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**Dr. Bhagavan BC**  
Department of Surgical Oncology,  
Kempegowda Institute of Medical  
Sciences, Bengaluru, Karnataka,  
India

**Dr. Pandudasappa**  
Department of Surgical Oncology,  
Kempegowda Institute of Medical  
Sciences, Bengaluru, Karnataka,  
India

**Dr. R Ganesh Kumar**  
Department of General Surgery,  
Kempegowda Institute of Medical  
Sciences, Bengaluru, Karnataka,  
India

**Dr. Sachin K G**  
Department of General Surgery,  
Kempegowda Institute of Medical  
Sciences, Bengaluru, Karnataka,  
India

**Corresponding Author:**  
**Dr. Pandudasappa**  
Department of Surgical Oncology,  
Kempegowda Institute of Medical  
Sciences, Bengaluru, Karnataka,  
India

## Surgical complications and its management after parotidectomy: Our 4 years experience

**Dr. Bhagavan BC, Dr. Pandudasappa, Dr. R Ganesh Kumar and Dr. Sachin KG**

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### Abstract

**Background:** The majority of parotid tumours are benign. Nealy 80 % of parotid tumour involve the superficial lobe. Parotidectomy was first introduced into the world literature by Berard in 1823 who removed first parotid tumor. Parotidectomy has well-documented post-operative complications.

**Aims & Objectives:** The aim is to study the postoperative complications and its management after parotidectomy.

**Methods:** This prospective study was conducted on 60 patients who underwent parotidectomy by antegrade technique from July 2014-july 2019 for parotid tumours. Patients were submitted to careful history taking, complete clinical examination, and examination of facial nerve integrity before surgery. 48 patients underwent superficial parotidectomy (44 patients for pleomorphic adenoma, 4 patients for warthin's tumour) and 12 patients underwent Total conservative parotidectomy (9 patients for parotid malignancy and 2 patients for pleomorphic adenoma recurrence and 1 patients for pleomorphic adenoma involving deep lobe of parotid).

**Results:** In our study, out of 48 patients underwent superficial parotidectomy 18 patient developed complications and 12 patients underwent Total conservative parotidectomy 10 patients developed complication. Several complications have been reported in parotid surgery. Temporary facial nerve paresis was the most common postoperative complication followed by hypoesthesia of greater auricular nerve. Most patient regained normal facial nerve function within 2 months after surgery.

**Conclusion:** Parotid tumours are the most common salivary gland tumours. Majority of parotid tumours are benign and involve the superficial lobe. Parotidectomy is the definite procedure for parotid tumours. Parotidectomy is challenging procedure because of the intraparenchymal course of the facial nerve and has its own complications. Surgical complications are higher in total conservative parotidectomy than in superficial parotidectomy. Complications are reduced by proper dissection technique and treated carefully if complication arises.

**Keywords:** Parotid; parotidectomy; parotid tumor; postoperative complications

### Introduction

Parotidectomy is the definite surgical procedure to treat benign and malignant diseases of the parotid gland, has well-documented post-operative complications<sup>[1, 2]</sup>. Numerous reports in the literature have described the surgical technique and outcome achieved by parotidectomy, however few reports have documented the complications of parotid gland surgery<sup>[3]</sup>. This operation is associated with some typical complications owing to the unique surgical anatomy of the gland. Major complications include facial nerve paresis or paralysis, and minor complications include salivary fistula, auriculotemporal syndrome (gustatory sweating or Frey syndrome), great auricular nerve anesthesia, and hemorrhage, infection, seroma formation<sup>[3, 4]</sup>. The present study was conducted to identify the complications of parotidectomy and its management by various methods.

### Materials and Methods

This prospective study was conducted over 4 year from July 2015 to June 2019 on 60 patients with parotid swelling; patients were subjected to careful history taking, including age, sex, occupation, duration of the swelling (whether short or long, or accidentally discovered), development of pain (either local or referred), subsequent development of lymph node enlargement in the neck, and history of diabetes mellitus or neurological disorders.

The patients were submitted to complete clinical examination, examination of facial nerve integrity before surgery, and the following laboratory and radiological investigations:

1. Ultra sonogram of parotid region and neck (all patients): to detect whether the enlargement is superficial or deep lobe swelling, solid or cystic, and well defined or ill defined, and to detect enlarged Lymphnode (LNs).
2. Computerized tomography (CT) (18 cases) : to obtain clear details about the extent of swelling (whether it extends to

the deep lobe) and metastasis to LN.

