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## RESEARCH COMMUNICATION

# Parotidectomy: A Review of 112 Patients Treated at a Teaching Hospital in Pakistan

Naeem Sultan Ali\*, Ahmad Nawaz, Shaheryar Rajput, Mubasher Ikram

### Abstract

**Objective:** The purpose of this study was to analyze the clinical presentation, histopathology and complications following parotid surgery. **Methods:** We retrospectively reviewed the charts of 112 patients who underwent parotidectomy from January 2000 to February 2010. Data including age, sex, clinical signs and symptoms, histology and complication were collected from medical records. **Results:** Of the total, 82 (74%) had benign lesions, 30 (36%) had malignant tumors. The most common benign tumor was pleomorphic adenoma (57%), and the most common malignant tumor was mucoepidermoid carcinoma (16%). Analysis of the correlation between fine-needle aspiration cytology and final histology revealed that fine-needle aspiration sensitivity, specificity and accuracy to 86.6%, 97.56% and 94.64% respectively. The most common complication following parotidectomy was transient facial nerve palsy (18.7%). **Conclusion:** Superficial parotidectomy is associated with a decrease incidence of transient facial nerve dysfunction compared with that of total parotidectomy. High grade or advanced tumour is a predictor of poor outcome which may require adjuvant therapy.

**Keywords:** Parotid neoplasms - fine-needle aspiration cytology - Frey's syndrome - facial nerve paralysis

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### Introduction

Parotid neoplasms represents the most diverse and complex group of tumours in head and neck region. Less than 3% of all head and neck tumours are located in the salivary glands, and approximately 85% of these are found in parotid gland (Sungur et al., 2002; Day et al., 2004; Ferrreira et al., 2005). Majority of parotid tumours are of benign histology (80-85%), with pleomorphic adenoma being the most common, constituting 70% of benign tumours (Witt, 2002). The probability of malignancy is relatively inversely proportional to the size of the gland. Patients often presents with a lump in a parotid region, facial swelling, facial paresis, pain, and enlarge neck node (O'Brien, 2003). Sudden enlargement of lump, pain, facial nerve dysfunction, and cervical lymphadenopathy are often cited as a indicators of malignancy (Loggins and Urquhart, 2004). The optimum treatment of parotid gland neoplasm is surgical resection whether partial or complete superficial parotidectomy and total parotidectomy with conservative or radical resection. All these depend upon the histology and site of lesion. The postoperative complications associated with parotidectomy are very well established that includes facial nerve dysfunction, Frey's syndrome, and recurrence. The primary aim of this study was to analyze the outcome of surgery on parotid gland and comparing result with local and international data. The study also assessed the sensitivity and specificity of fine needle aspiration cytology (FNAC).

### Materials and Methods

A retrospective review of 112 consecutive surgically treated patients was conducted at Aga Khan University Hospital in Karachi between the years 2000 and 2010. These operations were carried out by four different surgeons. From chart review information regarding patient demographics, presenting symptoms, FNAC results, type of parotidectomy, and postoperative outcome was assessed. We also compared the histopathology of the surgical specimens with the preoperative cytology of the FNAC specimens and evaluated the sensitivity, specificity and overall accuracy of FNAC to differentiate between benign and malignant disease. Intra operative facial nerve monitoring through a nerve stimulator was used in every case in the present series.

### Results

A total of 112 patients who underwent parotidectomy, 60 were males with a mean age of 49 years, and 52 were females, with a mean age of 42 years. All of the patients presented with palpable mass in the parotid region, 5 patients with ipsilateral pain, 2 patients presented with neck node and one presented with complete facial paralysis. The patient with the facial palsy had high grade mucoepidermoid carcinoma on final histopathology. All other patients with pain had malignancy.

FNAC was performed in all the patients as a diagnostic

modality. A result of FNAC compared with histopathology is shown in Table 1. A sensitivity of 86.6% was observed. The specificity was 97.56%, and the diagnostic accuracy was 94.64%. The positive and negative predictive value was 92.85% and 95.23% respectively.

Most patients underwent superficial parotidectomy (78.5%). Total parotidectomy was performed in 21.4%, who had deep lobe tumours or malignant tumours diagnosed with FNA preoperatively. Total radical parotidectomy was carried out in only one patient who already had complete facial nerve paralysis preoperatively. The final histological diagnoses of the included cases are listed in Table 2. There were 82 benign lesions (75 neoplastic and 7 non-neoplastic) while 30 (36%) were malignant tumors. Pleomorphic adenoma was the most common in benign tumor group (57%) while mucoepidermoid carcinoma (16%) in the malignant group.

Cervical lymphadenopathy was observed in 7 patients with high grade mucoepidermoid carcinoma and one patient with Squamous cell carcinoma. These entire patients underwent modified neck dissection.

Twenty-one (18.7%) patients had transient facial nerve weakness. Majority of these patients underwent total parotidectomy while only two had superficial parotidectomy. Seven (6.2%) developed symptomatic

Frey's syndrome. A list of complication following parotidectomy is shown in Table 3.

