

# Parotid Swellings: Report of 110 Consecutive Cases

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## Summary

Parotid swellings are uncommon. Over a twelve-year period, 110 cases of parotid swellings were treated at the Department of Plastic Surgery, Hospital Kuala Lumpur, of which 97 cases were histologically proven to be parotid tumours. 75% of these tumours were benign tumours, and 80% of the benign tumours were pleomorphic adenomas. Among the malignant tumours, 6 cases were adenoid cystic carcinoma and 5 were carcinoma ex-pleomorphic adenoma. There were equal number of male to female patients, with an age range of 14 to 83 years. There is a positive correlation between the final histological diagnosis and FNAC results in 74% of cases. Surgical treatment of choice for benign parotid tumours was near-total parotidectomy whilst for malignant tumours was total radical parotidectomy with sural nerve graft.

**Key Words:** Parotid tumours, Superficial parotidectomy, Total parotidectomy

## Introduction

Parotid swellings are uncommon. They usually arise from tumours or rarely inflammations. They are interesting because of their variable behaviour, diverse histologic expressions as well as their close and intimate relationship with the facial nerve. Due to marked variation in their histological features and incomplete knowledge of their histologies, there is a lack of a universally accepted classification<sup>1</sup>.

The biological behaviour of malignant salivary gland tumours as a group is also peculiar. This is best summarised by "Ackerman and el Regato", who says that "The usual tumour of salivary gland is a tumour in which the benign variant is less benign than the usual benign tumour and the malignant variant is less malignant than the usual malignant tumour"<sup>2</sup>.

Tumours of salivary glands comprise less than 3% of all neoplasms in the head and neck<sup>3</sup>. Between 75% and 85% are found in the parotid glands. The estimated incidence of parotid tumours ranges between 1 and 3

per 100,000. The benign tumours are much more common than the malignant ones. They account for over four-fifth of parotid tumours but less than half of the tumours of the salivary glands.

The overall incidence of salivary glands tumours is essentially the same throughout the world<sup>1</sup>. The exact incidence in Malaysia could not be worked out because they are being treated by various disciplines and are also recorded with other cancers.

Although there are some standard management protocols, treatment varies between surgeons treating them. Most agree that parotidectomy is the best option, but the controversy is the extent of surgery. The superiority of combined surgery and post-operative radiotherapy in the management of malignant tumours of the parotid gland is also well recognised.

## Materials and Methods

Between January 1985 and December 1996, the author

has treated 110 cases of parotid swellings. Data collected from case-records of the patients include patients' age, sex, race, clinical presentation, duration, size of tumour, presence of recurrence, histological diagnosis and mode of treatment. Preoperative diagnosis and FNAC results were also noted. Type of operation performed, post-operative histological diagnosis and follow-up findings were also recorded.

Fine needle aspiration cytology (FNAC) was performed in 46 cases when it was made available at Hospital Kuala Lumpur since July 1989. CT Scan was carried out when there is doubt as to the nature and extent of the tumour. All specimen were sent for histological examination.

All the patients were subjected to surgery for treatment. For definition, superficial parotidectomy is a surgical procedure where the author removes only the superficial lobe of the parotid gland that contains the benign tumour. This is undertaken when the tumour has been biopsy proven to be benign, small and lies in the superficial lobe or in the inferior pole of parotid gland. Near-total parotidectomy means the operation starts as superficial parotidectomy, but it is extended to include the deep lobe around the tumour. With prior knowledge of the histology of the tumour, this is the surgical treatment of choice in most cases of benign parotid tumours, where there is no necessity to remove all parotid tissue. Nerve-sparing total parotidectomy represents the removal of all parotid tissues with preservation of facial nerve. This procedure is done in cases of low-grade mucoepidermoid carcinoma, acinic-cell carcinoma and malignant schwannoma. Total radical parotidectomy is defined as total removal of superficial and deep lobe of the parotid gland with sacrifice of the facial nerve. This is accompanied by a sural nerve graft. This is undertaken in all cases of malignant parotid tumours.

### **Surgical Treatment**

The surgical treatment of parotid tumours is based on clinical diagnosis and FNAC results when this facility was made available at our hospital. Under hypotensive anaesthesia, and local infiltration of 10 ml. Marcaine 0.5% and 1:200,000 adrenaline, superficial parotidecto-

my is performed in all cases of benign tumours. This is usually extended to deep lobe parotidectomy when the tumour is large and the capsule was encroaching to the deep lobe.

