

Extracapsular Dissection Versus Superficial Parotidectomy for Benign Parotid Tumors

Vikas Mehta, MD; Cherie-Ann Nathan, MD, FACS

QUESTION

What are the indications and methods for performing an extracapsular dissection for benign parotid tumors rather than a superficial parotidectomy?

BACKGROUND

Surgery for benign parotid tumors has undergone several evolutionary steps over the past century. Prior to the 1930s, the focus of parotid surgery was to limit the risk of facial nerve paralysis, which made intracapsular enucleation the most common procedure performed. However, it became widely recognized that the postoperative risk of recurrence was unacceptably high, even for benign disease. Thus, surgeons began advocating for the superficial parotidectomy (SP) and/or partial parotidectomy, which decreased the recurrence rate to its current level of approximately 2%.¹ With the decrease in recurrence also came the unwanted side effects of increased facial nerve injury, Frey's syndrome, and salivary fistula.

Recently, extracapsular dissection (ECD) has emerged as an adjunctive method for removing benign parotid tumors. Extracapsular dissection can be differentiated from intracapsular enucleation, which involves incising the tumor capsule and "shelling out" the neoplasm, thus resulting in high rates of recurrence due to incomplete resection and seeding of the tumor within the parotid bed. Extracapsular dissection is conducted by careful dissection around the tumor capsule under magnification without preidentification of the facial nerve. The use of this technique has demonstrated decreased surgical complications from benign parotid tumor resection for a certain subset of patients. The evidence supporting the

use of ECD for benign parotid tumors, which meet certain criteria, will be the focus of this article.

LITERATURE REVIEW

The larger studies reporting on ECD for benign parotid tumors have primarily come from Europe.¹ In terms of patient selection, most studies advocate for smaller, superficial-lobe, mobile tumors.²⁻⁵ In the largest series of ECD by McGurk et al.,⁴ which retrospectively compared 503 patients who underwent ECD to 159 who received a SP, the authors utilized both a 4-cm cutoff for consideration of an ECD as well as intraoperative determination of tumor mobility to decide between the two techniques. In one study by Piekarski et al.,⁵ the risk of facial paresis after ECD of tumors 4 cm or greater was 21% compared to 4% for those for whom the tumor was less than 4 cm. Although all of the authors agree that ECD should be reserved for those tumors with benign etiology, some indicate that preoperative fine needle aspiration (FNA) is not necessary^{3,4} and others argue that it should be routinely used due to the high sensitivity and specificity.^{1,2} Because most of the studies are conducted in Europe, ultrasound was the imaging modality of choice for two of the groups,^{2,3} with computed tomography and/or magnetic resonance imaging reserved for suspected bony and/or deep lobe involvement, respectively. A consensus is generally reached that the tumors that demonstrate worrisome features intraoperatively should undergo a more extensive surgery than ECD, regardless of the FNA result, due to the 20% false-negative rate for malignancy seen on FNA.¹ This point also highlights the need for the technique to be utilized by experienced parotid surgeons who can identify suspicious characteristics for parotid malignancy as well as perform an appropriate parotid surgery for the particular histology.

As mentioned above, ECD is conducted by careful dissection around the tumor capsule under magnification without preidentification of the facial nerve. A loose areolar plane, approximately 2- to 3-mm adjacent to the tumor capsule, is the described plane of dissection.⁴ Iro et al.³ advocate for the use of intraoperative facial nerve neuromonitoring and bipolar cautery to prevent injury to the branches of the facial nerve that can sit adjacent to the tumor capsule. Given the pseudopods of tumor

From the Department of Otolaryngology/Head and Neck Surgery, Louisiana State University Health-Shreveport, Shreveport, Louisiana, U.S.A

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Send correspondence to Vikas Mehta, MD, Co-Director of Head and Neck Surgical Oncology Feist-Weiller Cancer Center, 1501 Kings Highway, Rm 9-203, Shreveport, LA 71130.
E-mail: dr.vikasmehtha@gmail.com

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TABLE I.
Outcomes after Extracapsular Dissection vs Superficial Parotidectomy.

	No. of Patients	Recurrence Rates		Facial Nerve Paralysis or Paresis (any branch)		Frey's Syndrome	
		ECD	SP	ECD	SP	ECD	SP
Albergotti et al.	1,882	1.5%	2.4%	8%	20.4%	4.5%	26.1%
Barzan et al.	349	2.3%	12%	1.3%	6%	1.3%	44%
McGurk et al.	630	1.7%	1.8%	10%	32%	5%	32%

ECD = extracapsular dissection; SP = superficial parotidectomy.

that are readily described in pleomorphic adenomas, magnification is encouraged to better visualize these outcroppings and avoid capsular rupture.

In terms of outcomes, ECD has demonstrated similar or improved recurrence rates, with decreased surgical morbidity in several large series and meta-analysis (Table I).¹⁻⁴ In a retrospective series of 349 patients, Barzan et al.² report a 2.3% and 12% recurrence rate in the ECD and parotidectomy group, respectively ($P = 0001$). Following ECD, permanent facial nerve paralysis, salivary fistula, and Frey syndrome occurred in 1.3%, 0.3%, and 1.3% of the patients, respectively; and following parotidectomy, it occurred in 6%, 4%, and 44% of the patients, respectively. When looking specifically at long-term follow-up for pleomorphic adenoma, Iro et al.³ had no recurrences in a minimum of 5 years follow-up and had only two of 79 patients with a permanent facial nerve branch paresis. From the series of 630 patients, both Frey's syndrome and transient facial nerve palsy were significantly lower in the ECD versus the SP group (5% vs. 32% and 10% vs. 32%, respectively).⁴ A meta-analysis of nine studies with 1,882 patients showed a mean reduction of 75% in the rate of transient facial nerve paralysis (8% vs. 20.4%; ECD vs. SP) and a 88% reduction in symptomatic Frey's syndrome (4.5% vs. 26.1%).¹ The recurrence rates and rates of permanent facial nerve paralysis were largely similar (1.5% vs. 2.4% and 1.4% vs. 1.1%, respectively) with almost identical follow-up periods.

Although these studies have been performed on a large series of patients with a meta-analysis of over 1,800 patients, the results need to be interpreted cautiously. Many of the authors advocate for an intraoperative decision approach, which thereby biases the morbidity outcomes and recurrence rates in favor of ECD because the easier, more straightforward cases will be preferentially handled with the ECD approach. Due to the retrospective nature of the studies, selection bias

remains a significant issue for internal validity. When looking at external validity, these studies have been conducted at high-volume, tertiary referral centers, suggesting that only experienced parotid surgeons with an intimate knowledge of the facial nerve anatomy should undertake the ECD approach.

BEST PRACTICE

Extracapsular dissection can be an effective and low-risk method for removing benign, superficial parotid tumors that are less than 4 cm, with similar recurrence rates and lower morbidity than superficial parotidectomy. Prospective, multi-institutional research would be required to show more definitive benefit over traditional, facial-nerve dissection techniques. The procedure is performed by careful dissection around the tumor capsule with bipolar cautery, under magnification, and without dissection of the facial nerve (\pm facial nerve monitoring) by an experienced parotid surgeon.

LEVEL OF EVIDENCE

Recommendations for ECD for benign parotid tumors are based on level III evidence, with a meta-analysis conducted of only level III studies.

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