

PAROTID TUMORS; PRESENTATION, SURGICAL MANAGEMENT AND COMPLICATIONS

AYAD AHMAD MOHAMMED, MBChB, FIBMS, CABS (General Surgery)*
SARDAR HASSAN ARIF, MBChB, FIBMS, FACS (General Surgery)**

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ABSTRACT

Background: The parotid gland is the most common salivary gland affected by tumors, 80% of them affects the parotid glands and 80% affects the superficial lobe. Pleomorphic adenoma is the commonest salivary tumor. Other types of tumors occur less frequently. Most tumors are diagnosed with ultrasound; MRI shows more anatomical details. Superficial parotidectomy is done for benign tumors, more extensive resection is done for malignant tumors.

Results: This a cross sectional study which included 69 patients who underwent various types of parotid surgeries over a period of 4 years. The mean age of our patients was 45.29 years, and 52.2% were males. The tumor was present in the right parotid gland in 49.3%, in the left side in 43.5%, and was bilateral in 2.9%. The mean duration of symptoms was 29.67 months, all patients were sent for ultrasound and 42 patients were sent for the FNAC, 91.3% of patients underwent superficial parotidectomy. Pleomorphic adenoma was the commonest type of tumors which was diagnosed in 69.6%, followed by Warthin's tumors in 13%, Non-Hodgkin's lymphoma in 4.3%, and the rest comprises some rare types of tumors. Complications were reported in 30.43% of patients and the commonest complications were transient facial nerve weakness followed by salivary leak (11.6 and 8.7 %) respectively.

Conclusion: Parotid tumors are rare types of tumors and pleomorphic adenoma is the commonest type, identifying the anatomy during surgery especially the course of the facial nerve is the most important step, complications are common but fortunately most are transient.

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Keywords: Facial nerve, Pleomorphic adenoma, Salivary tumors, Parotid tumors, Superficial parotidectomy, Warthin's tumors.

The parotid gland is the most common salivary gland affected by tumors. Eighty percent of the salivary tumors occur in the parotid glands, from these 80% of them occur in the superficial lobe.¹ Pleomorphic adenoma is the most common salivary tumor and mostly affects the parotid gland. It is a slowly growing tumor and composed of mixture of ductal epithelial cells, acinar cells, and myoepithelial cells, this mixture of various types of tissues is due to the ability of the myoepithelial cells to modulate their morphological appearance, the tumor

classically poses a thin capsule and there are usually areas of capsule penetration.^{2,3} Papillary cystadenolymphoma (Warthin's tumor) is a mono-morphic tumor mainly affects the parotid gland and constitutes about 5-10% of all parotid tumors, it mainly affects males and appears to be associated with smoking, it tends to be bilateral in some patients.⁴ Lymphoma of the parotid gland may be diagnosed, in the majority of the cases of parotid lymphomas the tumor is primary, and in around 20% of the cases the tumor is secondary to systemic disease.⁵

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* Assistant Professor, Department of Surgery, College of Medicine, University of Duhok, Kurdistan Region, Iraq.

** Assistant Professor, Department of Surgery, College of Medicine, University of Duhok, Kurdistan Region, Iraq.

Corresponding author: Dr Ayad Mohammed, Tel: +964750 450 4870, Email: ayad.mohammed@uod.ac

Other rare types of parotid tumors may include adenoid cystic carcinoma which arise from epithelial elements, this type of may arise in other anatomical sites such as the lacrimal glands and the respiratory epithelium. Basal cell adenoma or adenocarcinoma is another rare tumor affecting the parotid gland, the tumor tends to be smaller in size than pleomorphic adenoma with higher recurrence rates.^{6,7}

Tumors of the parotid gland may be diagnosed with ultrasound which show the nature of the lesion and the associated enlarged lymph nodes. MRI is useful in delineating the anatomy, the tumor location and the invasion to the capsule, subcutaneous fat and the associated enlarged lymph nodes.⁸

The diagnostic accuracy of the fine needle aspiration cytology may reach 80-85%, but this should not be used alone for determining the management strategy.⁹

Superficial parotidectomy is the best procedure that is done for benign tumors of the parotid gland and more extensive resection and sometimes total parotidectomy is done for malignant tumors.¹⁰

Identifying the anatomy during parotidectomy especially the course of the facial nerve and the use of the facial nerve monitoring will decrease the risk of the injury to the nerve.¹¹

PATIENTS AND METHODS:

This a cross sectional study that were done in three surgical centers and the operations were done by two surgeons who are specialized in the field of general surgery. A total number of 61 patients complaining from unilateral or bilateral parotid masses and operated in the period between the 1st of January, 2014 and the 1st of August, 2018 were included in this study.

