Management of the Recurrent, Benign Tumor of the Parotid Gland

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Learning Objectives: After studying this article, the participant should be able to: 1. Assess the patient who has a parotid mass. 2. Use the surgical principles and the technique of parotidectomy. 3. Select a rational approach to the management of the patient with a recurrent, benign tumor of the parotid gland and appreciate the role of adjunctive radiation therapy.

On occasion, the salivary gland surgeon is faced with clinical management questions related to the treatment of parotid gland tumors. Some of these are intraoperative and include margin of resection, management of the facial nerve when tumor abuts its branches, judicious use of lymphadenectomy, and the appropriateness of nerve grafting. Other questions concern postoperative care—such as the use of radiation therapy, reoperation when a malignancy is reported after surgery, timing of follow-up, and management of a recurrent, benign tumor. Although all of these issues cannot be addressed in one review article, the author has attempted to offer a rational approach to one of the most perplexing—the recurrent, benign tumor. The recommendations offered are based on the literature and a clinical experience of two decades of salivary gland surgery. Within this review a number of other management issues noted above are also addressed. (Plast. Reconstr. Surg. 108: 734, 2001.)

Primary tumors of the salivary gland are relatively uncommon, accounting for less than 3 percent of all tumors of the head and neck. More than 80 percent of all salivary gland tumors are located in the superficial lobe of the parotid gland, and the majority of those (more than 80 percent) are benign. More than 60 percent of these benign tumors are pleomorphic adenomas (mixed tumors), and another 30 percent are Warthin’s tumors (benign cystadenoma lymphomatosum). These facts alone make tumor surgery in the parotid gland rather predictable, but such is not always the case. Although one must always be prepared to deal with the rare, unexpected malignancy, even they can usually be dealt with in a rather straightforward fashion. It is when a recurrent, benign tumor of the parotid gland is encountered that questions arise regarding reoperation, the use of radiation therapy, nerve grafts, and even informed consent. The answers to these and other questions will be addressed in this article.

To understand the rationale of how to approach a recurrent, benign tumor of the parotid gland, it is important that we first review some of the basic principles of evaluation and treatment of a primary tumor of the parotid gland.

Presentation of the Parotid Mass

Most patients with salivary gland tumors, whether those tumors are benign or malignant, present with an asymptomatic mass that has existed for a nonspecific length of time. Patients with intermittent swelling and/or discomfort associated with meals likely have an inflammatory disease related to ductal obstruction. Other lesions to consider in the differential diagnosis of a parotid mass are a first branchial cleft cyst, aberrant salivary gland tissue, or lymphadenopathy within the gland. This latter lesion could be inflammatory in nature but, if it is not tender, may well represent regional metastases from a primary tumor of the scalp, forehead, or face. Generally, the medical history can help distinguish an inflammatory condition from a tumor.

The physical examination will also help dis-
tinguish between an inflammatory lesion and a tumor. Although tumors are almost always discrete in nature, those that are infectious involve a larger amount of the gland, producing a generalized enlargement. Exceptions to these rules are lymphomas of the gland and deep-lobe tumors, both of which may be asymptomatic but less discrete than tumors of the superficial lobe. A common location of the typical parotid tumor is in the tail, which overlies and therefore obliterates the angle of the mandible (Fig. 1). When presented with this finding, the surgeon must treat the mass as though it were a primary tumor of the parotid gland (then be pleasantly surprised to discover otherwise). Therefore, when the surgeon suspects a tumor of the parotid gland, he or she must prepare the patient for a formal parotidectomy to be performed in the operating room.

**EVALUATION OF THE PAROTID MASS**

An important element of the evaluation of a parotid mass is to establish a diagnosis of malignancy before any definitive surgical procedure is performed. Not only does this allay the patient’s fears, but it also gives the surgeon valuable information to share with his patient in counseling and planning the surgical procedure. This evaluation can be accomplished most easily with a fine-needle aspiration, which can be performed at the first visit with relative ease, although there must be a competent cytopathologist available to interpret the results.

