

## Chapter 5

# Retropharyngeal Approaches to the Upper Cervical Spine

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### Indications

The retropharyngeal approach allows surgical access when addressing neoplasms, infections, instability secondary to trauma, iatrogenesis, and degenerative or inflammatory conditions from the craniocervical junction to the cervicothoracic junction. Although the transoral route provides a more direct midline approach for the decompression of midline disease from the low clivus to C3, that approach cannot be extended inferiorly without splitting the mandible and tongue. Furthermore, because it uses a contaminated surgical corridor, the transoral route is unsuitable for the placement of allograft or instrumentation or for addressing intradural disease. Although stabilizing instrumentation and bone graft can be placed through the retropharyngeal approach, a posterior approach is preferred for procedures requiring stabilization.

### Contraindications

Although no absolute contraindications exist for this approach, caution must be exercised when using the approach in the setting of prior neck dissection. Preoperative evaluation of vocal cord function should be performed in such circumstances. When vocal cord paralysis is noted, a contralateral approach is contraindicated.

### Alternative Treatments

The transoral approach to the odontoid is well suited for the decompression of extradural conditions extending from the low clivus to C2 in most cases. We have used this technique successfully in the decompression of degenerative and rheumatoid pannus with minimal approach-related morbidity. Because the transoral route uses a contaminated surgical corridor, it is inappropriate for the placement of instrumentation or intradural work.

Although the retropharyngeal approach may be used for upper cervical spine stabilization, the posterior approach usually is preferred because it is more familiar to spine surgeons and has a much lower approach-related morbidity rate.

### Results

The retropharyngeal approach has been the subject of case reports and series reporting on patients with diverse diagnoses (Table 1). No large controlled trials provide an accurate comparison of this approach with alternative approaches. Surgeons must be cognizant of the unique complications that can occur during this atypical approach to the cervical spine.

### Technique

#### Setup/Exposure

The patient is positioned supine on the surgical table. Nasotracheal intubation allows greater upward mobility of the mandible and avoids the use of an esophageal thermometer or stethoscope. Somatosensory- and motor-evoked potentials are used in all patients who have significant com-

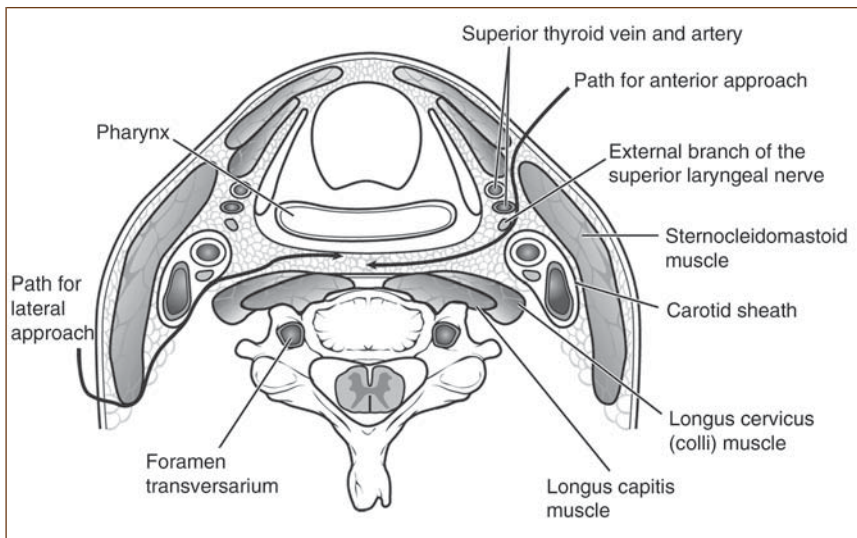
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**Table 1** Results of Retropharyngeal Approaches to the Upper Cervical Spine

Authors (Year)	Number of Patients	Approach	Mean Patient Age in Years (Range)	Mean Follow-up in Months (Range)	Fusion	Complications
Whitesides and McDonald (1978)	30	Lateral	NR	NR	24 of 27 with attempted fusion	2 deaths 1 nonunion 1 infection
McAfee et al (1987)	17	Anterior; posterior stabilization in 11	44 (14-66)	38 (12-120)	12 of 12 followed for >2 years	3 hypoglossal nerve palsy 2 facial nerve palsy 2 hypopharynx injury 2 graft subluxation
Laus et al (1996)	10	Mixed	44 (14-64)	28 (5-36)	6 of 6 with attempted fusion	4 facial nerve palsy (marginal mandibular)
Vender et al (2000)	7	Anterior; stand-alone construct with Caspar plate	NR	18	6	Graft dislodgement, "prolonged" intubation, and need for enteral feeding

NR = not reported.



**Figure 1** Cross-sectional drawing of the neck with the anterior and lateral approaches outlined.

pression or instability. The amount of allowable extension and rotation should be determined before induction by having the patient extend and rotate the neck while reporting symptoms such as the Lhermitte sign. A Halter sling or Gardner-Wells tongs are used for traction.

