

Extra-Capsular Dissection in Parotid Pleomorphic Adenoma: A Viable Alternative Technique to Superficial Parotidectomy?

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ABSTRACT

Objective: To assess the effectiveness of extra-capsular dissection in parotid pleomorphic adenoma as compared to superficial parotidectomy.

Material and Method: The study took place over the time of a year, from January 2021 to December 2021 at the Department of General Surgery, Liaquat University of Medical and Health Sciences. All patients who presented with parotid pleomorphic adenoma, age more than 12 years of either gender, were included. All the cases were divided into groups based on the type of surgical technique. Patients underwent superficial parotidectomy were kept in group A and those who underwent extra-capsular dissection were kept in group B. During the personal follow-up presentations, all patients received a clinical examination, facial nerve assessment, and personal standardized interviews after surgery. Clinical signs of the facial nerve weakness and Frey's syndrome were recorded. All the data were collected by study proforma and SPSS version 26 was used for the purpose of data analysis.

Results: A total of 41 patients were selected and particularly studied by dividing them into two groups. Mean age of superficial parotidectomy group's patients was 37.43±4.71 years and mean age of the extra-capsular dissection group was 33.22±5.31 years. The average operating time was significantly less in extra-capsular dissection group 43.03±10.7 min (p= 0.001). Estimated average blood loss was also significantly less in the extra-capsular dissection group 36.38±11.47 ml (p=0.001). Males were most common in both groups and the average size of excised glands was also statistically insignificant among both groups (p>0.05). The signs of facial nerve weakness were higher in superficial parotidectomy group 7(30.4%) of 23 cases compared with 2(11.1%) in the extra-capsular dissection group of 18 cases, while statistically insignificant (p=0.138). Frey's syndrome was observed in 2 patients in the superficial parotidectomy group and not found in the extra-capsular dissection group (p=0.200).

Conclusion: Extra-capsular parotidectomy was observed to be the feasible, reliable and noninvasive in terms of less operating time, less blood loss, minimal chances of facial nerve weakness and no evidence of Frey's syndrome compared to superficial parotidectomy technique in the treatment of parotid pleomorphic adenoma

Keywords: Parotid pleomorphic adenoma, Facial nerve weakness, Frey's syndrome

INTRODUCTION

Pleomorphic adenoma is the most prevalent benign parotid tumor, accounting for 60%–70% of all benign parotid tumors.¹ It is more common in people in their fourth and fifth decades of life, particularly women.^{1,2} It usually appears as a painless, slow-growing mass that does not interfere with facial nerve processes in the parotid.¹ Massive tumors frequently develop single, uneven nodular mass that strains the skin or mucosa above it and the tumor weight can range from a few grams to more than 8 kg, and the weight increases considerably as the duration of tumor.³ 90% of parotid gland neoplasms are found in the superficial lobe, which is placed laterally to the facial nerve. The varied surgical techniques have been shaped by the specific interaction between parotid gland tumors and the facial nerve.⁴ Different pathohistological traits and their values are still being debated, as they have an impact on both the fundamental knowledge of the tumor's activity and the surgical approaches used.⁵ Partial surgical excision, during surgery inadvertent, the pseudo tumor capsule rupture, incomplete removal of the tumor capsule, and multicentricity are all linked to tumor recurrence because they allow tumor cells to spillage into the tumor area.⁶ Despite the fact that extra-capsular dissection rate has risen in recent decades, primary pleomorphic adenomas treated with superficial parotidectomy have a recurrence rate of 1% to 4%.⁶⁻⁸ The recurrence rates stated in various literature publications are highly dependent on the length of the follow-up period and the type of follow-up examination used.⁶ Efforts have been made to develop tumor removal surgical procedures that reduce the risk of postoperative problems, recurrence, and undesirable cosmetic appearance.⁵ Extra-capsular parotidectomy is a conservative therapeutic option that avoids treating the facial nerve.⁴ Extracapsular dissection (ECD) has been proven in previous trials to be a feasible option to superficial parotidectomy for pleomorphic adenoma parotid tumors, with recurrence rates

comparable to superficial parotidectomy but much lower morbidity.⁹ This study has been done to determine the efficacy of extra-capsular dissection in parotid pleomorphic adenoma at tertiary care hospital

