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Original Research Article

Microscopic Antegrade Parotidectomy for Different Types of Parotid Tumor

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ABSTRACT:

Introduction: Salivary gland tumor accounts for about 5% of all the neoplasms of the head and neck. 75% of such tumors occur in the parotid glands. Pleomorphic adenoma is the most common type of benign salivary gland tumor. It tends to recur after inappropriate treatment. Surgery of parotid tumor includes enucleation, superficial parotidectomy and total parotidectomy. Identification and preservation of facial nerve trunk and its branches is very important in parotid surgery. Advancement of microsurgical technique has helped in better visualization, identification and preservation of the facial nerve. **Methods:** This prospective study included twenty-seven patients. Preoperative ultrasonography and fine needle aspiration cytology were done for all cases. Computed tomography/magnetic resonance imaging were performed in some cases when needed. Standard microsurgical technique with the help of microscope was performed for antegrade parotidectomy. Data analysis was done using SPSS version 26.0. **Results:** The patients age ranged from 12 to 78 years. Fifteen (55.6%) patients were female and 12 (44. 4%) were males. Sixteen (59.3%) tumors were located on the right side whereas 11 (40.7%) were on the left side. Most of the tumors (n=18, 66.7%) were pleomorphic adenoma. Two (7.4%) of the patients had temporary facial paralysis which improved with time. Two (7.4%) patients had developed hematoma. Frey's syndrome was not found in follow-up. **Conclusion:** This study showed low morbidity in parotidectomy using microsurgical techniques. No permanent injury to the facial nerve was found.

Keywords: Antegrade parotidectomy, Facial nerve trunk, Microsurgical technique

INTRODUCTION:

Salivary gland tumors account for about 5% of all the neoplasms of the head and neck. 75% of such tumors occur in the parotid glands.[1,2] Pleomorphic Adenoma (PA) is the most common type of benign salivary gland tumor comprising 40-60% of all salivary gland tumors.[3]

Parotidectomy is a common surgical procedure for parotid tumor.[4] In total parotidectomy, the parotid tissue present on the lateral and medial side of the nerve is to be removed, whereas in case of superficial parotidectomy, the parotid tissue lateral to the facial nerve is to be removed along with the tumor. In extracapsular dissection, 2 to 3 mm rim of healthy tissue should be removed together with the tumor.[5] The main concept behind the antegrade parotidectomy is to identify the trunk of the facial nerve coming from the stylomastoid foramen. The trunk of this nerve lies about 1cm deep and inferior to the tragal point. The landmark needed to identify the trunk are tympano-mastoid suture, posterior belly of digastric, and mastoid tip. In contrast to an antegrade method, the retrograde method requires identification of the buccal branch of the facial nerve which is about 4 cm anterior to the tragus along the alatragal line. This branch is dissected in a retrograde fashion as far as the main trunk of the

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facial nerve. The remaining branches of the facial nerve are dissected in an antegrade fashion.[6]

The concept of the microsurgical method in parotid surgery is a recent technique. The use of a microscope in such surgeries is to improve the clarity of dissection, to identify the trunk and branches of the nerve. The main aim of this research is the preservation of the facial nerve function in various types of parotid tumours in microscopic assisted parotidectomy.

METHODS:

This prospective study involving a consecutive cohort of 27 patients were conducted in the Department of Otolaryngology and Head and Neck Surgery, Gandaki Medical College, Pokhara, Nepal from February 2017 to January 2020. The study was approved by the Institutional Ethical Committee. Informed consent was taken from all the patients included in the study.

Preoperative ultrasonography and Fine Needle Aspiration Cytology (FNAC) were done in all cases. The histological diagnosis was established based on the preoperative FNAC. Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) were performed if necessary. The patients who had undergone surgery by antegrade method for parotid tumor with stage T1-T4a, any N, M_0 and those patients requiring revision surgery were included in the study. Tumors with stage T4b, M1and those performed with the retrograde method were excluded.