3. Pathological diagnosis (FNAC) (all patients): to diagnose whether the lesion is malignant or benign.

Patients fulfilling one or more of the following criteria were excluded from the study: those with previous facial nerve palsy, neuromuscular diseases affecting the face, diabetic neuropathy, psychiatric disease, or any other condition that could influence the study or that might affect the completion of the study.



**Fig 1:** Pre-operative and Intra-operative Images of Superficial Parotidectomy

Over the period of 4 year these 60 patients with parotid swelling underwent parotidectomy by modified Blair incision and antegrade dissection is performed by identifying the facial nerve using tragal pointer method with dissection and mobilization of parotid gland anteriorly and laterally. After identifying facial nerve, electrocautery is not used for hemostasis, ligatures and hemostatic clips are used to achieve hemostasis to prevent facial nerve injury. One suction drain was left and the wound was closed in two layers and suction drain is removed after 48-72hrs. For total conservative parotidectomy, once mobilization was completed we placed fine vascular slings beneath the nerve and gently lifted it away from the tumor and dissection of deep lobe is continued.

Out of 60 patients, 48 patients underwent superficial

parotidectomy (44 patients for pleomorphic adenoma, 4 patients for Warthin tumor) and 12 patients underwent Total conservative parotidectomy (9 patients for parotid malignancy and 2 patients for pleomorphic adenoma recurrence and 1 patient pleomorphic adenoma involving deep lobe of parotid).

### Results

In our study, 60 patients who presented with parotid gland neoplasms were evaluated. The age of the patient with parotid tumors in the study group ranged from 18 to 74 years, with the mean age of 44.03 years. Benign tumors are more common than malignant tumor in the ratio of 5.6:1. Parotid gland tumors clinically presented with the complaints of slow progressively swelling of parotid gland (below or in front of ear lobule)

followed by pain.

**Table 1:** Number of patients operated for benign and malignant disease

|           | Histopathology                     | No of patients |
|-----------|------------------------------------|----------------|
| Benign    | Pleomorphic adenoma                | 47(78%)        |
|           | Warthins tumour                    | 4(6.6%)        |
|           | Lymphoepithelial cyst              | 0              |
|           | schwannoma                         | 0              |
|           | Chronic granulomatous inflammation | 0              |
| Malignant | Lymphoepithelial carcinoma         | 1(1.6%)        |
|           | Mucoepidermoid carcinoma           | 8(13%)         |
|           | Adenocarcinoma                     | 0              |

Primary surgery accounted for 58 cases (96.6%), and only 2 case was a revision surgery (3.3%).

**Table 2:** Comparing complications after superficial and total conservative parotidectomy.

| Complications                           | No of patients underwent superficial parotidectomy | No of patients underwent total conservative parotidectomy |
|---|--|---|
| Facial nerve paralysis                  | NIL  | NIL   |
| Facial nerve paresis                    | 10(20.8%)  | 10(83.3%)   |
| Wound seroma                            | NIL  | 2   |
| Hematoma                                | NIL  | NIL   |
| Infection                               | NIL  | 1   |
| Flap necrosis                           | 1  | 1   |
| Frey syndrome                           | NIL  | NIL   |
| Hypoesthesia of Greater auricular nerve | 7(14.5%)   | 9(75%)  |

**Facial nerve paresis**

Out of 48 patients who underwent superficial parotidectomy 10 patients developed facial nerve paresis and out of 12 patients who underwent total conservative parotidectomy 10 patients developed facial nerve paresis in immediate post operative period Postparotidectomy facial nerve dysfunction was strictly recorded using the House–Brackmann (H–B) grading scale, which ranges from I (normal) to VI (no movement)<sup>6</sup>.In both groups paresis are mild (II and III)and improved after 48 hrs and resolved within 2 months. The incidence of facial nerve paresis is higher with total, than with superficial parotidectomy, which may be related to stretch injury or as result of surgical interference with the vasa nervorum. Marginal mandibular branch of facial nerve is the most commom nerve injured followed by buccal branch of facial nerve. In our study no patient had permanent facial nerve paralysis.



**Fig 2:** Facial paresis after Total conservative parotidectomy. Deviation of mouth and difficulty in blowing air after parotidectomy.

