

Chapter 35 – Transoral Excision of Oropharyngeal Malignancy

**David E. Eibling,
Eugene N. Myers**

More than half of patients with cancer of the oropharynx are initially found to have stage III or IV disease. Either primary surgery or an organ-sparing approach with either radiotherapy alone for early-stage disease/cancer or concurrent chemoradiotherapy for late-stage cancer can be used for treatment. A high percentage of patients with cancer of the tonsil will have cervical adenopathy, so management of the neck is of utmost importance. Cancer with local extension into the nasopharynx, parapharyngeal space, or carotid artery or metastasis to the retropharyngeal lymph nodes is considered inoperable, and nonoperative therapy is the only option available. Surgical management of advanced cancer results in postoperative oropharyngeal dysfunction, primarily swallowing disorders. In an attempt to avoid this problem, most advanced cancers are now managed with nonoperative organ-sparing protocols. Despite preservation of the “organ,” these patients also suffer from post-treatment swallowing disability that rivals that of surgical extirpation.[1]

A small subset of patients have early-stage cancer that may be successfully managed by surgery alone. Management of early cancer by transoral resection and elective neck dissection may spare the patient the adverse effects of radiotherapy. The surgeon must also be alert to the possibility of a lymphoma (Fig. 35-1) arising in either the base of the tongue or the tonsil. These lesions may look alike, but their management could be different. Rarely, a cancer can metastasize to the tonsil or the base of the tongue from a distant site (Fig. 35-2).

Selected cancers of the oropharynx, including those arising in the tonsil, soft palate (Fig. 35-3), or posterior wall of the oropharynx, may be resectable via a transoral approach. Cancers involving the base of the tongue, lateral or posterior wall of the hypopharynx, or supraglottic larynx have traditionally been considered unresectable through this route. However, with recent innovations in endoscopic instrumentation and with new paradigms for resection, some of these cancers are now being managed in this manner.

The decision to attempt transoral resection is the most critical part of the preoperative assessment. If the appropriate surgical approach is chosen, the actual excision is not difficult, whereas if the excision seems unduly difficult, it must be suspected that the wrong approach was selected. Attempting transoral resection of a tumor that cannot be adequately visualized or manipulated will result in a high probability of inadequate cancer excision with potential recurrence and, all too often, untimely demise of the patient.

The probability of occult neck metastases is sufficiently high with primary cancer in oropharyngeal sites to warrant elective management of the neck in all cases. Selective neck dissection should be performed in an at-risk but clinically negative neck. Sentinel node biopsy, which is still investigational, may in the future reduce the number of patients subjected to elective neck dissection. The goal of these strategies is to avoid radiation therapy and thereby spare the patient the xerostomia and fibrosis that downgrade swallowing function and quality of life. If the patient has palpable cervical adenopathy, adjunctive treatment with radiotherapy will be required either as primary treatment or in the adjuvant setting. Most of our patients with cancer of the oropharynx are now managed with nonoperative protocols, and hence the number of patients actually undergoing transoral resection with the intent of surgical cure is small. However, as these chemoradiation protocols continue to produce major problems with swallowing, there may be renewed interest in primary surgical treatment of early lesions of the oropharynx.

Cancer of the oropharynx may metastasize early to the retropharyngeal nodes. These nodes are not part of routine neck dissection because they lie medial to the carotid artery (Fig. 35-4). Some head and neck surgeons routinely recommend postoperative radiation therapy for these nodes after resection of tumors of the soft palate and oropharyngeal walls, regardless of the status of the sampled neck nodes. In such instances it may be more reasonable to treat the primary as well.

Salvage surgical extirpation of residual disease after nonoperative treatment is not uncommon. In most instances this involves salvage neck dissection for advanced-stage neck metastasis. Persistence of the primary tumor after treatment may require excision, and some of these patients may be suitable for transoral excision.



Figure 35-1 Lymphoma of the tonsil must be considered in the differential diagnosis.



Figure 35-2 Malignant melanoma metastatic from the lower extremity to the tonsil.