Patients were followed for at least one year after the surgery, and all patients with regular follow up were included in this study, patients who refused to be included in this study, those who lost from follow up and those with inadequate data were excluded from this study.

Statistical analyses:

Categorical variables are expressed as numbers and percentages. Continuous variables are exposed as mean $\pm$ SD if normally distributed or as median and interquartile range (IQR) if not.

The statistical analyses were done using the Statistical Package for Social Sciences (SPSS 25:00 IBM: USA).

RESULTS:

Sixty-one patients who were complaining from parotid tumors were included in our study, the majority of them were above 40 years of age and most were complaining from painless mass in either side or both sides. Table 1.

Table 1: Showing the patient characteristics and the mode of the presentation.

Patient characteristic (N=69)	Frequency	Percentage
Gender		
Males	45	51.7
Females	42	48.3
Age (M;SD) range 15-67 years	44.33	11.954
Age groups		
Less than 20 years	2	2.3
Between 21-40 years	33	37.9
Between 41-60 years	48	55.2
Above 61 years	4	4.6
Clinical presentation		
Right side lump	40	46
Left side lump	42	48.3
Bilateral lumps	2	2.3
Recurrent left side lump	2	2.3
Recurrent right side lump	1	1.1
Duration of symptoms (months)M;SD	26.94	29.255

Thirty-four patients were sent for the FNAC, the results of them are shown in figure 1.

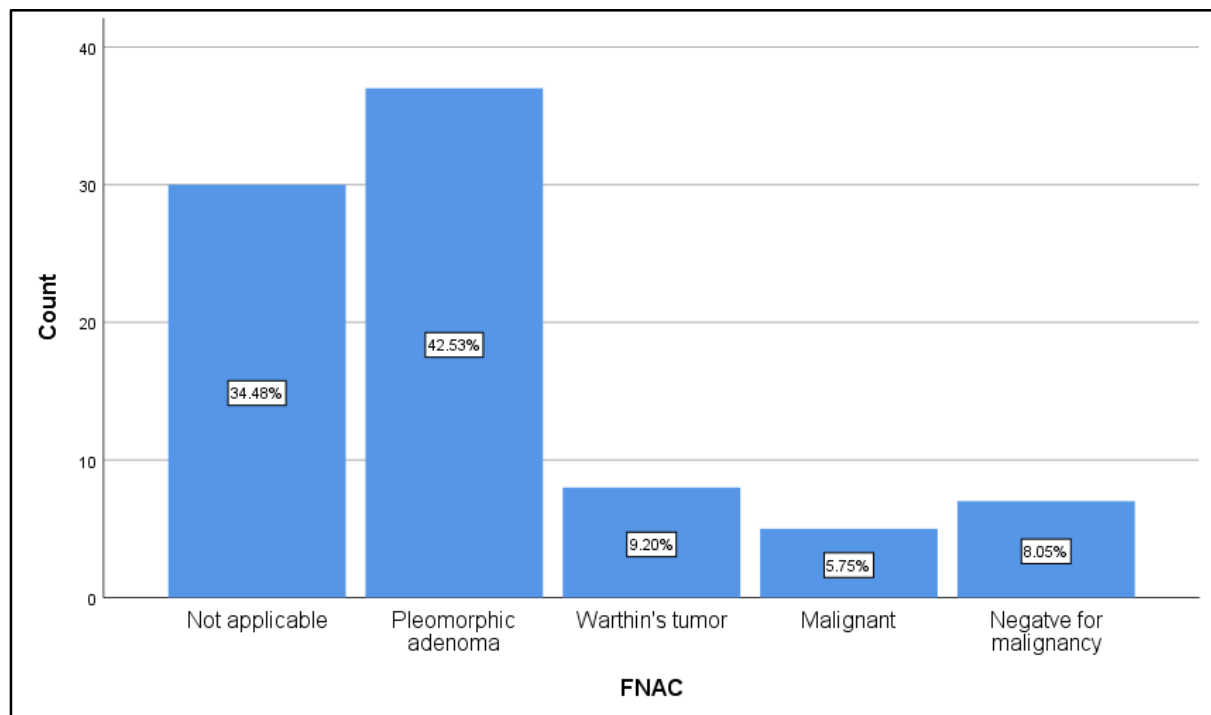


Figure 1: Showing the results of the FNAC which was done for 42 patients.

