Original Research Article

A prospective study of clinical presentation, management, and postoperative complications of benign parotid swellings

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ABSTRACT

Background: The incidence of parotid tumours is between 1-3/100000 per year, most of them are benign and 80% benign tumours are pleomorphic adenoma. Their management is more troublesome because of their late presentation, poor economic condition and lack of awareness of health.

Methods: This is a prospective observational study carried out from August 2016 to march 2018 in the Department of General Surgery, S.V.R.R.G.H., Tirupati. Detailed pre-operative workup done operative findings and post-operative complications were noted and biopsy reports analyzed.

Results: Total 30 patients were included in the study of which 28 were pleomorphic adenoma and 2 were Warthin's tumor. Post-operative complications and histopathology were studied and analyzed.

Conclusions: Pleomorphic adenoma was most common benign tumor. Conservative superficial parotidectomy was the common surgical procedure done. Most common complication was temporary facial nerve palsy. No recurrence was seen in 6 months follow up.

Keywords: Parotid tumor, Pleomorphic adenoma, Parotidectomy, Facial nerve palsy

INTRODUCTION

The parotid gland (para-otis means by the side of ear) is the largest of the major salivary glands. The parotid gland is pyramidal shaped organ that envelops the posterior border of ascending ramus of mandible.¹ The parotid duct and facial nerve branches emerge from anteromedial surface and run forwards deep to anterior border.² The terminal branches of external carotid artery (superficial temporal and maxillary) leave this surface.³ Posteromedial surface is in contact with mastoid process. The external carotid artery enters the gland through the lower part of this surface. The facial trunk enters the gland between mastoid and styloid process.^{4,5}

The parotid gland secretes serous fluid. The myoepithelial cells (Zimmerman's cells) are located

around the periphery of the acini and intercalated duct.⁶ They appear to have the ability to contract and expel saliva from the acini. The basal cells of the intercalated and excretory ducts act as reserve cells for the more differentiated cells of the salivary gland unit. It is now generally accepted that parotid gland tumours arise from one of these two cells and data from both light and electron microscope studies support this theory.⁷

Salivary gland neoplasms are distinctly rare and of interest to the specialist surgeon and pathologist. They vary in the degree of malignancy. At the lower end of the scale is adenolymphomas, which is completely benign, followed by mixed tumour, which is classified as benign but whose potentials for infiltration, implantation and carcinomatous change warrant its preferable classification as a tumor of low-grade malignancy. Next comes the

mucoepidermoid carcinoma and the cylindroma, which show definite malignant characteristics. Finally there are carcinomas, which are extremely malignant tumors with marked tendency to infiltrate and metastasis.⁸⁻¹⁰ Multiple studies have demonstrated an association of development of Warthin's tumor and smoking. Initial studies have demonstrated a high incidence of allelic loss on chromosome 12q in pleomorphic adenoma.^{11,12}

Clinical evaluation

Parotid swellings may present with mass behind and below ear lobule, pain, facial nerve palsy, sometimes if malignant infiltration is present trismus, facial nerve palsy, overlying skin involvement and lymphadenopathy.^{13,14} A complete examination of swelling and facial nerve is done and oral cavity should be examined for deep lobe involvement.^{15,16} A part from routine investigations, Ultrasound scan, FNAC of the swelling is done. CT scan is now considered standard for assessment of extent and local invasion of tumor.¹⁷⁻¹⁹

Management

Conservative superficial parotidectomy is the treatment of choice of benign tumours of the parotid gland, except when the tumour involves the deep lobe where total conservative parotidectomy is done.²⁰ In case of a recurrent pleomorphic adenoma, total parotidectomy with preservation of the facial nerve function is the ideal treatment.²¹ Postoperative radiotherapy is recommended if the lesion encases the nerve, for recurrent lesions, and when complete gross tumor removal is not possible.²²

Specific surgical procedures

Superficial conservative parotidectomy: Signifies removal of that portion of the gland that lies superficial to the facial nerve.

Total conservative parotidectomy: Refers to excision of the superficial lobe of the parotid gland followed by removal of the deep lobe of the parotid gland. In this procedure the facial nerve is left intact.