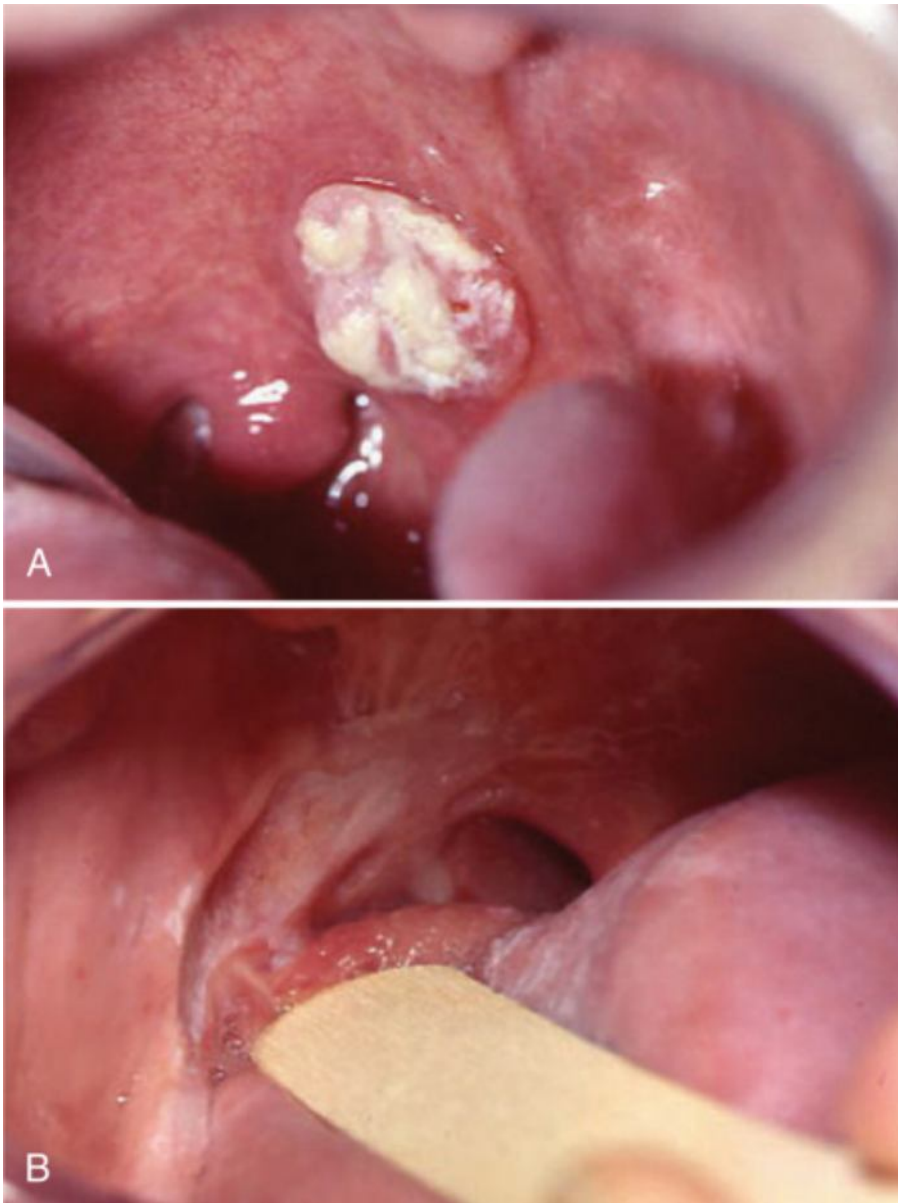


Figure 35-3 A, Squamous cell carcinoma arising on the soft palate. B, Reconstruction with a split-thickness skin graft after excision of a T1 lesion of the tonsil.

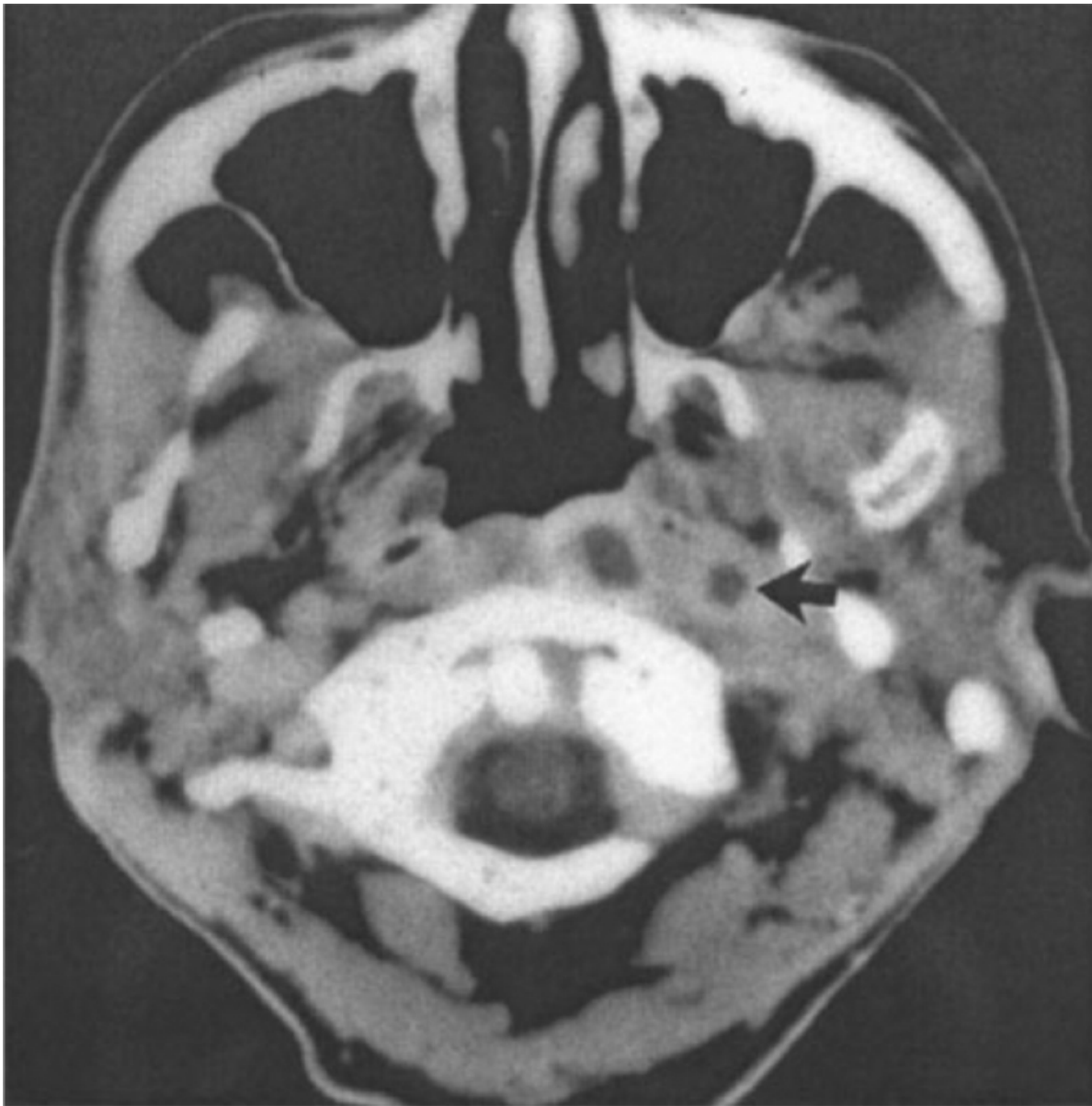


Figure 35-4 Computed tomography scan demonstrating an enlarged necrotic retropharyngeal lymph node (arrow).

