Emergency Imaging Assessment of Acute, Nontraumatic Conditions of the Head and Neck

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Patients often present to the emergency department with a wide variety of nontraumatic infectious, inflammatory, and neoplastic conditions of the head and neck. Because the use of cervical and neck computed tomography (CT) has become routine in the emergency setting, knowledge of the imaging findings of common acute conditions of the head and neck is essential to ensure an accurate diagnosis of these potentially life-threatening conditions, which include oral cavity infections, tonsillitis and peritonsillar abscess, sialadenitis, parotiditis, diskitis, thrombophlebitis, periorbital and orbital cellulitis, infectious cervical lymphadenopathy, and various neoplasms. Less common conditions that require rapid diagnosis and treatment include epiglottitis, invasive fungal sinusitis, angioedema, and deep neck abscess. Familiarity with these conditions enables the radiologist to make a prompt diagnosis, assess the extent of disease, and evaluate for potential complications. CT is the first-line imaging modality in the emergency setting; however, magnetic resonance imaging plays an important secondary role.

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LEARNING OBJECTIVES FOR TEST 5

After reading this article and taking the test, the reader will be able to:

■ List the common acute, nontraumatic head and neck conditions that may be seen in the emergency setting.
■ Describe the CT and MR imaging findings of common acute, nontraumatic head and neck conditions.
■ Discuss appropriate treatment of common acute, nontraumatic head and neck conditions.

TEACHING POINTS

See last page

Abbreviations: ACE = angiotensin-converting enzyme, HIV = human immunodeficiency virus

RadioGraphics 2010; 30:1335–1352 • Published online 10.1148/rg.305105040 • Content Codes: ER HN

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Introduction
There is a wide variety of infectious and inflammatory disorders of the head and neck that may manifest emergently. As the number of patients who use the emergency room as an initial point of access to healthcare increases, the number of acute neoplastic and nonneoplastic conditions involving the head and neck that are encountered in the emergency room will also increase. Computed tomography (CT) is the first-line imaging modality in the acute setting; however, magnetic resonance (MR) imaging plays an important secondary role. Awareness of these conditions is important to provide an accurate and prompt diagnosis, assess the extent of disease, evaluate for potential complications, and recommend definitive subspecialty evaluation. In this article, common nontraumatic abnormalities of the head and neck that are encountered in the emergency setting are described, as well as some less common but potentially life-threatening conditions that must be promptly identified.

Infections
Oral Cavity
Oral cavity infections frequently are the result of periodontal disease. Patients with oral cavity infections present with facial swelling, pain, dysphagia, and dysphonia. Infections of the second or third molar teeth likely involve the submandibular space because the roots of these teeth extend below the insertion of the mylohyoid muscle. If the more anterior teeth are involved, the infection typically is confined to the sublingual space because the roots of these teeth extend above the mylohyoid muscle (1). Cortical dehiscence is more common on the thinner, lingual aspect of the mandible than on the thicker, buccal aspect. Contrast material–enhanced CT is the preferred modality for evaluation of oral cavity infections and suspected periodontogenic abscess because it clearly depicts rimlike enhancement of fluid collections and associated cellulitis and myositis. Careful evaluation of CT images obtained with bone window settings may reveal the caustive periapical abscess and mandibular cortical dehiscence (Fig 1) (1,2). Signs of mandibular osteomyelitis such as permissive bone changes, osseous destruction, and periosteal reaction should be carefully assessed to ensure that appropriate long-term antibiotic treatment is employed. Periodontogenic abscess is treated with tooth extraction, abscess drainage, and intravenous antibiotic therapy (2).

Ludwig Angina.—Ludwig angina is a serious, potentially life-threatening infection of the floor of the mouth that rapidly extends bilaterally to the soft tissues of the oral cavity. Ludwig angina is a type of cellulitis, not a focal abscess. It most often is caused by an infection of the third mandibular molar tooth or pericoronitis (an infection of the gums surrounding the partially erupted lower third molar tooth), both of which typically are caused by Streptococcus organisms. Patients present with pain, swelling, dysphagia, fever, tongue elevation, drooling, and an inability to swallow. At physical examination, the submandibular tissues are firm and hard, and crepitation may be present. As soft-tissue swelling displaces the tongue into the pharyngeal airway, the patient may experience difficulty breathing or stridor. Prompt treatment with antibiotics and airway management is important (3). Imaging is performed to assess airway patency and determine if gas-forming organisms, an underlying dental infection, or a drainable abscess is present (1).