Surgical technique:

All the cases were performed under general anesthesia. Required aseptic precaution was taken. Local infiltration was done with 2%xylocaine and 1:200000 adrenaline solution in the incision line. Modified Blair incision was given. The anterior and posterior flaps were elevated. A microscope (Zeiss OPMI or Leica) was used for further dissection. Greater Auricular nerve was identified and the posterior branch was saved. Tragal pointer, mastoid tip, and the posterior belly of digastric muscles were identified. The facial nerve trunk was identified in each case. Tracing of each branch of the facial nerve was done (Fig.1). All the branches of nerve were identified and each branch was preserved (Fig.2). The tumor was removed.

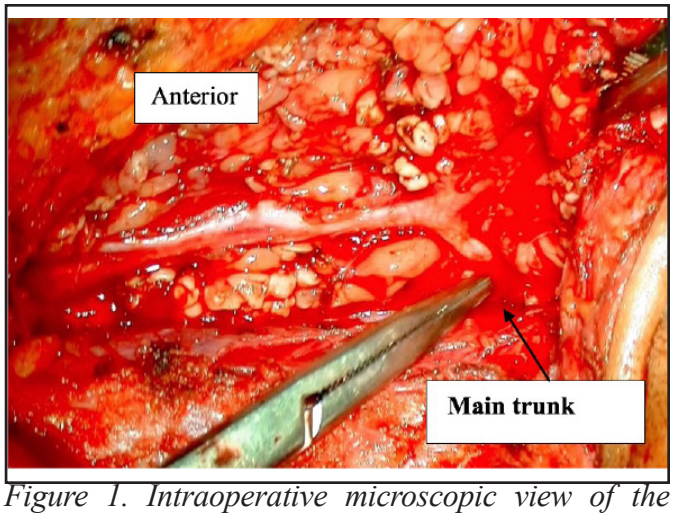

Figure 1. Intraoperative microscopic view of the Right main trunk and the branches of the facial nerve.

Depending on the histopathological type of tumor, further dissection was done. In cases where the deep lobe of parotid was involved by tumor, tumor removal was performed in between the two branches of facial nerve. Lateral Neck dissection was done in mucoepidermoid carcinoma and adenoid cystic carcinoma.

We observed temporary or permanent injury to the various branches of the facial nerve, the occurrence of Frey's syndrome, and aesthetic satisfaction. The mean follows up period was 20 months.

Data were entered in MS Excel spreadsheet. Analysis was done by using Statistical Package for Social Sciences (SPSS™) software version 26.0. Percentage and frequency were calculated using descriptive statistics.

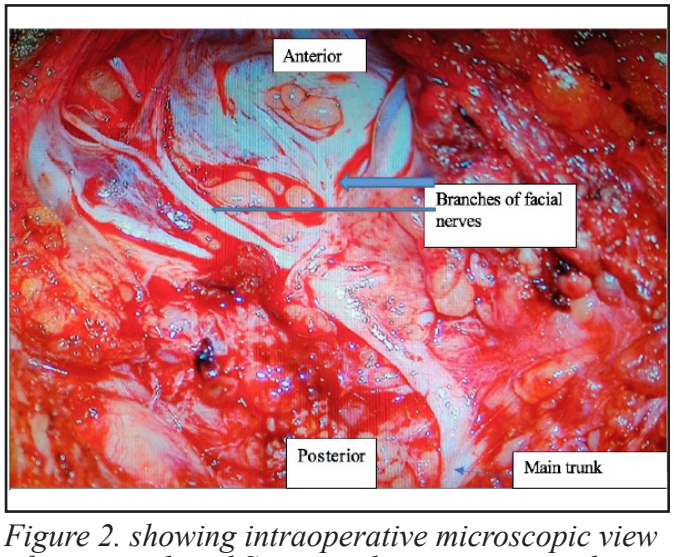

Figure 2. showing intraoperative microscopic view of main trunk and Superior division in parotid lymphangioma Pleomorphic adenoma.

RESULTS:

The mean age of the patients was 30±16.4 years, with a range from 12 to 78 years. Fifteen (55.6%) patients were female and 12(44. 4%) were males. Sixteen (59.3%) tumors were located on the right side whereas 11(40.7%) were on the left side. The average operation time in the superficial parotidectomy group was 2hours and 30 minutes (range: 2 hours to 3hours and 40 minutes) and for total parotidectomy, the average operation time was 3 hours 30 minutes (range: 2 hours 50 minutes to 6hours 30 minutes).