The majority of our patients underwent superficial parotidectomy as the primary surgical intervention, the results of the

histopathological examination are shown in table 2.

Table 2: Showing the type of the surgical procedure done and the results of the histopathological examination.

Type of surgery and the histopathology results(n=69)	Frequency	Percentage
Type of the surgical procedure:		
Superficial parotidectomy	78	89.7
Total parotidectomy	9	10.3
Size of the tumor in mm, M;SD	37.59	15.153
Range: 15-85 mm		
The histopathological findings:		
Pleomorphic adenoma	59	67.8
Warthin's tumor	11	12.6
Non-Hodgkin's lymphoma	3	3.4
Low grade muco-epidermoid carcinoma	3	3.4
Acinic cell carcinoma	3	3.4
Lympho-epithelial cyst	1	1.1
Adenoid cystic carcinoma	2	2.3
Metastatic invasive ductal carcinoma of the breast	1	1.1
Sialadenitis	2	2.3
Basal cell adenoma	1	1.1
Angio-lymphatic hyperplasia	1	1.1

In 48 patients the post-operative period was smooth with no complications, however the complications were reported in 21 patients (30.43%), table 3.

Table 3: Showing complications of the surgery.

Complications* (n=28)	Frequency	Percentage
Transient facial nerve palsy	9	10.34
Salivary leak	8	9.1
Hematoma	1	1.1
Frey's syndrome	4	4.5
Wound infection	2	2.2
Recurrence of the tumor	2	2.2
Loss of sensation of ear lobule	2	2.2

*In 59 patients (67.81%) no postoperative complications were reported.

DISCUSSION:

Superficial parotidectomy dramatically reduces the rate of tumor recurrence associated with simple enucleation. The accepted safety margins for resection is a matter of great debate between the surgeons all over the world, but all surgeons agree that extracapsular resection of the tumor is mandatory because once the capsule of the tumor is open during resection it will result in spillage of the tumor cells and increases the rate of the local recurrence. Radiotherapy may be needed when the resection margins are positive or when there is recurrent tumor.¹²

In case of high grade malignant mucoepidermoid cancer of the parotid gland the standard of care should be parotidectomy combined with radical neck dissection.¹³

Studies showed that when the size of the tumor is greater than 4 cm, it is associated with higher rates of facial nerve injury and Frey syndrome due to more complete parotidectomy and more risk of insulting the facial nerve.^{12]}

In our patients we reported a relatively lower rate of complications compared to other studies worldwide. In our study complications were reported in 21 patients (30.43%) while some authors stated that complications rate may reach up to 45 % of patients. Some authors divided the complications into temporary and permanent complications or may be divided into early or late complications, the temporary complications include

hematoma formation at the site of surgery, minor salivary leak, wound infection, and numbness around the surgical incision, necrosis of the skin flap, while the permanent complications may include facial nerve injury, scar complications, soft tissue deficit, permeant sensory changes, Frey syndrome and recurrence of the tumor.^{14, 15}

When the parotid lesion is diagnosed preoperatively as a benign condition, the extent of surgery should be limited to decrease the rate of the complications. While for malignant lesions the main aim of the surgery is to have complete resection, all the possible complications should be discussed very clearly with the patient before any type of intervention is done.¹⁴

