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EVALUATION OF PAROTIDECTOMY OUTCOMES IN THE TREATMENT OF PLEOMORPHIC ADENOMA OF THE PAROTID GLAND AT MILITARY HOSPITAL 103

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ABSTRACT

Objective: To evaluate the surgical outcomes in patients with pleomorphic adenoma of the parotid gland at Military Hospital 103.

Materials and Methods: This prospective study included 22 patients diagnosed with pleomorphic adenoma of the parotid gland who underwent surgery in the Department of Maxillofacial and Reconstructive Surgery at Military Hospital 103 from January 2023 to December 2024. Postoperative complications were monitored and evaluated at 1 week, 1 month, 3 months, and 6 months after surgery.

Results: The majority of patients (63.6%) underwent superficial parotidectomy. The rate of facial paralysis decreased over time: 81.8% at 1 week, 50.0% at 1 month, 27.3% at 3 months, and 0% at 6 months. By 6 months postoperatively, all patients had recovered normal facial motor function (House-Brackmann grade I). Complications included hematoma (4.5%) and salivary fistula (4.5%). There were no cases of surgical site infection, Frey syndrome, or tumor recurrence during follow-up.

Conclusion: Parotidectomy with facial nerve preservation is an effective and relatively safe surgical approach for the treatment of pleomorphic adenoma. Although early postoperative facial paralysis was relatively common, most patients achieved complete recovery within 6 months.

Keywords: Pleomorphic adenoma of the parotid gland; Parotid gland surgery; Facial nerve preservation; Surgical outcomes.

1. INTRODUCTION

Pleomorphic adenoma of the parotid gland is the most common benign tumor of the salivary glands, accounting for approximately 70–80% of all benign parotid tumors [1]. Simple tumor excision alone is associated with a high recurrence rate. Therefore, parotidectomy (either superficial parotidectomy or total parotidectomy) with preservation of the facial nerve is the preferred surgical approach for treating pleomorphic adenoma of the parotid gland. This technique allows complete removal of the tumor and surrounding glandular tissue, thereby reducing the risk of residual disease and minimizing recurrence [2]. However, parotidectomy may be associated with several complications and adverse events, most notably facial nerve paralysis (resulting from extensive dissection of all branches of the facial nerve, cranial nerve VII) and Frey's syndrome (caused by removal of a large portion of glandular tissue and injury to the postganglionic sympathetic fibers of the auriculotemporal nerve). At the Military Hospital 103, facial nerve–preserving parotidectomy has been routinely performed in the management of benign parotid gland tumors. To assess the treatment effectiveness and potential complications of this surgical approach, we conducted a study entitled: "Evaluation of parotidectomy outcomes in the treatment of pleomorphic adenoma of the parotid gland at Military hospital 103".

2. SUBJECTS AND METHODS

2.1. Study Subjects

The study was conducted on 22 patients diagnosed with pleomorphic adenoma of the parotid gland who underwent parotidectomy in the Department of

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Maxillofacial and Reconstructive Surgery at Military Hospital 103 from January 2023 to December 2024.

Inclusion criteria included patients with a confirmed diagnosis of pleomorphic adenoma of the parotid gland based on postoperative histopathological findings, without evidence of malignant parotid disease or a history of prior parotid surgery, who had complete clinical data and provided informed consent to participate in the study.

Exclusion criteria included patients with contraindications to surgery, those with a history of parotid gland disease or previous parotid surgery, and patients with incomplete postoperative follow-up data.

2.2. Methods

2.2.1. Study design: This was a prospective longitudinal clinical intervention study, in which patients were followed over time to evaluate postoperative outcomes and progression.

2.2.2. Sampling method and sample size: A convenience sampling approach was employed, including all patients who met the inclusion and exclusion criteria during the study period. A total of 22 patients were enrolled in the study.

2.3. Study procedures

- A standardized research medical record was established, and patients meeting the inclusion and exclusion criteria were selected and enrolled in the study.

- Surgical technique:

+ Anesthesia: Patients underwent general anesthesia with endotracheal intubation.

+ Step 1: Modified Blair incision: The skin incision follows three curvilinear lines: starting along the preauricular skin crease, curving around the earlobe to the postauricular crease, then extending posteriorly toward the mastoid process, approximately two finger-breadths from the mandibular angle and continuing downward along the upper cervical skin crease.

+ Step 2: Exposure of the lesion: Dissection is performed beneath the superficial musculoaponeurotic system (SMAS) to expose the facial nerve (cranial nerve VII) according to anatomical landmarks of muscle, cartilage, and bone. The posterior aspect of the parotid gland is freed from the anterior border of the sternocleidomastoid muscle to identify the posterior belly of the digastric muscle. The facial nerve trunk is located on the posterior surface of the digastric muscle, approximately 1.5–2.5 cm above the horizontal plane. Once the main trunk of the facial nerve is identified, the two primary branches are carefully traced.