**Table 3:** Different branch of facial nerve involved after parotidectomy

| Site     | Branches                               | No of patients |
|----------|--|----------------|
| Single   | Temporal                               | 0              |
|          | Zygomatic                              | 2              |
|          | Buccal                                 | 3              |
|          | Marginal mandibular nerve              | 12             |
|          | Cervical                               |                |
| Multiple | Marginal mandibular, buccal, zygomatic | 3              |
| All      | All                                    | 0              |

**Wound seroma**

Two patients developed wound seroma in patients whom total conservative parotidectomy with Modified Radical Neck dissection done for mucoepidermoid carcinoma. wound seroma is managed by repeated aspiration.



**Fig 3:** Post operative seroma formation after total conservative parotidectomy

**Skin flap necrosis**

Two patients developed skin flap necrosis in both groups at the distal tip of post auricular skin flap and it is treated conservatively with regular dressing and healed by secondary intention.



**Fig 4:** Postoperative flap necrosis following superficial parotidectomy

**Wound infection**

One patient who underwent total conservative parotidectomy had wound infection. The patient is known case of diabetes mellitus and smoker. The patient is treated by drainage and antibiotics and regular dressing.

**Hypoesthesia of greater auricular nerve**

Hypoesthesia of the greater auricular nerve is a frequent consequence of parotidectomy. Patients are informed that they

will feel numbness around the ear, especially at the lobule. The area of numbness will improve within 2 months of the surgery. Ear sensation return more rapidly and more completely patients whom the posterior – branch of the great auricular nerve was preserved [7].

### Discussion

Salivary gland tumors are quiet uncommon complex neoplasms accounting for 2%–6.5% of the head- and- neck tumor [8]. Parotid tumours are the most common salivary gland neoplasm. In our study of 60 patients, 32 patients are male and 28 patients are female with male to female ratio of 1.3:1 which was similar with other studies [9-11]. Majority of the tumors are located in the superficial lobe of the parotid gland, wherein benign tumors are more common, while deep lobe can be equally affected by both benign and malignant tumors. In our study, 95% cases were involved the superficial lobe and 5% cases were deep lobe tumor (one pleomorphic adenoma and 2 mucoepidermoid carcinoma) which is corresponding with other Study [12, 13]. In our study most of the parotid tumours are benign tumor (85% of cases) and 15% cases were malignant. This study was consistent with another study [14].

Facial nerve palsy is the most common postoperative complication encountered following parotid surgery. Mechanical trauma, such as nerve compression, crushing, and stretching, and electrocoagulation heat damage are possible etiologies. However, nerve compression, crushing, and heat damage are rare with careful parotidectomy. Nerve stretching is the most probable cause. Some studies have demonstrated that nerve elongation of 6% because of stress-strain can cause perineurium tears and result in loss of the compound action potential [15].

In our study, superficial parotidectomy was performed in 48 cases, Among this facial nerve paresis was noted in 10 cases (20.8%). Total conservative parotidectomy was performed in 12 cases, Among these facial nerve paresis was noted in 10 cases (83.3%). Hypoesthesia of greater auricular nerve is seen in 7 cases (14.5%) of superficial parotidectomy and 9 cases (75%) of total conservative parotidectomy. So, this study shows that, facial nerve paresis is more common in total conservative parotidectomy (83.3%) than in superficial parotidectomy (20.8%). This result is similar to a published work [16]. The branch of the facial nerve most at risk for injury during parotidectomy is marginal mandibular nerve [10]. In this study 60% cases marginal mandibular nerve is involved. All cases of facial nerve paresis improved after 48 hrs and resolved within 2 months.

### Conclusion

The incidence of parotid salivary gland tumors is increasing in recent years occurring in relatively younger age group due to changing lifestyle and dietary habits. Parotidectomy is the main modality of treatment and is safe procedures. The type of parotidectomy is planned based on the intraglandular location of the tumour. Surgeons have to pay attention to minimize the risk of complication during parotidectomy. The best means of reducing iatrogenic facial nerve injury, in parotid surgery, still remains a clear understanding of the anatomy, good surgical technique with the use of multiple anatomic landmarks. The goals of rational and risk of operation such as general complication associated with the surgical procedure must be clearly explained including the cosmetic sequelae of the incision and all patients have to be told that facial nerve paralysis or paresis is possible and can be temporary or permanent. If the complication arises, surgeon should able to manage the

complications. However, Parotidectomy continues to be a challenge on account of the wide range of tumours encountered and the variations in size and location. It is, therefore, mandatory that this operation be performed by experienced and skilled surgeons to prevent complication and manage complication if arises.

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