For the anterior approach, the patient's head may be left in midposition or rotated slightly contralaterally. An incision is marked 2 to 4 cm below the

angle of the mandible in a curvilinear fashion from the midline to the middle of the sternocleidomastoid muscle. Creation of the incision more than 2 cm from the angle of the mandible ensures preservation of the marginal mandibular branch of the facial nerve. The incision can be ended in a T inferiorly to aid in exposure of the subaxial spine for more extensile approaches, but we find a downward extension of this incision unnecessary

when approaching only the odontoid. For the lateral approach, the head may be positioned in the midline and the earlobe taped or sewn anteriorly to allow unimpeded access to the base of the mastoid. The incision is marked and created from the base of the earlobe and extended caudally along the anterior border of the sternocleidomastoid muscle (Figure 1).

**Instruments/Equipment/Implants Required**

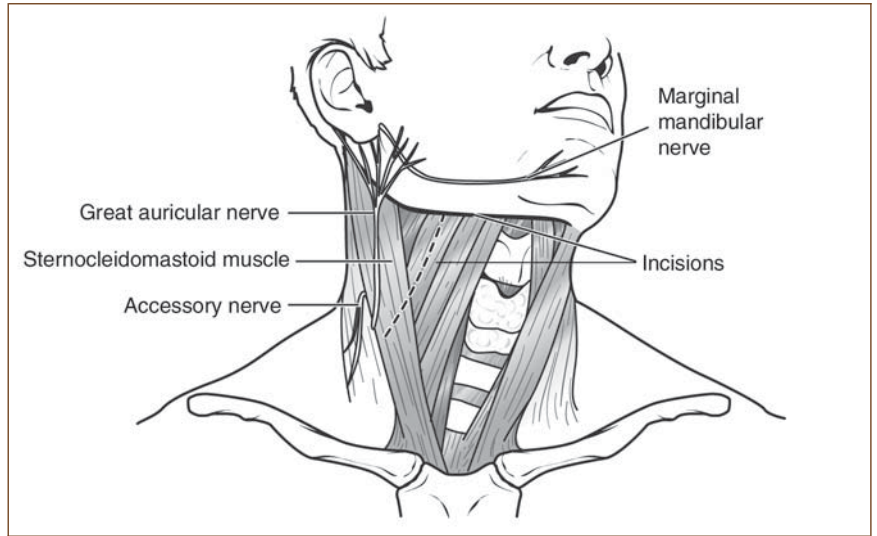
The retropharyngeal approach is an extension of the standard anterior cervical approach; therefore, the instruments and retractors used for the anterior cervical approach are required. To gain cranial exposure, we find a handheld Cloward retractor to be essential. An operating microscope allows better visualization, as the light source and optics can be directed in a cranial path. Direct stabilization of C1 and C2 has been attempted from an anterior approach, but the devices have significantly less stability than posterior craniocervical instrumentation. Therefore, after decompression and grafting, we have used a small kick-out plate, or buttress plate, at the

inferior end of the construct as our only implanted instrumentation.

### Procedure

Two variations of the retropharyngeal approach to the upper cervical spine have been described (Figure 2). The anterior retropharyngeal approach was described by de Andrade and MacNab as a cranial extension of the anterior approach to the cervical spine described by Southwick and Robinson. The anterior variation approaches the spine medial to the carotid sheath. More recently, the approach has been modified by McAfee and associates, who described resection of the submandibular gland and release of the digastric and stylohyoid muscles to gain the improved exposure needed for placing a strut graft. The anterior variation of the approach is favored by most surgeons because it is familiar—being a cranial extension of the normal anterior spinal approach—and allows for a more midline exposure, enabling maintenance of orientation, full canal decompression, protection and control of the vertebral arteries, and placement of a strut graft if desired.

The lateral variation of the retropharyngeal approach was first described by Whitesides and Kelly in 1966. As the name suggests, the lateral variation approaches the upper cervical spine lateral to the carotid sheath. The advantage of this approach is that it does not require rotation of the head. It also places fewer neurovascular structures at risk because the carotid sheath is retracted medially, eliminating the need to dissect the superior laryngeal nerves and external carotid vessels. The lateral approach, however, does not provide a midline view of the upper spine, making midline decompression and strut grafting difficult. Exposure of the basiocciput is limited compared with the anterior variant, and the ipsilateral vertebral artery lies in the approach corridor, placing it at risk. Finally, the lateral



**Figure 2** Drawing shows the incisions for the anterior retropharyngeal approach (solid line) and the lateral retropharyngeal approach (dashed line) with superficial nerves (marginal mandibular, great auricular, accessory) superimposed.

