

Novel Transoral Approach to the Posterolateral Maxilla and Infratemporal Region



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Surgical access to tumors involving the posterolateral maxilla and infratemporal region remains a considerable challenge for surgeons. Various surgical approaches for treating posterior maxillary lesions require transcuteaneous incisions, such as an upper or lower cheek flap, but they often result in substantial morbidity. This article describes a novel transoral approach involving a curvilinear incision, temporalis myotomy, and coronoidectomy to allow direct visualization of the posterolateral maxilla and infratemporal region. This surgical technique may be used for the surgical resection of maxillary tumors that extend into the posterior maxillary sinus wall and pterygoid plate region via a transoral approach.

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Adequate surgical resection of maxillary tumors that extend into the posterior sinus wall and pterygoid plate requires sufficient exposure of the lesion. In these cases, the use of an upper cheek flap is often recommended by use of a modified Weber-Ferguson incision with subciliary extension.^{1,2} Although this upper cheek flap approach improves access to the maxillary sinus, visualization of the posterolateral maxilla and pterygoid plates remains poor.

We describe a transoral approach using a curvilinear incision, temporalis myotomy, and coronoidectomy that enables controlled resection of tumors that involve the posterolateral maxilla and infratemporal region. By use of this approach, most tumors are easily accessible through the open mouth even when the primary tumor is large and involves the pterygoid plates.

Surgical Technique

General anesthesia via oral or nasal endotracheal tube intubation is performed in the usual manner. Local anesthetic containing a vasoconstrictor (1:100,000 epinephrine) is then infiltrated in the area of the planned dissection. In addition, local anesthetic may

be administered as maxillary and mandibular nerve blocks. A single curvilinear full-thickness soft tissue incision is made in the maxillary buccal sulcus starting at the facial midline (or extending to the contralateral side depending on whether a maxillectomy is planned), carried posteriorly to the base of the zygomaticomaxillary buttress, and extended inferiorly along the coronoid process and buccal surface of the ramus of the ipsilateral mandible (Fig 1A). A scalpel or electrocautery may be used for the incision, leaving at least 5 mm of non-keratinized mucosa on the alveolar side for ease of suturing later. Any exposed buccal fat pad is retracted with a pterygoid retractor.

Dissection proceeds subperiosteally to expose both the buccal and lingual sides of the anterior ramus border, stripping the lower fibers of the temporalis muscle attachment from the anterior border and coronoid process. The buccal surface of the process is then cleaned of its temporal fibers, with identification of the coronoid notch. The lingula is identified on the medial side and the inferior alveolar neurovascular bundle protected; the coronoid process is then grasped and transected along its base with a reciprocating saw. The remainder of the temporalis

