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Incidence of Facial Nerve Injury in Extracapsular Dissection vs Superficial Parotidectomy of Benign Parotid Lesions

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ABSTRACT

Background: Parotid neoplasms are an uncommon kind of tumor of the head and neck. The benign tumors that are most prevalent among them are basal cell adenoma, Warthin tumor, and pleomorphic adenoma (PA). The preferred surgical technique for treating parotid tumors has changed during the past century but the partial excision of the capsule of the tumor was performed using intracapsular enucleation in an effort to mostly preserve the facial nerve (FN). **Objective:** The objective of the study is to compare the incidence of facial nerve injury in extracapsular dissection versus superficial parotidectomy for benign parotid tumors. **Study Design:** Retrospective study. **Settings:** Department of Oral & Maxillofacial Surgery, Bakhtawar Amin Medical & Dental College, Multan Pakistan. **Duration:** This study was conducted from December 2021 to November 2022. **Methods:** Total 46 patients of both genders were presented. 20 patients underwent superficial parotidectomy (SP) and 26 underwent for extra capsular dissection (ED) for the treatment of pleomorphic adenoma. Facial nerve (FN) injury among patients of both procedures were compared. SPSS 23.0 was used to analyze all data. **Results:** The criteria were met by a total of 46 parotidectomies, including 20 superficial and 26 extracapsular dissections. Majority 26 were women. The age range of the patients was 18 to 83. The majority of lesions, which shared comparable characteristics across groups, were pleomorphic adenomas. Facial nerve weakness following surgery was comparable between groups. Patients mean age was 47.12±6.76 years. 20 (43.5%) patients were males and 26 (56.5%) cases were females. 10 (21.7%) patients were smokers. Mean operative time in SP group was 130.12±8.31 minutes and in ED group was 158.9±14.72 minutes. We found higher number of facial nerve injury in SP group 11 (23.9%) as compared to ED group 3 (6.5%) with p value <0.002. There is no statistically significant differences between SP and ED in terms of capsular rupture, recurrence, or salivary fistula. **Conclusion:** Extracapsular dissection, when performed by a skilled surgeon, is a safer alternative to conventional superficial parotidectomy and has a lower risk of causing facial nerve damage when treating benign parotid lesions. Further investigation is required to make sure that this alleged advantage endure throughout time.

Keywords: *Benign tumors, Pleomorphic adenomas, Facial nerve injury, Parotid gland, Recurrence.*

INTRODUCTION

Parotid neoplasms are an uncommon kind of tumor of the head and neck. The parotid accounts for just 1% to 3% of primary neck and head tumors, and 70% to 90% of such tumors exhibit benign histopathologic features. The benign tumors that are most prevalent among them are basal cell adenoma, Warthin tumor, and pleomorphic adenoma (PA). Lesions like oncocytoma and others are less frequent.[1,2]

The preferred surgical technique for treating parotid tumors has changed during the past century. Early in the 20th century, partial excision of the capsule of the tumor was performed using intracapsular enucleation in an effort to mostly preserve the facial nerve (FN). More harsh therapies have been demanded as a result of recurrence rates as high as 45%. By the middle part of the 20th century, superficial parotidectomy (SP), which decreased tumor rate of recurrence to as low as 2%, was universally accepted as the gold standard. As more glands were eliminated, patients were more vulnerable to FN palsy, Frey syndrome (FS), or loss of face contour.[3,4] In order to completely remove the tumor with the least amount of difficulty, partial SP, which only entails dissecting a nerve branch nearest to the malignancy, became the preferred approach in the later part of the 20th century. Extracapsular dissecting (ED), a procedure that removes a tumor and its capsule together with a narrow range of normal glandular tissue, has been pushed by knowledgeable salivary surgeons over the past 25 years. Without adequately identifying and analyzing the FN, this is done.[5-9] Although ED had less incidences of FN paralysis and FS, the most current meta-analysis by Albergotti et al. and other studies show that ED and SP generally have equivalent rates of recurrence. ED was recommended by Xie et al. in an updated meta-analysis as a less dangerous treatment option for a few benign, microscopic, superficial, migratory cancers without FN involvement. However, there is still disagreement over the ideal course of action.[10-13]

Although the clinical results of ED and SP are being compared, it is unknown how the two approaches differ in terms of healthcare quality.[14,15] In order to better understand the incidence of FN injury in ED & SP for the treatment of benign parotid tumors, the current study examines and compares the involvement of FN in both procedures to emphasize the role of ED in management of benign Parotid Tumors.