Most of the tumors were pleomorphic adenoma (n=18, 66.7%) (Table 1). Most commonly performed surgery was superficial adequate parotidectomy (23, 85.2%) (Table 2).

Table 1. Types of parotid tumor (N=27).

Type of tumor	Frequency (%)
Pleomorphic adenoma	18 (66.7)
Monomorphic adenoma	2 (7.4)
Warthin tumor	2 (7.4)
Mucoepidermoid carcinoma	2 (7.4)
Adenoid cystic carcinoma	1 (3.7)
Lymphangioma	1 (3.7)
Tuberculosis	1 (3.7)
Total	27 (100)

Table 2. Treatment of parotid tumor.

Type of surgery	Frequency (%)
Superficial adequate parotidectomy	23 (85.2)
Total conservative parotidectomy with Neck dissection	2 (7.4)
Total parotidectomy with Neck dissection	2 (7.4)

Post-operative complications were assessed. Two (7.4%) of patients had temporary facial paralysis which improved with time. One (3.7%) patient had developed a hematoma. One (3.7%) had permanent facial paralysis as the nerve was sectioned due to the infiltration of the nerve by adenoid-cystic carcinoma. Frey's syndrome was found in none in follow-up.

DISCUSSION:

In the early 20th century, parotid surgery was concerned more with damaging either the trunk or branches of the facial nerve rather than the recurrence of the disease.[7] In those days, injury to the facial nerve was avoided by simple enucleation of the tumor. Recurrence rate was high (20-40%) in such cases.[8] Tumor satellites could be missed during enucleation. Superficial parotidectomy was performed in an attempt to lower the recurrence rate. A study by Webb A and Eveson J reported 1-4% of recurrence rate while using the above procedure.[9]

In our study, 81.5 % of tumors were found to be benign, whereas in the study done by Bussu et al.,[10], 88.7% cases were benign. Superficial or total parotidectomy was considered the standard method for the treatment of parotid tumors.[11,12,13] Undesired complications were seen because the tumor was in contact with one or more branches of facial nerve and due to involvement of deep lobe and parapharyngeal space.[14,15]

We applied modified Blair incision in all cases. The posterior branch of the greater auricular nerve was saved which supplies lobule and infrauricular area. We closed wounds meticulously thereby providing better cosmetics results.[16]

Aiding the microscope in surgery helps better visualization of not only the main trunk of the facial nerve but also its branches.[17] We first identified the main trunk of the facial nerve then followed the branches. According to Witt et al., tympano-mastoid suture is the key structure used to identify the main trunk of the facial nerve.[18] Although it is a constant landmark, it lies deeper and is difficult to identify each time. So, more superficial and widely used landmarks are posterior belly of digastric and tragal pointer. We felt the microscope aided surgery was better in identifying the facial trunk and branches and in dissecting the tumor from the facial nerve or its branches due to better visualization and magnification. But it is difficult to handle for new surgeons and has a slow and steady learning curve.

In our study, 7.4% of patients had temporary facial paralysis which improved over time. One (3.7%) had permanent facial paralysis as the nerve was sectioned due to the infiltration of the nerve by adenoid-cystic carcinoma. Numbness of ear lobule was found in 14.8% cases which improved over three to five months. Hematoma developed in one case of lymphangioma which was managed by evacuation of the hematoma, daily pressure dressing and use

of amitriptyline for 10 days. It was completely subsided. None of the patients developed Frey's syndrome post-surgery. But is recognized that a high proportion of patients will develop Frey's syndrome after parotidectomy.[19,20] Use of a microscope during parotid surgeries enables better identification and therefore preservation of the associated and surrounding nerves which might be injured during the conventional method.

There are some limitations of the study. It is a single center study and the sample size is small. This calls for further similar multicenter studies with larger sample size.

CONCLUSION:

This study found that microscopic assisted antegrade parotidectomy led to fewer complications than reported for conventional methods. The use of a microscope in surgery may represent a useful tool in improving accuracy and minimizing local tissue trauma and thus decreasing facial nerve paresis.

Conflict of Interest: The authors declare that no competing interests exist.

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