The rate of the facial nerve injury is reported to be less than 10% in most literatures, in our study we reported transient facial nerve injury in 11.6 %. The facial nerve weakness was transient and resolved within 1–4 months in our patients, it affected the main trunk in two patients, the upper branch in 2 patients and the lower branch in 4 patients. Upper branch injury will result in problems related to eye lid movement which may result in corneal dryness, ulceration, and eventual blindness if not managed appropriately, the management may include the use of artificial tears and ointments together with mechanical eye protectors together with physiotherapy and electrical nerve stimulation, the use of botulinum toxin to temporarily cause ptosis of the eyelid may

avoid the need of tarsorrhaphy. The lower branch when injured will result in dropping of the angle of the mouth and drooling of saliva at the affected site and difficulty in wrestling and dysarthria. Protection of the both branches mainly the superior branch is mandatory to avoid the associated morbidity. Around 90% of facial nerve injuries will resolve within the first month, if the weakness persists for more than 6 months it is more likely to be permanent. Facial nerve weakness may occur due to excessive manipulation of the nerve during surgery or there may be an accidental injury to the facial nerve during surgery, or there may be excision of a segment of the nerve when there is a malignant invasion to it, this will definitely result in neurological deficit, there are some trials that encourage facial nerve reconstruction after ablative parotid surgery. When there is no segmental loss they used of nerve anastomosis using the microscope may be useful, but sometimes a nerve graft is needed for this reconstruction. The cutaneous branch of the radial nerve or greater auricular nerve may be used as an auto-graft for the nerve repair with variable results.^{11,15,16}

Frey syndrome, also termed sometimes gustatory sweating, is one of the major concerns after parotid surgery.

This syndrome is caused by an aberrant regeneration of the divided parasympathetic secreto-motor nerve fibers of the auriculo-temporal nerve with inappropriate innervation of the sweat glands in the skin over the parotid region, these glands are normally innervated by the sympathetic cholinergic nerve fibers, and as a result the patients develop unilateral facial sweating and flushing over the region of the parotid gland that occur during meals. Frey syndrome usually becomes evident between 1-12 months post-surgery. In our study 4 patients (5.8%) developed Frey syndrome which became evident after 8 months and 16 months after surgery. In the reported literatures mild form of Frey syndrome occurs in the majority of patients

when the iodine-starch test is done but the severe form which is clinically evident is seen in around 15%. the management of Frey syndrome may include the topical use of anticholinergic preparations, sternocleidomastoid transfer, fat graft, the use of interposition barriers, botulinum toxin injection, cervical sympathectomy, and tympanic neurectomy.^{15,17}

Other complications may include salivary fistula or sialocele which was reported in 6 (8.7%) of our patients. The salivary leak presented within 7-10 days after the surgery and all patients were managed conservatively and stopped with time. Some authors reported a lower percentage than our patients (4%), salivary leak usually increase during the meal times. Most leaks stopped spontaneously within time, when persists the management may include compression dressings, the insertion of suction drains, and completion of parotidectomy when there is no response.¹⁵

Hematoma, cosmetic concerns such as soft tissue deficit resulting in skin dimpling, scar problems such as hypertrophied or keloid scars, infection, trismus, sensory changes may occur to lesser extent.¹⁵

A very rare finding among our patients was the diagnosed of metastatic breast cancer to the parotid gland in one patient. The patient had history of invasive ductal carcinoma of the breast operated before 3 years, and after surgery CT scan revealed metastatic lesions in the brain and the lungs. Such case had not been reported before in the literatures.

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پوخته

وهرمی پاروتید؛ پیشکەشکردن، بەریوەبردنی نەشتەرگەری و ئالۆزییەکان

پیشینه: پڕۆتید پاروتید باوترین پڕۆتینی لیکییە کە تووشی وەرەم دەبێت، 80% ی کارێگەری لەسەر پڕۆتینیەکانی پاروتید ھەیە و 80% کارێگەری لەسەر لۆولە ی پروکەش دەبێت. گری پلۆمۆرفیک باوترین وەرەمی لیکییە. جۆرەکانی تری وەرەم کەمتر پرووودەن. زۆربە ی وەرەمەکان بە سۆنەر دەستنیشان دەکەین؛ MRI وردەکاری ئەناتۆمی زیاتر نیشان دەدات. پاروتیدیکتۆمی پروکەش بۆ وەرەمە سووکەکان ئەنجام دەدرێت، برینی بەرفراوانتر بۆ وەرەمە شیرپەنجییەکان ئەنجام دەدرێت.