Radical parotidectomy: The entire gland along with the facial nerve and its branches are resected.

Facial nerve identification

The following landmarks and techniques can be used for identification of the facial nerve trunk during superficial and total parotidectomy.²³

- *Tragal "cartilaginous pointer":* The main trunk of the facial nerve may be located approximately 1 to 1.5 cm deep and inferior to the tragal pointer.
- *Tympanomastoid suture:* The next landmark that may be used is to trace the tympanomastoid suture

line medially, approximately 6 to 8 mm deep, as this leads to the main trunk of the facial nerve.

- *Digastric muscle:* The posterior belly of the digastric muscle may be used alternatively to guide the surgeon close to the exit from the stylomastoid foramen, as the nerve trunk is found just superior to the posterior cephalic margin of the muscle.
- *Styloid process:* The base of the styloid process is 5 to 8 mm deep to the tympanomastoid suture line. The facial nerve trunk lies on the posterolateral aspect of the styloid process near its base.
- *Retrograde dissection:* Identification of the lower branches of the facial nerve, namely the cervical or marginal mandibular branches, is useful

Complications

Complication may include seroma, hematoma, infection, facial nerve injury, sialocele, salivary fistula and Frey's syndrome.²⁴

Figure 1: Facial nerve after superficial parotidectomy.

METHODS

This is a prospective observational study carried out from August 2016 to March 2018 in the Department of General Surgery, S.V.R.R Govt. General Hospital, Tirupati. The study is approved by the institute ethical committee. Written informed consent was obtained from patients participating in the study. The confidentiality of the information was maintained during and after the study. The patients were given full freedom to withdraw at any point during the study.

Study population

All adult patients attending the out-patient Department of General Surgery are recruited for the study after fulfilling the eligibility criteria.

Inclusion criteria

Inclusion criteria were patients admitted in General Surgery department with parotid swellings and proved to be benign swelling; patients who has given Written and informed consent.

Exclusion criteria

Exclusion criteria were parotid swellings of inflammatory origin; malignancy; children below 12 years.

Statistical methods

The data was entered in MS Excel and was analyzed using SPSS 22 software.

Detailed pre-operative evaluation of the patient and appropriate preparation for surgery. Operative findings are noted. Post-operative complications were noted and biopsy reports analyzed.

All patients presenting with benign parotid gland neoplasms are included in this study. All patients admitted were evaluated by documenting the history, thorough clinical examination, routine laboratory investigations and specific investigations. Importance is given to the site, extent of the tumor, deep lobe enlargement and fixity to the surrounding structures, facial nerve involvement and regional lymphadenopathy. Associated medical conditions like diabetes, hypertension and anemia are managed and controlled before surgery with physician's advice.

Specific investigations like FNAC are done for all patients in the study group. USG scan is done for all the patients. CT scan is not done as the study includes only benign diseases. Sialography is not done for any of these patients because it may cause inflammation or infection. Extravasation of the dye may cause a severe inflammatory reaction preventing a clear demarcation of tumor margins and may also delay the planned surgical procedure. After surgery the specimen is sent for histopathology for final diagnosis. Surgical procedures adopted in this study are conservative superficial parotidectomy and total parotidectomy. Post-operative complications identified and treated accordingly. The follow up period of these patients ranged from 3 to 6 months.

RESULTS

Following observations are made in 30 patients who presented with benign parotid gland neoplasms in this study.

The age incidence of the patients in the study group ranged from 21-63 years. Most patients in this study are in the 4th decade of life (36.66%). The mean age was 42 years.

Table 1: Age incidence of various types of parotid tumour.

Age group (in years)	Total no. of cases	%	Pleomorphic adenoma	Warthin's tumor	Basal cell adenoma	Oncocytoma
13 –20	0	0	-	-	-	-
21 –30	4	13.33	4	-	-	-
31-40	11	36.66	11	-	-	-
41-50	9	30	9	-	-	-
51 –60	4	13.33	3	1	-	-
61-70	2	6.66	1	1	-	-
71-80	0	0	-	-	-	-
Total	30	100	28	2	-	-

Table 2: Sex distribution of tumours.