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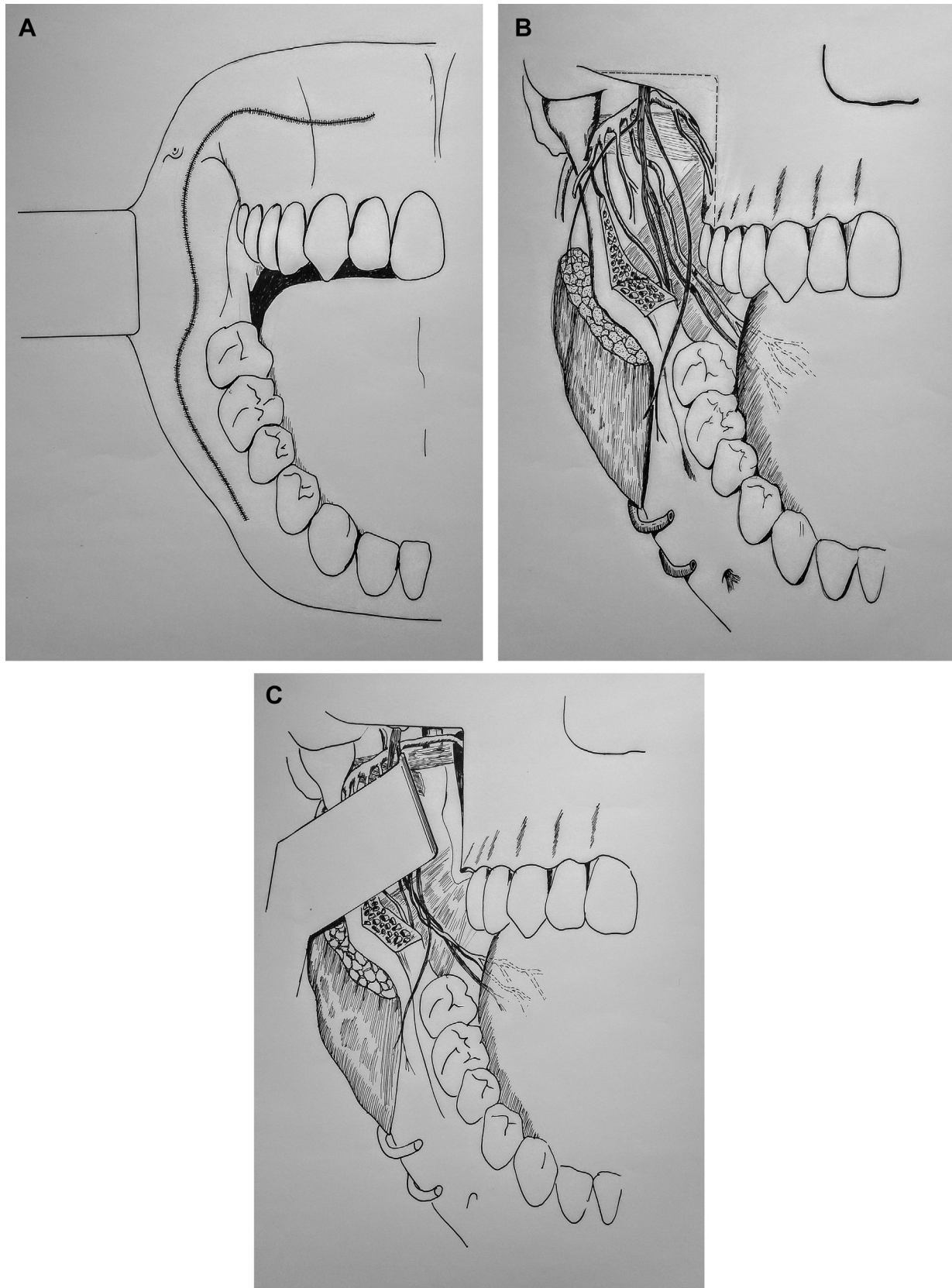


FIGURE 1. Transoral approach to posterolateral maxilla and infratemporal region. A, A curvilinear incision is made in the maxillary buccal sulcus starting at the midline, carried posteriorly to the base of the zygomaticomaxillary buttress, and extended inferiorly along the buccal surface of the ipsilateral mandibular ramus. A temporalis myotomy and coronoidectomy are then performed (B) to allow direct visualization of the posterolateral maxilla and infratemporal region (C).