PATIENT SELECTION

Proper patient selection is the most critical aspect in planning transoral excision. Not only must the cancer be appropriate for resection by a transoral route, but the surgeon must also be able to adequately visualize the tumor throughout the procedure. This requirement effectively limits these procedures to those involving the oral cavity and oropharynx. Cancer of the base of the tongue is not usually amenable to the transoral approach. The transhyoid pharyngotomy approach to these tumors has been well described.^[2] The transoral approach to the base of the tongue with laser ablation is another alternative to open procedures for cancer of the base of the tongue. Small cancers of the posterior wall of the oropharynx can be excised if the inferior aspect of the tumor does not extend beyond the tip of the epiglottis. For most lesions of the posterior wall of the oropharynx, a transhyoid or lateral pharyngotomy provides more exposure (see Chapters 29 and 30).

Physical examination must include visualization of all the mucosal surfaces of the upper aerodigestive tract, usually via transnasal fiberoptic examination. Careful palpation of the oral cavity and oropharynx, as well as palpation of the tumor, is mandatory. Not only must the size and “third dimension” of the tumor be assessed, but its attachment to underlying structures and the proximity of the tumor to vital structures, such as the carotid artery or the mandible, must also be assessed.

Absolute contraindications to transoral excision include trismus, deep invasion by the tumor, and poor accessibility. A high tooth profile, macroglossia, thick lips, or microstomia all interfere with adequate exposure and are therefore relative contraindications that must be considered. Preoperative palpation of the neck should be routine to help

assess the requirement for and selection of the appropriate neck dissection.

Computed tomography (CT) or magnetic resonance imaging (MRI) is not usually helpful in assessing the extent of a small primary cancer. Occasionally, imaging provides some clinically useful information regarding the depth of invasion, but CT or MRI is generally less reliable than palpation of the lesion. However, imaging of the neck is valuable in detecting suspicious adenopathy, particularly the presence of metastasis to the retropharyngeal lymph nodes (Fig. 35-4). The presence of enlarged or otherwise suspicious nodes may change treatment decisions because the intent of transoral resection of the primary tumor is usually to avoid radiation therapy.

PREOPERATIVE EVALUATION

All patients who are candidates for transoral excision should undergo endoscopy of the larynx, pharynx, and esophagus. This may be performed at the same time as the definitive procedure, before the actual excision and neck dissection. If the patient will be treated by nonsurgical means, endoscopy and biopsy should be done at the same time. Planning such multiple procedures in a single operation carries with it the risk of identifying unexpected tumor extension or a second primary malignancy. Such unexpected findings may require aborting the planned procedure and rescheduling for another time after further discussion with the patient. For this reason, many surgeons prefer to routinely perform endoscopy at a separate setting, typically several days before the planned excision. It is usually efficacious to perform the transoral excision before the neck dissection because more extensive transoral resection may extend into the neck. Performing the neck dissection after the primary resection has been carried out allows reconstruction of the intraoral wound, if necessary, and facilitates immediate re-resection in the same operative setting if necessary.

Preoperative dental evaluation is required for patients with residual dentition. Many patients have poor oral hygiene, periodontal disease, and multiple caries. Some of these patients will require postoperative radiotherapy, which will result in considerable risk for radiation caries and osteoradionecrosis if diseased teeth are present. The safest and most efficient approach is to have the patient evaluated by an oral surgeon preoperatively so that any necessary dental extractions can be scheduled at the time of excision of the cancer or endoscopy and the extraction sites can heal before radiation therapy. Extraction of diseased teeth, particularly those with severe periodontal disease, also helps with wound healing. Healthy teeth, especially if they play a role in dental rehabilitation, should be preserved.

Speech and swallowing will be significantly impaired in patients who require partial removal of the palate. These functional defects can be ameliorated with the use of an intraoral speech appliance fashioned by a maxillofacial prosthodontist. Preoperative impressions are essential in planning the fabrication of a temporary postoperative prosthesis. Therefore, if partial palatotomy is planned, preoperative consultation with a maxillofacial prosthodontist must be obtained to establish dental records and make impressions for a surgical prosthesis to be used at the completion of surgery.

Determination of the need for postoperative airway support must be made preoperatively. A tracheostomy may occasionally be required, even for smaller lesions amenable to transoral excision. When tumor excision requires skin grafting or reconstruction, in which case swelling is likely, or when tongue mobility will be diminished or a large intraoral gauze bolus is present, elective tracheostomy should be performed at the onset of the procedure. Other cancers may be appropriate for excision by the transoral route under orotracheal or nasotracheal intubation with planned extubation at the completion of the procedure. Tracheostomy is preferred instead of delayed postoperative weaning because emergency reintubation in an uncontrolled setting can lead to airway catastrophe. Moreover, the sedation and paralysis required for prolonged intubation increase the likelihood of associated (and often unnecessary) perioperative morbidity.

Because antibiotics have been shown to be beneficial in tonsillectomy, most head and neck surgeons routinely administer antibiotics to these patients perioperatively. Antibiotics appear to not only decrease the amount of postoperative wound contamination but also decrease oral odor and pain in the postoperative period.

