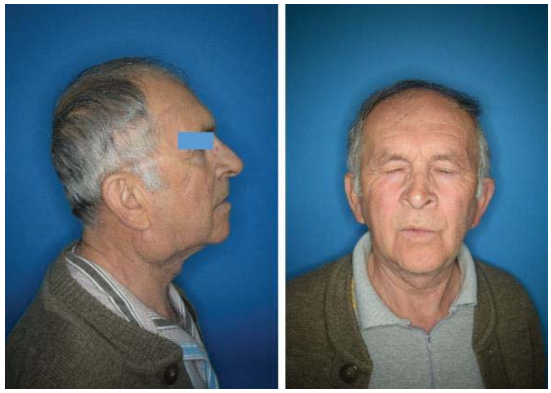

Figure 2. Right parotid tumor with slow growth, soft consistency and no facial nerve palsy

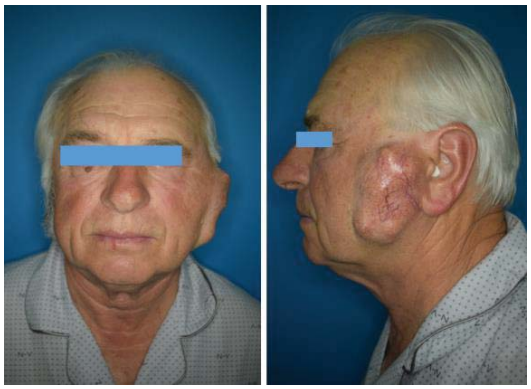

Figure 3. Left parotid tumor with skin vascular pattern

Figure 4. Left parotid tumor with facial nerve palsy

The association between the type of tumor and the sex of the patients is insignificant (Chi2 test, p = 0.725) (Table 8). The proportion of malignant tumors is significantly increased for those with rapid growth (Chi2 test, p <0.001) (Table 9). The proportion of malignant tumors is significantly increased for those with hard consistency (Chi2 test, p <0.001) (Table 10). The association between the type of tumor and the presence of the skin vascular pattern is insignificant (Chi2 test, p = 0.172) (Table 11), the situation being the same regarding the association between the tumor type and the presence of facial nerve palsy (Chi2 test, p = 0.172) (Table 12) and the presence of local and regional lymphadenopathy (Chi2 test, p = 0.119) (Table 13).

Age is significantly increased in patients with malignant tumor (Mann-Whitney test, p = 0.009). No significant association was established between the number of days of hospitalization and the type of tumor (Mann-Whitney test, p = 0.382) (Table 14).

Table 8. Association between tumor type and sex of the patient

			Sex		Total
			F	M	
Tumor type	Malign	Count	6	4	10
		% within Type	60,0%	40,0%	100,0%
	Benign	Count	12	6	18
		% within Type	66,7%	33,3%	100,0%
Total		Count	18	10	28
		% within Tip	64,3%	35,7%	100,0%

Table 9. Association between tumor type and tumor growth rate

			Tumor growth		Total
			Slow	Rapid	
Tumor type	Malign	Count	1	9	10
		% within Type	10,0%	90,0%	100,0%
	Benign	Count	18	0	18
		% within Type	100,0%	,0%	100,0%
Total		Count	19	9	28
		% within Tip	67,9%	32,1%	100,0%

Table 10. Association between tumor type and tumor consistency

			Tumor consistency		Total
			Hard	Soft	
Tumor type	Malign	Count	6	4	10
		% within Type	60,0%	40,0%	100,0%
	Benign	Count	0	18	18
		% within Type	,0%	100,0%	100,0%
Total		Count	6	22	28
		% within Tip	21,4%	78,6%	100,0%

Table 11. Association between tumor type and skin vascular pattern

			Skin vascular pattern		Total
			Present	Absent	
Tumor type	Malign	Count	1	9	10
		% within Tip	10,0%	90,0%	100,0%
	Benign	Count	0	18	18
		% within Tip	,0%	100,0%	100,0%
Total		Count	1	27	28
		% within Tip	3,6%	96,4%	100,0%

Table 12. Association between tumor type and facial nerve palsy

			Facial nerve palsy		Total
			Present	Absent	
Tumor type	Malign	Count	1	9	10
		% within Tip	10,0%	90,0%	100,0%
	Benign	Count	0	18	18
		% within Tip	,0%	100,0%	100,0%
Total		Count	1	27	28
		% within Tip	3,6%	96,4%	100,0%

Table 13. Association between tumor type and local and regional lymphadenopathy

			Lymphadenopathy		Total
			Present	Absent	
Tumor type	Malign	Count	2	8	10
		% within Tip	20,0%	80,0%	100,0%
	Benign	Count	0	18	18
		% within Tip	,0%	100,0%	100,0%
Total		Count	2	26	28
		% within Tip	7,1%	92,9%	100,0%

Table 14. Association between tumor type and age / tumor type and number of days of hospitalization

	Tumor type	N	Mean	Std. Deviation	Std. Error Mean
Age	Benign	18	55,50	12,650	2,982
	Malign	10	71,20	13,448	4,253
Days of hospitalization	Benign	18	6,89	2,083	,491
	Malign	10	6,10	3,479	1,100

DISCUSSIONS

Although the final diagnosis is determined by histopathological examination, clinical examination of any tumor is essential.

According to statistics, the incidence of malignancies is higher among elderly patients, but this cannot be considered a rule, as these tumors have also been observed in young people.

Pain, facial nerve palsy, adherence to deep planes, rapid growth and hard consistency are signs of malignancy. A malignant tumor can also ulcerate the covering skin and invade bone structures. None of the 28 patients in the study had skin ulceration or bone invasion, and the skin vascular pattern was present in a single tumor, although only 18 were benign and the remaining 10 were malignant. This highlights the fact that not all malignancies also have clinical signs of malignancy. There are situations in which the clinical examination may mislead us due to the absence of clinical signs of malignancy. One of the reasons could be the early stage of the malignant tumor when the tumor is small and without invasion or local changes.

A very useful aspect is the consistency of the tumor and its growth in the orientation towards a presumed diagnosis. The share of fast-growing and hard-growing tumors was significantly higher in malignancies.

Regarding local or regional lymphadenopathy, only 2 tumors had it associated, although this is a sign of malignancy especially in the advanced stages.

CONCLUSIONS

Early diagnosis of malignant parotid tumors is very important for the prognosis of the disease. Clinical examination can provide important information in diagnosing this type of lesion as soon as possible. There are a number of clinical signs that may be associated with malignancy in parotid tumors. These are represented by rapid tumor growth, hard consistency, ulceration of the covering skin, the presence of skin vascular pattern, bone invasion, facial nerve palsy, local or regional lymphadenopathy. The presence of one or more of these signs should warn of the possible malignancy of the tumor. The absence of these clinical signs in no way precludes the possibility that the tumor is malignant. Further investigation is absolutely necessary in the case of any parotid tumor. The histopathological diagnosis remains the definite diagnosis.

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