+ Step 3: Lesion management: For tumors located in the superficial lobe and measuring ≤3 cm, superficial parotidectomy was performed. For larger tumors (>3 cm) or those involving the deep lobe, total parotidectomy was indicated.

+ Step 4: Wound closure: The incision was closed layer by layer according to anatomical planes. A continuous negative-pressure drain was placed for the first 24–48 hours postoperatively, and a compressive dressing was maintained.

- Postoperative care: Patients received bedside care and were periodically evaluated at 1 week, 1 month, 3 months, and 6 months after surgery to assess facial nerve function and monitor for complications.

- Data collection and analysis.

2.4. Study variables

- General characteristics of patients: Including age and sex.

- Tumor characteristics based on surgical findings and MRI imaging.

- Characteristics of the surgical method.

- Assessment of postoperative complications at the immediate postoperative period, 1 week, 1 month, 3 months, and 6 months.

+ Facial nerve paralysis: Assessment of facial nerve function on the surgical side. The degree of facial paralysis was classified according to the House–Brackmann scale, ranging from Grade I (normal) to Grade VI (complete paralysis) [3].

+ Other postoperative complications: Early complications were recorded, including wound bleeding, infection, seroma (sialocele), sensory branch palsy of the superficial cervical plexus (numbness around the ear), and late complications such as prolonged salivary fistula and Frey's syndrome (redness and sweating in the parotid region during eating).

2.5. Data processing:

The data were processed and analyzed using SPSS version 26.0. Quantitative variables were presented as mean ± standard deviation (SD). Proportions were compared using Fisher's exact test (for variables with minor frequencies) or χ^2 test when appropriate. A p-value < 0.05 was considered statistically significant.

2.6. Research ethics

The study was conducted with the approval of the Head of the Department of Maxillofacial and Reconstructive Surgery, Military Hospital 103. Patients were fully informed about the study and provided their consent to participate. The research was conducted solely to protect and care for patient health and was not intended for any other purpose.

3. RESULTS

3.1. General characteristics of the study sample:

Table 1. General characteristics of the study participants

Characteristics	Number of cases (n)	Percentage (%)
Gender		
Male	8	36,4

Characteristics	Number of cases (n)	Percentage (%)
Female	14	63,6
Mean age	47.2 ± 12.7 [23-67]	
Male group	49.2 ± 13.0	
Female group	46.0 ± 12.5	

Among the 22 patients included in the study, 14 were female (63.6%), and eight were male (36.4%). The mean age of the female patients was 46.0 ± 12.5 years, with the youngest patient aged 23 and the oldest 67.

Table 2. Characteristics of parotid gland tumors

Tumor characteristics	Number of cases	Percentage (%)
Affected side		
Left	12	54.5
Right	10	45.5
Tumor size		
< 2 cm	6	27.3
2–4 cm	14	63.6
> 4 cm	2	9.1
Margins		
Well-defined, freely mobile	22	100.0
Consistency		
Firm	18	81.8
Medium or slightly soft	4	18.2

Regarding the affected side, 12 cases involved the left parotid gland (54.5%) and 10 cases the right side (45.5%). Most tumors measured 2–4 cm in diameter (63.6%), 6 cases (27.3%) were smaller than 2 cm, and only 2 cases (9.1%) were larger than 4 cm. On clinical examination, all tumors were well-defined and freely mobile. The majority were firm in consistency (18/22 cases, 81.8%), while only 4 cases (18.2%) had medium or slightly soft consistency.

Table 3. MRI characteristics of pleomorphic adenoma of the parotid gland

MRI characteristics	Number of cases (n = 22)	Percentage (%)
Tumor location		
Superficial lobe	16	72.7
Deep lobe	6	27.3
MRI signal characteristics		
High T2 signal, homogeneous	13	59.1
High T2 signal, heterogeneous	9	40.9

MRI images showed that the majority of tumors were located in the superficial lobe of the parotid gland (72.7%), while the deep lobe accounted for 27.3%. A high and homogeneous T2 signal was observed in 59.1% of tumors, whereas 40.9% exhibited a heterogeneous T2 signal.

3.2. Surgical method characteristics

Table 4. Extent of parotidectomy performed (n = 22)

Surgical method	Number of cases (n)	Percentage (%)
Superficial parotidectomy	14	63.6
Total parotidectomy	8	36.4

Among the 22 surgical cases, 14 cases (63.6%) underwent superficial parotidectomy (including the tumor), while 8 cases (36.4%) required total parotidectomy.

