

Original Article

Complications of Parotid surgery: A study in 60 cases

Kazi Atikuzzaman¹, Mushfiqur Rahman², Naseem Yasmeen³

Abstract:

Objective: To evaluate the common complications following parotid surgery.

Material & methods: A retrospective study was done from January 2011 to December 2019 in the Department of ENT & Head Neck Surgery, Enam Medical College & hospital, Savar. Sixty (60) patients with both benign & malignant parotid disease underwent surgical treatment was selected for this study. All cases were diagnosed preoperatively by Fine Needle Aspiration Cytology (FNAC). Patients with preoperative facial nerve palsy were excluded from this study. Patients were followed up for six months and per operative & postoperative complications were evaluated.

Results: Out of 60 patients, superficial parotidectomy was done in 52 (86.67%) patients and total conservative parotidectomy was done in 08 (13.33%) patients. In this study 56 cases were benign and 04 cases were malignant. Among this 41 (68.33%) pleomorphic adenoma, 05 (8.33%) Warthin's tumour, 03 (5%) benign lymphoepithelial cyst, 03 (5%) haemangioma, 02 (3.33%) sialocele, 01 (1.67%) dermoid and 01 (1.67%) had salivary fistula. All 04 (6.67%) malignant cases were diagnosed as mucoepidermoid carcinoma. Majority of pleomorphic adenomas (92.68%) involved the superficial lobe of the gland. Most commonly observed post operative complication was facial nerve paresis (05%), but only 1.67% developed permanent palsy. Others complication includes Hypoesthesia of the greater auricular nerve (05%), Frey's syndrome (3.33%) & wound infection (3.33%).

Conclusion: Facial nerve palsy is the frequent complication after parotid surgery in this study. Surgeons have to pay attention to minimize the risk of complication during parotidectomy. However, this operation continues to be a challenge on account of the wide range of tumours encountered and the variations in size and location and the facial nerve preservation.

Key words: Parotid surgery, pleomorphic adenoma, complications

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1. Associate professor, Dept of ENT & Head Neck Surgery, Enam Medical College & Hospital, Savar, Dhaka.
 2. Assistant professor, Dept of ENT & Head Neck Surgery, Enam Medical College & Hospital, Savar, Dhaka.
 3. Professor, Dept. of ENT & Head Neck Surgery, Medical College for Women & Hospital, Uttara

Address of Correspondence: Dr. Kazi Atikuzzaman, Associate professor, Department of ENT & Head Neck Surgery, Enam Medical College & Hospital, Savar, Dhaka. E-mail: dratikmmc@yahoo.com, Mobile: +8801912 098 142

Introduction:

Salivary gland tumors represent 3-10% of all head and neck neoplasms¹. These tumors occur predominantly in major salivary glands^{2,3}. The parotid gland is affected most often, ranging from 36.6% to 83%. Malignant tumors are a minority, occurring in 15-32% of cases^{1,4,5}. The most common malignant and benign tumors are the mucoepidermoid carcinoma and the pleomorphic adenoma, respectively^{6,7}. The pleomorphic adenoma comprises 45-60% of all salivary gland tumors. Approximately 80% occur in the parotid gland, usually in the inferior pole of the superficial lobe; however, less frequently, it can occur at the deep lobe or in the accessory parotid tissue⁸.

Benign parotid tumors present as painless, well-defined, mobile lesions, of firm-elastic consistency, with slow growth, without alterations of the overlying skin, remaining asymptomatic for a long period of time. Dysphagia may be present in deep lobe parotid tumors or in cases of parotid tumors with extension in the parapharyngeal space. A significant proportion of malignant tumors exhibit a clinical picture difficult to differentiate from benign tumors, especially in the early stages of evolution. Alarm signs and symptoms of malignant parotid tumors are pain, rapid growth with surrounding tissue invasion, ulcerations of the overlying skin, pathological cervical adenopathy, facial nerve palsy, otalgia, weight loss, and reduced appetite²⁵.

The surgical treatment planning varies according to the histological type of parotid tumor. Surgery for malignant tumors must follow the oncological principles, while benign lesions require less invasive surgical treatment²⁶. For this reason, preoperative diagnostic classification of parotid lesions into benign or malignant type is of paramount importance. Since biopsy is banned for the parotid territory, because facial nerve injury and permanent salivary fistulae pose a severe risk to the procedure, the preoperative imaging diagnosis supported with cytologic

investigation becomes the key element of optimum management. Several surgical approaches have been described to treat this tumor. In 1895, Senn described enucleation as the technique of choice. However, tumor removal was incomplete with an unacceptable rate of recurrence.⁸ Total parotidectomy removes all gland tissue lateral and medial to facial nerve, whereas superficial parotidectomy removes parotid gland lateral to the facial nerve. In extracapsular dissection, it is not performed any dissection of the facial nerve^{8,10-14}.

