

## Clinical Presentations And Surgical Outcomes Of Parotid Gland Tumors

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**Abstract:** Background & Objective: To assess Clinical Presentations and Surgical Outcomes of various parotid gland tumors which required Parotidectomy. Methodology: The present retrospective study was carried out at the Department of E.N.T. & Head Neck Surgery, Medical College Vadodara from January 2010 to December 2014 and included 34 patients who underwent parotidectomy. Data were collected regarding clinical presentations, benign versus malignant nature of the disease on FNAC reports, radiological findings, type of surgery instituted, complications encountered and histology reports of the surgical specimens and subjected to statistical analysis. Results: All patients had presented with a lump usually painless. Thirty (88%) patients had benign pathology while four (12%) had malignancies. Most common surgical procedure instituted was superficial parotidectomy, performed in 90% (n = 31). The most common complication was Sialocele (n=5; 15%) followed by facial nerve palsy (n= 2; 6%). The value of FNAC as a diagnostic tool was with 96.66% specificity and 75% sensitivity. Conclusion: Pleomorphic adenoma is most common benign pathology. Superficial parotidectomy is the most commonly offered surgical procedure. Parotid surgeries are safely performed with low morbidity and no mortality. [Jayman R NJIRM 2015; 6(5):6-10]

**Key Words:** Facial nerve palsy, Parotid Gland, Parotidectomy, Pleomorphic Adenoma.

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**Introduction:** Salivary gland tumors account for approximately 3% of all head and neck malignancies<sup>1</sup>. Approximately 80% of salivary gland tumors occur in the parotid gland. In approximately 75-80% cases, it is pleomorphic adenoma while Warthin's tumor accounts for 10%. Among the malignancies, mucoepidermoid carcinoma is the most common followed by adenoid cystic carcinoma<sup>2-4</sup>.

Most of benign parotid tumors present as slow growing, painless lump often in the tail of the parotid gland. Thorough clinical examination of mass lead us towards final diagnosis. It guides us in right direction to know type of tumor (benign versus malignant).

Ultrasonography (US) is a low-cost modality with high sensitivity in detecting masses in the superficial lobe of the parotid gland. It has limitations in identifying the involvement of deep lobe of parotid gland. Computerized tomography (CT) and/or magnetic resonance imaging (MRI) are complementary for correct surgical planning. Fine-needle aspiration cytology (FNAC) is useful to know benign or malignant nature of tumor preoperatively.

Parotid gland surgery is challenging and requires expertise because of intricate relation with facial

nerve. The facial nerve emerges at the stylomastoid foramen, enters the gland and branches out within the parotid gland substance. The facial nerve branches divide the gland in larger superficial and smaller deep lobe. Individual branches must always be identify and dissected while performing parotidectomy.

Parotid gland surgery has slowly evolved over the last few centuries. In the 16th century, it was limited to the treatment of ranula and salivary gland calculi. In the 19<sup>th</sup> century, enucleation was performed for parotid gland tumors which had high recurrence rate. In the 20th century, more extensive surgeries were recommended to deal with recurrent rate & superficial parotidectomy became the minimum required procedure. Today, the most accepted procedures for benign parotid gland tumours is superficial parotidectomy and total parotidectomy / extended parotidectomy for malignant involvement of parotid gland<sup>5-8</sup>.

The present study was conducted with aims to assess the clinical presentation, evaluating pathological and surgical outcomes. It also aimed at to understand complications in patients who underwent parotidectomy at our institution.

**Material and Methods:** The present retrospective study was carried out at the Department of E.N.T.

& Head Neck Surgery, Medical College and S.S.G. Hospital, Vadodara from January 2010 to December 2014. It included 34 patients who underwent parotidectomy for benign and malignant neoplasm. All patients of either gender who presented with parotid gland tumors and underwent parotidectomy were included. Patients with diseases such as parotid abscess who did not undergo parotidectomy were excluded. Initial diagnosis was made by history, physical examination and other investigations.

