

# Minimally invasive extracapsular dissection of pleomorphic adenoma of the parotid gland: a 4 years study at Rehman Medical Institute Peshawar

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Ltd., Islamabad, Pakistan**Citation:** Ullah S, Ullah I, Khan MAA, Khan N, Hayat MK, Anwar S. Minimally invasive extracapsular dissection of pleomorphic adenoma of the parotid gland: a 4 years study at Rehman Medical Institute Peshawar. J Rehman Med Inst. 2021 Oct-Dec;7(4):11-4.**ABSTRACT**

**Introduction:** The most common benign tumour of salivary glands is known as Pleomorphic adenoma (PA). Minimally invasive extracapsular parotidectomy is becoming more common for this tumor.

**Objective:** To provide an insight into the newer modality in Parotid gland surgery which is not a common ground of practice in Pakistan.

**Materials & Methods:** This study was conducted at the Otolaryngology/Head & Neck surgery department of a tertiary care hospital of Peshawar. Records of patients from July 2016 till March 2021 for cases diagnosed as "pleomorphic adenoma of parotid and submandibular glands" were retrieved, their corresponding patient files accessed from the archive, and case notes analyzed using Microsoft Excel. Subsequent to discharge, follow up visit after one week was done for all 16 patients. Data were analyzed for descriptive statistics.

**Results:** In this series of 16 cases of pleomorphic adenoma treated by extracapsular parotidectomy, males were predominant (62.5%). Right side (75.0%) predominance was also observed for the tumour location. Only one case (6.25%) developed a small collection of seroma while all the others did not show any complications. Regular follow-ups have not shown recurrence of the tumour.

**Conclusion:** The recommended treatment of pleomorphic adenoma is surgical removal of the entire tumour with a cuff of normal tissue. The minimal invasive extra capsular parotidectomy procedure showed minimal complications and recurrence rate was negligible in 4 years of follow up.

**Keywords:** Pleomorphic Adenoma; Parotid Gland; Otolaryngologic Surgical Procedures; Salivary Glands; Seroma.

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**INTRODUCTION**

Both major and minor salivary glands share a common embryological origin. Glands that lie within the mucosa are called minor salivary while those lying away from the oral mucosa, connected by excretory ducts, are called major salivary glands. By the fourth week of embryogenesis, the parotid gland has already developed. It is followed by the submandibular glands (6 weeks) and lastly the sublingual glands.

Neoplasms of the parotid gland include a heterogeneous group of histotypes with markedly different biological characteristics, behaviour, and evolution, therefore requiring different forms of treatment. The majority (70-80%) of salivary gland tumours are benign. Pleomorphic adenomas (PA) represent up to 75% of salivary gland tumours, 90% in the superficial lobe, lateral to facial nerve usually in the tail of the parotid gland. This very slow growing tumour has three cellular components, epithelial, myoepithelial, and stromal.

The usual presentation is an asymptomatic, painless mass.<sup>1,2</sup> Fine Needle Aspiration Cytology (FNAC) may be of value while the diagnostic investigations of choice are Computed Tomography (CT) and Magnetic Resonance Imaging (MRI).

Parotid gland surgery has gradually evolved over time. In the past, it was mainly limited to ranula treatment and removal of salivary gland calculi. In the 19<sup>th</sup> century, the enucleation procedure for parotid gland tumours was done, with a recurrence rate of 25%. Around 1-5% of tumour recurrence is due to tumour spillage intraoperatively because of the parotid gland pseudocapsule. This procedure however is still practiced for those patients in whom multiple recurrences have already occurred despite the increased risk of further relapses. Fast forward to the 20<sup>th</sup> century when superficial parotidectomy procedure was introduced aimed at reducing the high recurrence rate of parotid gland tumours. In the modern age, the superficial parotidectomy and extracapsular resection procedure is the procedure of choice for benign tumours while the options range from total to extended parotidectomy for malignant neoplasia.<sup>3-8</sup>

The objective of this paper is to provide an insight into the newer modality in Parotidectomy surgery which is not a common ground of practice in Pakistan.

**MATERIALS & METHODS**

A descriptive cross-sectional study was conducted from July 2016 to March 2021. Data were obtained from the computerized database and medical records of a tertiary care hospital in Peshawar, Khyber Pakhtunkhwa. Any patient who had undergone extracapsular dissection surgery for the parotid gland were included in the study regardless of age, gender, ethnicity, or outcome. Incomplete records were excluded from the study. A total of 16 cases were identified. A single surgeon had performed all the procedures.

All the patients were referred from the outpatient department after review from the primary surgeon. A detailed history had been taken, and a thorough examination of all lesions done. Investigations like ultrasound and FNAC had also been performed.

Patients with FNAC confirmed pleomorphic adenoma had a further CT done to rule out deep lobe extension. Adenoma less than 4cm in size were selected for extracapsular parotidectomy. All patients had extracapsular dissection surgery under general anaesthesia through pre- and retro- mandibular incision, layer wise dissection was done up to parotid fascia and surface marking in centripetal fashion after localization of tumour (Fig 1).



**Fig 1: Per-operative Findings**

Four strips of parotid fascia were raised over the mass using size 10 knife. By gentle dissection underneath the fascia loose areolar tissue was kept away from tumour capsule. Dissection was carried out 3-4 mm away from the tumour capsule. Small mosquito forceps and bipolar diathermy were used for the dissection. By careful dissection around the capsule all the tumours were removed without damaging the capsule. Haemostasis was secured with approximation of parotid fascia using 3/0 Vicryl and 4/0 Monocryl for subcuticular stitches and Steristrips were placed on the incision with no bandages (Fig 2).

All patients were discharged the following day with follow up after a week including the biopsy reports. All patients were serially followed up for the duration of the study.