There is ample data pertaining to site specific morbidity following parotidectomy (e.g. facial nerve weakness, salivary fistula, and Frey's syndrome); however, the literature on general postoperative surgical morbidity following parotidectomy is lacking¹⁵. Our investigation aims to provide a reference in parotidectomy surgery including patient demographics, operative variables, and to evaluate the common complications and postoperative outcomes following parotid surgery.

Material & methods:

A retrospective study was done from *January 2011 to December 2019* in the Department of ENT & Head Neck Surgery, *Enam Medical College & Hospital, Savar*. Sixty (60) patients with both benign & malignant parotid disease underwent surgical treatment was selected for this study.

All cases were diagnosed preoperatively by Fine Needle Aspiration Cytology (FNAC) and confirmed by postoperative histopathology report. Patients with preoperative facial nerve palsy were excluded from this study. Investigator himself was remain vigilant on every aspect of the study starting from case selection, follow up, investigating patients, data sheet filling up, maintenance of all records, data checking, data entry, analysis and report writing. He was personally examine each and every case and was constantly guide the proceeding as far as possible. Patients were followed up for six months and postoperative complications were evaluated.

Results:

Table I :
Demographic data of 60 patients

Parameters		
Age	Median: 39.5	Range: 14-65
Sex	Male: 48	Female: 12
side	Right: 27	Left: 33
Previous parotid operations	03	

Table II :
Types of surgery performed(n= 60)

Name of surgery	Number of patients	Percentage
Superficial parotidectomy	52	86.67%
Total conservative parotidectomy	08	13.33%

Table II :
Distribution of disease for parotid surgery (n=60):

Nature of disease	Number of patients	Percentage
Pleomorphic adenoma	41	68.33 %
Superficial lobe	38	(92.68%)
Deep lobe	03	(7.32%)
Warthins tumor	05	12.5%
Benign lymphoepithelial cyst	03	8.33%
Haemangioma	03	8.33%
Sialocele	02	3.33%
Dermoid	01	1.66%
Parotid fistula	01	1.67%
Mucoepidermoid Carcinoma(Low grade)	04	6.67%

Table IV :
Common postoperative complications:

Complications	No. of patients	Percentage
Facial nerve palsy	03	5%
Hypoesthesia of great auricular nerve	03	5%
Frey's syndrome	02	3.33%
Wound infection	02	3.33%
Recurrence	0	0%
Salivary fistula	0	0%

Table V :
Study of nerve injury after parotid surgery:

Nerve injured	No. of patients	percentage
Facial nerve		
Temporary(partial)	02	3.33%
Permanent(partial)	01	1.57%
Great auricular nerve(C2,3)	03	05%

Table VI :
Branches of facial nerve injured during parotid surgery

Types of injury	Branches	No. of patients	Percentage
Single branch	Tempotal	0	0%
	Zygomatic	0	0%
	Buccal	0	0%
	Mandibular	02	3.33%
	Cervical	0	0%
Multiple branch	Lower trunk (cervicofacial)	01	1.67%
Complete	All	0	0%

Discussion:

Facial weakness is a major complication after parotidectomy, which severely affects patient quality of life postoperatively¹⁵. The reported incidences ranges from 14.0 to 23.1% in terms of temporary facial weakness¹⁸⁻²⁰ with one exceptionally high occurrence of 64.6%²¹.

Our aim was to see the early and late complications in patients undergoing parotid surgery. Successful management depends on accurate clinical assessment and diagnosis with appropriate use of FNAC and imaging. Parotidectomy is the main modality of treatment and is safe procedures. The type of parotidectomy is planned based on the intraglandular location of the tumour. Benign parotid tumors are treated with superficial parotidectomy. Management of malignant parotid tumor depends on the tumor stage and histological grade; those in the advanced

stage are treated with total parotidectomy with MRND along with adjuvant chemoradiotherapy. A comprehensive understanding of the anatomy of the facial nerve with meticulous dissection is paramount to reducing the incidence of facial nerve injury during parotidectomy. The overall prognosis is good for all type of parotid gland tumors, with early proper diagnosis and appropriate treatment. Long-term follow-up is necessary as these tumors tend to recur. Since the most malignant tumor is asymptomatic and long standing benign tumor can undergo malignant change, community awareness, and early referral are necessary, as the prognosis is good if treated early.

