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ORIGINAL RESEARCH

Does Enucleation of Mixed Parotid Tumor Predispose to Recurrence? A Decade Experience of 297 Parotid Surgeries

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ABSTRACT

This study aimed to compare the recurrence and postoperative morbidity in the patients operated by enucleation and superficial parotidectomy for pleomorphic adenoma. This was primarily a retrospective study in which a decade of records of 297 patients were accessed to compare between enucleation and superficial parotidectomy. In addition, 5-year records of 102 patient were further analyzed to evaluate post-operative complications. The enucleation group had a single case of recurrence and a significant reduction in post-operative complications as compared to the superficial parotidectomy group. In the future enucleation can be considered a valid option for small pleomorphic adenomas (Size < 2 cm) due to lower post-operative morbidity, shorter hospital stays and acceptable cost, and negligible recurrence in expert hands.

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INTRODUCTION

Pleomorphic adenoma is the most common benign neoplasm of the parotid gland which is painless, slow growing, and remains asymptomatic for long duration of time.[1] Parotidectomy is a common primary surgical approach indicated for benign parotid gland tumors. Types of parotidectomy chosen are based on the preservation of facial nerve to avoid significant morbidities which can affect a patient's quality of life. Superficial parotidectomy and enucleation are commonly performed surgeries for Pleomorphic adenomas. Historically management consisted predominantly of local excision, with rates of recurrence from 20 to 45%.[1-3] During Enucleation tumor is rapidly removed but there is a risk of capsule rupture and incomplete removal. During enucleation, microscopic portions of the tumor perforate the tumor capsule resulting in residual tumor and recurrence.[4] A meta-analysis revealed a recurrence rate of 25% with enucleation.[5] Superficial parotidectomy is the most widely accepted technique in which parotid tissue lateral to the facial nerve is excised along with the tumor. This technique has reduced recurrence rates to 1 to 4%. Complications like facial palsy, Frey's syndrome, Xerostomia, hypoesthesia of ear lobule and pain at operated site are higher in superficial parotidectomy than in enucleation.[6] However, with carefully selected cases with small superficial tumors wherein the chances for capsule rupture during manipulation are minimal the enucleation is hypothesized to provide excellent long-term results with practically no morbidity. Hence the intention of this study is to compare enucleation with superficial parotidectomy in terms of recurrence and postoperative morbidity.

MATERIAL AND METHODS

This is primarily a retrospective study of 297 patients' archival records who underwent parotid surgeries for benign tumours between 2010 and

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2020. The archival data base was analysed in terms of demographic variables and recurrence profile. In addition, the case records of 102 patients operated between 2013 to 2018 were also accessed in detail to evaluate postoperative complications arising out of enucleation and superficial parotidectomy. A proper ethical consent was obtained from the institutional review board for collecting such information in a thesis project (94th ECM II B-Thesis/P13). The basic data of complications of parotidectomy in this paper has been adapted from a Master's thesis work of SG under chief supervision of SK. The criteria for selecting enucleation was primarily small benign tumor size (<2 cm) located superficially, in contrast superficial parotidectomy was carried out in larger sized tumours as well. The enucleation included a small transverse 2 cm (approx.) incision over the most prominent part of the tumour followed by a sharp dissection around the tumor nodule with cold instruments to deliver out the same with its intact capsule. No attempt was made to identify the facial nerve as the tumour was deemed quite superficial. However, a facial nerve monitor was always available in our operating room and nowhere did we use any magnification (microscope) during dissection. The superficial parotidectomy on the other hand was carried out with classical technique as described in the literature but with variability of skin incisions. The clinical parameters of interest were age, gender, type of surgery, recurrence if any, time to recurrence, complications and long-term morbidity. The data was tabulated and evaluated using Microsoft Excel software.

RESULTS

Out of 297 patients, 160 (54%) were males and 137 (46%) females. The age ranged from 4 to 72 years (mean –32.5 years, SD - 14.4, interquartile range –20), with adult population (21–50 years) being most commonly affected (N = 196, 65.9%). The superficial parotidectomy was carried out in 242 (81%) cases, while enucleation in 55 (18.5%) cases. In terms of recurrence only a single case recurred with enucleation amounting to 1.8% in the enucleation group and 0.3% overall. The single recurrence occurred in a 37 years female after 6 years. The summary of complications is depicted in table 2.

