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Partial Superficial Parotidectomy: An Effective and Conservative Approach for Pleomorphic Adenoma

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ABSTRACT

Background: To avoid high recurrence associated with enucleation due to the histological structure of pleomorphic adenoma, a complete superficial Parotidectomy approach with increased morbidity was adopted, which has become the gold standard even up till now for tumors of the superficial lobe. This study was designed to evaluate the effectiveness of the conservative approach of partial superficial Parotidectomy in terms of recurrence and facial nerve injury for treatment of pleomorphic adenoma. **Objective:** To compare the standard superficial Parotidectomy with partial superficial Parotidectomy in terms of recurrence and facial nerve injury. **Study Design:** Experimental study. **Settings:** Department of Surgery, DHQ Hospital, Rawalpindi Pakistan. **Duration:** 01-02-2018 to 30-01-2019. **Methods:** After taking written informed consent, a total of 21 (N=21) patients were included in this experimental study according to the selection criteria by probability sampling and divided into two groups by the Lottery method. Patients were followed for a period of one year for recurrence. SPSS-22 did data analysis. The p-value was set at 0.05. Pearson correlation was used for statistical significance. **Results:** There were 66.67% males and 33.34% females. The mean tumor size was 2.45 cm ± 0.289 with a 2-2.9 cm range. In group 1 (n=9), transient facial nerve injury occurred in 1 patient, whereas in group 2 (n=12), it occurred in 3 patients. No recurrence was found in either group. **Conclusion:** Partial superficial Parotidectomy is an effective and conservative surgical approach for pleomorphic adenoma of the parotid gland. The recurrence rate in this approach is comparable with conventional superficial Parotidectomy, whereas the rate of facial nerve injury is significantly reduced.

Keywords: *Parotidectomy, Facial nerve, Recurrence, Pleomorphic adenoma.*

INTRODUCTION

The most common benign tumor of the parotid gland is pleomorphic adenoma. In comparison, warthin's tumor is the second in number. Surgery is the mainstay of treatment for these tumors. Pleomorphic adenomas were initially treated by the enucleation method until 1930. In 1936, McFarland pointed out the high incidence of recurrence associated with enucleation.[1] Later, it became well-known that there are microscopic tumor extensions from the main tumor body at points of capsule deficiency. So, to avoid this high recurrence associated with enucleation due to the histological structure of pleomorphic adenoma, a complete superficial Parotidectomy approach with increased morbidity was adopted, which has become the gold standard even up till now for tumors of the superficial lobe. During the last few years, researchers have floated the idea of a conservative approach of partial superficial Parotidectomy in place of conventional complete superficial parotidectomy.[2] So this study was designed to evaluate the effectiveness of partial superficial Parotidectomy in terms of recurrence and facial nerve injury for treatment of pleomorphic adenoma.

OBJECTIVES

To compare the standard superficial Parotidectomy with partial superficial Parotidectomy in terms of recurrence and facial nerve injury.

MAIN OUTCOME MEASURES

1. Recurrence rate.
2. Facial nerve injury rate.

METHODS

This experimental study was carried out at the surgical unit of DHQ Hospital, Rawalpindi Pakistan. Duration of

the study was one year from 01-02-2018 to 30-01-2019, over one year. By using probability sampling technique, a total of 21 (N=21) were the sample size of the study.

The study included all patients with a histological diagnosis of pleomorphic adenoma and a tumor size of less than 3cm.

The study excluded patients with signs of malignant transformation, such as facial nerve involvement.

This experimental study was conducted in the Department of Surgery DHQ Hospital Rawalpindi from 01-02-2018 to 30-01-2019 over 12 months after approval from ERC vide letter no. 167/2018/Surg-DHQ dated: 01-02-2018. All Patients (N=21, calculated by online sample size calculator and statistics used in the formula were confidence interval 95%, Margin of error 5%, Population proportion 50%, Total population 25 patients) were admitted through the outpatient department after taking written informed consent and were allocated to one of two groups, limited superficial Parotidectomy group-1 (n=9) or conventional superficial Parotidectomy group-2 (n=12) by lottery method according to the inclusion/exclusion criteria after detailed clinical examination. Routine investigations were done for both groups. FNAC was done to rule out malignancy, and MRI was done in suspicious cases. Patients were followed for one year for recurrence.