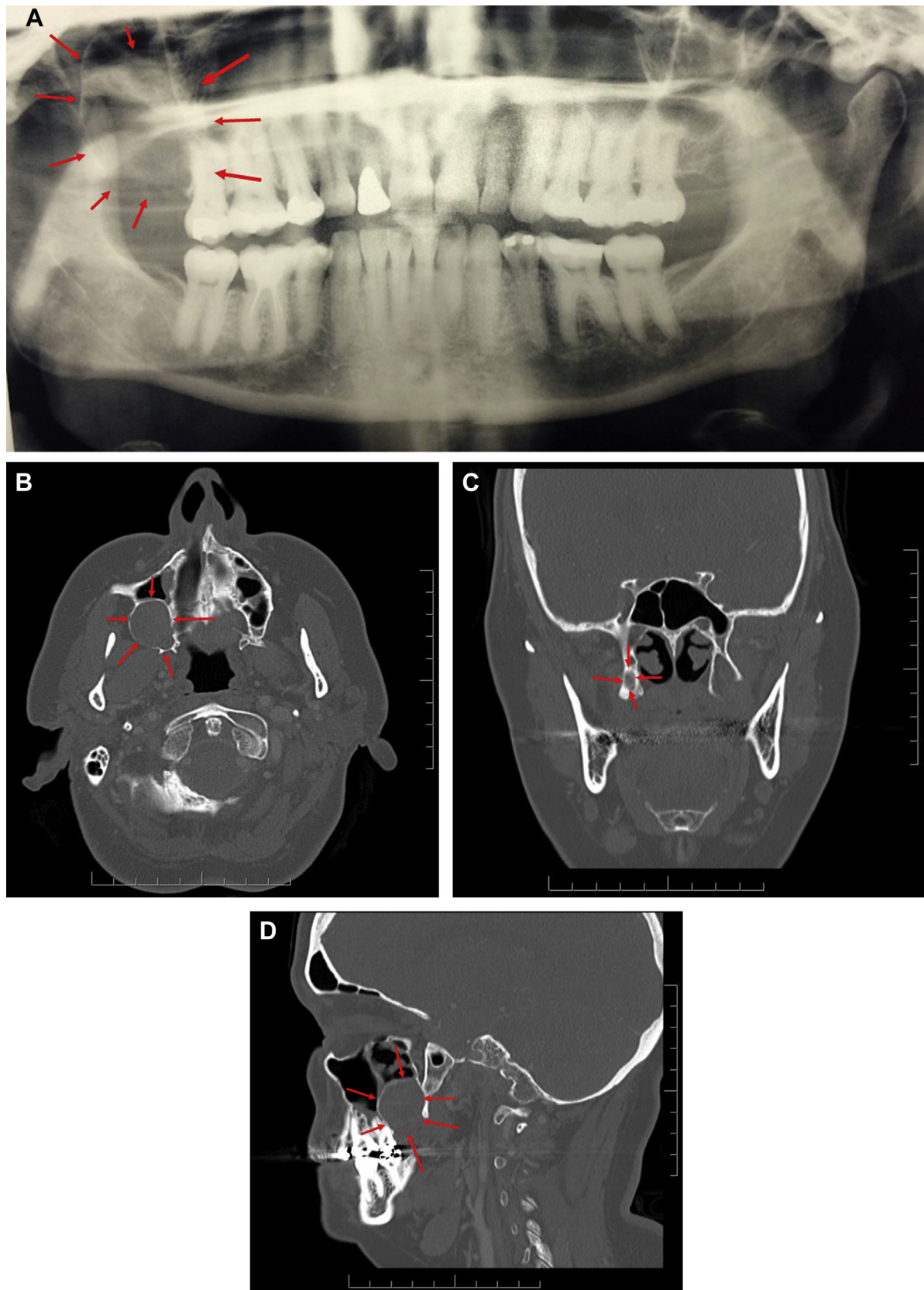


FIGURE 2. Radiographic findings in a patient with a right maxillary ameloblastoma. A panoramic radiograph (A) and axial (B), coronal (C), and sagittal (D) computed tomography views show a well-defined 2.5 × 2.0 × 2.5-cm lesion in the right posterolateral maxilla with extension into the maxillary sinus and pterygoid plates. Arrows indicate tumor extent.

