



## A RETROSPECTIVE ANALYSIS OF INCIDENCE OF FACIAL NERVE DYSFUNCTION IN SUPERFICIAL PAROTIDECTOMY PATIENTS

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**ABSTRACT** Salivary gland neoplasms constitute 5 percent of head and neck tumors. Among them 80% arise from parotid gland, 10% from submandibular gland, 10% from sublingual and other minor salivary glands. In parotid neoplasms, 80% are benign and 20% are malignant. Most common benign tumor is pleomorphic adenoma, which accounts for 40-70% of all salivary gland neoplasms. Other benign parotid tumors are various monomorphic adenomas (warthin tumor, oncocytoma, basal cell adenoma, canalicular adenoma), ductal papilloma and capillary hemangioma. Most common malignant tumor is mucoepidermoid carcinoma, which is further divided into low and high grade tumors. Adenoid cystic carcinoma constitute 10% of all salivary gland neoplasms with characteristic indolent growth and perineural invasion. Rapid increase in size, pain and facial nerve palsy are signs of malignancy. Based on the location of tumor and pathological status superficial or total conservative parotidectomy can be done. Facial nerve as well as its branches are very close to the gland, they are at high risk of injury. Therefore successful surgery depends on the identification and preservation of facial nerve. Marginal mandibular nerve damage is most commonly encountered complication. Temporary neuropraxia is common and expected to recover with in few months following Surgery. It is mainly due to stretching of Vasa vasorum. **AIMS AND OBJECTIVES:** The main objective of this study is to access the incidence of facial nerve dysfunction as temporary or permanent, complete or incomplete in post superficial parotidectomy Patients. **MATERIALS AND METHODS:** A retrospective study was conducted from June 2016 to June 2019 in the department of general surgery, government general hospital, kakinada among the Patients who underwent surgery for parotid neoplasms. **RESULTS:** Among 50 remaining Patients, 36 were female and 14 were male patients with male to female ratio of 1:2.5. The mean age was 39+/-9 years. Among 54 Patients 50 underwent superficial parotidectomy. Among 50 Patients who underwent surgery, 18 were observed to have no complications in the immediate postoperative period. And 28 patients presented with transient facial weakness, which was incomplete and temporary in the immediate postoperative period. Only 4 patients had permanent facial weakness which was complete. **CONCLUSION:** Overall incidence of temporary and permanent facial nerve dysfunction in this study is 63.3% and 6.6% respectively without using any intraoperative monitoring with a nerve stimulator or magnification. And the incidence is mainly depending on the location of the tumor, extent of the surgery, excessive traction, proper anatomical knowledge and experience of the surgeon.

**KEYWORDS :** pleomorphic adenoma, parotid, superficial, parotidectomy, facial, palsy

### INTRODUCTION

Approximately 3% of all tumours are salivary gland tumours, while 5% of head and neck tumours are salivary gland tumours. 1 The parotid glands account for 80% of salivary gland tumours, the submandibular glands for 10%, and the sublingual gland and other small salivary glands for the remaining 10%. 2 Following primary parotid surgery, transient facial nerve paralysis ranges from 15% to 66%, with entire parotidectomy exhibiting a higher prevalence than partial or superficial parotidectomy. Only 2.5% to 5.0% of facial nerve paralysis instances are reported to be permanent. The parotid gland is a salivary gland with deep and superficial lobes connected by facial nerve branches. 3 The facial nerve travels over the parotid gland's postero-medial region for a shorter distance after leaving the stylomastoid foramen. 4 The facial nerve separates into two main trunks in the parotid, the cervico-facial and temporo-zygomatic branches. These terminal branches also divide within the parotid gland. The bulk of parotid gland tumours, or 80% of them, are benign pleomorphic adenomas, followed by Warthin's tumour and mono-morphic adenomas.

The majority of tumours are detected in the superficial lobe of the parotid gland. Significant symptoms of malignancy, sarcoidosis, or tuberculosis include a sudden increase in gland size, pain, and facial palsy. The only choice for treatment of a parotid gland tumour is surgical removal, which can be accomplished via one of two procedures depending on where the tumour is located. It is indicated to do a superficial parotidectomy for tumours in the superficial lobes and a whole parotidectomy for tumours in the deep lobes and recurrent tumours in order to protect the facial nerve. 8 Facial nerve trauma is the main worry during and after parotid gland surgery since the facial nerve and its branches are intimately connected to the parotid gland. 9 Therefore, locating and preserving the facial nerve is crucial for a parotid gland surgery to be effective. Total parotidectomy is used to treat deep lobe tumours and recurrent tumours, which increases the risk of damaging the facial nerve during surgery. The most frequent

side effect of parotid gland operation is facial nerve impairment, particularly as a result of marginal mandibular nerve loss. Temporary facial nerve weakness following parotidectomy is another typical problem, with a predicted recovery period of roughly six months in most cases. following complete parotidectomy Because of strain injuries or surgical trauma to the vasa nervosum, facial nerve palsy is seen to be more common than in superficial parotidectomy. Neuropraxia is reported in between 8-46% of benign parotid gland surgeries.