In group 1, limited superficial Parotidectomy was done by modified Blair incision, exposing the main trunk of the facial nerve at the contly's pointer and then following it towards two main divisions. Only the nerve branches in the tumor area were exposed, and in at least one area of the tumor where the plane of one of these nerve branches abutted, dissection was done just outside of the capsule (pericapsular). Other branches of the facial nerve away from the tumor (≥1 cm) were not dissected, and that part of the superficial lobe was not excised. Whereas in group 2, a conventional complete superficial Parotidectomy was done. A nerve stimulator was not used in either group.

The data was analyzed using SPSS-22. The P-value was set at 0.05, and the Pearson correlation was used for statistical significance.

RESULTS

There were 66.67% males and 33.34% females. The average age of male patients was 45.5y±5.40, and the average age of female patients was 42y±8.56. The mean tumor size was 2.45cm ± 0.289 with a 2-2.9cm range. Individual demographic features of the two groups are shown in Table No. I. In group 1(n=9), transient facial nerve injury occurred in 1 patient, whereas in group 2(n=12), it occurred in 3 patients. The difference between the two groups was statistically significant based on Pearson correlation (Table no. II). All cases recovered within one to three months. There was no permanent facial nerve injury in either group. Patients were followed for one year for recurrence of the tumor, and no recurrence was found in either group.

Table 1: Demographic features of two groups

Features		Group-1 (n=9) Partial superficial Parotidectomy	Group-2 (n=12) Complete superficial Parotidectomy
Gender distribution	Male	6	8
	Female	3	4
Mean age (Years)	Male	45.17	45.75
	Female	41	42.75
Tumor size		2.46±0.437	2.47±0.253

Table 2: Main outcome measures

Outcome measure		group-1 (n=9) Partial superficial Parotidectomy	group-2 (n=12) Complete superficial Parotidectomy	P-Value (Pearson correlation)
Facial nerve palsy rate	Transient	1 (11.11%)	3 (25%)	0.626
	Permanent	0	0	0
Recurrence rate		0	0	0

DISCUSSION

Common complications of surgery for pleomorphic adenoma are tumor recurrence, facial nerve injury, and frey's syndrome. The choice of adequate surgical procedure depends on these complications and factors like tumor size. Preserving the facial nerve and gland function is the priority of the selected procedure. Partial superficial Parotidectomy is the procedure of choice that can serve this purpose.

Li C *et al*,[3] in their study, compared conventional Parotidectomy with modified partial Parotidectomy and reported that the modified partial Parotidectomy group had a significantly lower complication rate, including facial nerve injury ($P \leq 0.05$), supporting the results of the present study. Witt RL *et al*[4] shared their experience with partial superficial Parotidectomy from 1987 to 1997. They reported that there was no recurrence of the tumor. Emodi O *et al*[5] compared superficial Parotidectomy with retrograde limited superficial Parotidectomy and reported no difference in recurrence rate, whereas the difference in facial nerve injuries was significant ($p = 0.0003$). There was no facial nerve injury in 90% of the patients of limited retrograde superficial Parotidectomy, and only 3 patients had temporary facial nerve injury, whereas 8 patients had temporary and 3 patients had permanent facial nerve injury in the superficial

Parotidectomy group. They concluded the superiority of limited retrograde superficial Parotidectomy over superficial Parotidectomy for benign parotid pleomorphic adenoma. Klingemann MP *et al*[6] conducted a retrospective study and compared conventional prograde Parotidectomy with retrograde Parotidectomy. In their study, temporary paresis of the facial nerve was seen in 18.2% of patients, and permanent paresis confined to one branch was seen in 2.3% of patients. Stathopoulos P *et al*[7] carried out a 10-year prospective study to evaluate the role of partial superficial, superficial, and total Parotidectomy in managing benign parotid gland tumors in 205 patients. They reported 28% ($p \leq 0.05$) transient facial nerve injury in superficial Parotidectomy patients as compared to partial superficial Parotidectomy patients (9.6%). They concluded that less aggressive parotid surgery approaches have a low recurrence rate and minimal risk of facial nerve injury, in line with the results of the present study.

Cristofaro MG *et al*[8] conducted a retrospective cohort study and compared extracapsular dissection with superficial Parotidectomy. Transient facial nerve injury and permanent facial paralysis were significantly more common in the superficial Parotidectomy group than after extracapsular dissection (p=0.001 and p=0.065). No significant difference was seen in the recurrence rate in the two groups (2.2% in the SP group and 3.3% in the ED group). The result of this study supports the present study that conservative methods of treatment of pleomorphic adenoma are effective with fewer complications.