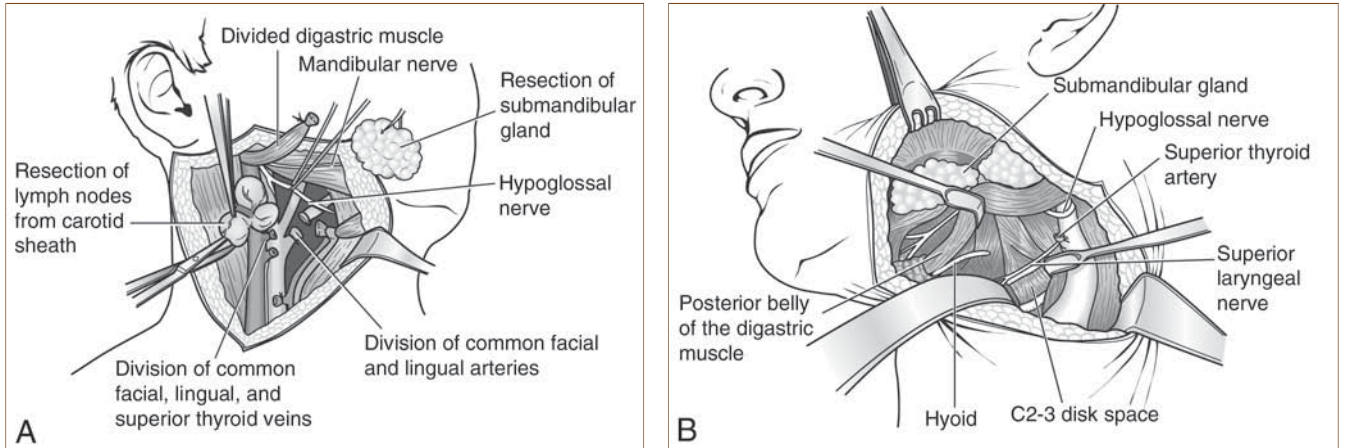
approach is unfamiliar to most spine surgeons.

Either variation of the approach requires an appreciation of the fascial planes of the neck. The superficial fascia invests the platysma muscle, whereas the deep fascia is divided into three layers: the investing, the pretracheal, and the prevertebral fascia. The investing layer encases the sternocleidomastoid muscle. The pretracheal fascia encloses the viscera of the neck, specifically investing the esophagus, trachea, and thyroid gland. It blends laterally with the carotid sheath. The prevertebral fascia invests the spinal column and paravertebral muscles, including the longus colli. Respect for and knowledge of the contents of each fascial plane are critical to ensuring a safe approach to the high anterior cervical spine.

### ANTERIOR APPROACH

The incision is opened sharply, and the superficial fascia and platysma are divided transversely. The subplatysmal plane is then dissected superiorly and inferiorly for a short distance. The greater auricular and anterior cervical nerves are identified overlying the

sternocleidomastoid muscle and are preserved, if possible, to prevent anesthesia around the ear and mandible. The investing fascia is incised sharply along the deep medial edge of the sternocleidomastoid muscle. The carotid pulsation is then palpated, and blunt dissection is used to separate the plane medial to the carotid artery and lateral to the trachea, esophagus, and strap muscles. The submandibular gland can be resected to facilitate superior exposure (Figure 3, A). Care should be taken to suture closed the submandibular duct, however, to prevent the formation of a fistula tracking to the skin or a sialocele, a collection of saliva beneath the skin. The facial vein also is identified in this plane. Although division of this vein is without consequence, developing the plane of dissection deep to the vein helps to preserve the marginal mandibular branch of the facial nerve. The superior thyroid artery and vein often are exposed at this level and are divided to extend the exposure. Caution is advised during this step because these vessels have an intimate relationship with the branches of the superior laryngeal nerve, which course medially



**Figure 3** Drawings show the anterior approach. **A**, The external carotid branches and nerves deep to the sternocleidomastoid fascia when viewed from the anterior approach. Note the resection of the submandibular gland and the division of the digastric muscle, which can be undertaken to improve visualization. **B**, Deep view, with retraction of the carotid sheath. Note the proximity of the superior laryngeal nerve to the C2-3 disk space.

from their origin in the nodose ganglion. The external branch lies just posterior to the superior thyroid vessels at the level of the hyoid, whereas the internal branch courses obliquely just inferior to the genu of the hyoid bone to pierce the thyrohyoid membrane at approximately the C3-4 interspace. Damage to the external branch, which supplies motor innervation to the cricothyroid muscles and regulates vocal cord tension, may result in voice abnormalities, including increased fatigability or loss of high-pitched tone. Damage to the internal branch, which provides sensory innervation to the larynx and some motor innervation to the interarytenoid muscles, may be of greater consequence, causing laryngeal anesthesia and a reduced laryngeal cough reflex, which could predispose the patient to aspiration pneumonia. Thus, care must be taken to fully mobilize the superior laryngeal nerve to allow adequate retraction and reduce the risk of palsy (Figure 3, B).