3.3. Postoperative complications

** Facial nerve paralysis after surgery*

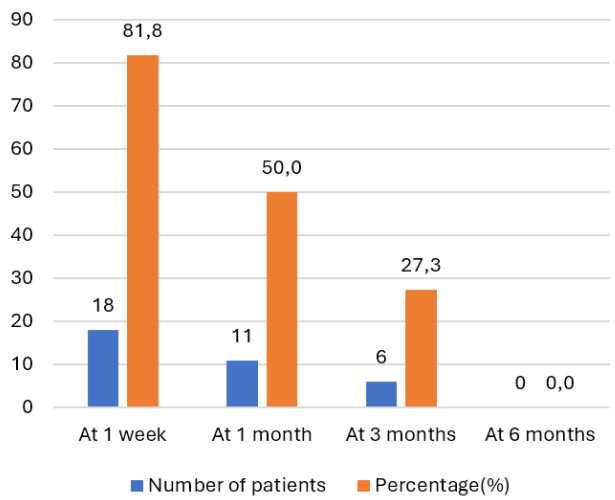

Figure 1. Incidence of postoperative facial nerve paralysis

After 1 week of surgery, 18 out of 22 patients (81.8%) exhibited facial nerve paralysis of varying severity (ranging from mild to severe). The incidence gradually decreased over time: 50.0% (11 patients) were affected at 1 month, 27.3% (6 patients) at 3 months, and no patients presented with facial paralysis at 6 months, indicating complete recovery in all cases.

Regarding the distribution of facial nerve paralysis according to the House-Brackmann scale, at 1 week postoperatively, grade III paralysis was the most common, affecting approximately 35% of patients, predominantly representing mild to moderate paralysis. At 1 and 3 months, grade II (mild) paralysis predominated among the remaining cases, accounting for about 20–25% of the total patient population, with no instances of persistent severe paralysis. By 6 months, all 22 patients (100%) achieved complete facial motor recovery (House-Brackmann grade I).

** Other Complications*

Other postoperative complications were also observed, albeit infrequently. Specifically, one case (4.5%) developed a sialocele in the parotid region, and one case (4.5%) experienced a persistent salivary fistula through the surgical incision. No patients had severe wound infections requiring drainage or prolonged antibiotic therapy. Other mild symptoms included numbness of the periauricular skin (due to injury to the great auricular nerve) and subcutaneous bruising at the surgical site—both of which occurred in most patients during the first postoperative weeks and resolved spontaneously within 4–6 weeks. Notably, no cases of tumor recurrence or Frey's syndrome were observed during the 6-month follow-up period.

4. DISCUSSION

4.1. Patient Characteristics and Surgical Methods

In our study, the mean age of patients with parotid pleomorphic adenoma was approximately 47 years, consistent with reports from other authors indicating that the tumor commonly occurs in middle-aged adults [4]. The 40–60 age group accounted for the highest proportion. Regarding sex distribution, females predominated (64%), in line with general observations that benign salivary gland tumors are more frequent in women than in men [1]. All cases in our patient series were definitively diagnosed as benign pleomorphic adenomas based on histopathological examination.

In this study, 63.6% (14 patients) underwent superficial parotidectomy, while 36.4% required total parotidectomy. The extent of surgery was individualized based on the size and location of the tumor as determined by imaging studies. These findings are also consistent with the current trend in the management of benign parotid tumors, where surgeons may choose varying degrees of intervention: from simple tumor enucleation, partial or total superficial parotidectomy, to complete parotidectomy, depending on the extent of the lesion and the need to ensure safe surgical margins [5]. Superficial parotidectomy remains the standard procedure for the complete management of parotid pleomorphic adenomas without increasing the risk of recurrence, particularly when the tumor margin is unclear or located adjacent to the facial nerve. However, several recent studies, such as that by Li et al., have demonstrated that partial superficial parotidectomy can be safely applied to small, well-circumscribed, and superficially located tumors, with a 5-year recurrence rate of 0% and a significantly lower incidence of complications (facial nerve paralysis, Frey's syndrome) compared to the group undergoing total superficial parotidectomy [6]. Our results are also consistent with this general trend: no cases of recurrence were observed, and the overall complication rate was low. However, it should be emphasized that, to ensure safety when performing superficial parotidectomy alone, patient selection must be meticulous. This approach is generally limited to small, superficial, non-invasive tumors, and the superficial parotid lobe must be excised thoroughly.

