



## Is the Extracapsular Dissection a Reliable Alternative for the Surgical Treatment of Parotid Gland Tumors?

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### Abstract

**Purpose:** To describe extracapsular dissection as a surgical technique in the treatment of tumors in the parotid gland.

**Materials and Methods:** A descriptive, retrospective and longitudinal study in patients with parotid neoplasms treated surgically with extracapsular dissection, within the period of November 2010 to April 2017 is presented.

**Results:** A total of 45 patients were included in the study, aged between 24 - 70 years with an average of 37.5 years and prevalence by the female gender. The pleomorphic adenoma was the most frequent benign pathology. The transient paresis of the VII pair in 2.2% of cases was the only complication. There was a recurrence rate of 0%.

**Conclusion:** The extracapsular dissection is a reliable surgical approach for parotid tumors, taking into account the low recurrence rate and minimal facial nerve injury.

**Keywords:** Parotid Gland; Tumor; Parotidectomy; Extracapsular Dissection

### Introduction

Salivary gland tumors are rare, representing up to 4% of neoplasms of the head and neck. The parotid gland (PG) represents the site of greatest prevalence of this pathology, being the pleomorphic adenoma, the most common benign neoplasm representing up to 85%. The treatment of choice for PG tumors is surgery. In the 1940s, the surgical management of benign tumors of the PG was not entirely satisfactory; the standard surgical protocol was the enucleation of the tumor, leaving the capsule in situ, with a high rate of recurrence. The superficial parotidectomy (SP) with facial nerve dissection was established as the ideal treatment for benign PG tumors, with a reduction in the recurrence rate and causing loss of parotid function and paralysis of the facial nerve in many patients. Other associated complications are sinking of the face due to volume loss and Frey's syndrome. Another surgical technique described in the last decades is the Extracapsular Dissection (ECD), which involves the removal of parotid parenchyma only containing the tumor, with preservation of parotid function, minimizing the incidence of facial nerve palsy and Frey's syndrome and improving the aesthetic results [1-6]. The primary objective of this technique is to minimize the damage to the facial nerve [7]. The ECD has been offered as an alternative method to minimize the morbidity of parotidectomy. Several studies suggest that ECD has lower rates of complications without a higher recurrence rate compared to superficial parotidectomy [8].

### Aim of the Study

The aim of this research is to describe ECD as a surgical technique in the treatment of tumors in the parotid gland.

### Materials and Methods

A descriptive, longitudinal and retrospective study in patients with parotid neoplasms treated surgically with ECD, by the Head and Neck Surgery Unit of the University Hospital of Maracaibo, Venezuela, from November 2010 to April 2017 is presented. The tumors were assessed by clinical examination, nasofibroscopy, computed tomography and histopathology report. This study was approved by the University Hospital of Maracaibo, Venezuela IRB and all participants signed an informed consent agreement.

### Inclusion and exclusion criteria

All the adults patients treated surgically with ECD performed ( $\geq 18$  years) were included. All parotid neoplasms included in this study were limited to primary parotid tumors with pathologic classifications recognized by the World Health Organization. Only lesions definitively confirmed by histopathology report of the exci-

sional biopsy were included, without restrictions to size, number of foci, and preoperative or intraoperative mobility characteristics. Lesions with multiple foci were designated a size measurement regarding the largest focus. Patients presenting with recurrent lesions and history of surgery on the affected parotid gland were excluded.

### Surgical technique

All the cases shared the following: the surgeries were performed by the same surgeons, using the same surgical approach and the same suturing technique; a capillarity drain was used for all cases along with pressure dressing. By means of a Blair incision, a careful dissection of the tumor is performed respecting and preserving the tumor capsule, without exposure of the facial nerve. In this technique, the area of the gland that involves the tumor is removed with a margin of 1.5 cm (Figure 1-4).

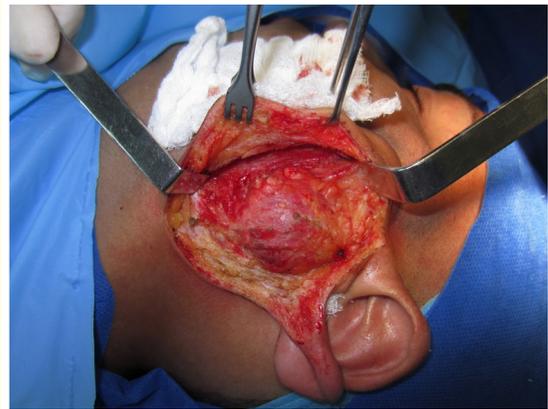


Figure 1: Blair incision and tissue dissection.

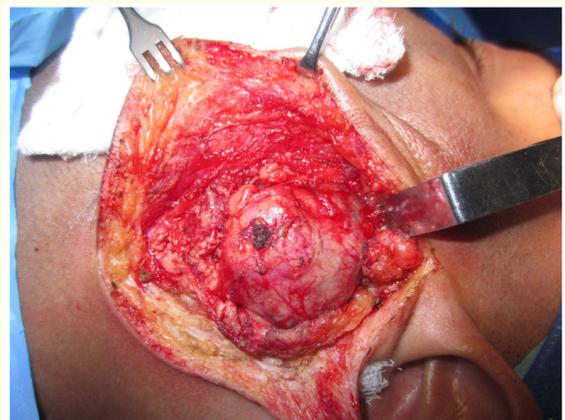


Figure 2: Tumor dissection.