Descending Necrotizing Mediastinitis.—A rare but emergent complication of periodontal infection is descending necrotizing mediastinitis, which has a mortality rate of 25%–40% (4,5). This high rate is due to delayed diagnosis, a result of nonspecific, subtle symptoms and clinical findings. Infection most commonly spreads from the oral cavity or oropharynx to the mediastinum by way of the retropharyngeal space (the “danger” space), but it also may spread by way of the carotid space. Contrast-enhanced CT allows the most accurate and rapid detection of descending necrotizing mediastinitis, and it often depicts both the source of infection and the route of spread. CT findings of acute mediastinitis include mediastinal fluid collections, increased attenuation of mediastinal fat, locules of gas within the mediastinum, and pericardial or pleural effusions (Fig 2). Aggressive treatment is essential and includes airway management; broad-spectrum antibiotics; and early mediastinal exploration, débridement, and drainage (6).

Oropharynx
Tonsillitis and peritonsillar abscess are the most commonly encountered deep neck infections...
among adolescents and young adults, with peri-
tonsillar abscess accounting for one-third of all
soft-tissue abscesses of the head and neck (7,8).
Symptoms include severe unilateral sore throat,
fever, tender cervical lymphadenopathy, dys-
phagia, and pharyngotonsillar exudates; otalgia
and trismus also are common. The most com-
mon pathogens are β-hemolytic *Streptococcus*,
*Staphylococcus aureus*, pneumococcus, and
*Haemophilus influenzae*. Acute tonsillitis may
suppurate and internally cavitate to create an intratonsillar abscess; however, a true tonsillar abscess is rare. Infection that penetrates the fibrous tonsillar capsule and the peritonsillar space—a potential space between the tonsillar capsule and the superior constrictor muscle—is more common. The infection may then continue to extend into the parapharyngeal, masticator, or submandibular space. The resulting peritonsillar cellulitis resolves over several days when antibiotics are administered; however, if it goes untreated, a peritonsillar abscess develops, typically along the superior tonsillar pole.

Imaging is not routinely performed if the diagnosis is clinically apparent. However, contrast-enhanced CT is used if the diagnosis is uncertain, a full clinical examination cannot take place (eg, when severe trismus is present), a deep neck space infection or complication is suspected, or the patient does not respond to therapy. For the detection of peritonsillar abscess, contrast-enhanced CT has specificity of approximately 75% and sensitivity that approaches 100%; however, false-positive results are common because of the difficulty in differentiating phlegmon from abscess (9). CT findings of peritonsillar cellulitis include tonsillar enlargement and linear, striated enhancement of the palatine tonsils and posterior pharyngeal soft tissues (Fig 3). Medial apposition of the enlarged tonsils results in a “kissing tonsils” appearance. Central liquefaction with surrounding rimlike enhancement is diagnostic of peritonsillar abscess (Fig 4). Peritonsillar cellulitis is treated with antibiotics, whereas abscess requires needle aspiration or surgical drainage (2,7,8,10).

Retropharynx
Infections of the retropharyngeal space often result from the spread of infection from a site with a primary drainage path to the lymph nodes of the retropharyngeal space. Such infections are caused by tonsillitis, pharyngitis, otitis, and infections of the oral cavity. Once involved, the affected retropharyngeal lymph nodes enlarge and suppurate. Acute suppurative lymphadenitis is common among pediatric patients. Contrast-enhanced CT depicts central areas of low-attenuation cystic change with peripheral enhancement within a retropharyngeal lymph node (Fig 5). Adjacent inflammatory change or retropharyngeal cellulitis may be present. If left untreated, the affected lymph node may rupture into the retropharyngeal space, creating a retropharyngeal

Figures 3, 4. (3) Pharyngitis and tonsillitis. (a) Axial contrast-enhanced CT image shows mild prominence of the posterior pharyngeal soft tissues, which demonstrate linear, striated enhancement. (b) Axial contrast-enhanced CT image shows that the palatine tonsils demonstrate a similar pattern of linear, striated enhancement (arrows). (4) Peritonsillar abscess. Axial contrast-enhanced CT image shows enlargement of the right palatine tonsil and central liquefaction, findings indicative of peritonsillar abscess (arrow).
Causative organisms of retropharyngeal infections include *S aureus*, *Haemophilus parainfluenzae*, and β-hemolytic *Streptococcus* group A (2,11).