MATERIAL AND METHODS

The study occurred over the time of a year, from January to December 2021 at the Department of General Surgery at Liaquat University of Medical and Health Sciences. This was a cross-section comparative study and non-probability consecutive sampling technique was used. All patients who presented with parotid pleomorphic adenoma, age more than 12 years of either gender, were included. All the patients who did not want to participate in the study, with suspicious of malignant tumour and already had facial nerve involvement were excluded. After taking brief medical history and clinical examination, routine laboratory investigations were done. After disclosing the study's goal, each patient signed a written informed consent form. All the patients had a head and neck ultrasound, which included the parotid gland. In individuals whose tumors were not completely obvious on US, further magnetic resonance imaging (MRI) was conducted. Based on the type of surgical procedure used, all of the cases were categorized in two groups. All the cases those underwent superficial parotidectomies, were kept in group A and those who underwent extra-capsular technique were kept in group B. Surgeries were done by senior surgeons having minimum experience of more than 5 years. During the personal follow-up presentations, after surgery, all patients had a clinical examination, an ultrasound (and, if needed, an MRI), facial nerve tests, and personal standardized interviews. Clinical indications of facial nerve impairment and Frey's syndrome were documented using standard questions concerning whether the parotid region developed any redness or sweating. All the data were collected by

the study proforma and for the purpose of data analysis, SPSS version 26 was adopted.

RESULTS

A total of 41 patients were selected and particularly studied by dividing them into two groups. Mean age of the patients in the superficial parotidectomy group was 37.43+4.71 years and mean age of the patients of extra-capsular technique was 33.22+5.31 years. The average operating time was significantly less in extra-capsular dissection group 43.03+10.7 min compared to superficial parotidectomy group 59.13+9.14 min (p- 0.001). Estimated average blood loss was also significantly less in the extra-capsular dissection group 36.38+11.47 ml compared to superficial parotidectomy group 58.82+7.25 ml (p-0.001). Males were most common in both groups without a significant difference and the average size of excised glands was also statistically insignificant among both groups (p->0.05), the results shown in Table.1

Signs of facial nerve weakness were higher in superficial parotidectomy group 7(30.4%) of 23 cases than 2(11.1%) in the extra-capsular parotidectomy group of 18 cases, while findings were statistically insignificant (p-0.138). Frey's syndrome was observed in 2 cases of the superficial parotidectomy group and not found in the extra-capsular dissection group (p-0.200). Table.2

Table 1: Descriptive statistics of demographic characteristics n=41

Variables	Study groups		p-value
	Group A n=23	Group B n=18	
Age (years)	37.43+4.71	33.22+5.31	0.011
Operative time (minutes)	59.13+9.14	43.03+10.7	0.001
Loss of blood (ml)	58.82+7.25	36.38+11.47	0.001
Size of excised gland (cm)	5.08+1.11	5.36+0.86	0.396
Gender	Male	14	0.702
	Female	09	

Group A= Superficial Parotidectomy
Group B= Extra-capsular Parotidectomy

Table 1: Facial nerve weakness and Frey's syndrome in both modalities n=41

Variables		Study groups		p-value
		Group A n=23	Group B n=18	
Signs of Facial Nerve Weakness	Yes	7(30.4%)	2(11.1%)	0.138
	No	16(69.6%)	16(88.9%)	
Frey's Syndrome	Yes	2(8.7%)	--	0.200
	No	21(91.3%)	18(100.0%)	