METHODS

This retrospective study was conducted at Department of Oral & Maxillofacial Surgery, Bakhtawar Amin Medical & Dental College, Multan Pakistan and comprised of 46 patients of pleomorphic adenomas. This study was conducted from December 2021 to November 2022. Patients who had undergone parotid gland surgery in the past or who had preexisting facial weakness were not considered.

Ultrasound, computed tomography (CT) or magnetic resonance imaging (MRI) of the head and neck, and fine needle aspiration cytology (FNAC) or FNAB confirmed the presence of a pleomorphic adenoma. Patients were included in the trial if they had a parotid gland tumor in its superficial layers. On echography, magnetic resonance imaging, or computed tomography, the average lesion size was 3.0 +/- 0.5 cm. The surgeons were given no say in which procedure they would use.

The hind's and risdon incision follows the patient's organic flexion lines of their face and neck and starts in the preauricular area and extends up to the insertion of the ear lobe, along the anterior border of the mastoid, and ultimately downward along the mandibular angle.

The bigger auricular nerve was localized, and the SMAS was elevated to protect it. We identified the common trunk of the face nerve, isolated it, and modulated it using a neurostimulator (Neurosign model 800 nerve monitoring equipment) and a system that provides ongoing facial nerve monitoring. The face planes and skin were sutured together after the tumor was removed, and the bleeding was stopped using bipolar coagulation.

The ED also included cutting the skin, like the SP. Careful attention was paid to maintaining the integrity of the tumor capsule while removing a considerable amount of the parenchyma around the incision (approximately 2-3 mm from the tumor).

Patients with a parotid tail tumor had their tumors treated in a somewhat different fashion. The facial nerve's marginal mandible branch was found, and the patient's skin was spared an incision near the ear.

Chi-squared and t-tests, respectively, to compare the two methods' complication and recurrence rates using a univariate analysis of each variable. P=0.05 was chosen as the threshold for statistical significance.

RESULTS

Patients mean age was 47.12±6.47 years. 26 (56.5%) patients were males and 20 (43.5%) cases were females. 10 (21.7%) patients were smokers. (table 1)

Table 1: Demographics of the all included cases

Variables		Frequency (46)	Percentage
Mean age (years)		47.12±6.47	
Gender	Male	20	43.5
	Female	26	56.5
Smokers	Yes	10	21.7
	No	36	78.3

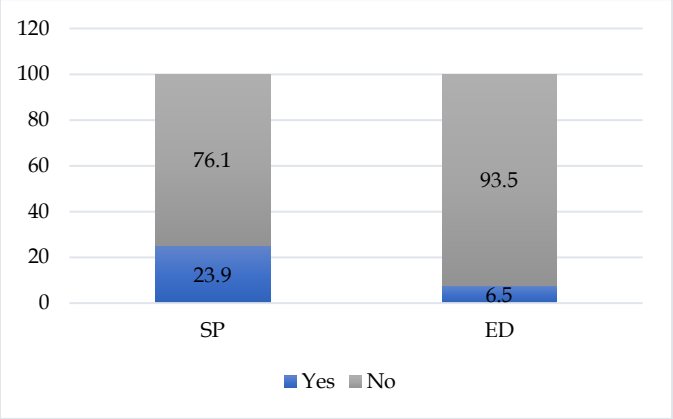
Mean operative time in SP group was 130.12±8.31 minutes and in ED group was 158.9±14.72 minutes. Mean follow up in group SP group was 58.5±10.36 months and in ED group was 52.13±5.37 months. (table 2)