Direct spread of adjacent diskitis or osteomyelitis and inoculation from a penetrating trauma also may lead to retropharyngeal abscess. Patients with retropharyngeal abscess present with fever, sore throat, neck pain, and a limited range of motion. Although retropharyngeal abscess is most common in children under the age of 6 years, it is becoming increasingly frequent among adults, particularly those who are immunocompromised and those with a spinal infection resulting from trauma (2). Lateral radiography may depict prevertebral swelling or air within the prevertebral soft tissues. At contrast-enhanced CT and MR imaging, it is possible to accurately localize the infection and distinguish between suppurative lymphadenopathy, retropharyngeal edema, and a true abscess (10). Contrast-enhanced CT is preferred because it generally is readily available and it allows rapid acquisition of diagnostic images. At contrast-enhanced CT, a retropharyngeal abscess appears as a low-attenuation fluid collection that distends the retropharyngeal space with peripheral rimlike enhancement (Fig 6). Imaging also is useful for the assessment of potential complications such as inferior extension through the anatomic danger space into the mediastinum; compromised airway; direct extension to the spine and epidural space; and involvement of the carotid space, with possible internal jugular vein thrombosis, pseudoaneurysm formation, and narrowing of the internal carotid artery (2). Early consultation with an otolaryngologist is imperative. The prognosis of patients with a retropharyngeal abscess is good with early diagnosis and aggressive treatment with intravenous antibiotics and airway management; however, surgical drainage may be necessary for a large or complex abscess.

**Hypopharynx**

Epiglottitis is a life-threatening disease that often requires emergent intubation, especially when it occurs in children. Patients with epiglottitis present with abrupt onset of stridor and dysphagia, a toxic appearance, and high fever. Overall, epiglottitis has become less prevalent since the introduction of the *H influenzae* vaccine (11). Nevertheless, an increasing number of cases caused by other bacterial and viral organisms such as *Streptococcus* are being encountered. This has led to a demographic shift, with epiglottitis more prevalent among adults than children (12–14).
Acute epiglottitis caused by a gas-forming organism. Axial (a) and sagittal (b) contrast-enhanced CT images show the epiglottis, which is enlarged and contains multiple foci of air (arrow in b).

**Salivary Gland**

**Sialadenitis.**—Patients with acute sialadenitis present with painful swelling that is exacerbated by eating, a condition that often is referred to as salivary colic. The most common causative organism of sialadenitis is *S. aureus*. At contrast-enhanced CT, the submandibular gland is enlarged and enhancing, with ductal dilatation secondary to an obstructive calculus or stenosis; these findings typically are unilateral. Associated cellulitis and myositis often are present within the sublingual and submandibular spaces (Fig 8). Among patients with sialadenitis, calculi are present in the submandibular duct in 80%–90% of cases, and they are seen in the parotid duct in 10%–20% of cases. They occur most often in the submandibular duct because of its large diameter and ascending course, its thicker and more mucinous and alkaline salivary content, and the presence of salivary stasis (2). In contrast to the pain and swelling of acute sialadenitis, in chronic sialadenitis the submandibular gland is firm and painless with unilateral atrophy and fatty infiltration,
which typically results from chronic calculi and salivary stasis. Secondary sialadenitis often occurs as a result of ductal obstruction from squamous cell carcinoma in the floor of the mouth.

**Parotiditis.**—Acute parotiditis may be bacterial, viral, or calculus induced. Acute suppurative parotiditis usually is unilateral, and it manifests with a sudden onset of pain and swelling. Patients present with a toxic appearance, high fever, and tenderness of the involved gland. In acute suppurative parotiditis, purulent material may be expressed through the Stenson duct by applying pressure over the parotid gland (16). In adults, bacterial parotiditis is most common among the elderly and those who are debilitated. It also is common in postoperative patients who underwent intubation and are dehydrated (11,17). The most common pathogens in acute parotiditis are *S aureus* and anaerobic bacteria; *S aureus* is recovered in more than 50% of patients (2,16). At contrast-enhanced CT, the parotid gland is diffusely enlarged and enhancing, and the margins may be ill defined. Internal areas of low attenuation are indicative of intraparotid abscesses.
Figure 10. Diskitis. (a, b) Axial (a) and sagittal (b) contrast-enhanced CT images show prevertebral fluid and edema (arrow in b). On the sagittal image, soft-tissue fullness is seen in the ventral epidural space at levels C5–6. (c) Sagittal T2-weighted MR image also shows prevertebral edema (arrows). The disk space at the C5–6 level demonstrates abnormal signal intensity, a finding indicative of diskitis. Infection extends into the ventral epidural space, and an epidural abscess is seen displacing the spinal cord posteriorly (arrowhead).

parotiditis include abscess formation, which may rupture into the deep spaces of the neck; thrombophlebitis of the retromandibular or facial veins; and, rarely, cranial nerve VII dysfunction (2). Treatment of parotiditis includes hydration and antibiotic therapy. Drainage may be required if an abscess develops.