Sex	No.	%	Pleomorphic adenoma	Warthin's tumor	Basal cell adenoma	Oncocytoma
Male	16	53.33	14	02	0	0
Female	14	46.66	14	0	0	0
Total	30	100	28	2	0	0

In my study, 16 (53.33%) patients are male and 14 (46.66%) are female. M: F ratio is 1.14:1 (Table 2).

In this study, among the benign tumors pleomorphic adenoma constituted 25 cases (83.33%) and Warthin's tumor 4 cases (13.33%). One patient diagnosed as pleomorphic adenoma on FNAC, on histopathological examination biopsy report came as mucoepidermoid carcinoma (Table 3).

56.66% of the parotid tumors occurred in the left parotid gland in this study (Table 4).

All patients presented with swelling in the parotid region and two patients are presented with vague pain over swelling (Table 5).

All patients presented with swelling in the parotid region of which most cases (73.33%) presented within 1 year after noticing the swelling (Table 6).

Table 3: Incidence of benign parotid tumours.

S. no	Individual tumours	No of patients (n=30)	Percentage (%)
1	Pleomorphic adenoma	25	83.33
2	Warthin's tumor	4	13.33
3	Basal cell adenoma	0	0
4	Oncocytoma	0	0

Table 4: Distribution of side of the tumour.

Side of the tumour	No. of cases	Percentage (%)
Rt. side	13	43.33
Lt. side	17	56.66

Table 5: Clinical presentation of parotid tumors.

Signs and symptoms	No of cases	Percentage (%)
Swelling	30	100
Pain	2	6.66
Symptoms of facial palsy	0	0
Cervical lymphadenopathy	0	0
Deep lobe enlargement	0	0

Table 6: Incidence in relation to duration of the mass.

Signs and symptoms	No of cases	Percentage (%)
1-6 months	13	43.33
6-12 months	9	30
1-2 yrs	7	23.33
2-3 yrs	0	0
3-4 yrs	1	3.33
4-5 yrs	0	0

FNAC and histopathology

All 30 cases subjected to FNAC and are reported as benign parotid tumors. After surgical excision, all specimens are studied histopathologically.

Surgery was performed for 30 patients, the type of surgery is chosen according to clinical presentation, FNAC findings and intra-operative findings. 29 Patients underwent conservative superficial parotidectomy and one patient conservative total parotidectomy.

In my study, impairment of facial nerve function, a total of 4 patients (13.33) had temporary facial nerve weakness in the immediate post-operative period. All patients recovered within a maximum period of 6-12 weeks. Two patients develop seroma (6.66%), one patient developed

surgical site infection (3.33%), one patient developed flap necrosis (3.33%), and one patient developed numbness of ear lobule (3.33%).

Table 7: Correlation of FNAC with histopathological examination.

FNAC (diagnosed as benign)	Histopathology	
	Benign	Malignant
30	29	1

Table 8: Types of procedures adopted in the study.

Procedure	Number of cases	Percentage (%)
Conservative superficial parotidectomy	29	96.66
Conservative total parotidectomy	1	3.33

Table 9: Incidence of complications.

Postop complications	No of cases	Percentage (%)
Seroma	2	6.66
Hematoma	0	0
SSI	1	3.33
Temporary FN palsy	4	13.33
Permanent FN palsy	0	0
Numbness of ear lobe	1	3.33
Salivary fistula	0	0
Flap necrosis	1	3.33
Frey's syndrome	0	0
Sialocele	0	0

DISCUSSION

The incidence of parotid gland tumors is between 1-3/100000 per year, approximately 75–85% of the salivary gland neoplasms occur in parotid gland, of which 70-80% are benign and 80% benign tumors are pleomorphic adenoma. 80% of parotid tumors are located in the superficial lobe. Deep lobe neoplasms are considered to have a greater incidence of malignancy.¹ The main symptom of parotid is swelling in parotid region. In my study, all patients presented with swelling in the parotid region (100%) and two patients are presented with vague pain over swelling (6.66%). These results are similar to Shashikala et al.²⁷