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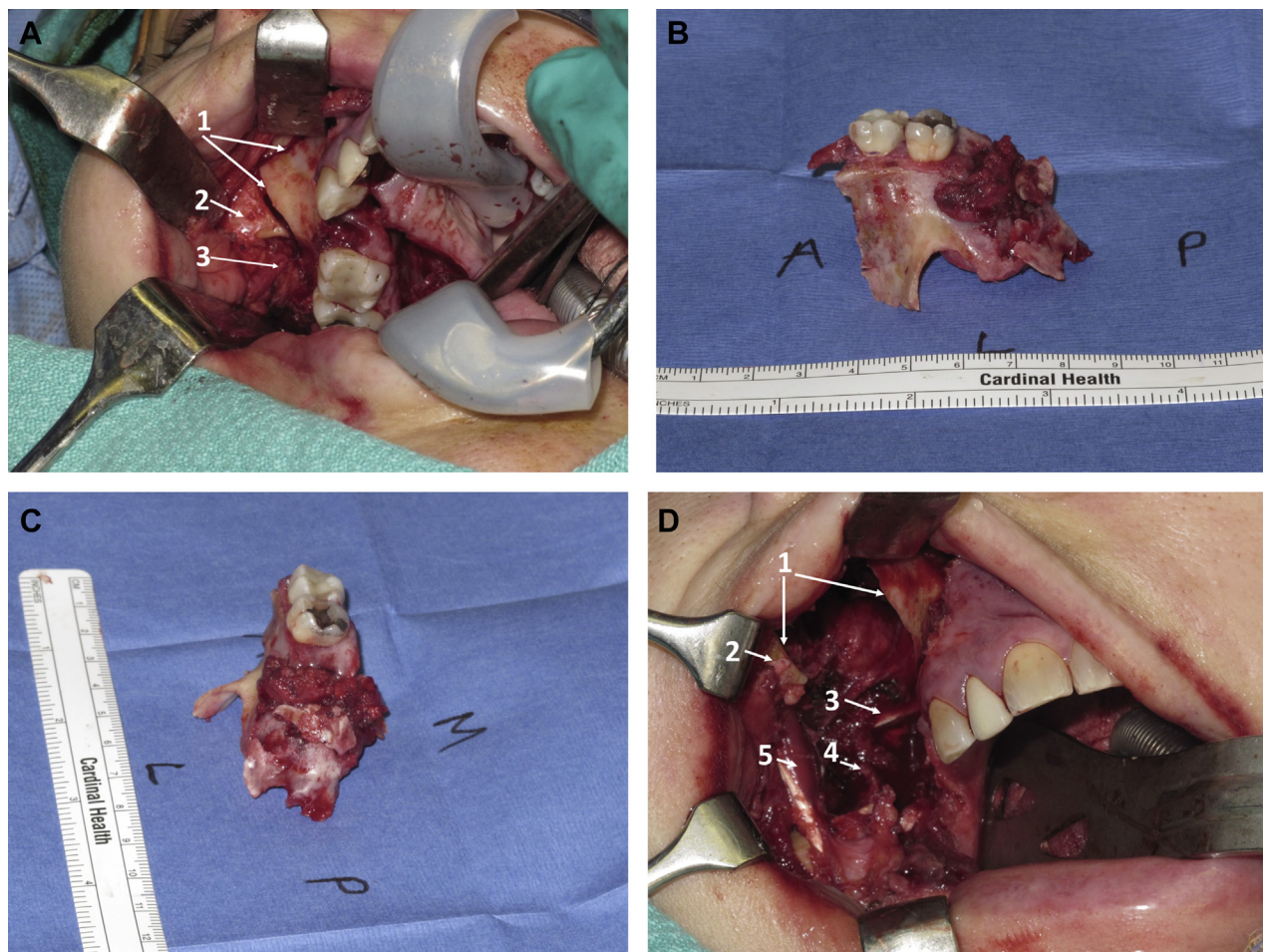


FIGURE 3. Clinical case showing the transoral approach to the posterolateral maxilla and infratemporal region. *A*, The posterolateral maxilla and pterygoid muscles are readily visible after temporalis myotomy and coronoidectomy to allow transoral removal of an ameloblastoma involving the right maxillary sinus and pterygoid plates. *B* and *C*, Appearance of surgical specimen including pterygoid plates. *D*, View of surgical site after partial right maxillectomy including removal of involved pterygoid plates. 1, osteotomy lines; 2, zygoma; 3, lateral pterygoid muscle; 4, medial pterygoid muscle; 5, masseter muscle; A, anterior; L, lateral; M, medial; P, posterior.