Preoperative counseling of the patient must include the possibility of tracheostomy, as well as frank discussion regarding resectability of the cancer by transoral means. The patient and family must understand what functional problems are likely to result from the procedure, especially those of speech and swallowing, as well as the length of time expected for rehabilitation.

SURGICAL TECHNIQUE

Proper lighting and retraction are mandatory for the transoral excision of tumor. Though typically viewed as "easy cases," many of these smaller cancers can present a daunting surgical challenge because of the requirement for adequate exposure throughout the entire tumor excision.

Cancer involving the tonsillar fossa and soft palate can be exposed by using an oral mouth gag such as the

Crowe-Davis gag used in tonsillectomy. Suspending the mouth gag from a Mayo stand plus operating in the Rose position as for tonsillectomy (see Chapter 23) is often the easiest approach and permits the familiar hand-eye coordination similar to that required for tonsillectomy. In this manner, the endotracheal tube is held anteriorly by the tongue blade and is not likely to obstruct the surgeon's view or be involved in the surgical excision. Appropriate cuffed endotracheal tubes must be chosen and protected if excision by either laser or electrocautery is planned. Laser strike against the oral portion of the tube can ignite a fire, and high concentrations of oxygen accumulating in the oral cavity from a leaking or uncuffed endotracheal tube may support combustion of the tube, even if not actually contacted by the cautery unit. Visualization of tumors of the posterior oropharyngeal wall is often obstructed by the soft palate. Exposure can be improved with retraction of the soft palate either by placing red rubber catheter tubing through the nose and out the mouth or by placing a suture through the uvula and out through the nose.

The margin of resection should be carefully palpated and identified. Margins should maintain a width of at least 1 cm around the tumor and should be marked with a marking pen or methylene blue before the initiation of excision. If electrocautery is being used, "dots" can be made with the electrocautery to mark the excision line. Some surgeons choose to tattoo the planned excision with India ink or methylene blue on a needle. Those electing to use the hand-held laser can use it for marking. The initial mucosal incision should be made as far posterior or inferior as feasible because this portion of the mucosa will be the most difficult to visualize as the tumor is being elevated. The mucosal incision is then carried around both sides of the cancer to the most anterior or superior portion and then deepened (Fig. 35-5). Before delivering the specimen, a suture should be placed that can serve not only for traction but also as a marker to orient the pathologist (Fig. 35-6). Maintaining an adequate margin in the third dimension is critical in this portion of the procedure and requires not only good visualization and retraction but also periodic palpation. A surgical error in technique occurs when there is insufficient depth of excision, which results in difficulty obtaining cancer-free margins because the site at which the cancer was transected frequently cannot be readily identified in the tumor bed (Fig. 35-7).

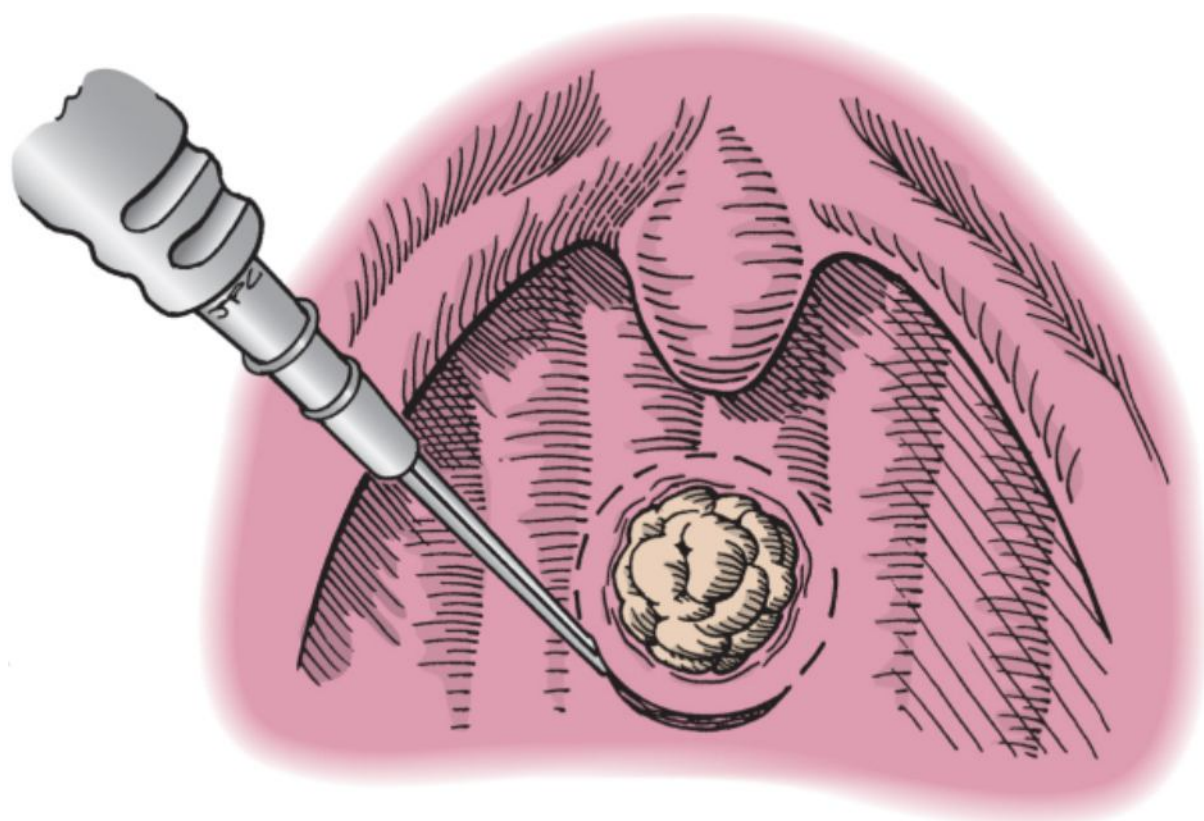


Figure 35-5 The portion of the mucosal incision that is most difficult to visualize (usually inferior) should be made first to reduce the likelihood that blood from the more anterior or superior portion will obscure the planned incision site.