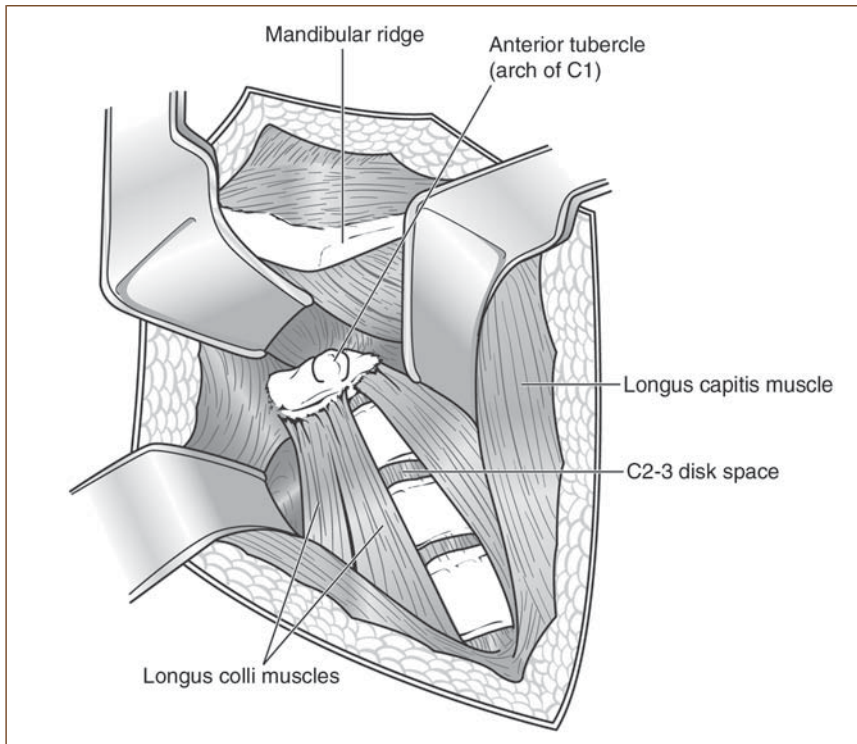
Other vessels, including the ascending pharyngeal artery and vein, lingual artery and vein, and facial artery and vein, can limit superior exposure and may be divided if necessary.

The retromandibular vein also can obscure the approach in this region and may be divided without consequence. This vessel, however, also serves as a good landmark for the superior extent of exposure because more superior dissection may place the superficial branches of the facial nerve at risk.

The superomedial extent of dissection may be limited by the attachment of the stylohyoid and digastric muscles (via the tendinous sling) to the hyoid bone. Aggressive superior retraction must be avoided because retraction on the origin of the stylohyoid muscle can cause injury to the facial nerve as it exits the stylomastoid foramen. The stylohyoid and digastric muscles can be divided if necessary to enable greater mobilization of the hyoid bone and the hypopharynx and greater exposure of midline structures. If division is necessary, the digastric muscle should be divided at its tendinous junction, and each end should be tagged for later reapproximation. This maneuver rarely is necessary, however, for simple decompression. The hypoglossal nerve lies at the superior extent of the exposure and in close relation to the digastric

tendon and is at its most superficial point in this region. Direct localization of this nerve with the aid of a nerve stimulator is performed routinely to prevent accidental ligation. Aggressive superior retraction also can injure the hypoglossal nerve, so, following identification, the nerve is dissected sharply and mobilized from the hypoglossal canal to the hypoglossal muscle. Although the recurrent laryngeal nerve is not routinely exposed, we do recommend deflation and reinflation of the endotracheal tube cuff once the retractors are in place to minimize the risk of dysphonia.

Once the medial and lateral structures are mobilized, dissection through the alar and prevertebral fascial layers is performed with a Kittner dissector to expose the anterior surface of the vertebral bodies, disk, and overlying longus colli muscles. Exposure is maintained with a blunt handheld retractor. The medial borders of these muscles are situated closer to the midline cranially than caudally, being separated by a distance of 4.5 mm at the C2-C3 level (Figure 4). The midline is marked between the longus muscles with monopolar electrocautery, and the mus-



**Figure 4** Drawing shows the exposure of the spine from the anterior approach with retraction of the longus colli muscles and identification of the C2-3 disk space.

cles are then elevated laterally in a subperiosteal fashion. Self-retaining toothed blade retractors are placed, and the endotracheal cuff is deflated and reinflated. Another set of retractors can be used to maintain cranial-caudal exposure, although interference of the mandible can be problematic. In such cases, a handheld retractor can be used for superior exposure. It is important to note the amount of head rotation, if any, at this stage to avoid coursing too far laterally during the dissection and removing too much of the lateral arch of C1 or the lateral mass of C2, which would put the vertebral arteries at risk.

Depending on the amount of decompression necessary, it often is useful to start by performing a discectomy at C2-3, a maneuver that exposes the uncovertebral joint and thus provides an additional landmark by which to keep midline orientation. The removal of the anterior arch of C1 and exposure of the odontoid process

for decompression is accomplished with a high-speed drill. In cases of basilar invagination, the tip of the odontoid process is removed before sectioning of the base to prevent superior retraction of this structure. The body of the odontoid is drilled, leaving a thin shell of bone posteriorly, which is then penetrated and removed with curets and Kerrison rongeurs. Caution should be exercised to leave the lateral pillars intact if possible, because they are the primary load-bearing structures of the atlantoaxial articulation. Microsurgical techniques appropriate for the given pathologic condition are then used to perform resection and canal decompression. Special care is taken to prevent dural entry and cerebrospinal fluid (CSF) leakage. If evidence of a CSF leak is found, we recommend 48 to 72 hours of diversion using a lumbar drain, to allow the dural repair to seal down.

