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Partial Superficial Parotidectomy for Pleomorphic Adenoma

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Objective: This study aimed to determine the indications of partial superficial parotidectomy with extracapsular dissection and traditional superficial parotidectomy for the removal of pleomorphic adenoma.

Design: Retrospective review study.

Setting: Department of Otorhinolaryngology and Head and Neck Surgery, King Abdulaziz University, KSA.

Method: Treatment of 30 patients of pleomorphic adenoma is reviewed. Partial superficial parotidectomy (PSP) and extracapsular dissection (ECD) were performed using nerve monitoring.

Result: Most of the tumors were 4-5 cm in diameter and located in the lower half of the gland. Postoperatively, we had 5 facial nerves weakness, which resolved within three months. No tumor recurrence or postoperative depression was observed. Some of the gland function was retained.

Conclusion: This alternative approach is safe and can be considered in cases of small tumors of the superficial lobe of the parotid gland.

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Salivary gland tumors constitute 6% of head and neck tumours[1-4]. The parotid gland is commonly affected, accounting for 70-80% of all types of salivary gland tumors. Fortunately, the majority of these tumors are benign[1-3].

Superficial parotidectomy, partial superficial parotidectomy (PSP), and extracapsular dissection (ECD) were described to remove these tumors. The last two techniques have gained acceptance and are increasingly used to treat parotid gland tumors in an effort to retain some glandular function, minimize the complication rate and still secure complete removal of the tumor.

It is difficult to determine whether to save the facial nerve branches with primary anastomosis or cable grafting if the tumor encases the facial nerve trunk or one of its branches. Most authorities agree that complete extirpation of the involved branches and subsequent cable

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grafting, with or without onsite facial reanimation procedures, is preferred to prevent or decrease the incidence of tumor recurrence or malignant transformation. Without complete tumor extirpation, the incidence of malignant transformation is 5-10%[1,3].

The aim of this study is to determine the indications of PSP with ECD retrospectively.

METHOD

Thirty patients' charts diagnosed with pleomorphic adenoma of the parotid gland were reviewed; 17 were men and 13 were women, the median age is 38.1 years (range, 23-65 years). Swelling associated with the parotid gland had been observed in the patients for an average period of 30.1 months (range, 10-60 months), prior to surgical intervention. Four patients were admitted for revision surgery which had been performed in different institutions.

Parotid gland tumors were diagnosed by fine needle aspiration cytology, which was suggestive of pleomorphic adenoma in most cases but was inconclusive in ten individuals[5]. Most of our patients had computed tomography scans of the glands and surrounding regions of the neck for better evaluations. Magnetic resonance imaging was attempted preoperatively in some cases in order to identify the position of the facial nerve, but was abandoned because of its failure to clearly identify the position of the nerve and its relationship to the tumors[6,7].

Dissection of the tumor from the branches of the facial nerve was facilitated by the use of a facial nerve monitor and stimulator. Twenty-four patients had PSP for the removal of the lateral portions of the tumor and ECD was performed in all patients when the tumor was in contact with one of the branches of the facial nerve. Initially, the marginal mandibular nerve is identified at its lateral portion and traced to the lower trunk. ECD was performed if the tumor was in close proximity to one of the terminal branches (marginal mandibular or buccal); complete parotidectomies were performed in 6 patients. PSP was performed on the affected part of the gland while the rest of the normal tissue of the gland was left undisturbed.

All of the resected tumor specimens were examined by standard histopathologic techniques to determine the dominance of cellular and morphologic tumor patterns.

RESULT

Most of the tumors were 4-5 cm in diameter and were located in the lower half of the gland. Resection required a retrograde dissection of the lower division of the VII nerve. The utilization of a facial nerve monitor and stimulator greatly facilitated the separation of the tumor from the nerves. The unaffected parotid tissue was left undisturbed if there was no intraoperative evidence of involvement. The deep lobe of the parotid gland was removed in six patients, four were revision surgery. None of the treated patients demonstrated any signs of recurrence during more than 48 months of follow-up.