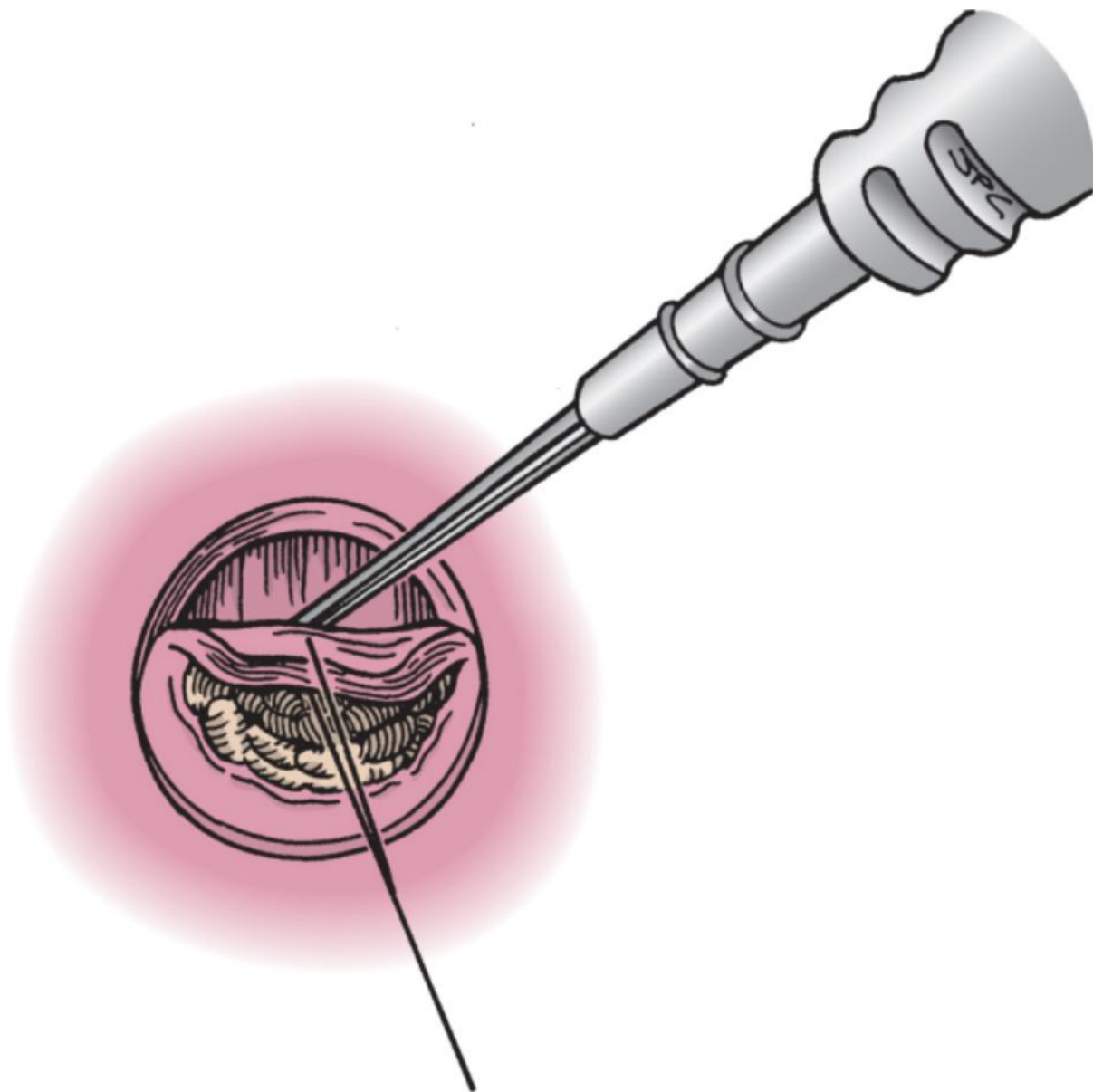


Figure 35-6 A suture is placed for retraction, as well as for orientation of the specimen for the pathologist.