Viral parotiditis is associated with systemic viral infection and is bilateral in 75% of cases; the submandibular and sublingual glands also may be involved. The mumps virus (paramyxovirus) is the most common pathogen. Other pathogens include influenza virus, parainfluenzavirus, coxsackievirus, cytomegalovirus, and adenovirus. The peak prevalence of viral parotiditis occurs in patients aged 5–9 years. It is a self-limiting condition that manifests with prodromal symptoms, which are followed by bilateral parotid gland tenderness (2). Calculus-induced parotiditis is secondary to ductal obstruction by a stone and typically is unilateral. In the parotid gland, 90% of calculi are radiolucent on conventional radiographs. The majority of parotid duct stones are visible at CT; however, findings may be limited to ductal dilatation and a diffusely enlarged parotid gland (18).

Spinal and Perivertebral Infections

Diskitis.—Diskitis results from direct inoculation from trauma or surgery, extension of an adjacent infection, or hematogenous spread of infection. S aureus is the most common pathogen and is present in more than 50% of cases (19,20). Symptoms of diskitis include neck and back pain, focal tenderness, fever, and myelopathy. It has a bimodal age distribution and occurs most often in young children and adults in the 6th or 7th decade of life. Pyogenic spondylodiskitis is associated with predisposing factors such as intravenous drug use, immunocompromised status, and diabetes mellitus, and it is more common in the thoracic and lumbar spine than the cervical spine.

At imaging, involvement of two adjacent vertebrae and the intervening disk is seen. CT findings of early diskitis and osteomyelitis are subtle, but early loss of disk height and endplate irregu-
Figure 11. Septic facet arthritis. (a) Axial contrast-enhanced CT image obtained with soft-tissue window settings shows fluid and edema within the posterior paraspinal soft tissues (black arrows) and areas of low attenuation within and surrounding the right C3–4 facet joint (white arrow). (b) Axial contrast-enhanced CT image obtained with bone window settings shows lytic change and cortical destruction (arrow). (c) Coronal T2-weighted MR image better depicts the edema within the right paraspinal musculature. An area of focal, high signal intensity also is seen within and surrounding the right C3–4 facet joint (arrow).

larities are more conspicuous on sagittal and coronal reformatted images than they are on axial images (20). More overt findings include vertebral body collapse, paraspinal or epidural soft-tissue inflammation, and fluid collections (Fig 10). MR imaging is the most sensitive modality for assessment of osteomyelitis and epidural abscess, which appear as areas of high signal intensity on inversion recovery images and low signal intensity on T1-weighted images. Enhancement of the involved disk space and adjacent bone marrow also is seen. If the patient is neurologically intact and the spine is mechanically stable, needle biopsy is performed before initiation of intravenous antibiotic therapy. Perivertebral or epidural fluid aspirate—or a bone biopsy specimen in the absence of a fluid collection—may be obtained under CT guidance for this purpose. The positive yield from aspirate or a biopsy specimen is approximately 77% as opposed to blood cultures, which have a positive yield in only 58% of cases (21). Surgical decompression is indicated if cord compression or spinal instability is present or if the patient progresses clinically despite appropriate medical therapy (19).

**Septic Facet Arthritis.**—Septic facet arthritis is an uncommon cause of acute neck pain with focal tenderness and fever. It typically involves a single vertebral level and results from hematogenous spread of infection, most commonly *S aureus* infection (22). Risk factors for septic facet arthritis include intravenous drug use and an immunocompromised status. At CT, expansion of the facet joint, joint effusion, and periarticular edema are seen, and the joint may demonstrate diffuse rimlike enhancement (Fig 11a). When bone window settings are used, mixed lytic and sclerotic change may be seen (Fig 11b). It is important to assess for extension into the paraspinal soft tissues and epidural space. MR imaging is more sensitive than CT for the detection of associated osteomyelitis, myositis, and epidural extension. Complications of septic facet arthritis include paraspinal or epidural abscess, foraminal compromise, meningitis, and progression to a more extensive spinal infection, which results in spinal instability and neurologic deterioration (23). Facet joint aspiration often is necessary to obtain a culture and guide antibiotic therapy. If an associated
epidural abscess or neurologic deficit is present, surgical decompression typically is required.