Fourteen patients (12.5%) were referred for adjuvant radiation therapy. No recurrence for benign tumours was observed however six (5%) patients with malignancy developed recurrence for which they underwent a second surgery. Four of them had high grade mucoepidermoid carcinoma and the rest were squamous cell and adenoid cystic carcinoma.

## Discussion

Parotid gland has a distinct morphology and their histology is extremely varied and complex due to its heterogeneous cellular composition. Although relatively rare, parotid neoplasms are a diverse group of head and neck tumours (Jozefowicz-Korczyńska, et al., 2004). The etiology factors for these tumours are poorly understood. Alcohol and tobacco has not been found convincing in playing a role, despite their significance in causing other head and neck malignancies (Eneroth, 1971). Radiation therapy on the other hand, has been implicated in instances where someone is exposed for range of 15 to 20 years.

Patients with parotid lesions usually presents with a palpable or visible mass, nerve dysfunction, pain or cervical lymphadenopathy. In our series, all patients had palpable mass in the parotid region, 4.4% with ipsilateral pain, 1.8% patients presented with neck node and one presented with complete facial paralysis. These figures were consistent with the literature (Sungur et al., 2002; Ferrreira et al., 2005; Friedrich, et al., 2005).

The diagnostic sensitivity of cytopathology in detecting malignant disease was 86.6% in this series. This result implicate that if FNAC is used as a screening tool, 13% of the malignant lesions would have been missed. These values fall within wide range of sensitivity reported in various studies, from as low as 27% up to 97% (Zurrída et al., 1993; Jayaram, 1994; Cajulis et al., 1997; Boccato et al., 1998; Wong and Li, 2000; Hee and Perry, 2001). The reason often cited for this wide range is the dependence on skills of the cytotechnologist performing FNAC and the expertise of the pathologist to assess adequacy and accurate examination of the specimen. Specificity in our study was 97.56%. Specificity reported in literature has been similarly high, in the range of 84% to 100% (Zurrída et al., 1993; Atula et al., 1996). In the recent literature, the accuracy has ranges from 79% to 97% (Aversa et al., 2006; Salgarelli et al., 2009). In our study it was 94.64%.

The reported incidence of benign tumours in parotid gland is 80% (Witt, 2002; Day et al., 2004). Pleomorphic adenoma and Warthin's tumour which account for 70% and 10% of all parotid tumours are considered the most common benign tumour (Takashima et al., 1996). The incidence of benign parotid lesions in this series was 73.2%. Of these, 57.1% were pleomorphic adenomas, whereas 9% were warthin tumours. The incidence of benign tumours in this series coincides with the literature. The incidence of malignant tumours (30%) in this study was consistent with other published figures (Jozefowicz-Korczyńska, et al., 2004; Zbaren et al., 2004). Pleomorphic adenoma was seen slightly higher in female population

**Table 1. Comparison of Histological Results in 112 Cases with Preoperative Cytology Results**

		Histological Diagnosis		Total
		Benign	Malignant	
FNAC	Benign	80 TN	4 FN	84
Diagnosis	Malignant	2 FP	26 TP	28
	Total	82	30	112

**Table 2. Histological Diagnosis**

Benign		
Pleomorphic adenoma		64
Warthin's tumour		10
Monomorphic adenoma		1
Lipoma		1
Inflammatory lesions		6
Malignant		
Mucoepidermoid carcinoma		18
Squamous cell carcinoma		1
Adenoid cystic carcinoma		3
Acinic cell carcinoma		3
Salivary duct carcinoma		1
Carcinosarcoma		1
Metastatic melanoma		1
Myoepithelial carcinoma		1
Lymphoma		1
Total		112

**Table 3. Postoperative Complications Following Parotidectomy (n=112)**

Complications	n	%
Transient facial nerve palsy	21	18.7
Frey's syndrome	7	6.2
Epidermolysis	5	4.4
Haematoma	2	1.7
Seroma	2	1.7
Keloid	1	0.89

while warthin tumour was found exclusively in males. However, no trend was observed in rest of the tumours.

Facial nerve dysfunction is the most common postoperative complication encountered after parotid surgery and the reported incidence is 18 to 27% (Marshall et al., 2003; O'Brien, 2003; Al Salamah et al., 2005; Guntinas-Lichius et al., 2006; Lin et al., 2008). In our series 18.7% of patients suffered transient facial nerve dysfunction, majority were those who underwent total parotidectomy. The rate of permanent facial nerve paralysis was not available in this retrospective series. Frey's syndrome (also known as gustatory sweating or auriculotemporal syndrome) is the second most common complication in our series. The majority of the patients were asymptomatic. The incidence reported in literature is varied widely between 11 and 100% (Eckardt and Kuettner, 2003).

Approximately thirteen percent of the patients were referred for adjuvant radiation therapy and all of these patients had high grade malignancy. In conclusion, our experience with surgical management of parotid tumours at the Aga Khan University Hospital is almost similar to that reported in other series. The incidences of complications including facial nerve dysfunction and Frey's syndrome are comparable with those of other institutions. Thorough knowledge of facial nerve anatomy combined with meticulous dissection is paramount to reducing the incidence of facial nerve injury during parotidectomy.

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