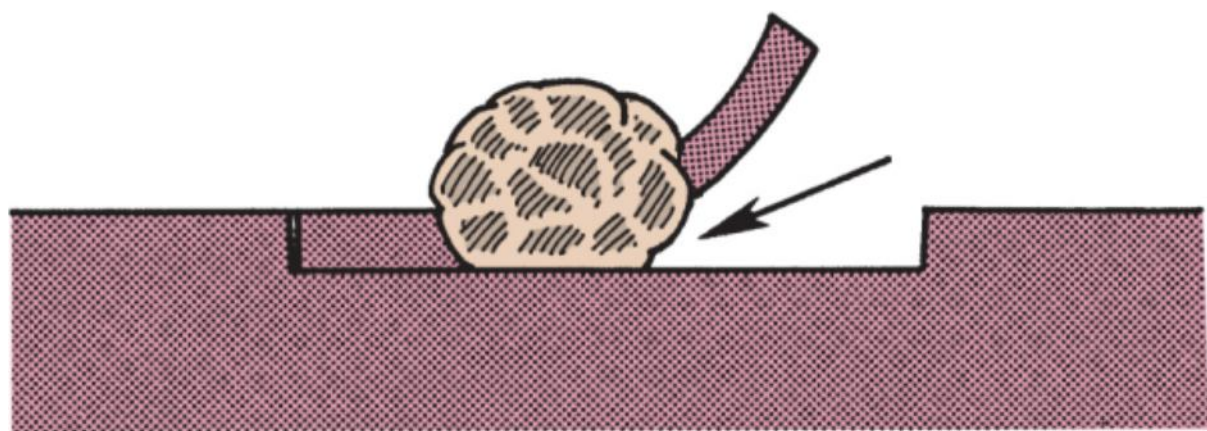
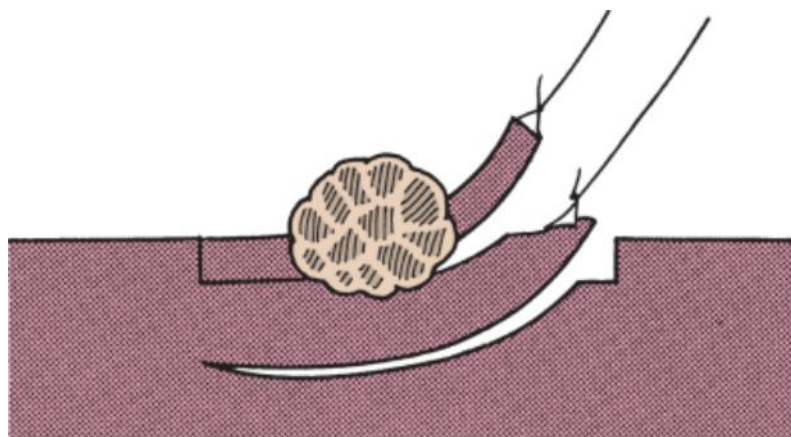


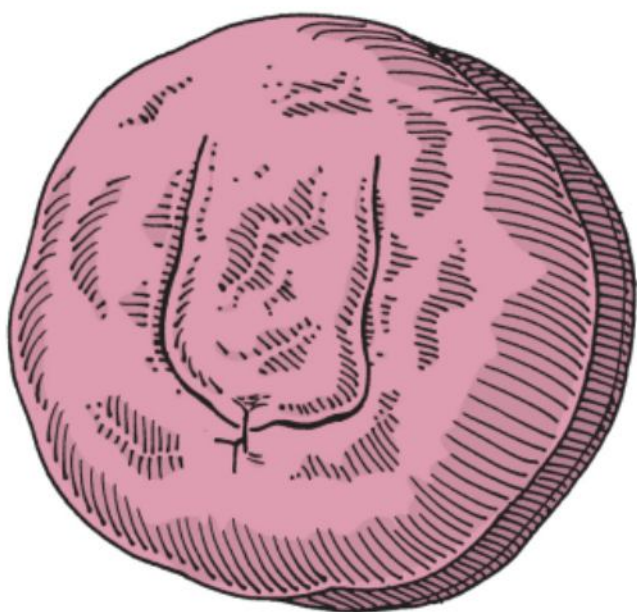
Figure 35-7 A grave error is allowing insufficient depth of excision, which results in cutting across the tumor (*arrow*). Attempting to complete the excision and then re-excise the base often produces an inadequate excision.

Once the cancer is excised, it should be carefully examined by the surgeon and reviewed with the pathologist.

Orientation is critical because positive or close margins cannot be re-resected unless their position is known. A sketch or photo is often very useful, but the most effective means of communication with the pathologist is face to face while examining the specimen and surgical defect! Surgical margins should be taken from the tumor bed, the tumor, or both; proper orientation of the margins must be ensured before they are removed from the patient. A typical error at this stage is removal of additional margins from the tumor bed with inaccurate registration to the excised tumor specimen. If during excision the line of dissection appears to be too close to the tumor, the surgeon should take an additional margin (Fig. 35-8). At the completion of the procedure, the flap that has been raised from the specimen should be sutured into position to demonstrate to the pathologist that the affected area did not represent a true margin.



A



B

Figure 35-8 **A**, If it is recognized that the deep margin is insufficient, the surgeon should “back up” and include an additional margin. **B**, The “flap” thus created is sutured down to facilitate proper orientation of the specimen and ensure accurate assessment of the additional margin of resection.

Once clear margins have been obtained, the wound can be closed. Defects of the posterior pharyngeal wall may be resurfaced with a split-thickness skin graft (Fig. 35-9) or simply left to heal by secondary intention by suturing the margins of the mucosa to the prevertebral fascia. Lesions of the tonsillar fossa and palate can be left open to heal as with a tonsillectomy. If the defect is large and the neck spaces are exposed, a split-thickness skin graft will help seal the oral cavity from the neck and prevent scar contracture during the postoperative healing phase, which may result in trismus or decreased tongue mobility.