Following data was analysed in every patient, regarding:

- Clinical presentation of the parotid tumor.
- Pre-operative diagnosis benign versus malignant based on FNAC,
- Involvement of superficial or deep lobe of gland by radiological CT scans,
- Involvement of Facial nerve and its branches
- Type of Surgical procedure instituted,
- Complications if any,
- Histology report of surgical specimen

The type of surgery performed depended on the pre-operative diagnosis based on FNAC and radiological scans and clinical presentation of the tumor. All the patients were hospitalized. Surgeries were classified as superficial parotidectomy with facial nerve preservation, Total parotidectomy with facial nerve preservation and Total parotidectomy with facial nerve sacrifice of the main trunk or individual nerve branch.

Follow up data was collected and analysed. The numerical data such as age was expressed as mean  $\pm$  standard deviation while categorical data such as gender distribution, histological diagnosis, surgical procedure and complications if any were expressed as frequencies and percentages. 2 x 2 tables were used to calculate sensitivity and specificity of FNAC for malignant lesions.

**Results:** In our study out of 34 patients, 18 (53%) were males and 16 (47%) were females. Age at Presentation ranges from 19-63. Majority of Patients were in 4<sup>th</sup> and 5<sup>th</sup> decade of life. The mean age was  $40 \pm 12.3$  years.

In the case of benign disease, the clinical presentation was usually a swelling in parotid

region, slowly growing or apparently stable in dimensions. In cases of malignant disease, common clinical presentation was parotid mass and in 6% (n = 2) of those the mass was painful.

**Table 1: Benign Tumors of Parotid Gland**

Type of tumor	Number	Percentage
Pleomorphic adenoma	26	87
Lipoma	01	3
Warthin's tumor	03	10

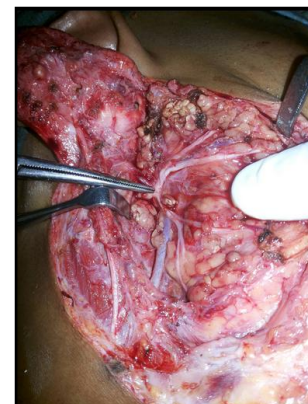
**Table 2: Malignant Tumors of Parotid gland**

Type of tumor	Number	Percentage
Adeno carcinoma	2	50
Adenoid cystic carcinoma	2	50

Out of 34 patients 88% (n = 30) cases had benign pathology while 12% (n = 04) had malignancies. Among the benign lesions, the most frequent, by far, 87% (n= 26) were pleomorphic adenomas, 10% (n=3) were Warthin's tumors and 3% (n=1) was parotid lipoma. Out of 34 patients 18% (n=6) had involvement of both superficial and deep lobe of parotid gland and in 82%(n=28) had involvement of only superficial lobe. Two of pleomorphic adenomas presented to us were recurrent tumors.

Superficial parotidectomy was the commonest surgical procedure performed in 90% (n = 31) patients. Total parotidectomy was performed in 10% (n = 03) cases. None of our patient required a more extensive trans-mandibular approach. Two patients (6%) developed permanent facial nerve palsy and one patient developed marginal mandibular nerve paresis post operatively.

**Figure 1: Identification and Preservation of facial nerve branches.**



Early complications of surgery were the same both in the case of benign and malignant lesions:

Sialocele, which is by far the most frequent complication of surgery in our series, occurring in 5 patients (15%). Facial nerve palsy was noted in 9% (n=3) cases in post operative period though physical integrity of nerve was noted. Wound gaping was noted in 15% (n=5) cases. Flap tip necrosis developed in 3% (n = 1) case.

**Figure 2: Wound Gaping with flap tip necrosis in post operative period**



**Table 3: 2x2 tables to calculate diagnostic accuracy of FNAC for diagnosing Malignancy in parotid gland (n = 34)**

		FNAC		Total
		Positive for malignancy	Negative for malignancy	
Histo-pathology Report	Positive for malignancy	03	01	04
	Negative for malignancy	01	29	30
Total		04	30	34

$Sensitivity = a/a+c \times 100 = 03/03+1 \times 100 = 75\%$   
 $Specificity = d/b+d \times 100 = 29/1+29 \times 100 = 96.66\%$   
 $Positive\ predictive\ value = a/a+b \times 100 = 03/03+1 \times 100 = 75\%$   
 $Negative\ predictive\ value = d/c+d \times 100 = 29/1+29 \times 100 = 96.66\%$   
 $Diagnostic\ accuracy = TP+TN/TP+FP+TN+FN \times 100 = 03+29/03+1+29+1 = 32/34 \times 100 = 94.11\%$

The value of FNAC as a diagnostic tool was also assessed and was found to have 96.66% specificity

and 75% sensitivity. The overall diagnostic accuracy was 94.11% (Table 3).