Mehle EM *et al*[9] shared their experience of surgical concluded the treatment of 256 patients with parotid tumors and concluded that the risk of long-term paresis of the facial nerve is higher in extended Parotidectomy and revision surgeries. Orabona GD *et al*[10] shared their experience of 232 cases of benign parotid tumors comparing extracapsular dissection with superficial Parotidectomy. Temporary (26.8% vs. 3.9%, p=0.001) and permanent (8.9% vs. 0%, $p \leq .001$) facial nerve injury was more frequent in the superficial Parotidectomy group as compared to the extracapsular dissection group. They also concluded that conservative Parotidectomy is effective with fewer complications for benign tumors of the superficial lobe of the parotid.

O, Brien CJ *et al*[11] conducted a study and reviewed data of patients with benign parotid tumors treated with limited superficial Parotidectomy from 1988 to 2002. Pleomorphic adenoma was found in 70% of cases, and Warthin's tumor in 15% of cases. Limited superficial Parotidectomy was carried out in the previously untreated patients. Temporary postoperative facial nerve weakness occurred in 27% of patients, whereas permanent facial nerve weakness occurred in 2.5% of cases, including previously treated and deep lobe tumors. XieS *et al*[12] conducted a meta-analysis and included 14 cohort studies and 3194 patients. The study aimed to find the effectiveness of extracapsular dissection (conservative approach) compared to superficial Parotidectomy (conventional approach) for treating benign parotid tumors. They reported a significantly lower incidence of temporary and permanent facial nerve injury in the ED group than in the SP group. They concluded that ED could be an effective treatment option for small and mobile tumors located in the superficial lobe.

McGurk M *et al*[13] analyzed the outcome of 821 clinically benign parotid tumor patients and compared the extracapsular dissection surgical approach with superficial Parotidectomy. According to the study results, there was no significant difference in recurrence rates of the extracapsular dissection group and superficial Parotidectomy group. In contrast, there was significantly reduced morbidity in the ED group ($p \leq 0.001$). They concluded that the conservative ED approach is an effective treatment option that can be used as an alternative to SP with reduced morbidity and without oncological compromise. Foresta E *et al*[14] conducted a meta-analysis to compare extracapsular dissection with superficial Parotidectomy to treat pleomorphic adenoma and benign parotid tumors. They reported that the recurrence rate was higher in the ED group, whereas facial nerve injury was higher in the SP group. They also termed a conservative approach like ED as an effective treatment strategy for pleomorphic adenoma and other benign parotid tumors. However, Valentini V *et al*[15] favored superficial Parotidectomy with facial nerve preservation and rejected enucleation of pleomorphic adenoma. However, Kadletz L *et al*[16] reported a 7.7% recurrence rate after extracapsular dissection compared to 0.4% after superficial Parotidectomy for benign parotid tumors. Martin H *et al*[17] reported reduced recurrence and facial nerve injury rate after extracapsular dissection (conservative approach) for benign parotid tumors due to the less radical nature of the procedure. Lin YQ *et al*[18] similarly concluded a rate of complications with a conservative extracapsular dissection approach for benign parotid tumors. Kato MG *et al*[19] declared conservative extracapsular dissection as a shorter, less costly, and equally safe alternative to conventional superficial Parotidectomy because of the comparable complication rate.

CONCLUSION

Partial superficial Parotidectomy is an effective and conservative surgical approach in terms of less sacrifice of functional gland tissue for pleomorphic adenoma of the parotid gland. The recurrence rate in this approach is comparable with conventional superficial Parotidectomy,

whereas the rate of facial nerve injury is significantly reduced.

LIMITATIONS

Parotid tumors are not common in the area where the study was conducted, so a relatively small sample size was one of the limitations of this study. Another limitation of this study is that Patients were followed for one year for recurrence of the disease.

SUGGESTIONS / RECOMMENDATIONS

Multi-Centre studies with large sample sizes are needed to further confirm the results of this study. Long-term follow-up to see the recurrence of the disease after one year is also suggested.

CONFLICT OF INTEREST / DISCLOSURE

The authors declare no conflict of interest.

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