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# Parotid gland surgery: a retrospective review of 108 cases

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**Abstract**
One hundred and eight parotidectomies performed by a single consultant were reviewed. Eighty-five patients had primary parotid disease, 23 patients had extra-parotid primaries. Pleomorphic adenoma was the most common histological diagnosis. In patients with primary parotid disease, a post-operative temporary facial nerve palsy was noted in 15 patients, with a further four developing a permanent palsy. Patients with metastatic disease to the parotid had a poor prognosis.

**Key words: Parotid Gland; Surgery; Review, Multicase**

## Introduction

Parotid gland surgery is of particular interest for a number of reasons. Firstly many of the patients are young and the complications potentially disfiguring. Procedures for recurrent disease are technically difficult, and patients with malignant disease either primarily or secondarily involving the parotid often require additional major procedures.

In view of this, we feel that units with a particular interest in this surgery need to carefully assess their results, to ensure that outcome and complication rates are in keeping with current international standards.

In this light we have undertaken to perform a retrospective audit of 108 parotidectomies performed under a single consultant, over a seven-year period.

## Patients and methods

A series of 108 patients were reviewed, all of whom underwent a parotidectomy between 1992–1999. All patients were operated under a single consultant. Eighty-five patients had primary disease of their parotid. Fine-needle aspiration was performed in 70 per cent of cases. A computed tomography (CT) scan was performed in patients in whom a malignant lesion was suspected, or if a fixed mass was present, suggestive of a deep lobe lesion, or malignancy. Twenty-three patients had parotidectomy for malignant extra-parotid disease, as a result of tumour directly invading or abutting on the parotid, or as part of a regional lymphadenectomy.

## Results

The ages ranged from 23 to 89-years-old, with a mean of 55 years. The mean age for patients with benign disease was 49 years, and 69 years of age for patients with malignant disease. Forty-eight per cent of patients with benign disease and 83 per cent of patients with malignant disease were male.

Fine-needle aspiration was performed in 60 patients with primary parotid disease (70 per cent). A correct diagnosis was achieved in 40 cases (accuracy = 70 per cent), an inconclusive result in 15 cases (25 per cent), and an incorrect result in three cases (five per cent). The sensitivity was 66 per cent, and the specificity 100 per cent.

Patients with primary parotid pathology, had a varied histological distribution, with pleomorphic adenoma being the most common diagnosis (Table I).

There were seven patients with primary malignant disease of the parotid. The average age at presentation was 69 years. Eighty-six per cent were male. The most common histology was squamous cell carcinoma (SCC) (three patients), followed by salivary duct carcinoma (two patients) and non-Hodgkin's lymphoma (two patients). Five patients had additional major procedures (neck dissection – four, pectoralis flap repair – three, temporal bone resection – one). Five patients had post-operative radiotherapy, and two had chemotherapy. Three patients had neck nodes positive for tumour in the resected specimen. Follow-up ranged from six months to 60 months. One patient died from

TABLE I
HISTOLOGY OF PAROTID DISEASE

| | |
|---|---|
| Pleomorphic adenoma | 43 |
| Warthin's tumour | 16 |
| Primary malignancy | 7 |
| Extra-parotid malignancy | 23 |
| Miscellaneous | 19 |
| Total | 108 |

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TABLE II
ADDITIONAL MAJOR PROCEDURES ON 26 PATIENTS

| | |
|---|---|
| Temporal bone resection | 8 |
| Neck dissection | 22 |
| Flap repair* | 14 |
| Other | 7 |

*= latissimus dorsi, pectoralis major, trapezius and temporalis flaps used.

locoregional recurrence at six months and one from metastatic disease at 18 months. One patient died from an unrelated complaint 60 months after her original operation, but was disease-free at this stage. The remaining four are well having been followed for an average of 38 months.

Seventy-five patients had superficial parotidectomies, 33 had total parotidectomies, and two had removal of a primary parapharyngeal component. Twenty-six patients had additional major procedures performed (Table II), all of whom had malignant disease.

Facial palsy occurred in 13 patients (17 per cent) with benign disease, all of which were temporary, taking up to 12 months to recover, with a mean time to recovery of four and a half months. A facial palsy occurred in six out of seven patients with primary malignant disease, five of whom had documented intra-operative branch sacrifice. One patient had a cable graft inserted at the time of operation, and had a recovery noted at six months. The patient with a post-operatively palsy, with no documented nerve injury intra-operatively recovered at six months. Another patient had a Gortex® sling re-animation procedure performed, and another had a sural nerve graft, but had no return of facial function. In total there were then four permanent facial palsies (five per cent), and 15 temporary palsies (18 per cent), in patients with primary parotid pathology. A further 10 palsies occurred in patients with extra-parotid primaries, three of which were permanent (Table III).

There was one recurrence of pleomorphic adenoma, a patient who had an enucleation procedure performed in a separate institution three years previously. He represented with recurrent disease and had a total parotidectomy with excision of the scar. He re-presented two years later with a further recurrence. He underwent revision parotidectomy. Histology showed myoepithelioma arising from pleomorphic adenoma, and the patient received radiotherapy subsequently. There is no evidence of further recurrence two years later.