**Discussion:** Parotid gland is involved by different benign and malignant conditions for which multiple surgical options are available<sup>8-11</sup>. In this study, the mean age at presentation for parotid gland disorders was  $40 \pm 12.3$  years like that of several published studies<sup>11-14</sup>. However, several studies from the West have reported these disorders to be more common in relatively advanced age groups<sup>2,3</sup>.

In our study, there was a slight male predominance. Dorairajan from India reported male predominance<sup>14</sup>. Several published studies have reported more frequent involvement of females than males<sup>11-13</sup>. In this study, pleomorphic adenoma of parotid gland was the commonest pathology (87%), while most of other studies also had the same findings<sup>11-16</sup>.

The incidence of malignancies in different studies have differed and have ranged between 12% to 40%. In our study, it was about 12%, Kara *et al.* have reported 24%<sup>11</sup>, and Takahama *et al.* have reported even higher 40%<sup>2</sup>. In this series the commonest malignant tumour was adenocarcinoma followed by adenoid cystic carcinoma, whereas in other studies mucoepidermoid carcinoma has been shown to be the commonest malignancy<sup>17-20</sup>.

CT scan is very useful noninvasive diagnostic tool for detection of deep lobe involvement in parotid tumor. In this study, FNAC was found to be very useful for diagnosing malignancies of the parotid gland. It is economical and easy to perform in parotid swellings. It was found to have 96.66% specificity and 75% sensitivity. The overall diagnostic accuracy was 94.11%. Awan *et al.* and Hartimath *et al.* have also reported similar diagnostic accuracy of FNAC in parotid gland tumours<sup>21,22</sup>.

Sialocele, was the most frequent complication of surgery in our series (15%) and was always a self limiting problem within 2 weeks of local medications, aspiration and compressive dressing.

In our study, 6% (n=2) patients had a Permanent facial nerve palsy. However some studies have

reported very high incidence of post operative facial nerve palsy to of 39%<sup>11, 23, 24</sup>. Though the use of nerve Monitor during parotid surgery is recommended to safeguard the integrity of nerve and to reduce the frequency of post operative facial palsy, we did not use nerve monitoring system. At our institute nerve monitoring system is used in case of revision surgeries and in proved malignancy. Out of two cases of facial palsy we encountered as complications, one was a case of recurrent pleomorphic adenoma with distorted anatomy due to scarring and fibrosis. Second facial nerve palsy was in a case of proved adenocarcinoma wherein the facial nerve was sacrificed for tumor clearance. Excessive use of monopolar electrocautery and acute angle while taking cervico-masto-facial incision for parotidectomy was responsible for flap tip necrosis.

This study had some limitations. It is a single-centre observational study. Observer bias could not be eliminated completely. Long-term functional results among the patients could not be evaluated.

#### Conclusion:

1. In our study benign pleomorphic adenoma was the commonest tumor noted.
2. Parotid gland tumor was commonly presents at 4<sup>th</sup> and 5<sup>th</sup> decade of life.
3. Preoperative FNAC study was very useful diagnostic tool with high 94% diagnostic accuracy.
4. CT scan with contrast is gold standard to evaluate extend & involvement of deep lobe.
5. Superficial parotidectomy was the most common surgery performed.

#### References:

1. Spiro R, Spiro J. *Cancer of the salivary glands*. In: Meyers E, Suen J, eds. *Cancer of the head and neck*. New York: ChurchillLivingstone; 1984, p. 645.
2. Takahama Junior A, Almeida OP, Kowalski LP. Parotidneoplasms: analysis of 600 patients attended at a single institution. *Braz J Otorhinolaryngol*2009; 75:497-501.
3. Satko I, Stanko P, Longauerová I. Salivary gland tumour treated in the stomatological clinics in Bratislava. *Craniomaxillofac Surg*2000; 28:56-61.