Only five (20.8%) patients of postoperative facial nerve weakness were encountered, all resolved within 3 months after surgery. Three (10%) patients developed Frey's syndrome (revision cases), one patient was affected mildly, while others severely affected. Patients severely affected were given Botulinum toxin-A injections (40 IU) at 6-month intervals for two years which gave them reasonable relief.

DISCUSSION

Pleomorphic adenomas are slow growing tumors with poor or incomplete capsule formation. They are characterized by the development of pseudopod projections into the surrounding tissues, which explains their recurrence after removal by enucleation[8-10]. Recurrence of a pleomorphic adenoma may occur decades after the primary surgery, and much research has been put forward to explain the phenomenon, including cell behavior, multicentricity, genetic mutation, incomplete excision or tumor spillage during resection[8-12].

Traditionally, superficial parotidectomy is the standard technique employed to resect parotid adenomas[1,3,12-14]. However, in the last two decades, PSP or ECD techniques were employed to remove the tumor along with a cuff of healthy tissue around it, while preserving the rest of the parotid gland[12,14-23]. PSP combined with ECD was employed in the majority of the cases described in the present study and no recurrence was seen. However, long-term follow-up is necessary to ascertain the validity of this technique and its limitations.

The thickness of the parotid gland capsule is variable and this may be associated with challenges in determining an appropriate resection margins for the tumor as well as for postoperative radiologic detection of early recurrence. Detection of early stage recurrence is hampered by the radiologist’s experience in differentiating between recurrent tumor tissue and other tissue planes[6,7]. Given these limitations, the dissection techniques (ECD and PSP) are justified, particularly among young patients, female patients and those with small tumors. The drawbacks of performing superficial parotidectomy with ligation of the parotid duct, the dissection of the upper and lower trunks of the facial nerve and the postoperative depression of the operated site should be reconsidered.

Facial nerve paralysis is a known complication of parotid gland surgery, the incidence of which is 10-53%[24]. The paralysis could be temporary (15-65%) or permanent (2-15%)[24-26]. This wide diversity in the observed incidence of postoperative paralyses may be attributed to the frequency of cases seen at an institution, the size of the tumor and its proximity to the facial nerve, the experience of the surgeons, the monitoring devices used intra-operatively, the dissection technique employed and the postoperative examination and evaluation[24-32]. Most nerve paralysis occurs in one of the branches of the facial nerve, particularly the marginal mandibular branch (up to 48%). Most of the parotid tumors occur in the lower portion of the gland compared to the upper half where the incidence of frontal branch injury is low[27,32].

Total parotidectomies and revision surgeries carry a high incidence of nerve injuries, up to 53% (38% temporary and 15% permanent)[27,32]. Previous studies on the ECD technique have reported a decreased incidence of facial nerve injuries, although other researchers have contradicted that[16,19-23,33,34]. The type of dissection technique used particularly in the ECD may be a factor related to the disparity associated with the incidence of nerve injuries. Sungur et al reported that there was no statistically significant difference between the antegrade and the retrograde dissection techniques and the incidence of facial nerve injury[8]. Although this

may be a valid observation, the retrograde technique employed in the present cases indicates that the retrograde dissection carries a low chance of injury because the nerve is identified at its terminal branches and dissected back under direct vision to its lower trunk division while the tumors is dissected away from the nerve.

The present study used facial nerve stimulator; others have found it to be beneficial, especially in revision cases, surgeries associated with large tumors, total parotidectomies and for teaching purposes in academic institutions[31]. Dulguerov et al found the use of facial nerve monitoring helpful, but they could not make definite conclusions due to lack of a control group[24]. Alternatively, Reily et al concluded that the use of a facial nerve stimulator is not necessary as their outcomes were the same[29].

The incidence of Frey's syndrome is highly variable (15-60%)[23,27,31,35,36]. Three patients in the present study were documented to have Frey's syndrome. Botulinum toxin-A injection is a minimally invasive treatment which was used in our series and the patients are satisfied with the outcome[36].

CONCLUSION

Partial Superficial Parotidectomy (PSP) with Extracapsular Dissection (ECD) and identification of the facial nerve branches is justified and should be considered for all benign parotid tumors, including small pleomorphic adenomas.

Potential conflicts of interest: None.

Competing interest: None. **Sponsorship:** None.

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