The aspiration will not always lead to a definitive diagnosis and will probably not eliminate the need for the definitive surgery—a superficial parotidectomy with preservation of the facial nerve—but it should be viewed as a valuable part of the work-up of the parotid mass.

Fine-needle aspiration is a simple, safe, and highly accurate tool that will often confirm the surgeon’s initial impression, aid in informed consent, and help determine the urgency of the surgery. We find that patients are very accepting of the procedure, regardless of its known limitations.

On the other hand, radiologic studies are generally not as necessary unless (1) the surgeon suspects a malignancy, (2) the mass is believed to involve the parapharyngeal space, or (3) the mass involves the parotid gland medial to the facial nerve (deep-lobe or “dumbbell”-type tumor). Oftentimes, a patient who is referred to the surgeon’s office will already have had a computed tomography scan of the head and neck performed, which we use to show the patient the tumor in question; however, the scan is usually not helpful to the surgeon with regard to a surgical decision.

Other studies that should be mentioned include the technetium scan, which can occasionally be used to identify a Warthin’s tumor. Another study (mentioned only to be condemned) is the sialogram. Not only does this study provide no useful information, but it causes the patient considerable discomfort.

In the unlikely circumstance that an open biopsy is considered—or even demanded—by the patient, the skin incision should be placed so that the biopsy site can be excised at the time of a more definitive procedure. The typical scenario in which an open biopsy might be appropriate is when a lymphoma is suspected.

**SURGICAL PRINCIPLES OF EXCISION OF THE PAROTID MASS**

First, the definitive “biopsy” of a mass in the parotid gland is a superficial parotidectomy with preservation of the seventh nerve. In the vast majority of patients, this procedure will remove 80 percent of the salivary gland, yielding a safe margin of resection for all benign tumors and most low-grade malignant tumors. “Berry-picking” of parotid tissue deep to the facial nerve in the face of a malignant tumor is oncologically unnecessary and introduces the potential of unnecessary morbidity related to the facial nerve. All patients who have a malignant deep-lobe tumor should receive postoperative radiation therapy, because it will effec-

![Fig. 1. Obliteration of the angle of the mandible by a firm, distinct mass (arrow) should be considered a primary tumor of the parotid gland and appropriate surgery to be performed in an operating room should be planned.](image)
tively ablate residual tumor cells that could still exist in the “tongue” of salivary tissue deep to the seventh nerve.

Second, enucleation of a benign tumor will frequently result in recurrence of the tumor. If the tumor is close to the nerve, it should be “peeled” off the seventh nerve. In benign disease, this is almost always possible and will not result in recurrence if the capsule of the tumor is not violated.

Third, when the seventh nerve is functioning preoperatively, it should rarely require sacrifice, even in the face of malignancy. The exception to this is the uncommon circumstance that the seventh nerve is directly invaded by a malignant tumor. This invasion of the nerve can be confirmed using loupe magnification. The use of postoperative, adjunctive radiation in this situation will minimize the risk of locoregional recurrence and will not compromise function of the dissected seventh nerve.

Fourth, if all or a portion of the seventh nerve must be sacrificed, it ideally should be resected and reconstructed immediately. If reconstruction is not possible, the proximal and distal ends of the nerve should be marked for later identification to simplify later nerve grafting before radiation therapy.