Out of 60 patients, superficial parotidectomy was done in 52 (86.67%) patients and total conservative parotidectomy was done in 08

(13.33%) patients. In this study 56 cases were benign and 04 cases were malignant. Among this 41 (68.33%) pleomorphic adenoma, 05 (8.33%) warthin's tumour, 03 (5%) benign lymphoepithelial cyst, 03(5%) haemangioma, 02(3.33) sialocele, 01(1.67) dermoid and 01 (1.67%) had salivary fistula. All 04(6.67%) malignant cases were diagnosed as low grade mucoepidermoid carcinoma. Majority of pleomorphic adenomas (92.68%) involved the superficial lobe of the gland. Most commonly observed post operative complication was facial nerve paresis (05%), but only 1.67% developed permanent palsy. Others complication includes Hypoesthesia of the greater auricular nerve (05%), Frey's syndrome (3.33%) & wound infection (3.33%).

The cases of transient facial nerve paresis generally resolved within 6 months, with 90% within 1 month. Temporary paresis usually resolves, according to Laccourreye, within the 18th post-operative month^{16,17}. In this study temporary paresis resolved within 6months. The rate of facial nerve injury was higher in recurrent cases & those involved the deep lobe of parotid. Malignancy and recurrent tumors were common risk factors of postoperative facial weakness in previous studies²²⁻²⁴. In our study, the size of the tumor was not a significant risk factor for facial weakness, but the subsite of the tumor was. Previously, one study found that tumors larger than 70 cm³ correlated with a significant risk for facial weakness¹⁸. In the case of malignant tumors, it is important to secure a safety margin during surgery. Therefore, there can be a high possibility that the facial nerve is intentionally resected during surgery. The rate of recurrence is very low (0%) in this study. The clinical incidence of Frey's syndrome, after parotidectomy, has been reported in various studies, to be as high as 50% (severe in 15%). Gustatory sweating is detected in almost 100% of cases, evaluated

by means of a post-operative iodine-starch test¹⁷. Salivary fistula and sialocele are usually self-limiting problems and are initially submitted to conservative treatment. Anticholinergic drugs induce a temporary decrease in salivary secretion and are consequently considered useful in fistula management.

Conclusion:

Transient facial palsy is the most common postoperative complication. The best means of reducing iatrogenic facial nerve injury in parotid surgery still remains a clear understanding of the anatomy, good surgical technique with the use of multiple anatomic landmarks & use of modern instruments eg. nerve monitor.

Limitations:

This study is subject to some limitations inherent to the use of a large national database. It is hospital based one centre study that is not representing whole feature of country The most notable of these is the absence of procedure-specific outcomes such as facial nerve paresis or recurrence and the inability to assess complications beyond six months of postoperative period.

References:

1. Foresta E, Torroni A, Di Nardo F, de Waure C, Poscia A, Gasparini G, et al. Pleomorphic adenoma and benign parotid tumors: extracapsular dissection vs superficial parotidectomy - review of literature and meta-analysis. *Oral Surg Oral Med Oral Pathol Oral Radiol.* 2014;117:663-76.
2. Loyola AM, Araújo VC, de Sousa SOM, de Araújo NS. Minor salivary gland tumors. A retrospective study of 164 cases in a Brazilian population. *Oral Oncol Eur J Cancer.* 1995;31:197-201.