The retropharyngeal approach enables the placement of an iliac crest

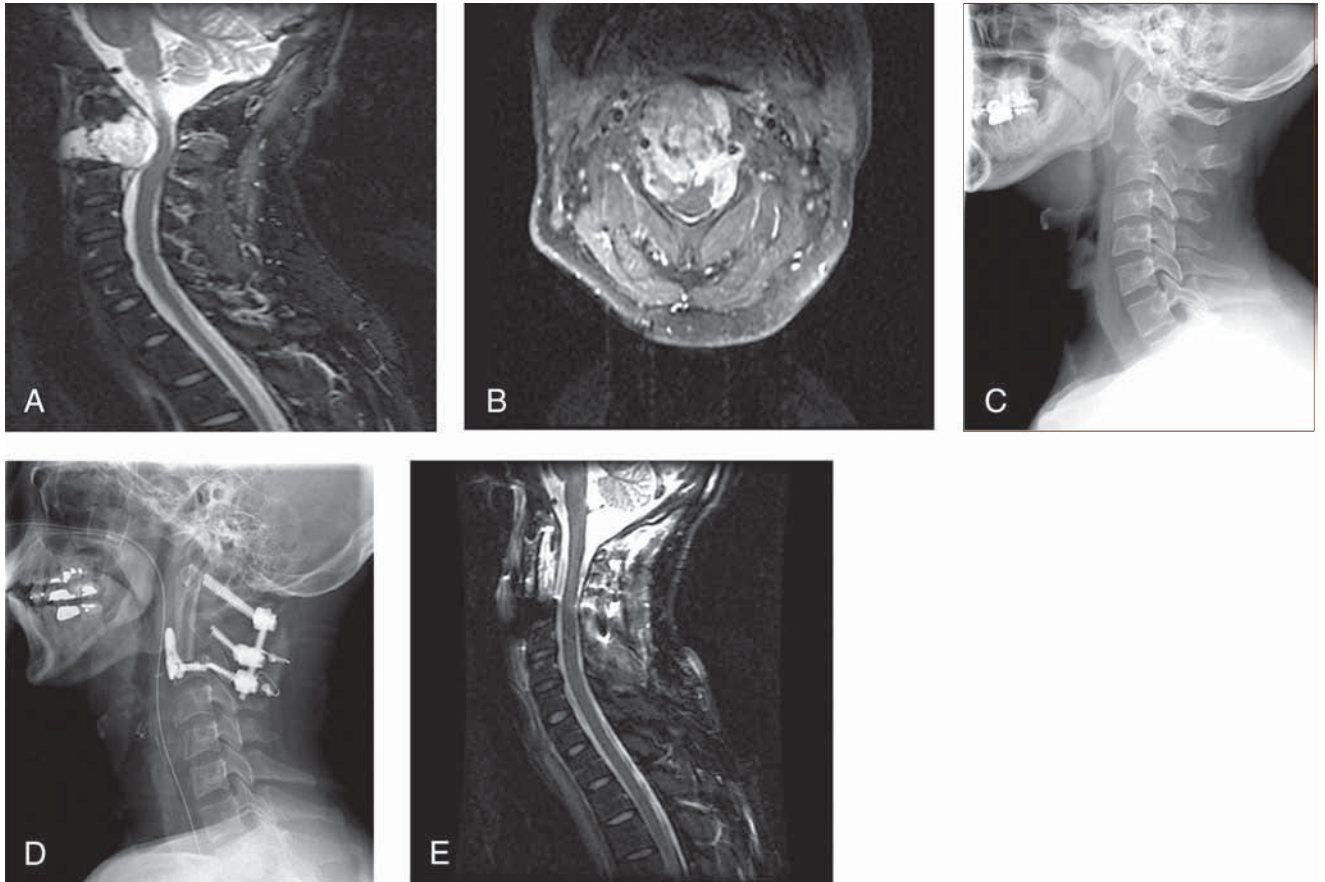
graft or fibular strut allograft to aid in fusion, a procedural component associated with an exceedingly high infection rate when performed through the transoral approach. Although good fusion results have been reported with anterior graft placement, supplemental stabilization is mandatory and can be accomplished with posterior instrumentation, anterior instrumentation, or a halo device (Figure 5).

Closure is straightforward and begins with reapproximation of the digastric muscle. A drain is placed following lengthy cases or those in which significant bleeding has occurred. The sternocleidomastoid fascia, platysma muscle, and skin are then closed in separate layers.

#### LATERAL APPROACH

The incision is created as outlined previously (Figure 2) and taken down to the sternocleidomastoid fascia. The greater auricular nerve is dissected in the subcutaneous tissue just posterior and inferior to the base of the ear. Careful dissection and retraction enable preservation of the nerve and the prevention of postoperative anesthesia around the ear. The spinal accessory nerve is identified where it penetrates the sternocleidomastoid muscle approximately 3 cm caudal to the mastoid tip (Figure 6). For limited exposures of the upper cervical spine, the accessory nerve may be retracted medially with the internal jugular vein and carotid artery, but for more extensive exposure of the subaxial spine, it should be identified from its exit at the jugular foramen, allowing it to be retracted posteriorly and laterally as the sternocleidomastoid muscle is everted medially. Once the nerve has been identified and protected, the sternocleidomastoid muscle is detached from the tip of the mastoid. A fascial cuff for the lateral approach should be left for reapproximation.