The gland is approached through a "face-lift" incision. This gives a far more acceptable scar than the usual lazy-S incision. The incision should also be very close to the base of the auricle. The critical point of the surgery is the localisation and preservation of the facial nerve. There has been many different techniques used to identify of the trunk of the facial nerve. The author's preferred technique is to use the posterior belly of digastric muscle as a reliable landmark. As the superior margin of the posterior belly of digastric is traced upward, the trunk of the facial nerve could be identified. It is always about the size of a "match-stick", and glistening white in colour. It is however recommended that any surgeon who wishes to do parotid surgery should familiarise himself with all the other techniques of identifying the facial nerve. The superficial lobe is then dissected from the division and branches of the facial nerve. The author tends to remove as much parotid tissue as possible including the deep lobe even for a biopsy proven benign lesion. No attempt is made to specifically look for parotid duct but it is ligated if it happens to be identified.

Radical total parotidectomy where the facial nerve is sacrificed and replaced by sural nerve graft is performed in all cases of proven carcinoma of the parotid gland. The facial nerve trunk is first identified just anterior to the posterior belly of digastric muscle. The extraglandular facial nerve branches are identified, marked and divided. The gland is then removed in toto after dividing the nerve trunk proximally at a comfortable distance for easy anastomosis with a nerve graft which is taken from the sural nerve.

A large suction drain is left for five days to make sure the skin flap is completely adherent to the parotid bed before it is removed. This is a very important precaution especially if there is still some remnant parotid tissue left behind.

All patients are given intravenous cloxacillin and metronidazole post-operatively.

All patients with carcinoma is also given post-operative radiotherapy.

**Results**

The age of these patients ranges from 14 to 83 years. There were equal number of male as compared to female patients. 55 patients were Malays (49%), 43 were Chinese (39%) and 12 were Indian (12%).

Table I,II and III shows the distribution of parotid swellings according to histology. The classification is as suggested by Batsakis and Regezi<sup>4</sup>. Of a total of 110 cases of parotid swellings, 97 cases were proven to be tumours (Figure 1). Seventy-three cases (75 %) had benign lesions. Pleomorphic adenoma is the most common benign tumour and is seen in fifty-eight patients (80%). Seven patients (6.5%) were adenolymphoma, in one of them the presentation is bilateral.

**Table I**

**Distribution of parotid swellings by histologic diagnosis (n = 110) (based on Batsakis & Regezi Classification system)**

<b>Benign tumours (n = 73)</b>	<b>No of patients</b>
Pleomorphic adenoma	58
Adenolymphoma	7
Oncocytoma	1
Haemangioma	2
Schwannoma	1
Neurolemomma	1
Acinic cell adenoma	1
Tubular adenoma	1
Epidermoid cyst	1

**Table II**

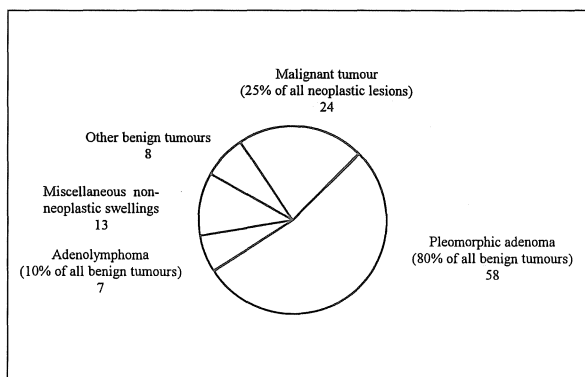
**Distribution of Parotid swellings by histologic diagnosis (n = 110) (based on Batsakis & Regezi classification system)**

<b>Malignant tumours (n = 24)</b>	<b>No. Of patients</b>
Carcinoma ex-pleomorphic adenoma	5
Adenoid cystic carcinoma	6
Mucoepidermoid carcinoma	4
Squamous cell carcinoma	2
Adenocarcinoma	1
Malignant lymphoma	1
Acinic cell carcinoma	3
Haemangiopericytoma	1
Malignant Schwannoma	1