Group A= Superficial parotidectomy
Group B= Extra-capsular Parotidectomy

DISCUSSION

The majority of salivary neoplasms are pleomorphic adenomas, which most typically arise in the parotid gland's superficial lobe. The most prevalent onset of these tumors is in the fourth to the fifth decade of life, but they can occur at any age. In this study, a total of 41 patients were selected and particularly studied by dividing into two groups and mean age of the patients in the superficial parotidectomy group was 37.43+4.71 years and mean age of the patients in the extra-capsular dissection group was 33.22+5.31 years and men were most common in both groups. Similarly, Hornung B et al¹⁰ reported that the average age of the patients 48.9±15.4 years and inconsistently they found females in majority out of 844 cases with a male-to-female ratio: 0.53:1. In another study of Tiago RS et al¹¹ reported that the women had a greater incidence in their study, with a ratio of 3.5:1 and the patients' average age was 48.7 years with ages ranged from 18 to 84 years as well as tumors were more common in the fifth decade, than the sixth and seventh decades. In this study average of operating time was significantly less in extra-capsular parotidectomy group 43.03+10.7 minutes as compared to superficial parotidectomy group 59.13+9.14 minutes (p- 0.001) and estimated average of

blood loss was also significantly less in extra-capsular dissection group 36.38+11.47 ml compared to superficial parotidectomy group 58.82+7.25 ml (p-0.001). On other hand, Hornung B et al¹⁰ reported that the average size of resected pleomorphic adenomas was 40.5±13.8 mm. In another study of Grasso, M et al¹² reported that the 66% cases had tumor size less than 2 cm, in 31% cases had tumor size 2–4 cm and 3% had tumor size more than 4 cm. In the study of Kato MG et al¹³ reported that the average size of the tumour was 2.2±0.9 cm in the extra-capsular group and 2.3±1.1 was in the superficial parotidectomy group (p-0.10). In this study, the signs of facial nerve weakness were in higher superficial parotidectomy group 7(30.4%) of 23 cases compared with 2(11.1%) in the extra-capsular parotidectomy group out of 18 cases, while statistically insignificant (p-0.138). Frey's syndrome was observed in 2 patients in the superficial parotidectomy group and not found in the extra-capsular dissection group (p-0.200). However, Infante-Cossio P et al¹⁴ conducted a study after superficial parotidectomy for pleomorphic adenoma, to assess facial nerve damage and other postoperative issues and they found Frey's syndrome 11.4% and further they reported that the 77.2 percent of patients had facial nerve paresis at 1 week, half of the them recovered facial function at 1 month, 94.9 percent at 6 months, and 100 percent at 12 months, indicating a rather quick recovery time. Consistently in the study of Foresta E et al¹⁵ reported that with extracapsular dissection individuals were less likely to develop Frey syndrome 5.0% versus 28% and further they observed that the extra-capsular dissection may be a potential therapeutic option for unilateral benign parotid tumors of the superficial lobe that are less than 4 cm in size and do not affect the facial nerve.¹⁵ Parotid surgery for pleomorphic adenomas has progressed significantly over the last century, moving from a minimally invasive non-radical operation to a more thorough radical procedure, but with increased risks.¹⁵⁻¹⁷ In the treatment of benign parotid neoplasms, the therapeutic benefits of ECD over SP are still being contested. Numerous studies have provided data supporting ECD as an alternative to SP in recent decades, with a focus on known essential postoperative problems, whereas other health-care outcomes, such as cost-effectiveness, have yet to be investigated.^{13,18,19} There was also a small sample size in this study, as well as various additional limitations. However, large-scale multicenter studies are recommended for confidential application of this surgical modality.

CONCLUSION

In this study the extra-capsular parotidectomy was observed to be the feasible, reliable and noninvasive modality in terms of less operating time, less blood loss, less sign of facial nerve weakness and without evidence of Frey's syndrome compared to superficial parotidectomy technique in the treatment of parotid pleomorphic adenoma. This was a single-center study with a limited sample size; hence, further more large-scale multicenter studies are recommended to assess the more accurate effectiveness of extra-capsular dissection technique.

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