Finally, high-grade tumors should receive an upper-neck dissection (removal of any clinically positive nodes and resection of the subdiagnostic and midjugular nodes). This might be best accomplished at the time of a second operation if the nature of the malignancy is apparent only after the first operation. This strategy, in combination with radiation therapy, results in a high rate of locoregional control, even in high-grade, aggressive tumors.\(^2\)

THE PAROTIDECTOMY

Parotidectomy would be a relatively simple operation, were it not for the presence of the seventh nerve. Once the nerve is identified as it exits the stylomastoid foramen, the parotid gland can be resected with safety. Many techniques are described to isolate and preserve the nerve, although most of the anatomic structures traditionally mentioned are readily seen after the nerve has been identified. However, there are some keys to this dissection that are valuable to consider. The first is adequate exposure. “Broad-front” surgery with wide exposure of the surgical field is extremely valuable in allowing identification of the anatomic structures leading to the nerve as well as to the nerve itself. The second key is loupe magnification of the surgical field. The third is identification of the tympanomastoid suture line: the only bony landmark lateral to the facial nerve. The bony junction of these two bones—the tympanic and the mastoid—is a most valuable landmark for the salivary-gland surgeon. The nerve is found just lateral and deep to the tympanomastoid suture line.\(^3\)

In dealing with deep-lobe tumors of the parotid gland, it is still necessary to perform a superficial resection of the parotid gland to adequately expose the facial nerve so that it can be dissected and lifted off the tumor medial to it.

At times the size or location of the tumor will not permit identification of the facial nerve at the stylomastoid foramen; in such a case, the branches of the nerve should be identified distally and traced (retrograde) back to the main trunk of the nerve. The nerves most easily identified distally for this purpose are the marginal branch and buccal branch.

Role of Postoperative Radiation Therapy

The only malignant tumors that should be treated with postoperative radiation therapy are high-grade neoplasms or those low-grade tumors in which the margin is suspect. This would include cases of adenoid cystic carcinoma, adenocarcinoma, high-grade mucoepidermoid carcinoma, carcinoma ex-pleomorphic adenoma, and malignant mixed tumors. When a low-grade tumor is encountered, it can usually be excised with a cuff of normal tissue, and the surgical procedure is therefore the definitive therapy. Radiation is never used in a preoperative setting for a primary tumor nor is it appropriate for residual gross disease after a subtotal removal of a malignant tumor. It is maximally effective when microscopic seeding is suspected.\(^2\)

As noted below, an additional indication for postoperative radiation therapy is a multicentric “benign” tumor that recurs after a failed initial attempt at resection has been performed.

THE PROBLEM OF THE RECURRENT, BENIGN MIXED TUMOR OF THE PAROTID GLAND

Although the incidence of recurrence after surgery for benign mixed tumors of the parotid gland is very low, it is cause for concern when it is encountered by the surgeon. Although the tumor is benign in this clinical
setting, it takes on malignant potential in terms of morbidity when it recurs locally after enucleation or superficial parotidectomy. In these situations, the surgeon must first select the most effective type of resection, make decisions related to the sacrifice or preservation of the facial nerve, be conscious of any abnormal anatomic relationships that may exist after prior surgery, and then consider postoperative use of radiation therapy (Figs. 2 through 4).

**REVIEW OF THE LITERATURE**

A review of the literature seems to indicate some confusion regarding treatment. One can find suggestions that radiation alone might be indicated, surgery alone is appropriate, aggressive surgical management is mandatory, and radiation therapy is of little benefit. This apparent lack of agreement on the management of this problem is primarily related to two facts: first, there is a wide constellation of signs that accompany recurrent benign tumors of the parotid gland, and second, adjunctive radiation therapy is being used more frequently and effectively than it has been in the past.

In their 1976 review of a large series of recurrent salivary gland tumors (n = 129), Hanna et al. considered benign and malignant recurrences together and concluded that “radiation therapy, due to its limited effect on both benign and malignant salivary gland tu-

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**Fig. 2.** The patient had undergone a parotidectomy 12 years previously for a benign, mixed tumor of the parotid gland. Painless “lumps” (arrow) started appearing approximately 7 years after the initial surgery. This clinical situation requires excision of the recurrence with preservation of the seventh nerve if possible, followed by radiation therapy.