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attachment to the transected coronoid is freed by use of electrocautery. The posterolateral maxilla and infratemporal region are now readily accessible under direct vision (Fig 1B).

With the coronoid process removed, a partial maxillectomy may be easily performed (Fig 1C). In cases of tumor extension into the posterior sinus wall and pterygoid plate, the posterolateral attachments of the maxilla and/or pterygoid plates (ie, buccinator and lateral and medial pterygoid muscles) are easily visible and the pterygoid muscles can be divided close to their attachment to the mandible to increase surgical margins; this can include the pterygoid plates if necessary.

A clinical case is presented to illustrate the surgical technique. A 58-year-old woman presented with a 2.5 × 2.0 × 2.5-cm solid multicystic ameloblastoma involving the right posterior maxilla with extension into the maxillary sinus and pterygoid

plates (Fig 2). After an ipsilateral curvilinear incision, temporalis myotomy, and coronoidectomy, we could readily visualize the ipsilateral palate, medial pterygoid plate, lateral pterygoid plate, and hamulus. A partial right maxillectomy consisting of a wide local excision, including a supraperiosteal dissection in the region of the tumor, with a 1-cm margin of normal tissue (including the pterygoid plates), could be easily performed via the transoral approach (Fig 3). An obturator was placed to reconstruct the defect. The patient is doing well with no evidence of recurrence at 2 years' follow-up.

Discussion

We describe a novel transoral approach to the posterolateral maxilla and infratemporal region. This approach provides excellent exposure to the pterygoid muscles and plates, making removal of

posteriorly located lesions much easier under direct vision to achieve free surgical margins. Additional benefits of this transoral approach are preservation of function and cosmesis.

To date, the various surgical approaches for treating posterior maxillary lesions required transcutaneous incisions such as a modified Weber-Ferguson incision with subciliary extension^{1,2} or a lower cheek flap³ to provide sufficient exposure of the lesion. Various other transcutaneous approaches have been described including a coronoidectomy to further improve access to the retromaxillary-infracranial⁴ or parapharyngeal⁵ spaces. These approaches and methods are often associated with substantial morbidity. The modified Weber-Ferguson incision, running from the oral commissure to the anterior aspect of the zygomatic arch, often provides suboptimal posterolateral maxilla exposure because it is limited by the presence of the infraorbital nerve. The subciliary incision also may result in esthetic and functional compromise because of ectropion of the lower eyelid.

Although the lower cheek flap incision,³ running from the nasal vestibule to the mastoid tip, provides improved exposure of the posterolateral maxilla, injury to the mental nerve branches during flap raising results in ipsilateral sensory disturbance. The midline or paramedian lower lip cutaneous incision also may result in poor cosmesis because of the visible scar. The additional risk of marginal mandibular nerve injury can result in lower lip asymmetry and oral incompetence. The addition of a paramedian mandibulotomy with the lower cheek flap⁶ may further improve access; however, this approach may result in trismus, malunion, nonunion, and/or malocclusion.

Another surgical approach involves the use of a Le Fort I approach and downfracture of the maxilla to

provide access to the posterior maxilla.⁷ Although the ability to access lesions is excellent from a superior aspect because of good visibility, this approach may be challenging for tumors that may extend posterolaterally. Furthermore, the additional requirements of re-establishing the occlusion, the application of rigid fixation, the changes to the nasal base, and the increased bleeding risk from descending palatine vessels are all inherent issues with the Le Fort I approach and add to the complexity of the surgical procedure.

Our transoral approach using a curvilinear incision, temporalis myotomy, and coronoidectomy enables controlled resection of tumors that involve the posterolateral maxilla and infratemporal region. Most tumors are easily accessible by this transoral approach even when they are large and involve the posterior sinus and pterygoid plates.

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