The carotid pulsation is palpated, and a soft-tissue plane is developed posterior to the carotid sheath. The C1



**Figure 5** MRIs and radiographs of a 47-year-old man with progressive neck pain and a Lhermitte sign. Sagittal T2-weighted MRI (A), axial T1-weighted MRI with contrast (B), and lateral radiograph (C) show a destructive mass in the C2 vertebral body. A biopsy was done before referral to our institution, the results of which were consistent with chordoma. Surgery was performed in two stages, with a posterior stabilization followed by an anterior retropharyngeal approach along the path of the biopsy (D). A gross total excision was performed, as demonstrated on postoperative sagittal T2-weighted MRI (E), and the C2 body was reconstructed with a fibular graft. At 3 months following surgery, the patient was referred for proton beam radiotherapy.

lateral mass is the most prominent bony protrusion and can be used as a landmark (Figure 7). The lateral mass of C2 and anterior tubercle of C1 also should be palpated. A malleable retractor is then used to maintain this plane of exposure, elevating the carotid sheath and sternocleidomastoid muscle anteriorly to allow an anterolateral view of the C1 arch. The prevertebral plane can then be extended caudally using blunt dissection techniques. The longus colli muscles are identified and subperiosteally dissected from medial to lateral to provide the necessary exposure. A 90° bent-tip monopolar cautery can be

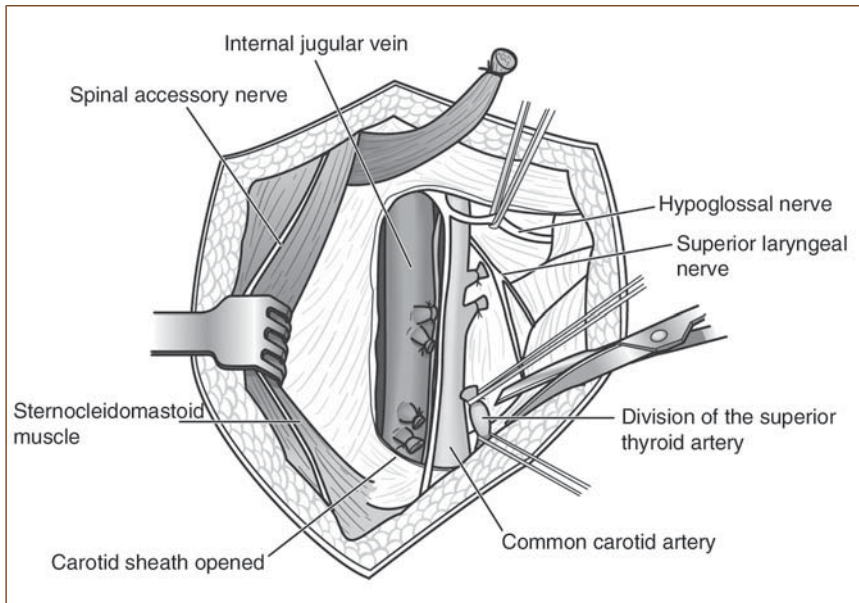
used to initiate the dissection of the prevertebral tissue and longus colli muscles.

Identification of the midline and maintenance of the midline orientation is a challenging but critical component of the lateral approach, especially if the head is rotated significantly. Palpation of the jaw, identification of the tubercle of the C1 arch, and identification of the midline prominence of the base of the odontoid, along with the frequent use of fluoroscopy, can aid in maintaining orientation. Canal decompression and tumor resection are performed as above, with care taken to identify and preserve the vertebral ar-

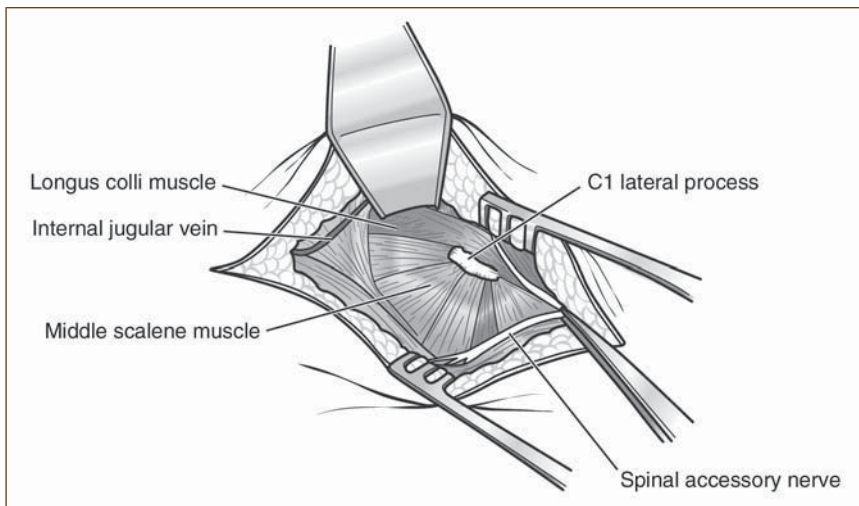
tery as it courses within the lateral window of approach.