دەرەنجامەکان: ئەمە توێژینەومیەکی بربرەیی بوو کە ٦٩ نەخۆشی لەخۆگرتبوو کە جۆرە جیاوازمەکانی نەشتەرگەری پاروتیدیان بۆ کراوە لە ماوەی ٤ سالدا. مامناوەندی تەمەنی نەخۆشەکانمان ٤٥.٢٩ سال بوو، و ٥٢.٢% لە ڕەگەزی نێر بوون. وەرەمە کە لە پڕۆتینی راستی پاروتید لە 49.3% و لە لای چەپ لە 43.5% و دوولایەنە بوو لە 2.9%. مامناوەندی ماوەی نیشانەکان ٢٩.٦٧ مانگ بوو، ھەموو نەخۆشەکان بۆ سۆنەر و ٤٢ نەخۆش نێردراون بۆ FNAC، ٩١.٣% ی نەخۆشەکان نەشتەرگەری لابردنی پروکەشی پاروتیدیکتۆمییان بۆ کراوە. وەرەمی پلۆمۆرفیک باوترین جۆری وەرەم بوو کە لە 69.6% دەستنیشانکرا، دواتر وەرەمەکانی وارتین لە 13%، لیمفۆمای نا ھۆدجکین لە 4.3%، و ئەوانی دیکەش ھەندیک جۆری دەگمەنی وەرەم لەخۆدەگرن. ئالۆزییەکان لە 30.43% ی نەخۆشەکاندا راپۆرتکراون و باوترین ئالۆزییەکان لاوازی کاتی دەماری دەموچاو بوون و دواتر دزەکردنی لیکیی (11.6 و 8.7%) بە ریککەوت.

دەرەنجام: وەرەمی پاروتید جۆریکی دەگمەنی وەرەمە و گری پلۆمۆرفیک باوترین جۆرە، دەستنیشانکردنی ئەناتۆمی لە کاتی نەشتەرگەریدا بە تایبەت ڕەوتی دەماری دەموچاو گرنگترین ھەنگاو، ئالۆزییەکان باون بەلام خۆشەختانە زۆربەیان ڕاگوزەرن.

الخلاصة

ورم النكفية. العرض والإدارة الجراحية والمضاعفات

الخلفية: الغدة النكفية هي الغدة اللعابية الأكثر شيوعاً للإصابة بالأورام، حيث يؤثر 80% منها على الغدة النكفية و80% يؤثر على اللوزتين السطحييتين. الأورام متعددة الأشكال هي الأورام اللعابية الأكثر شيوعاً. أنواع الأورام الأخرى أقل شيوعاً. يتم تشخيص معظم الأورام عن طريق الموجات فوق الصوتية. يظهر التصوير بالرنين المغناطيسي المزيد من التفاصيل التشريحية. يتم إجراء استئصال الغدة النكفية السطحية للأورام الحميدة، ويتم إجراء استئصال أكثر شمولاً للأورام الخبيثة.

النتائج: كانت هذه دراسة مقطعية شملت 69 مريضاً خضعوا لأنواع مختلفة من جراحة الغدة النكفية على مدى 4 سنوات. وكان متوسط عمر مرضانا 45.29 سنة، منهم 52.2% ذكور. تركز الورم في الغدة النكفية اليمنى بنسبة 49.3%، وفي الجانب الأيسر بنسبة 43.5%، وفي الجانب الثنائي بنسبة 2.9%. كان متوسط مدة الأعراض 29.67 شهراً، وتمت إحالة جميع المرضى لإجراء الموجات فوق الصوتية و42 مريضاً لإجراء FNAC ، وخضع 91.3% من المرضى لاستئصال الغدة النكفية السطحية. وكانت الأورام متعددة الأشكال هي أكثر أنواع الأورام شيوعاً بنسبة 69.6%، يليها أورام وارتين بنسبة 13%، وسرطان الغدة الليمفاوية غير الهودجكينية بنسبة 4.3%، وأخرى تشمل بعض أنواع الأورام النادرة. تم الإبلاغ عن حدوث مضاعفات لدى 30.43% من المرضى وكانت المضاعفات الأكثر شيوعاً هي ضعف العصب الوجهي العابر يليه تسرب اللعاب (11.6 و 8.7%) على التوالي.

الاستنتاج: ورم الغدة النكفية هو نوع نادر من الأورام والورم متعدد الأشكال هو النوع الأكثر شيوعاً، والتشخيص التشريحي أثناء الجراحة وخاصة مسار العصب الوجهي هو الخطوة الأكثر أهمية، والمضاعفات شائعة ولكن لحسن الحظ معظمها عابرة.