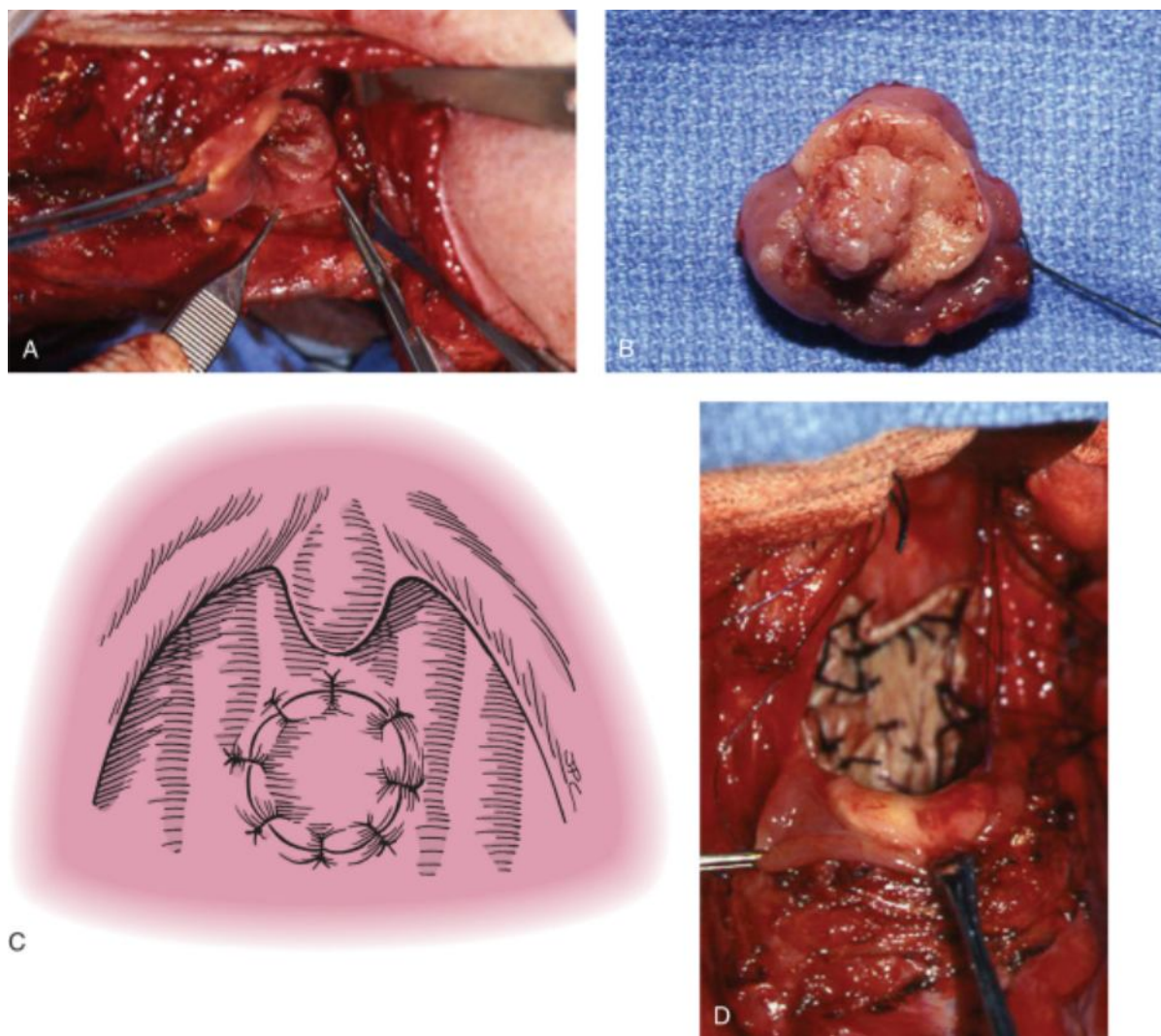


Figure 35-9 **A**, Squamous cell carcinoma on the posterior wall of the oropharynx. **B**, Specimen demonstrating grossly adequate margins of resection. **C**, Diagram of a split-thickness skin graft sewn into the defect in the posterior pharyngeal wall. **D**, Split-thickness skin graft sewn into the prevertebral fascia.

Resurfacing oropharyngeal defects following transoral excision of residual tumor after primary radiation therapy is problematic. The tumor often extends deeper than may be anticipated preoperatively, thereby resulting in opening into deeper planes of the neck or even leading to exposure of the carotid artery. Healing by secondary intention is not an option in these cases, and another modality, such as a vascularized free flap, should be used to ensure coverage of the irradiated carotid artery.

Nearly all cases will require elective neck dissection, which can be performed at the same procedure. The goal of neck dissection in an N0 neck is for purposes of staging. If the patient has an N1 or N2a or N2c neck, selective neck dissection is appropriate. Higher-stage neck disease will require a modified or radical neck dissection. In most oropharyngeal sites this would include levels II to IV. As previously noted, the retropharyngeal nodes are not sampled by routine neck dissection and, if identified on imaging studies, should be excised during the neck dissection.

A more extensive procedure for carcinoma of the tonsil has recently been described by Holsinger and colleagues.^[3] This is also carried out by the transoral approach and is a wider, more extensive resection of the tonsil and lateral pharyngeal wall.

POSTOPERATIVE MANAGEMENT

Postoperative management of patients undergoing resection of a small cancer is similar to that of patients undergoing tonsillectomy. Patients should be given a soft or liquid diet until they can tolerate solids and must be evaluated for the risk of aspiration, especially if tongue mobility has been compromised. Silent aspiration may occur, particularly in more elderly, debilitated patients, and can lead to serious postoperative pulmonary morbidity, so careful observation and involvement of the dysphagia team is necessary.^[1] Intravenous antibiotics are

discontinued after 24 hours, but many surgeons maintain oral antibiotics for 7 to 10 days. Rinsing the mouth with normal saline solution or mixtures of saline solution and peroxide is helpful in decreasing oral cavity odor. If a tracheostomy is required, decannulation can begin as soon as the patient can tolerate plugging of the tracheostomy tube or removal of the bolus from a skin graft. Patients who have had a split-thickness skin graft for tonsil cancer may have the bolus removed safely in the office. Patients with a bolus on a site in the posterior pharyngeal wall will need to have the bolus removed in the operating room to provide proper relaxation and exposure.