**Fig. 3.** The same patient shown after undergoing surgery and radiation therapy (note the hyperpigmentation of the radiated fields). She has been free of disease with a normal functioning seventh nerve since 1995.

**Fig. 4.** This 15-year-old patient underwent local removal of a “mass in front of the ear” by his local medical doctor. When the mass recurred 2 years later, a surgeon performed a parotidectomy; no radiation therapy was administered at that time. Eighteen months later, the patient presented at our office with this “benign, mixed” tumor mass growing from the previous incision site behind his ear. Although his seventh nerve was clinically intact, it had to be sacrificed and grafted to rid the patient of his recurrent disease burden. The patient then received postoperative radiation to the tumor bed.
mors...[should] not be used for benign salivary gland tumors."

In a later, and more focused, review, Piorkowski and Guillamondeguí asked the question "Is aggressive surgical treatment indicated for recurrent benign mixed tumors of the parotid gland?" Their response, on the basis of surgical treatment of 58 patients treated over a 20-year period at the M. D. Anderson Cancer Center, was affirmative for initial surgery, while they cautioned against using radiation as a primary method of treatment for this problem.

Liu et al. from Princess Margaret Hospital, the well-known Canadian center for radiation therapy, documented the value of postoperative radiation therapy in their 1995 article. Their study reviewed 55 patients who had some surgical procedure for treatment of a benign mixed tumor and who had received postoperative radiation therapy for one of the following reasons: "recurrent disease, gross or microscopic residual disease, and/or nerve involvement by the tumor." With a median follow-up period of 12.5 years, they found that postoperative radiation was particularly important for patients with recurrent disease or those who had an enucleation only of their tumor.

In a retrospective study by Renihan et al. from the United Kingdom, the results of the treatment of 114 patients with recurrent pleomorphic adenoma of the parotid gland were examined. The authors separated the patients in groups by modality of treatment [surgery alone (n = 63) and surgery with radiation therapy (n = 51)] and reported their results with respect to long-term tumor control and facial nerve function. Multinodular recurrences treated by surgery alone had a recurrence rate of 45 percent versus 4 percent in those managed by surgery plus radiation therapy. In contrast, no difference was demonstrated in the uninnodular, recurrent tumor group (15 percent in the surgery group and 13 percent in the surgery plus radiation therapy group). The authors also found that the incidence of permanent facial-nerve injury was 15 percent and that such injury was primarily related to the extent of the previous surgery and the scarring that resulted from it. The only reported morbidity of radiation included unilateral hearing loss in six of 55 patients and an additional patient with osteoradionecrosis of the mandible. Renehan et al. cited only the "potential of radiation-induced tumors" when radiation is administered for "benign" disease.

These facts notwithstanding, we suggest the judicial use of adjuvant radiotherapy and the need to tailor it to the individual patient, accounting for other factors such as the patient's age and health status. The dosage suggested by the report from the Princess Margaret Hospital study is 45 Gy in 20 treatments over a 4-week period. This dosage is associated with minimal morbidity.

And, finally, in a 1998 report from the Mayo Clinic, Yugueros et al. reviewed the charts of 39 patients with recurrent benign mixed tumors of the parotid gland who had been treated over a 28-year period: 36 of the patients had been referred after the recurrence of their tumors. The authors concluded that if a parotidectomy has not been previously performed, it should be carried out as part of the treatment plan, and that if a parotidectomy has previously been performed, a simple excision with an adequate margin of normal tissue would seem to be appropriate therapy. They felt that the value of radiation therapy was "still indeterminate."