### AIMS AND OBJECTIVES:

The main objective of this study is to access the incidence of facial nerve dysfunction as temporary or permanent, complete or incomplete in post superficial parotidectomy patients.

### MATERIALS AND METHODS:

A retrospective study was conducted from June 2016 to June 2019 in the department of general surgery, government general hospital, kakinada among the Patients who underwent surgery for parotid neoplasms.

Clinical data recovered from 54 patients and among them 4 patients had preoperative facial nerve palsy due to tumor infiltration, So they were excluded from the study. All the data regarding their age, sex, preoperative investigations, surgery performed and its complications were collected. In most of the cases antegrade technique was used to identify facial nerve and retrograde technique was used in difficult cases. Intraoperative facial nerve stimulator was not used. The nature and severity of facial nerve dysfunction is assessed by House-Brachmann grading system.

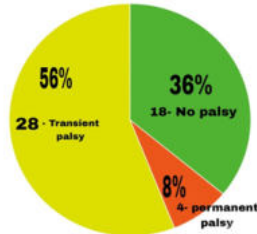
### RESULTS:

Among 50 remaining Patients, 36 were female and 14 were male patients with male to female ratio of 1:2.5. The mean age was 39+/-9 years.

Among 54 Patients 50 underwent superficial parotidectomy . Among 50 Patients who underwent surgery, 18 were observed to have no complications in the immediate postoperative period. And 28 patients presented with transient facial weakness, which was incomplete and temporary in the immediate postoperative period. Only 4 patients had permanent facial weakness which was complete.

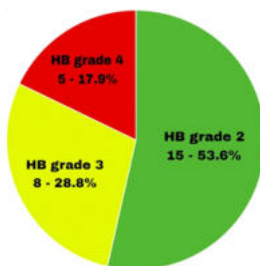
**DISCUSSION:**

Our study showed that most of the Patients had transient facial weakness in the immediate postoperative period which was graded with the help of House- Brackmann scale from 1 to 7 post operative days and then at 6 months following:



TOTAL PATIENTS = 50  
 NO PALSY = 18  
 TRANSIENT PALSY = 28  
 PERMANENT PALSY = 4

Grade	Description	Characteristics
I	Normal	Normal facial function
II	Mild dysfunction	Slight weakness on close inspection; normal tone and symmetry at rest
III	Moderate dysfunction	Obvious weakness +/- asymmetry, but not disfiguring; synkinesis, contracture or hemifacial spasm; complete eye closure with effort
IV	Moderately severe dysfunction	Obvious weakness or disfiguring asymmetry; normal symmetry and tone at rest; incomplete eye closure
V	Severe dysfunction	Barely perceptible motion asymmetry at rest
VI	Total paralysis	No movement



HB grade 2 = 15  
 HB grade 3 = 8  
 HB grade 4 = 5

Facial nerve impairment was identified in 28% of individuals very away following surgery in a research by Shashinder S et al. Rehman et al. and Ramadan et al. showed 34% transient facial weakness in a series of parotidectomies, while Rehman et al. recorded 26.6% temporary face weakness. Adeyoma et al. reported temporary facial nerve impairment in 30% of subjects. Contrarily, El-Shakhs et al. found transient facial paralysis following surgery in just 16.6% of parotidectomies. According to one study, the rate of transient facial weakness ranged from 5 to 20%. In comparison to total parotidectomy (49%) and recurring tumours (65%) the frequency of temporary and permanent facial nerve impairment was 23% lower in superficial parotidectomy. There has been a rise in the frequency of facial nerve injuries, according to numerous research. In a different study, 54% of

cases with facial nerve injury indicated zygomatic nerve damage, while 90% of cases implicated the marginal mandibular nerve.

Many explanations have been proposed to explain the malfunctioning of the facial nerve after anatomical preservation after parotid surgery. Mechanical trauma, such as crushing and compression during surgery or ischemia injury during nerve dissection, may be the cause of this. According to Dulguerov et al., the most likely cause of facial nerve dysfunction following anatomical preservation is nerve stretching. Although new data suggests there is no difference in the prevalence of temporary nerve dysfunction between antegrade and retrograde approaches, the frequency of facial nerve dysfunction may also be related to nerve identification techniques.

**CONCLUSION:**

Overall incidence of temporary and permanent facial nerve dysfunction in this study is 63.3% and 6.6% respectively without using any intraoperative monitoring with a nerve stimulator or magnification. And the incidence is mainly depending on the location of the tumor, extent of the surgery, excessive traction, proper anatomical knowledge and experience of the surgeon.

The most prevalent benign parotid tumour in this study was pleomorphic adenoma. After performing parotid surgery, it was predicted that the incidence of complications related to the facial nerve injury were lesser as compared to the available literature. Furthermore, it is recommended that proper knowledge of anatomical landmarks and careful dissections may be helpful for reducing the rate of facial nerve injury after parotidectomy.

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