The age incidence of the patients in my study group ranged from 21-63 years, most patients in this study are in the 4th decade of life (36.66%). The mean age is 42 years. In my study pleomorphic adenoma occurred in 4th decade and Warthin's tumor occur in old age group (5th decade). Similar results found in the study conducted by Ungari et al.⁷

In the present study, the tumors show slightly male predominance, M:F ratio is 1.14:1. The results also similar to study conducted by Devi et al and Ghosh et al.^{25,26} In this study, among the benign tumours pleomorphic adenoma constituted 25 cases (83.33%) and Warthin's tumor 4 cases (13.33%). In other studies shows incidence of pleomorphic adenoma between 60-75% Ungari et al shows the more frequent benign histological type resulted pleomorphic adenoma (74.5%) Shashikala et al shows 71.42% are pleomorphic adenomas.²⁷

Distribution of side of tumor in my study is 56.66% occurred in the left side of parotid gland. Similar results found in the study conducted by Ghosh et al (52.4%).²⁶ In other studies conducted by Al-Khtoum et al and Friedrich et al showed more involvement of right side (65.8%, 72.5% respectively).^{28,29}

In my study all 30 cases subjected to FNAC, reported as benign parotid tumours. After surgical excision, all specimens are studied histopathologically, 29 cases reported as benign (96.66%) (pleomorphic adenoma 25 cases, Warthin's tumor 4 cases) 1 case diagnosed as malignant (3.33%) (Mucoepidermoid carcinoma). Overall, in present study, there is one case of false negative diagnosis. So, the sensitivity and specificity of FNAC in diagnosis of benign parotid gland lesions in present study is 96.5% and 100% respectively.

In our study, 29 patients underwent superficial parotidectomy, 1 patient with deep lobe involvement, identified intra operatively, underwent total conservative parotidectomy. Follow up is then done every month for 3 months and then every 3 months for a year and complications are recorded.

The complications of patients undergoing parotid surgery include damage to the facial nerve, bleeding, hematoma, seroma, sialocele, and flap necrosis, fistula of the salivary gland, infection and Frey's syndrome.

Facial nerve palsy

It is the most dreaded complication of superficial parotidectomy and may occur due to inadvertent injury to the main trunk of the facial nerve or one or more of its major branches. More commonly, even though the branches of the nerve remain intact, the nerve may not function properly in the immediate post-operative period due to the effect of manipulation and stretching during surgery. A thorough knowledge of the surgical anatomy of the gland is a must for good results especially due to its close relationship to the facial nerve. In the present study four patients (13.33%) has developed temporary facial nerve palsy with symptoms of deviation of mouth. In other studies Ugani et al shows 2.6% Klintworth et al 6% and Correia et al, 35.3%.^{30,31} We have prescribed a 14 day course of oral steroids in tapering doses to these patients to aid the recovery of nerve function unless

otherwise contra-indicated. Normal function returns within 6-12 weeks of period.

Seroma

Two patients (6.66%) develop seroma. These patients are treated with repeated aspirations and pressure dressings daily done.

SSI (surgical site infection)

One patient (3.33%) developed surgical site infection, which is treated with removal of sutures and daily dressings.

Flap necrosis

One patient (1.33%) develops flap necrosis in this study, necrotic tissue debrided, daily dressings done.

Numbness of ear lobe

It is inevitable after this operation because of division of the greater auricular nerve. It is a minor complaint and all it needs is reassurance to the patient that it will improve over 6 months. Occurrence of complication in this study is 3.33%.

Tumor recurrence

In the present study, no recurrence has been noted up to a minimum of 6 months follow up.

Limitations of the study

Benign parotid tumors are very slow growing and we can only be more definitive about the recurrence, after further follow-up is necessary in this study.

CONCLUSION

In our study 3rd and 4th decade left side slightly male predominance was observed. Pleomorphic adenoma was most common benign tumor and superficial lobe involvement was most common presentation. FNAC was major diagnostic tool but histopathology was the gold standard for final diagnosis. Conservative superficial parotidectomy was the common surgical procedure done. Most common complication was temporary facial nerve palsy. No recurrence was seen in 6 months follow up.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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