**Table III**

**Distribution of Parotid swellings by histologic diagnosis (n=110) (based on Batsakis & Regezi classification system)**

<b>Miscellaneous non-neoplastic swellings (n=12)</b>	<b>No. of patient</b>
Kimura's disease	7
Chronic sialadenitis	2
Sclerosing sialadenitis	1
Normal parotid tissue	3



**Fig. 1 Distribution of Parotid swellings (110 cases)**

Thirteen patients presented with non-neoplastic swellings. Seven were cases of Kimura's disease (Eosinophilic hyperplastic lymphogranuloma) of parotid gland, two were chronic sialadenitis, and one case of sclerosing sialadenitis. Three patients presented with an enlarged normal parotid gland. FNAC was performed in one of them and the histology was reported to be inconclusive. A decision to do a parotidectomy was made based on a clinical diagnosis that this may be a parotid tumour.

There were ten cases of recurrent pleomorphic adenoma referred following primary surgery at other centres. No information was available as to the nature and extent of primary surgery. The shortest period of recurrence was two years, while the longest was nine years after the initial surgery.

There has been no recurrences on all benign tumours that was primarily treated by the author. There was also no recurrence of all the recurrent benign tumours that the author treats by doing a near-total parotidectomy. The longest follow-up being eleven years.

Recurrences were seen in five cases of malignant tumours, namely two cases of carcinoma ex-pleomorphic adenoma, one case each of mucoepidermoid carcinoma, acinic cell carcinoma and malignant schwannoma.

Fine needle aspiration cytology (FNAC) was available at

our hospital since July 1989, and it was performed in 46 patients. Positive correlation between final histological diagnosis and FNAC findings were seen in thirty-four patients (74 %).

Thirty patients (26%) had superficial parotidectomy, fifty-eight (53%) had near-total parotidectomy, fourteen (13%) had nerve-sparing total parotidectomy, and seven (6%) had total radical parotidectomy with sural nerve-graft. One patient had radical neck dissection in continuity with total radical parotidectomy but did not have a sural nerve graft because of the massive size of the tumour and unfit medical condition of the patient.

### Complications

#### 1. Facial nerve injury

There was no case in this series where the facial nerve could not be identified. Where the surgeon has trouble identifying the facial nerve, he will proceed to look for the distal branches and trace it retrogradely. This happened in three cases where the tumour was so big that the facial nerve trunk could not be easily identified. There was no case where the facial nerve was accidentally divided because it could not be identified.

The most frequent early complication is facial nerve weakness. The most common weakness is seen at the angle of the mouth and the forehead. This weakness is usually noted the next day when the patient is fully awake and it usually recovers within 3 months. There was no patients in this series where there was permanent facial nerve weakness as a result of traction during surgery.

#### 2. Infection

There was no case of wound infection in this series. Prior to closing the wound, it was irrigated with povidone-iodine solution. The patient was also covered with intravenous metronidazole and cloxacillin.

#### 3. Blood loss

Blood loss was minimal and there was no case that needed transfusion.

#### 4. Haematoma

This complication occurred in one patient where a small

suction was used, and this got blocked very soon after the surgery was completed. The haematoma was evacuated and the wound was allowed to heal with dressings. Although the facial nerve weakness was slow to recover, it totally recovered within three months.

#### 5. Sialocele

Post-operative collection of saliva underneath the skin flap can be a troublesome complication of this surgery. This is especially so when a lot of parotid tissues is left behind. There was no such complication in this series. The author believes that leaving a large suction drain for 5 days until the skin flap is completely adherent to the parotid bed has helped in avoiding this complication.

#### 6. Salivary fistula

None of the cases developed a salivary fistula. The author believes that using a large suction drain has helped in avoiding this complication.

#### 7. Frey's syndrome

Frey's syndrome or gustatory sweating was first documented by Lucie Frey in 1923, but the earliest known observation of this disorder is probably attributable to Duphenix in 1757 who noted symptoms in a patient who sustained parotid injury<sup>8</sup>. The symptoms that occur during mastication are flushing, sweating and general discomfort over the skin anterior to the ear as well as in the region of the mandible over the parotid bed. It is generally agreed that an abnormal regeneration of cholinergic nerve fibres to the sweat glands over the parotid bed effects the secretomotor response and thus the abnormal localised sweating. In this series we found that fifteen out of forty-eight patients (30%) have symptoms of Frey's syndrome. Only two patients volunteer this symptom, the rest only reveal that they have symptoms of gustatory sweating after direct questioning. In all of them, the symptoms were mild and they never sought treatment.