### Wound Closure

Closure for the anterior approach is straightforward and begins with reapproximation of the digastric muscle. A drain is placed following lengthy surgeries or those in which significant bleeding occurs. The sternocleidomastoid fascia, platysma muscle, and skin are then closed in separate layers. After reapproximation of the sternocleidomastoid muscle, closure for the lateral approach is performed in the same way as for the anterior approach.



**Figure 6** Drawing of the superficial anatomy encountered in the lateral retropharyngeal approach. Care is taken to identify and preserve the spinal accessory nerve prior to division and retraction of the sternocleidomastoid muscle. In this approach, the carotid sheath is retracted medially.



**Figure 7** Drawing depicts the exposure of the spine from the lateral approach with identification of the anterior tubercle of C1 following carotid retraction medially. The spinal accessory nerve needs to be fully mobilized before retraction or resection of the insertion of the sternocleidomastoid muscle.

## Postoperative Regimen

In patients who have undergone uncomplicated retropharyngeal odontoidectomy, extubation is attempted immediately after surgery. In cases

complicated by lengthy surgical times, greater than expected blood loss, or significant soft-tissue edema, or in patients undergoing posterior stabilization as part of the same procedure, intubation is maintained during immediate postoperative care. The decision to extubate the patient depends

on the patient's clinical status. The absence of a cuff leak around the breathing tube is one indicator that extubation should be delayed. A nasoduodenal feeding tube can be placed during surgery in cases in which prolonged intubation is expected.

Patients extubated immediately after surgery are allowed to begin oral intake with thick liquids on postoperative day 1. The diet is advanced as the patient can tolerate it. Suspected aspiration should be evaluated by a speech therapist, and the placement of a temporary feeding tube can be considered. In our experience, however, postoperative dysphagia usually is short lived. Elderly patients are more likely to have problems with dysphagia and are at greater risk for aspiration pneumonia after high anterior cervical procedures. Greater vigilance and preoperative counseling about these risks is mandated in these patients.

## Avoiding Pitfalls and Complications

The retropharyngeal approach to the high cervical spine is complicated by a high rate of dysphagia. The incidence of this complication can be reduced by minimizing the amount and length of retraction of the trachea and esophagus. Detethering external carotid vessels and dividing the digastric and stylohyoid muscles may allow greater mobilization of midline structures. Additionally, care must be taken to identify and preserve the superior laryngeal nerve; injury to this nerve may cause pharyngeal anesthesia and predispose the patient to aspiration pneumonia.

Injury to other nerves, including the accessory, hypoglossal, and greater auricular nerves, can be avoided by early identification and protection as described previously. The marginal

mandibular branch of the facial nerve is protected by keeping the incision more than 2 cm inferior to the angle of the mandible and below the retromandibular view.

Esophageal perforation is a rare complication. When it is suspected, indigo carmine dye can be injected into the esophagus to identify the site of perforation, which must then be closed in two layers. A nasogastric tube is left in place for 1 week in these patients, and antibiotics with anaerobic coverage are administered.

Spinal fluid leaks are treated by placing a dural repair substitute or fascial autograft over the site of the leak. We place a biologic fibrin glue over the repair. A lumbar drain placed at the conclusion of the procedure is used to drain spinal fluid for 3 days.

In summary, retropharyngeal approaches to the upper cervical spine present challenges to the spine surgeon because of the unique anatomy and the difficult pathology encountered during these procedures. A full understanding of the prevertebral and

spinal anatomy is required. Full discussion with the patient of the potential complications, including dysphagia and dysphonia, and the possible need for prolonged intubation and nasogastric feeding tubes is essential. Although careful dissection allows good access for resection of the pathology and placement of a graft, stabilization is best accomplished with a staged approach through occipitocervical or C1-C2 fixation.

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<b>Coding</b>		<b>Corresponding ICD-9 Codes</b>	
<b>CPT Codes</b>			
22551	Arthrodesis, anterior interbody, including disc space preparation, discectomy, osteophylectomy and decompression of spinal cord and/or nerve roots; cervical below C2	711.01 711.03 711.05	711.02 711.04 711.06
22552	Arthrodesis, anterior interbody, including disc space preparation, discectomy, osteophylectomy and decompression of spinal cord and/or nerve roots; cervical below C2, each additional interspace (List separately in addition to code for separate procedure)	711.01 711.03 711.05	711.02 711.04 711.06
22554	Arthrodesis, anterior interbody technique, including minimal discectomy to prepare interspace (other than for decompression); cervical below C2	722.0 805.03 805.05	733.13 805.04 805.06
22556	Arthrodesis, anterior interbody technique, including minimal discectomy to prepare interspace (other than for decompression); thoracic	721.2 722.51 737.39	721.41 733.13 805.2
22558	Arthrodesis, anterior interbody technique, including minimal discectomy to prepare interspace (other than for decompression); lumbar	567.31 721.42 733.13	721.3 722.52 737.20
22845	Anterior instrumentation; 2 to 3 vertebral segments (List separately in addition to code for primary procedure)	170.2 342.9 343	342.1 342.90 343.0
22846	Anterior instrumentation; 4 to 7 vertebral segments (List separately in addition to code for primary procedure)	170.2 342.9 343	342.1 342.90 343.0
22847	Anterior instrumentation; 8 or more vertebral segments (List separately in addition to code for primary procedure)	170.2 342.9 343	342.1 342.90 343.0
22848	Pelvic fixation (attachment of caudal end of instrumentation to pelvic bony structures) other than sacrum (List separately in addition to code for primary procedure)	170.2 342.9 343	342.1 342.90 343.0