In our series of 22 patients, no cases of postoperative clinical Frey's syndrome were observed. This may be attributable to the relatively short follow-up period. Some instances of Frey's syndrome may have a delayed onset several years after surgery; Chamisa reported a case in which Frey's syndrome first appeared 20 years postoperatively [7]. Therefore, long-term follow-up for this complication is still recommended, although the likelihood of its occurrence is low if no symptoms manifest within the first postoperative year.

4.2. Facial Nerve Paralysis and Postoperative Complications

Facial nerve paralysis is the most common complication following parotid surgery, even when the facial nerve is meticulously preserved. In our study, 81.8% of patients experienced some degree of facial weakness or paralysis during the first postoperative week. This rate is higher than that reported in some previous studies; for example, Infante-Cossio et al. observed facial weakness in approximately 30–50% of patients following superficial parotidectomy [8]. The higher initial rate in our study may be attributable to the relatively sensitive assessment method, as we included even mild cases (House-Brackmann grade II), which are often difficult to detect, in our analysisIn fact, immediately after surgery, most patients exhibited only mild paralysis of a few peripheral branches of the facial nerve (particularly the marginal mandibular branch, resulting in weakness of the lower lip), rather than complete hemifacial paralysis. According to the literature, the marginal mandibular branch is the most susceptible to temporary injury during parotid surgery due to its superficial course and distal location relative to the main trunk [8]. In addition to injury to the marginal mandibular branch, this study observed mild paralysis of the buccal and zygomatic branches, manifested as slight weakness of the cheek or orbicularis oculi muscles. This may be related to tumor characteristics, such as adhesion to the nerve or extension close to the nerve sheath boundary. During dissection and handling of the lesion, separating the tumor from surrounding tissues may temporarily compress, contuse, or stretch these nerve branches. However, the prognosis for facial nerve function recovery after surgery for benign parotid tumors is generally excellent. All cases of facial paralysis in our study gradually improved, with 73% recovery at 3 months and 100% recovery at 6 months. These findings are consistent with those of other studies, in which postoperative facial nerve paralysis following parotid surgery is primarily temporary and typically resolves completely within 6–12 months [8, 9]. The underlying mechanisms of facial paralysis are mainly related to edema, thermal injury, or mechanical trauma to the nerve during dissection, resulting in a transient conduction block [9]. The recovery time depends on the severity of the injury (neuropraxia or axonotmesis), although most cases of neuropraxia recover within a few weeks to several months.

Regarding other complications, we observed two cases of sialocele and mild postoperative salivary fistula (each accounting for ~4.5%). These are common complications of salivary gland surgery, with reported incidences ranging from 5–10% across patient series [7, 8]. Sialocele occurs due to saliva secretion from the residual glandular tissue into the subcutaneous dead space. In this study, both patients with sialocele and salivary fistula were successfully managed conservatively (aspiration and compression) without the need for further invasive intervention. Other measures that can be applied for cases of persistent salivary fistula include injection of botulinum toxin into the parotid gland to reduce saliva secretion [7]. We did not encounter any severe postoperative infections; only a few patients experienced mild bruising and transient numbness around the surgical site, which were temporary and did not result in long-term sequelae. Regarding recurrence, although no cases were observed in our series, the maximum follow-up period was only 2 years. Long-term follow-up is necessary, as pleomorphic adenomas may recur many years after surgery if small satellite lesions are left behind during the initial procedure [5, 10]. The recurrence rate of parotid pleomorphic adenomas has been reported domestically at approximately 6–7% [5, 10], and in international studies, it ranges from 4–10% depending on the duration of follow-up [2]. Therefore, surgeons must ensure complete tumor excision with adequate surgical margins to minimize the risk of recurrence. Careful dissection and avoidance of capsule rupture are critical. Accordingly, in our study, only two surgical approaches, superficial parotidectomy and total parotidectomy, were employed to reduce the risk of tumor recurrence.

5. CONCLUSION

In this study of 22 patients with parotid pleomorphic adenoma, who underwent preoperative assessment and parotidectomy with maximal facial nerve preservation at the Department of Oral and Maxillofacial – Reconstructive Surgery, Military Hospital 103, between January 2023 and January 2024, the results indicate that facial nerve - sparing parotid tumor excision (in many cases limited to total superficial parotidectomy) yielded highly favorable outcomes: 100% of patients achieved complete recovery of facial motor function within 6 months, with no cases of serious long-term complications or tumor recurrence observed during the follow-up period. Facial nerve paralysis is a common early complication (approximately 80% of patients exhibited facial weakness immediately after surgery). Still, it was mostly mild to moderate in severity, and all cases achieved complete recovery within 6 months. Other complications, such as sialocele and salivary fistula, occurred at low rates and were successfully managed conservatively. No cases of severe infection, Frey's syndrome, or tumor recurrence were observed in this patient series.

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