Table 2: Surgery time and follow up among SP and ED group

Variables	Superficial Parotidectomy	Extracapsular Dissection
Operative time (months)	130.12±8.31	158.9±14.72
Follow up (months)	58.5±10.36	52.13±5.37

We found higher number of facial nerve injury in SP group 11 (23.9%) as compared to ED group 3 (6.5%) with p value <0.002. (figure 1)

Figure 1: Comparison of facial nerve injury



We did not find any statistically significant differences between SP and ED in terms of capsular rupture, recurrence, or salivary fistula. (table 3)

Table 3: Comparison of complications in SP and ED group

	Variables	SP (20)	ED (26)
Complications	salivary fistula	1 (5%)	2 (7.7%)
	capsular rupture	1 (5%)	1 (3.8%)
	Recurrence	2 (10%)	4 (15.4%)

DISCUSSION

Patients' quality of life is drastically affected by the complication of facial paralysis following parotidectomy. Temporary facial weakness has been recorded at rates as high as 64.6%,[17] with the average reported rate falling somewhere between 14.0 and 23.1%.[16] Temporary facial weakness was still found at a rate of 20-33.3 percent, even with intraoperative facial nerve monitoring.[18] However, the incidence of persistent facial weakness was low, at a rate of 0-9 percent, after parotidectomy. When it comes to primary parotidectomies, however, one meta-analysis found that intra-operative facial nerve monitoring did not reduce the risk of persistent facial paralysis.[19]

Several methods, such as preoperative imaging and intraoperative facial nerve monitoring, have been implemented to lessen the risk of facial nerve problems following parotidectomy. Few research,[20] however, have examined the surgical results utilizing these methods.

In parotid surgery for benign tumors, the facial nerve must be preserved while the lesion itself must be removed with sufficient margins of healthy parotid tissue.

After enucleation, pleomorphic adenomas frequently return, which is frequently attributed to inadequate excision or capsule breakage with cancer cell spread.[21] Therefore, either a partial or superficial parotidectomy is advised.

Although a substantial amount of normal tissue is eliminated with a superficial or total parotidectomy, less of the facial nerve is dissected. Frey's condition, salivary fistula, and significant auricular nerve injury are more prevalent after SP than ED. Studies show that ED is equally successful as SP, but with fewer complications thanks to a less intrusive approach that decreases the likelihood of paralysis of the facial nerve and its recurrence and produces superior cosmetic results.[22,23]

From 26% after SP, the rate drops to 11% after ED.[24] This problem may or may not have a nervous system origin. It can happen as a result of surgical manipulation that temporarily injures a nerve, and its severity is directly related to how long the nerve is exposed. When the facial nerve is not in contact with the tumor, it is not exposed in the emergency department, and when it is in contact with the tumor, just a tiny fraction of the nerve's branches are handled. In contrast to what has been described in previous studies (4% after Spand 3.5% after ED),[25] our results demonstrated a much lower risk of persistent facial nerve injury (3.3% after SP and 0% after ED). Even after a long follow-up time of 58.510.36 months, we discovered no statistically significant variations in capsular rupture, recurrence, or salivary fistula among patients who received SP or ED.

ED is a high-risk operation with several potential complications when performed by an untrained or seldom parotid surgeon.[26] At least one of the examined sequelae was linked to SP in a statistically significant way, as shown by clinical and epidemiological data. Therefore, external parotid adenomas with pleomorphism may best be treated with ED. We recommend selective/ superficial parotidectomy (SP) for cases where the tumor has returned or is more than 3.5 cm in diameter.

CONCLUSION

Extracapsular dissection, when performed by a skilled surgeon, is a safer alternative to conventional superficial

parotidectomy and has a lower risk of causing facial nerve damage when treating benign parotid lesions. Further investigation is required to make sure that these alleged advantages endure throughout time.

LIMITATIONS

The limitation of the current study was smaller sample size.

SUGGESTIONS / RECOMMENDATIONS

It was suggested that larger study with larger sample size should be conducted, so that further advantages and disadvantages of technique was evaluated.

CONFLICT OF INTEREST / DISCLOSURE

There will be no conflict of interest

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