Table 1: Age distribution

Age in years	No.	%
<10	13	4.4
11–20	55	18.5
21–30	72	24.2
31–40	81	27.3
41–50	43	14.5
51–60	20	6.7
61–70	12	4.0
71–80	1	0.3

No incidence of pain, temporary facial palsy and Frey's syndrome was noted with enucleation. However, a single case of permanent facial palsy was the result of tumor extending a bit deeper or possibly some associated anomaly of facial nerve. The same case presented with dryness of mouth and sensory phenomenon. Otherwise the postoperative phase was largely uneventful. In contrast a lot more sensory impairment across tragus (in about 1/3rd patients) along with temporary facial palsy (17%) characterised superficial parotidectomy. The later was critical in prolonging the hospital stay and thereby the cost of treatment. The troublesome Frey's syndrome was seen to the tune of 18% that along with tragal anaesthesia/ paraesthesia significantly

Table 2: Distribution of patients according to complications (n=102)

Type of surgery	No. of cases	Pain at operated area	Sensory impairment	Temporary facial palsy	Permanent facial palsy	Frey's syndrome	Dryness of mouth
Enucleation	9	0	1 (11 %)	0	1 (11 %)	0	2 (22%)
Superficial parotidectomy	70	6 (8.5%)	22 (31%)	12(17%)	3(4%)	13(18.5%)	1(1%)
Total parotidectomy	23	7(30%)	14(60%)	12(23%)	6(26%)	5(21%)	11(47%)

increased the long-term morbidity of the patient. Not the least the time taken in enucleation may be less than half as needed in superficial parotidectomy and that along with short hospital stay turns out to be less expensive both for the hospital as well as to the patient. The summary of complications for total parotidectomy is shown in the table 2.

DISCUSSION

This study suggests that enucleation in selected cases (tumour size <2 cm) with experienced hands does not pose a significant risk of recurrence and moreover considerably reduces the postoperative as well as long term patient-morbidity as compared to superficial parotidectomy. The ideal tumour fit for enucleation is a freely mobile small nodule with no adhesions/ scarring, without previous surgery and where the inferior limit of tumor could be felt at its edges. Enucleation is no doubt better in terms of facial nerve complications, greater auricular nerve-branch injury, Frey's syndrome occurrence, postoperative discomfort, short hospital stays and reduced expenses. In addition, enucleation has the potential to be adapted as a day care surgery under local anaesthesia as compared to classical parotidectomy in future. All the surgeries including enucleation were carried out by senior faculty exclusively. The follow-up in this paper is however less to really comment upon a 20 years recurrence rate. To further reduce the complication rates and improve overall results it is advisable to use operating microscope and nerve monitor in a 'difficult' case. Furthermore, the most essential criteria for the best outcome of enucleation is a proper selection of cases as mentioned above. In a previously operated case or with a prominent deep scar, it is always advisable to avoid enucleation surgery and opt for open parotidectomy.

The advanced age of our cohort may account for poor surgical compliance or increased rate of complications. In this study, 1.8 and 0% recurrence rate were seen with enucleation and superficial parotidectomy respectively while a meta-analysis[5] revealed a corresponding recurrence of 25 and 3%, respectively. The enucleation for pleomorphic adenoma has been considered inadequate as it leads to positive margins, tumor rupture and spillage, with unacceptable rates of recurrence. The reduced rate of recurrence in enucleation in this cohort was possibly due to meticulous surgery conducted by an experienced faculty keeping the tumor capsule intact. The mean time to recurrence reported in the literature is 7 years.[5-10] Further follow-up is required for a better assessment of recurrence in our cohort as late recurrences are known to occur even beyond 10 years.[11,12.]

Transient facial palsy occurred in 23% with total parotidectomy, 17% with superficial parotidectomy and none in the patients operated by enucleation. A meta-analysis[5] revealed transient facial palsy in 60% with total parotidectomy, 26% with superficial parotidectomy and in 11% with enucleation. In our study permanent facial palsy occurred in 23% with total parotidectomy, 4% with superficial parotidectomy and in only a single case with enucleation. The same meta-analysis[5] revealed permanent facial palsy in 4% with total parotidectomy, 1.9% with superficial parotidectomy and 3.5% with enucleation. A higher% of permanent facial palsy with enucleation is possibly related to a very small sample (N=9) while reduced incidence in superficial parotidectomy was due to early identification of facial nerve and often the use of microscope. The incidence of permanent facial palsy in enucleation can be improved by the use of magnification.

Frey's syndrome was seen in 21% with total parotidectomy, 13% with Superficial Parotidectomy as compared to 47% with Total Parotidectomy, 17% with superficial parotidectomy in a meta-analysis.[5] The reduced incidence may have been due to obliteration by sternocleidomastoid flap. None of the patients with enucleation had Frey's syndrome. Hypoesthesia of ear lobule was seen in a single case with enucleation, 31% with superficial parotidectomy, 60% with total parotidectomy which suggest higher chances of preserving anterior branch of greater auricular nerve in enucleation. Hypoesthesia can be troublesome especially in females wearing earrings. Pain at operation site was seen in 8.5% with superficial parotidectomy, 30% with total parotidectomy while no patients operated by enucleation had pain at operation site. This might be due to smaller incision required for enucleation. Dryness of mouth was seen in 22% with enucleation, 1% with superficial parotidectomy and 47% with TP. The higher incidence of xerostomia in total

parotidectomy was due to absent serous component in saliva after the removal of parotid tissue.

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