**Recommendations**

On the basis of the literature and the scenarios that a surgeon may see in his office, the following suggestions are made regarding the management of a patient who has received prior treatment for a benign mixed tumor of the parotid gland and who now presents with one or more recurrent tumors in the surgical bed:

1. Prior enucleation of a mixed tumor: completion parotidectomy with preservation of the facial nerve and postoperative radiation therapy.
2. Prior incomplete excision of a mixed tumor without palpable residual tumor: completion parotidectomy as indicated, preservation of facial nerve, and postoperative radiation therapy.
3. Prior parotidectomy for mixed tumor with local recurrence in the wound scar or a single nodule in the surgical bed: simple excision only.
4. Prior parotidectomy for mixed tumor with multinodular local recurrences: radical resection dictated by the extent of the previous surgery and the type of recurrence, followed by radiation therapy.

The most common clinical setting is the latter, in which case every attempt should be made to preserve the facial nerve. Informed consent should include the need to resect and
graft the facial nerve or its branches if that nerve is involved with the tumor. If there is significant recurrence in the area of the stylomastoid foramen in the bed of a prior parotidectomy, it may be necessary to enter the mastoid bone to identify the normal facial nerve and then trace it distally to the point of involvement with the tumor in the parotid bed, at which point a decision should be made regarding the integrity of the nerve.

CONCLUSIONS

The anatomy of the facial nerve and parotidectomy are intimately associated. Although parotidectomy for benign disease is usually performed without any mishap, violation of the capsule surrounding the tumor and resultant seeding of the operative bed can occur from time to time. Clinical management of this situation can present a conundrum to the surgeon. This article outlines the indications for reoperation and the judicial use of radiation therapy in such cases.

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REFERENCES


Self-Assessment Examination follows on page 740.
Self-Assessment Examination

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1. A PRIMARY TUMOR OF THE PAROTID GLAND USUALLY PRESENTS AS A:
   A) Fluctuant mass
   B) Sebaceous cyst
   C) Mass that changes in size
   D) Discrete, asymptomatic mass
   E) Non-tender mass that obliterates the junction of the lobule of the ear and the neck

2. WORK-UP OF A PAROTID MASS MAY REASONABLY INCLUDE ALL OF THE FOLLOWING EXCEPT:
   A) Computed tomography scan
   B) Fine-needle aspiration
   C) Magnetic resonance imaging
   D) Sialogram
   E) Plain film of the parotid gland

3. THE DEFINITIVE BIOPSY OF AN ASYMPTOMATIC, DISCRETE MASS OF THE PAROTID GLAND IS:
   A) An open biopsy
   B) Fine-needle aspiration
   C) Superficial parotidectomy with preservation of the seventh nerve
   D) Total parotidectomy
   E) Enucleation of the mass

4. DIFFERENTIAL DIAGNOSIS OF A PAROTID MASS INCLUDES ALL OF THE FOLLOWING EXCEPT:
   A) Intraparotid lymph node
   B) Branchial cleft cyst
   C) Aberrant salivary gland
   D) Primary parotid tumor
   E) Thyroglossal duct “arrest”

5. RADIATION THERAPY IS OF PARTICULAR VALUE IN:
   A) Treating a low-grade tumor of the superficial lobe of the parotid gland
   B) Treating an intermediate-grade tumor confined to the tail of the parotid gland
   C) The preoperative setting when malignancy is suspected
   D) Malignant tumors of the deep lobe of the gland
   E) Treating residual gross disease in the postoperative setting

6. THE SEVENTH NERVE:
   A) Exits from the tympanomastoid suture line
   B) Demonstrates weakness whenever involved with a tumor
   C) Should always be grafted immediately if there is a need to sacrifice a portion of the nerve
   D) Usually must be violated when a deep-lobe tumor is being removed
   E) Is derived from the third branchial arch

7. SEEDING OF THE PAROTID BED BY A PLEOMORPHIC ADENOMA:
   A) Occurs with violation of the tumor capsule
   B) Can be treated by vigorous irrigation at the time of the occurrence
   C) Is of little concern because it is a benign tumor
   D) Is usually apparent within 18 to 24 months
   E) Is least likely to be evident during a biopsy in a doctor’s office

To complete the examination for CME credit, turn to page 815 for instructions and the response form.