TABLE III
COMPLICATIONS

| | | |
|---|---|---|
| VIIth nerve palsy | Benign | Temporary – 13<br>Permanent – 0 |
| | Malignant | Temporary – 2<br>Permanent – 4 |
| | Extra-parotid primaries | Temporary – 7<br>Permanent – 3 |
| Haematoma | | 2 |
| Neuroma | | 2 |
| Salivary fistula | | 2 |
| Frey's syndrome | | 1 |
| Flap breakdown | | 1 |

TABLE IV
SITE OF EXTRA-PAROTID PRIMARIES

| | |
|---|---|
| Pinna | 7 |
| Cutaneous | 5 |
| Upper aerodigestive | 4 |
| Conjunctiva | 1 |
| Unknown primary | 4 |
| Lymphoma | 1 |
| Orbit | 1 |
| Total | 23 |

Other complications (Table III) were haematomas (two, requiring evacuation), neuromas (two, both of which were excised), salivary fistulas (two, both settled on conservative management), and Frey's syndrome (one), noted four months after surgery. However, follow-up in some patients did not exceed six months, and the true incidence of Frey's syndrome is likely to be higher.

Twenty-three patients had a parotidectomy as part of surgery for malignant disease arising outside the parotid. The indications were malignant disease where the primary tumour was felt to involve the parotid gland by direct extension, or where the parotid was removed as part of a regional lymphadenectomy.

The site distribution of the primary malignancies is shown in Table IV. Fourteen of these lesions were squamous cell carcinomas (60 per cent). There were three malignant melanomas, one non-Hodgkin's lymphoma, two poorly differentiated carcinomas, one Merkel cell carcinoma, one adenocarcinoma and one verrucous carcinoma.

Twenty-two of the patients had an additional major procedure performed (Table II). Fourteen had post-operative radiotherapy, and two had chemotherapy.

There was one peri-operative mortality, a 77-year-old man who had a SCC of the pinna, and underwent a pinnectomy, temporal bone resection, parotidectomy, modified radical neck dissection and a latissmus dorsi flap repair. He developed a post-operative myocardial infarction, and died within 24 hours of the procedure.

Four patients were lost to follow-up, one of whom had been recurrence free for 26 months, and another for 12 months. Follow-up ranged from three months to 84 months. Ten patients (53 per cent) have been well, with no evidence of recurrence at an average of 41 months follow up (range, three months to 84 months). Three patients died of locoregional recurrence of their disease at an average of 10 months (range, three months to 14 months). Four died of metastatic disease at an average of 13 months (range, six months to 27 months). Nine patients had metastatic disease to the parotid, involving either the parotid tissue itself, or intra-parotid nodes. Seventy-seven per cent of these were SCCs. Three have died from their disease an average of eight months (three months to 14 months) after initial treatment. Six are disease-free an average of 28 months (range, three months to 78 months) post-treatment.

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## Discussion

Salivary gland tumours are uncommon, with an estimated incidence of 3–4/100 000/year.[1,2] The individual experience of a surgeon in treating these disorders is, therefore, potentially limited.

The facial nerve courses through the substance of the parotid gland, artificially dividing it into superficial and deep portions. Injury to the nerve is a serious complication after surgery to the parotid gland. Because many patients with parotid disease are young, this disfiguring complication is potentially disastrous. The incidence of a temporary neuropraxia is high being reported in 46 per cent of patients in the Cleveland Clinic's experience.[3] Our own figure of 18 per cent compares favourably. The more serious complication of a permanent palsy was estimated to be three per cent in patients with benign disease, rising to 36 per cent in malignant tumours in Renehan's study of 1000 patients with salivary gland neoplasms.[4] We had a permanent palsy in five per cent of cases, all of which were malignant, and, all of whom, with the exception of one, had documented intra-operative branch sacrifice. A nerve monitor was used in all cases, and its use may be advocated in all parotid gland surgery.

Fine-needle aspiration was found to be useful, accurately predicting the final diagnosis in 70 per cent of cases. Sensitivity and specificity of 66 per cent and 100 per cent respectively, correlates with published data on identification of malignant parotid disease, using this technique.[5] However, again, while we felt that this was a useful clinical aid, it did not affect the decision to operate in any patient.

Surgery for recurrent pleomorphic adenoma of the parotid gland is technically difficult, and, once a tumour has recurred, the risk of further disease increases to 15 per cent.[4] Recurrence rates reported in the literature vary, but rates of less than two per cent are now reported in many of the larger series.[1,4,6] To date we have had no recurrences in patients who were treated primarily in our unit, however, the length of follow up in many of these is only a few years, and the final recurrence rate may be higher.

Surgery for malignancy, either primarily, or, secondarily involving the parotid, often requires major additional surgery. Units that are involved in parotid gland surgery, should be in a position to be able to perform this if necessary. Metastatic disease to the parotid carries a notoriously bad prognosis, with five-year survival rates of only 10–15 per cent, in patients with primary carcinoma of the head and neck with parotid involvement.[7] Our own series shows 66 per cent of patients to be disease-free at an average of 28 months post-operatively. However, many of these patients, again, have only been followed for a short period of time, and the final figure is likely to be higher.

Parotid gland surgery can present some difficulties for the surgeon. The disfiguring complication of a facial nerve palsy can be disastrous in a patient who is often young, and for disease that is often benign. Procedures for recurrent disease are technically difficult. Primary or secondary malignant disease may require additional major procedures, with, or without, reconstruction. Surgery on patients with parotid disease, should be limited to units with appropriate expertise in this interesting field.

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