3. Nanda KDP, Mehta A, Nanda J. Fine-needle aspiration cytology: a reliable tool in the diagnosis of salivary gland lesions. *J Oral Pathol Med.* 2012;41: 106-12.
4. Kayembe MK, Kalengayi MM. Salivary gland tumors in Congo (Zaire). *Odontostomatol Trop.* 2002;25:19-22.
5. Satko I, Stanko P, Longauerova I. Salivary gland tumors treated in the stomatological clinics in Bratislava. *J Craniomaxillofac Surg.* 2000;28:56-61.
6. Long-Jiang L, Yi L, Yu-ming W, Hongwei Z. Clinical analysis of salivary gland tumor cases in West China in past 50 years. *Oral Oncol.* 2008;44:187-92.
7. Lima SS, Soares AF, de Amorim RF, Freitas R, de A. Epidemiologic profile of salivary gland neoplasms: analysis of 245 cases. *Braz J Otorhinolaryngol.* 2005;71:335-40.
8. Zbären P, Vander Poorten V, Witt RL, Woolgar JA, Shaha AR, Triantafyllou A, et al. Pleomorphic adenoma of the parotid: formal parotidectomy or limited surgery? *Am J Surg.* 2013;205:109-18.
9. Senn N. *The pathology and surgical treatment of tumors.* Philadelphia, PA: W.B. Saunders; 1895.
10. Witt RL. The significance of the margin in parotid surgery for pleomorphic adenoma. *Laryngoscope.* 2002;112: 2141-54.
11. Klintworth N, Zenk J, Koch M, Iro H. Postoperative complications after extracapsular dissection of benign parotid lesions with particular reference to facial nerve function. *Laryngoscope.* 2010;120:484-90.
12. Roh JL, Kim HS, Park CI. Randomized clinical trial comparing partial parotidectomy versus superficial or total parotidectomy. *Br J Surg.* 2007;94: 1081-7.
13. Malard O, Wagner R, Joubert M, Delemazure AS, Rio E, Durand N, et al. Prognostic factors for secondary recurrence of pleomorphic adenoma: a 20-year, retrospective study. *J Laryngol Otol.* 2013;127:902-7.
14. Zhang SS, Ma DQ, Guo CB, Huang MX, Peng X, Yu GY. Conservation of salivary secretion and facial nerve function in partial superficial parotidectomy. *Int J Oral Maxillofac Surg.* 2013;42:868-73.
15. Koch M, Zenk J, Iro H. Long-term results of morbidity after parotid gland surgery in benign disease. *Laryngoscope.* 2010;120(4):724–30.
16. Laccourreye H, Laccourreye O, Cauchois R, Jouffre V, Ménard M, Brasnu D. Total conservative parotidectomy for primary benign pleomorphic adenoma of the parotid gland: a 25-year experience with 229 patients. *Laryngoscope.* 1994 Dec; 104(12):1487-94.
17. R Marchese-Ragona, C De Filippis, G Marioni, and A Staffier. Treatment of complications of parotid gland surgery. *Acta Otorhinolaryngol Ital.* Jun 2005; 25(3): 174–178
18. Guntinas-Lichius O, Gabriel B, Klusmann JP. Risk of facial palsy and severe Frey's syndrome after conservative parotidectomy for benign disease: analysis of 610 operations. *Acta Otolaryngol.* 2006;126(10):1104–1109. doi: 10.1080/00016480600672618
19. Witt RL. Facial nerve function after partial superficial parotidectomy: an 11-year review (1987-1997) *Otolaryngol Head Neck Surg.* 1999;121(3):210–213. doi: 10.1016/S0194-5998(99)70173-7.

20. Yuan X, Gao Z, Jiang H, Yang H, Lv W, Wang Z, et al. Predictors of facial palsy after surgery for benign parotid disease: multivariate analysis of 626 operations. *Head Neck*. 2009;31(12): 1588–1592. doi: 10.1002/hed.21134.
21. Laccourreye H, Laccourreye O, Cauchois R, Jouffre V, Menard M, Brasnu D. Total conservative parotidectomy for primary benign pleomorphic adenoma of the parotid gland: a 25-year experience with 229 patients. *Laryngoscope*. 1994;104(12): 1487–1494. doi: 10.1288/00005537-199412000-00011
22. Watanabe Y, Ishikawa M, Shojaku H, Mizukoshi K. Facial nerve palsy as a complication of parotid gland surgery and its prevention. *Acta Otolaryngol Suppl*. 1993;504:137–139. doi: 10.3109/00016489309128140.
23. Mehle ME, Kraus DH, Wood BG, Benninger MS, Eliachar I, Levine HL, et al. Facial nerve morbidity following parotid surgery for benign disease: the Cleveland Clinic Foundation experience. *Laryngoscope*. 1993;103(4 Pt 1): 386–388. doi: 10.1002/lary.5541030404.
24. Bron LP, O'Brien CJ. Facial nerve function after parotidectomy. *Arch Otolaryngol Head Neck Surg*. 1997; 123(10):1091–1096. doi: 10.1001/archotol.1997.01900100065009.
25. Zhan KY, Khaja SF, Flack AB, Day TA. Benign parotid tumors. *Otolaryngol Clin North Am*. 2016;49(2):327–42.
26. Prasad RS. Parotid gland imaging. *Otolaryngol Clin North Am*. 2016;49(2): 285–312.