

# Margins for Benign Salivary Gland Neoplasms of the Head and Neck



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## KEYWORDS

- Superficial parotidectomy • Partial superficial parotidectomy • Extracapsular dissection
- Facial nerve • Pseudocapsule • Linear margin • Anatomic barrier margin

## KEY POINTS

- The superficial parotidectomy is the procedure for ablation of benign parotid tumors to which all other procedures are compared and vetted.
- The partial superficial parotidectomy and extracapsular dissection represent modifications of the superficial parotidectomy that are commonly performed in the management of benign parotid tumors.
- Unlike their counterparts in the parotid gland, benign tumors of the submandibular gland are most commonly surgically managed by removal of the entire gland and the tumor en bloc.
- Benign neoplasms of minor salivary gland origin are able to be managed with margins of the pseudocapsule of the tumor as well as the etiologic salivary gland tissue.
- The evaluation of a surgical margin, whether by a frozen section or by routine light microscopy, is always a collaborative effort between the operating surgeon and the surgical pathologist.

## INTRODUCTION

Evaluation of patients with a salivary gland swelling should be quickly followed by the development of a differential diagnosis that must include neoplastic and non-neoplastic entities. The primary objective in the initial evaluation of a patient with a parotid swelling, for example, is to initiate the process of distinguishing a parotitis from a parotid tumor. When correctly performed, this approach leads to proper diagnosis and treatment.<sup>1,2</sup> This exercise is particularly important in the case of a possible malignant tumor of the parotid gland. As a whole, salivary gland tumors are rare compared with the

overall incidence of head and neck tumors, varying internationally from about 0.4 to 13.5 cases per 100,000 people in the population.<sup>3</sup> Further, parotid tumors only represent approximately 0.6% of all tumors in the human body.<sup>4</sup> The parotid gland is the most common site of occurrence of salivary gland tumors, generally 60% to 75% of all salivary gland tumors in large series.<sup>5–8</sup> In an evaluation of 140 parotidectomy specimens, 102 (73%) demonstrated neoplastic disease and 38 (27%) specimens demonstrated non-neoplastic entities.<sup>9</sup> The investigators also examined 110 submandibular gland excisions, 17 (15%) of which were performed

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for neoplastic disease and 93 (85%) were performed for non-neoplastic disease. Therefore, when examining a patient with a parotid swelling, the likelihood of a neoplastic process should be highly considered. In contrast, examining a patient with a submandibular swelling is more likely to ultimately result in a diagnosis of inflammatory disease. Further, the cause of a sizable swelling of the minor salivary glands is almost always neoplastic. As many as 50% of these tumors are malignant, as typically occurs in the palate. An expedient investigation into the specific diagnosis of minor salivary gland tumors is, therefore, important to undertake.

The execution of surgery for all salivary gland tumors requires preoperative planning for the inclusion of a linear margin and surrounding anatomic barrier margins. Both types of margins are planned according to the specific salivary gland being addressed, as well as the specific surgical procedure being performed. In so doing, linear margins are quantitative and typically involve a calculated removal of normal salivary gland surrounding a tumor. Anatomic barrier margins are qualitative and typically involve careful dissection of the pseudocapsule surrounding the salivary gland tumor. Although the salivary gland literature commonly uses the nomenclature capsule, this article preferentially refers to this structure as a pseudocapsule because the host is responsible for the formation of this reactive tissue rather than the tumor itself. The performance of a superficial parotidectomy involves the inclusion of the anatomic barrier of the pseudocapsule without the intentional designation of a linear margin because the entire superficial lobe of the parotid gland is removed. By contrast, a partial superficial parotidectomy includes the anatomic barrier of the tumor's pseudocapsule, as well as a linear margin of normal parotid gland surrounding the tumor, for which dimensions are variably described in the literature. Finally, an extracapsular dissection (ECD) includes the pseudocapsule as an anatomic barrier margin but not a specific linear margin in this conservative removal of a parotid tumor. In all surgical procedures, at least a small area of the anatomic barrier of pseudocapsule of the tumor is likely to be exposed and is intentionally not violated during the ablative surgery.

Benign tumors of the submandibular gland are managed somewhat differently in that the tumor and the entire submandibular gland are excised with curative intent. As such, anatomic barrier margins are included with the tumor but no linear margin is planned because the entire gland is removed with the specimen. Benign minor salivary gland tumors are managed with surgical excision

of the tumor and its etiologic minor salivary glands, during which time the pseudocapsule of the tumor is likely to be identified and intentionally preserved. In addition, in the case of a benign minor salivary gland tumor of the palate, a linear margin of normal palatal mucosa is included at the periphery of the tumor specimen whose length is variably recommended in the international literature. Regardless of the specific benign major or minor salivary gland tumor, the inclusion of margins is executed in the best interests of a complete and curative tumor surgery.

This article reviews the particulars associated with margin inclusion and analysis in benign salivary gland tumor surgery. In so doing, evidence from the international literature, as well as anecdotal information, is drawn on as best practices to support recommended surgical procedures.

## BENIGN PAROTID GLAND TUMORS

The international literature is a source of numerous monographs and observational reports of historical interest on tumors of the major salivary glands.<sup>10-12</sup> Early papers concentrated their comments on the details of histologic diagnosis and patient outcomes rather than on the specifics of surgical treatment and observation of margins. For example, McFarland<sup>11</sup> indicated in 1933 that treatment of parotid tumors centered on surgical excision although irradiation was becoming increasingly implemented. The publication of this paper preceded the widespread use of parotidectomy, as well as the establishment of specific nomenclature associated with this procedure or its required margins. McFarland<sup>11</sup> indicated that 30% of tumors recurred following excision. In his 1936 paper, McFarland<sup>12</sup> similarly used the term excision for surgical treatment of parotid tumors. This report reviewed 301 salivary gland tumors of which 278 were located in the parotid gland and 60 of these subjects developed recurrent disease following excision. Although it is unclear as to the specifics of surgical excision in these cases, it is possible that enucleation of the parotid tumors was performed because this procedure was commonly performed during that time. The 1953 report of Foote and Frazell<sup>10</sup> provided a review of 877 major salivary gland tumors, including 766 parotid tumors accumulated during the 20-year period ending in 1949. The primary emphasis of the report was to review the histologic classification and analysis of the natural history of a variety of tumor types that were primarily managed by surgery. As in the McFarland<sup>11,12</sup> papers, there were no comments about the type of surgery performed for these subjects. In 1941, Bailey<sup>13</sup>

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