**Fig 2: Post-operative view**

The retrieved data were analysed using Microsoft Excel for descriptive statistics including the demographics, presenting symptoms and outcomes.

**RESULTS**

Of 16 cases of pleomorphic adenoma treated by extracapsular parotidectomy, males were 62.5% and females 37.5%. After a week, all 16 patients had been followed up. Right side (75.0%) predominance was also observed for the tumour location. Table 1 shows the demographics.

**Table 1: Demographics of patients (n=16).**

Demographic Data		N (%)
Gender	Males	10 (62.5)
	Females	06 (37.5)
Age Range (Years)	Males	22 – 50
	Females	19 – 60
Mean Age (Years)		42.56 ± 18.78
Mean Lump Size (cm)		2.65 ± 0.61
Tumour Location	Right Side	12 (75.0)
	Left Side	03 (18.75)
	Submandibular	01 (6.25)

Follow-up condition of the patients can be seen in Table 2. Only one patient (6.25%) developed a small collection of seroma, which was treated with needle aspiration and pressure dressing for 48 hours. At the time of this publication, there were no signs of recurrence of tumour in any of the patients, in nearly 5 years.

**Table 2: Follow-up Condition (n=16).**

Follow-up	N (%)
Normal/No symptoms	15 (93.75)
Seroma	01 (6.25)
Tumour recurrence	-

**DISCUSSION**

Pleomorphic Adenoma (PA) is a painless, slow growing mass in the parotid gland usually. It has a pseudocapsule hence it recurs in 1-5% after excision. Multiple hypothesis have been put forward regarding PA's recurrence, genetics, cell biology, tumour spillage, or incomplete capsule excision. The pseudocapsular violation has thus far been proven as a contributory factor.<sup>9</sup> Malignant transformation into carcinoma ex pleomorphic adenoma is 2-25%.<sup>10</sup> Because of high risk of

observation, the concept of surgery credit goes to Bertrandi (1802) but it was in 1850 that the relation between the parotid tumour and facial nerve dissection was determined. Enucleation of PA was the procedure in the early history of parotid surgery. High recurrence rate after enucleation was due to capsular rupture or incomplete excision of the tumour.<sup>11</sup>

There are two main concepts of parotid surgery for PA: removal of the tumour with good margin, and facial nerve safety. This can be achieved by superficial parotidectomy, total parotidectomy or extracapsular parotidectomy. In the former two procedures, the facial nerve is dissected, and the tumour is removed however, the latter surgery does not require exposure of the facial nerve.

The ideal patient for the extracapsular surgery is with pleomorphic adenoma of less than 3 cm located in superficial lobe. The postoperative complications rate and the cost effectiveness of the extracapsular surgery have been examined very clearly in the recent literature.<sup>12</sup> Enucleation was treatment in early period with a high recurrence rate. The first total parotidectomy with facial nerve resection was performed by Codreanu and it was managed with grafting in the early 1950. Adson and Beahrs in 1958 described the current surgical techniques for the parotid gland tumours.<sup>13</sup>

The proportion of facial nerve damage corresponds to the extent of facial nerve dissection and exposure at the time of surgery. Every attempt should be made to access the tumour before surgery. Preoperative assessment like history, examinations and investigations like FNAC, CT, and MRI are the cornerstone of a successful outcome of the PA surgery. FNAC is a definitive diagnostic tool when performed by a skilled operator.<sup>14,15</sup>

The capsule of PA may be thick and fibrous or absent in some part. Because of this pseudocapsule and the ability of the tumour to infiltrate the capsule, some surgeons are controversial about the practical implication of extracapsular dissection.<sup>16</sup> Handling of myxoid stroma of PA during surgery is very important and a highly skilled surgeon should perform the procedure. It has high fragile contents and can burst easily during operation. Some studies say that the risk of tumour rupture during surgery is the same with both method of surgery (2-4%).<sup>17</sup> This complication can be avoided by removal of an envelope of 3-4 mm of normal glandular tissue.

The incidences of complications of extra capsular surgery are less than superficial and total parotidectomy. Recurrence after extracapsular surgery after a long-term follow-up (mean 46 months) was 4.5% in a study by Dell'aversana Orabona et al.<sup>18</sup> Kato M et al<sup>19</sup> stated that the superficial parotidectomy procedure was more cost effective, safe and did not show any immediate complications on follow-up, however longer follow-up studies are necessary.

The complications of parotid surgery like facial nerve injury, salivary fistula, Frey's syndrome, injury to greater auricular nerve, recurrence and cosmetic results were not reported in our patients in during four- and half-year follow-up. The literature shows that the incidence of these complications decline by 26% after superficial parotidectomy to 11% after extracapsular surgery. Extracapsular surgery is a minimal invasive surgery. Its complications are less in the hand of high-volume surgeon than occasional parotid surgeon.<sup>20,21</sup> Reduced operative time, low morbidity, reduced hospital stay time and no surgical site defects are the main characteristics of extracapsular parotid surgery. Postoperative complications were not reported in our cases; however, all the complications mentioned in this paragraph have been reported in the literature.<sup>14</sup>

## CONCLUSION

The recommended treatment of pleomorphic adenoma is surgical removal of the entire tumour with a cuff of normal tissue. The minimal invasive extracapsular parotidectomy procedure showed minimal complications and recurrence rate was negligible in 4 years of follow up.

## RECOMMENDATION

Minimally invasive extracapsular parotidectomy procedure should be adopted all over Pakistan in lieu of the conventional parotidectomy surgery.

## LIMITATIONS

Due to a low-volume centre, the procedure of minimally invasive extracapsular parotidectomy was performed only 16 times in almost 5 years. Such a study should be conducted at a high-volume centre to determine its usefulness in comparison to other parotidectomy modalities.

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