**Coding (continued)**

<b>CPT Codes</b>		<b>Corresponding ICD-9 Codes</b>	
22851	Application of intervertebral biomechanical device(s) (eg, synthetic cage(s), methylmethacrylate) to vertebral defect or interspace (List separately in addition to code for primary procedure)	170.2 342.9 343	342.1 342.90 343.0
63075	Discectomy, anterior, with decompression of spinal cord and/or nerve root(s), including osteophytectomy; cervical, single interspace	721.1 722.71 806.01	722.0 806.00 806.02
63076	Discectomy, anterior, with decompression of spinal cord and/or nerve root(s), including osteophytectomy; cervical, each additional interspace (List separately in addition to code for primary procedure)	721.1 722.11 722.72	722.0 722.71 806.00
63077	Discectomy, anterior, with decompression of spinal cord and/or nerve root(s), including osteophytectomy; thoracic, single interspace	721.41 722.72 806.21	722.11 806.20 806.22
63078	Discectomy, anterior, with decompression of spinal cord and/or nerve root(s), including osteophytectomy; thoracic, each additional interspace (List separately in addition to code for primary procedure)	722.11 806.20 806.22	722.72 806.21 806.23
63081	Vertebral corpectomy (vertebral body resection), partial or complete, anterior approach with decompression of spinal cord and/or nerve root(s); cervical, single segment	170.2 806.00 806.02	722.71 806.01 806.03
63082	Vertebral corpectomy (vertebral body resection), partial or complete, anterior approach with decompression of spinal cord and/or nerve root(s); cervical, each additional segment (List separately in addition to code for primary procedure)	170.2 806.00 806.02	722.71 806.01 806.03
63085	Vertebral corpectomy (vertebral body resection), partial or complete, transthoracic approach with decompression of spinal cord and/or nerve root(s); thoracic, single segment	170.2 806.20 806.22	721.41 806.21 806.23
63086	Vertebral corpectomy (vertebral body resection), partial or complete, transthoracic approach with decompression of spinal cord and/or nerve root(s); thoracic, each additional segment (List separately in addition to code for primary procedure)	170.2 722.72 806.21	721.41 806.20 806.22
63087	Vertebral corpectomy (vertebral body resection), partial or complete, combined thoracolumbar approach with decompression of spinal cord, cauda equina or nerve root(s), lower thoracic or lumbar; single segment	170.2 721.41 722.72	567.31 721.42 722.73
63088	Vertebral corpectomy (vertebral body resection), partial or complete, combined thoracolumbar approach with decompression of spinal cord, cauda equina or nerve root(s), lower thoracic or lumbar; each additional segment (List separately in addition to code for primary procedure)	170.2 721.42 722.73	567.31 722.72 805.4
63090	Vertebral corpectomy (vertebral body resection), partial or complete, transperitoneal or retroperitoneal approach with decompression of spinal cord, cauda equina or nerve root(s), lower thoracic, lumbar, or sacral; single segment	170.2 806.4 806.6	567.31 806.5
63091	Vertebral corpectomy (vertebral body resection), partial or complete, transperitoneal or retroperitoneal approach with decompression of spinal cord, cauda equina or nerve root(s), lower thoracic, lumbar, or sacral; each additional segment (List separately in addition to code for primary procedure)	170.2	567.31

**Coding** *(continued)*

<b>CPT Codes</b>		<b>Corresponding ICD-9 Codes</b>	
63300	Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; extradural, cervical	170.2 238.0 733.13	213.2 239.2
63301	Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; extradural, thoracic by transthoracic approach	170.2 238.0 733.13	213.2 239.2
63302	Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; extradural, thoracic by thoracolumbar approach	170.2 238.0 733.13	213.2 239.2
63303	Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; extradural, lumbar or sacral by transperitoneal or retroperitoneal approach	170.2 238.0 733.13	213.2 239.2
63304	Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; intradural, cervical	170.2 238.0 733.13	213.2 239.2
63305	Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; intradural, thoracic by transthoracic approach	170.2 238.0 733.13	213.2 239.2
63306	Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; intradural, thoracic by thoracolumbar approach	170.2 238.0 733.13	213.2 239.2
63307	Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; intradural, lumbar or sacral by transperitoneal or retroperitoneal approach	170.2 238.0 733.13	213.2 239.2
63308	Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; each additional segment (List separately in addition to codes for single segment)	170.2 238.0 733.13	213.2 239.2

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