#### 8. Greater auricular nerve neuroma

This is a rare complication, but when it does occur it can be very disturbing. Two patients had this complication. The neuroma had to be surgically explored, the nerve end divided and buried deep in the sternomastoid muscle.

## Discussions

This is a study undertaken by the author on all patients who presented with parotid swellings over a twelve-year period. The incidence, sex distribution and age range of both benign and malignant tumours seems to correspond to other published series<sup>3,7</sup>.

Parotid tumours are not common tumours, their incidence has been reported as between 1 and 3 per 100,000 per year<sup>3</sup>. In our series the age range for benign parotid tumours is 14 to 75 years with a mean of 40 years. 58 patients (80%) had pleomorphic adenoma with a mean age of 42 years (range 14 - 75 years). 7 patients (6.5 %) had adenolymphoma with a mean age of 59 years (range 48 - 65 years). 24 patients (25 %) had malignant tumours, with a mean age of 50 years (range 16 to 88 years). Therefore the mean age for malignant tumours exceeds that for benign tumours by 8 years. There is no significant difference between the number of male compared to female patients.

All these patients presented with a lump in the parotid gland. Seven patients (6.4%) presented with a painful mass, five of them had malignant neoplasm and the other two had sialadenitis. Presentation of a mass with facial nerve palsy is not common, and as in two cases in this series, they are histologically proven to be carcinoma ex-pleomorphic adenoma. The diagnosis of parotid tumour must be strongly considered in any patient who presents with a swelling in the parotid region.

Various investigations have been recommended. At Hospital Kuala Lumpur fine needle aspiration cytology were performed in 46 cases since the facility was made available. We have a positive correlation in 73%, which is about the commonly accepted figure, although Eneroth reported as high as 92% accuracy in diagnosing parotid tumours by this method<sup>6</sup>. In general only positive diagnosis should be accepted. Aspiration cytology is cost effective, accurate and safe. There has been no report of seedlings along the needle tract. The knowledge of FNAC results is a big help to plan surgical treatment for parotid tumours, for example in the treatment of a carcinoma of parotid gland, which is by radical total parotidectomy with sural nerve graft.

CT Scan is not a routine investigation in our department. It is indicated in situation where there is suspicion of extension into the deep lobe and also the nature of the lump.

The treatment for parotid tumours is confusing and this is more so for benign tumours. Because of its close proximity to the facial nerve and fear of damage to it during surgery, there are some surgeons who still do enucleation or local excision. Our treatment of choice for all benign tumours is near-total parotidectomy. This procedure starts as superficial parotidectomy but it is usually extended to remove the deep lobe and as much of the surrounding parotid tissue as possible. After all, whatever parotid tissue that is left behind is almost functionless. This may be the reason why there is no recurrence for benign tumours of the parotid gland treated by this approach. Near-total parotidectomy as a secondary operation for recurrence of pleomorphic adenoma as practised by the author has also not resulted in further recurrences.

Radical total parotidectomy with resection of the 7th nerve and sural nerve grafting is performed in all cases of proven carcinoma. We believe that in patients who

has an FNAC proven carcinoma in a parotid gland, a very radical approach should be taken. All these patients had postoperative radiotherapy. In spite of a very radical approach to the treatment of carcinomas of parotid gland, there is still a high incidence of recurrences especially carcinoma that has arisen from pleomorphic adenoma. Only in adenoid cystic carcinoma, where six cases has been treated this way and are on close follow up has not shown any recurrence as yet. The longest follow-up being 9 years.

### Conclusion

The age distribution, sex ratio and histology of parotid tumours is similar to that found elsewhere in the world. The author has taken a very radical approach in treating pleomorphic adenoma of the parotid gland by doing near-total parotidectomy and this may have led to no recurrence of this tumour after surgical treatment. A similar approach in treating recurrent pleomorphic adenoma by doing near-total parotidectomy has also led to no further recurrences. Recurrences after surgical treatment of carcinoma ex-pleomorphic adenoma is high. A very aggressive approach in treating adenoid cystic carcinoma by doing total radical parotidectomy with sural-nerve graft followed by post-operative

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