**Figure 3:** Surgical bed once the tumor has been resected.



**Figure 4:** Primary closure.

**Data collection**

The following patient data was extracted through the clinical patient record: age; gender (Table 1); and lesion features, histological type, adjuvant therapy and postoperative complications (Table 2). Any documented sign of facial nerve dysfunction in the immediate postoperative period was considered facial nerve weakness.

	N (Cases)	% (Cases)	Mean ± DE
Age (yr)			37.5 ± 12.3
Gender			
Men	3	6.66	
Women	42	93.3	
Size (cm)			3.66 ± 0.52
Follow-up (months)			35 ± 5.2

**Table 1:** Characteristics of patients included in the study.

Histological Type	N (%)	Surgical Technique	Adjuvant Therapy
Pleomorphic adenoma	42 (93.3)	Extracapsular dissection	None
Acinar Cell Carcinoma	1 (2.2)	Extracapsular dissection	Chemo/radiotherapy
Epithelial Myoepithelial Carcinoma	1 (2.2)	Extracapsular dissection	None
Non-Hodgkin Lymphoma	1 (2.2)	Extracapsular dissection	Chemotherapy

**Table 2:** Distribution of patients according to histopathological diagnosis, surgical technique, adjuvant therapy and complications.

**Statistical analysis**

Once the data was collected, it was analyzed by using statistical software (version 20, SPSS Inc). According to the type of research and the established objectives, a descriptive analysis of each variable was performed, represented by absolute and relative frequency tables.

**Results**

A total of 45 patients treated by extracapsular dissection were included in the study, aged between 24-70 years with an average of 37.5 years and prevalence by the female gender. These tumors appeared as asymptomatic, mobile, slow-growing masses on the face (parotid) or angle of the jaw (parotid tail). The most frequent benign pathology was the pleomorphic adenoma in 42 patients (93.3%, 2 men and 40 women). The remainder was treated malign-

nant lesions, which are: acinar cell carcinoma in 1 female patient (2.2%) who received adjuvant therapy (chemo/radiotherapy), epithelial myoepithelial carcinoma in 1 female patient (2.2%) and Non-Hodgkin lymphoma in 1 male patient (2.2%) who received adjuvant therapy (chemotherapy). The mean lesion size was  $3.66 \pm 0.52$  cm ( $P < .001$ ) and the mean follow-up was  $35 \pm 5.2$  months. Among postoperative complications, only transient paresis of the seventh pair in 1 patient (2.2%) diagnosed with benign neoplasm was presented. No tumor recurrence was observed during the follow-up period.

## Discussion and Conclusion

Recurrences and nerve dysfunctions were the main causes of changes in the surgical management of parotid tumors, as well as the control of other complications such as Frey's syndrome and hypoaesthesia of the great atrial nerve. Among the different surgical techniques, partial or total parotidectomy with preservation of the facial nerve and great auricular nerve, as well as ECD stand out [9]. Removal of parotid tumors by extracapsular dissection involves all pseudopods of the pseudocapsule. While in the ECD the tumor is removed with a millimeter margin of surrounding tissue, in parotidectomies (partial or total) a significant part or all the glandular tissue is included, obtaining a wider safety margin. However, a total parotidectomy can become an ECD at some point through the surgery if there is a direct relationship of the parotid tissue with branches of the VII pair, or if the nerve is in close proximity to the tumor. The superficial and/or total parotidectomy with preservation of the facial nerve does not give greater guarantee of non-recurrence when compared with partial resections; while on the other hand, it is well known that the frequency of post-surgical paralysis of the facial nerve is proportional to the length of the dissection [8]. The microscopic study of resection margins of pleomorphic adenomas estimated that recurrences occur in 17.6% of cases when the tumor is contained in the margins, while doing resection with margins of up to 1 mm is sufficient to reduce the recurrence rate up to 1.8%, which makes the ECD justifiable [10]. Numerous case series stipulate that ECD does not expose the patient to more frequent recurrences and significantly reduce complications when compared to any variant of parotidectomies, with a relapse rate of 1%, facial nerve paralysis at a range between 1.6% to 2.1%, salivary fistulas 0.6% to 2.1% and Frey's syndrome in 5% of cases [11-14], these results being comparable with ours. An important meta-analysis shows that ECD can represent a viable alternative to superfi-

cial parotidectomy in the treatment of pleomorphic adenomas for 2 fundamental reasons: a higher recurrence rate and a higher incidence for paralysis of the facial nerve and Frey's syndrome in those patients treated with superficial parotidectomies when compared with patients treated with ECD [8]. Based on the literature we know that the pleomorphic adenoma is the most frequent tumor in the parotid gland and usually presents as mobile, asymptomatic mass that generally does not exceed 4 cm [8], as it was in our case series. However, in our study, there were lesions with more than 4cm and some others with characteristics of benignity, but when the histopathological results were obtained they turned out to be malignant. The alternative of adjuvant treatment for these lesions was taken into account, obtaining favorable results. For this reason, we conclude that ECD is a valid and viable option for the treatment of parotid tumors with benign characteristics, taking into account the low recurrence rate and reduction of facial nerve injury when applying this technique. On the other hand, although this technique is not indicated for malignant pathology, we include 3 cases of malignant lesions and, due to the good response of these tumors to coadjuvance, We were able to achieve good results. However, it is recommended to examine this topic further.

## Conflicts of Interest

The authors declare that they have no conflicts of interest.

## Role of the Funding Source

No external funding, apart from the support of the authors' institution, was available for this study.

## Ethical Approval

All applicable international, national, and/or institutional guidelines for the care and use of animals were followed.

## Informed Consent

The manuscript does not contain clinical studies or patient data.

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