4. Al-Khateeb TH, Ababneh KT. Salivary glands tumours in NorthJordanians: a descriptive study. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*2007; 103:53-9.
5. Quer M, Pujol A, López M, García J, Orús C, Sañudo JR. Parotidectomies in benign parotid tumours: "Sant Pau" surgical extension classification. *Acta Otorrinolaringol Esp*2010; 6:1-5.
6. Laccourreye H, Laccourreye O, Cauchois R, Jouffre V, Mónard M, Brasnu D. Total conservative parotidectomy for primary benign pleomorphic adenoma of the parotid gland: a 25-year experience with 229 patients. *Laryngoscope* 1994; 104: 1487-94.
7. Johnson JT, Ferlito A, Fagan JJ, Bradley PJ, Rinaldo A. Role of limited parotidectomy in management of pleomorphic adenoma. *J Laryngol Otol*2007; 1:1-3.
8. Roh JL, Kim HS, Park CI. Randomized clinical trial comparing partial parotidectomy versus superficial or total parotidectomy. *Br J Surg*2007; 94:1081-7.
9. Guntinas-Lichius O, Gabriel B, Klussmann JP. Risk of facial nerve palsy and severe Frey's syndrome after conservation parotidectomy for benign disease: analysis of 610 patients. *Acta Oto-laryngologica* 2006; 1104-9.
10. Auclair PL, Ellis GL, Gnepp DR, Wenig BN, Janey CG. Salivary gland neoplasms: general considerations. In: Ellis GL, Auclair PL, Gnepp DR, editors. *Surgical pathology of salivary glands*. Philadelphia: WB Saunders; 1991. p.135-64.
11. Kara MI, Goze F, Ezirganli S, Polat S, Muderris S, Elagoz S. Neoplasms of the salivary glands in a Turkish adult population. *Med Oral Pathol Oral Cir Bucal* 2010; 15:880-5.
12. Musani MA, Sohail Z, Zafar A, Malik S. Morphological pattern of parotid gland tumours. *J Coll Physicians Surg Pak* 2008; 18:274-7.
13. Malik KA. Parotid gland tumours: a six years experience. *Pak J Surg* 2007; 23:133-5.
14. Dorairajan N. Salivary gland tumours: a 10-year retrospective study of survival in relation to size, histopathological examination of the tumour, and nodal status. *Int Surg* 2004; 89:140-9.
15. Silas OA, Echejoh GO, Manasseh AN, Mandong BM. Patterns of malignant salivary gland

- tumours in Jos University Teaching Hospital (JUTH), Jos: a ten-year retrospective study. Niger J Med 2009; 18:282-5.
16. Amirlak B. Malignant parotid tumours. (serial online) Dec15, 2011: (03 screens) :(Cited Nov 03,2012). Available at: URL: [emedicine.medscape.com/article/1289616-overview](http://emedicine.medscape.com/article/1289616-overview).
  17. Li LJ, Li Y, Wen YM, Liu H, Zhao HW. Clinical analysis of salivary gland tumour cases in west china in past 50 years. Oral Oncol 2008; 44:187-92.
  18. Subhashraj K. Salivary gland tumours: a single institution experience in India. Br J Oral Maxillofac Surg 2008; 46:635-8.
  19. Vargas PA, Gerhaid R, Filho A, DeCastro IV VJ. Salivary gland tumours in Brazilian population: a retrospective study of 124 cases. Rev Hosp Clin Fac Med Sao Paulo 2002; 57:271-6.
  20. Thakur J. Bilateral parotid tuberculosis. J Glob Infect Dis 2011; 3:296-9.
  21. Awan MA, Ahmed Z. Diagnostic value of fine needle aspiration cytology in parotid tumours. J Pak Med Assoc 2004; 54: 617-20.
  22. Hartimath B, Kudva A, Singh Rathore A. Role of fine-needle aspiration cytology in swellings of the parotid region. Indian J Surg 2011; 73:19-23.
  23. Shashinder S, Tang IP, Velayutham P, Prepageran N, Gopala KG, Kuljit S, et al. A review of parotid tumours and their management: a ten-year-experience. Med J Malaysia 2009; 64:31-3.
  24. Redaelli de Zinis LO. Management and prognostic factors of re-current pleomorphic adenoma of the parotid gland: personal experience and review of the literature. Eur Arch Otorhinolaryngol 2008; 265:447-52.

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