Speech and swallowing function is severely impaired in patients in whom a portion of the soft palate has been removed. Fabrication of a speech appliance prosthesis (Fig. 35-10) to assist in closing the defect is usually helpful in restoring oral-nasal separation. Preoperative impressions should be made so that a temporary prosthesis can be available in the early postoperative period. Many months are required for adequate healing before a final prosthesis can be fashioned. Fabricating plus fitting these devices requires considerable expertise, and patients should be referred to a maxillofacial prosthodontist experienced in these techniques.

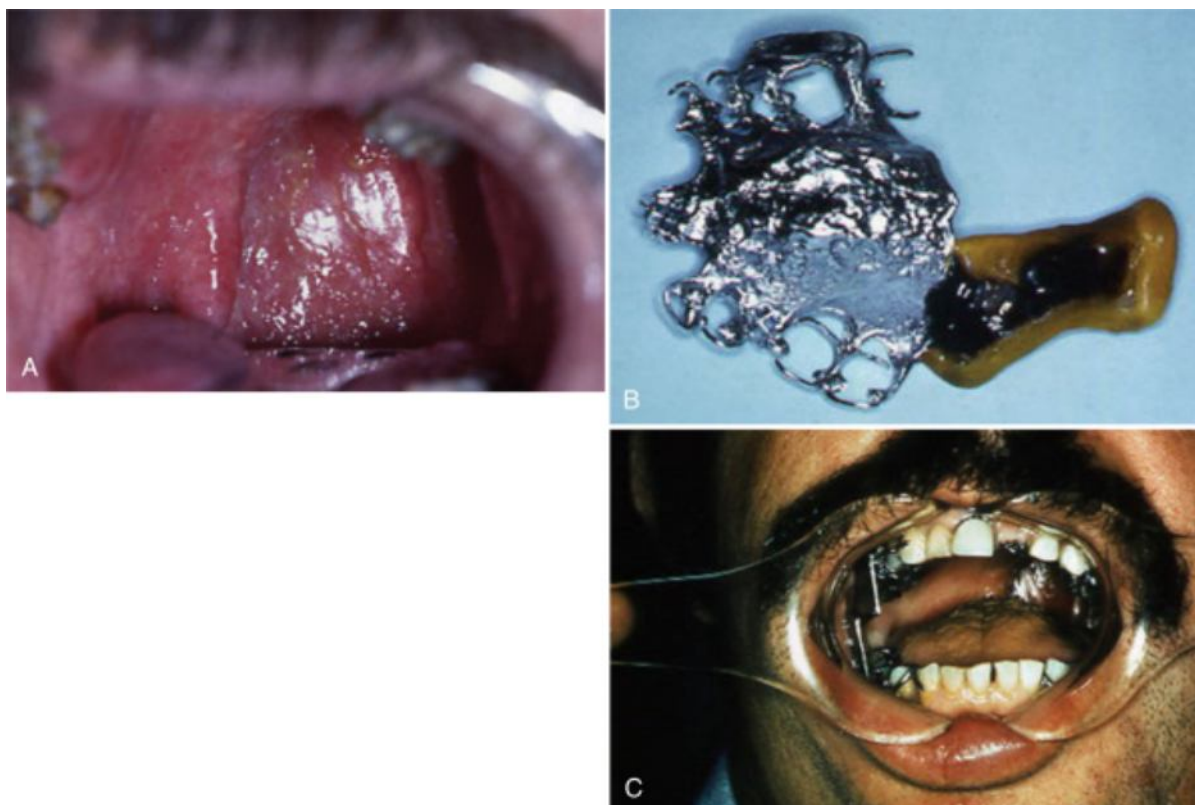


Figure 35-10 A, Patient with an extensive defect in the soft palate and tonsillar pillar after transoral resection of squamous cell carcinoma. B, A speech appliance restores oral-nasal separation and aids speech and swallowing after partial palatotomy. C, Patient with a speech appliance in place.

Postoperative management must include careful review of the permanent pathologic report. If tumor margins are found to be involved with cancer, re-excision is necessary because it is unlikely that radiation therapy alone will control positive margins.

PEARLS

- Some early oropharyngeal cancers are easily accessible and may be amenable to transoral excision.
- Accurate assessment of tumor extent is critical when planning a transoral resection.
- Adequate visualization is essential for successful transoral excision.
- Dissecting the deep margin requires three-dimensional knowledge of the anatomy and should proceed slowly to facilitate frequent reassessment of the anatomic relationships.
- A decision regarding treatment of the neck must be made early because the choice of treatment will have an impact on decision making for management of the primary cancer.

PITFALLS

- The choice of an inappropriate approach to a cancer that cannot be adequately managed through a transoral route can lead to failure of treatment.
- Failure to excise positive retropharyngeal lymph nodes will result in treatment failure.
- Postoperative hemorrhage, similar to that seen after tonsillectomy, can occur after transoral excision.
- Failure to accurately register additional margins with the resected specimen may be a cause of recurrent cancer.
- Failure to address the neck in patients at risk for neck metastasis will result in a high incidence of recurrent cancer in the neck.

Copyright © 2009 [Elsevier](#) Inc. All rights reserved. Read our Terms and Conditions of Use and our Privacy Policy.
For problems or suggestions concerning this service, please contact: online.help@elsevier.com