**Vascular Space**

In the vascular space, acute jugular vein thrombophlebitis may be seen, in which the occluded vessel is enlarged with adjacent inflammation and rimlike enhancement of the venous wall. Patients present with tenderness, erythema, and, often, a palpable “mass.” Aggressive antibiotic therapy is administered to treat any underlying infection. A clinically significant thromboembolism to the lungs is relatively rare in patients with internal jugular vein thrombosis; thus, anticoagulation therapy typically is not administered. The superior aspect of the thrombus must be identified: If it extends proximally to the sigmoid dural sinus, neurologic monitoring, surgical intervention, and anticoagulation therapy may be necessary. In chronic jugular vein thrombophlebitis, a thrombus is present, but there is no adjacent soft-tissue inflammation. Venous collateral vessels may be evident.

**Lemierre syndrome** is an uncommon and potentially life-threatening complication of acute respiratory tract infection. It is most common in otherwise healthy adolescents and young adults. In Lemierre syndrome, septic thrombophlebitis of the internal jugular vein and disseminated abscesses are present, as well as septic pulmonary emboli (Fig 12). The causative organism is *Fusobacterium necrophorum*, an anaerobe found in normal oropharyngeal flora (24,25).

**Orbits and Sinuses**

**Periorbital and Orbital Cellulitis.**—Periorbital cellulitis, also known as preseptal cellulitis, is limited to the soft tissues anterior to the orbital septum and often results from contiguous spread of an infection of the face, teeth, or ocular adnexa. At CT, diffuse soft-tissue thickening and areas of enhancement anterior to the orbital septum are seen. Periorbital cellulitis is treated with oral antibiotic therapy.
The term *orbital cellulitis* refers to a postseptal infection that typically results from extension of a paranasal sinusitis infection. Complications of orbital cellulitis include superior ophthalmic vein thrombosis, cavernous sinus thrombosis, loss of vision, meningitis, and intracranial abscess. Orbital cellulitis is treated with intravenous antibiotic therapy; however, if a subperiosseal abscess is present, surgical drainage may be necessary (Fig 13) (26).

*Dacryocystitis.*—Acute dacryocystitis refers to inflammation and dilatation of the lacrimal sac. It results from obstruction or stenosis of the lacrimal duct, which leads to stagnation of fluid and infection (28,29). At contrast-enhanced CT, a well-defined cystic fluid collection is seen along the inner canthus with rimlike enhancement and adjacent inflammation and soft-tissue thickening (Fig 14) (26). Dacryocystitis typically is diagnosed at clinical examination, but CT or MR imaging may be performed if an underlying mass is suspected. Imaging also may be used to assess possible complications of orbital cellulitis or abscess. Patients with dacryocystitis present with acute onset of pain, erythema, mucopurulent discharge from the puncta, conjunctivitis, and, often, concurrent preseptal cellulitis.

*Invasive Fungal Sinusitis.*—Invasive fungal sinusitis is a rapidly progressive fungal infection. It occurs almost exclusively in immunocompromised patients and typically results from mucormycosis or aspergillosis. Patients with invasive fungal sinusitis present with fever, sinusitis, facial pain, and nasal mucosal ulcerations. Infection is spread from the sinus by vascular invasion, and rapid orbital and intracranial extension ensue if it is not appropriately treated. At CT, opacification of the involved sinus is seen, and high-attenuation secretions frequently are encountered. Worrisome imaging findings include erosion of the sinus wall, obliteration of the periantral fat planes, and invasion of adjacent structures such as the maxillofacial soft tissues, orbit, pterygopalatine fossa, and anterior cranial fossa (Fig 15). Complications and associated findings of invasive fungal sinusitis include vascular invasion and thrombosis,
presenting symptoms. Tuberculous lymphadenopathy, also known as scrofula, has become prevalent among patients with human immunodeficiency virus (HIV) or acquired immunodeficiency syndrome, and it may be caused by Mycobacterium tuberculosis or nontuberculous Mycobacterium (30). Scrofula may involve a single lymph node, but it often manifests as bilateral painless cervical lymphadenitis. Pulmonary tuberculosis and constitutional symptoms usually are absent. At imaging, enhancing and necrotic lymph nodes are seen in multiple nodal chains within the neck, which may calcify in the chronic phase of infection (Fig 16). It may be difficult to differentiate scrofula from the necrotic lymph nodes seen in metastatic disease such as squamous cell and thyroid carcinoma (25,30).
Noninfectious, Acute Inflammatory Conditions

Angioedema
Angioedema is transient swelling. It may involve any portion of the body, but it primarily affects the face, tongue, lips, and larynx, and it is a potentially life-threatening cause of airway compromise.

Causes of angioedema include allergic and hypersensitivity reactions and, rarely, hereditary disorders such as C1 esterase inhibitor deficiency (31). Angiotensin-converting enzyme (ACE) inhibitors are the most common cause of angioedema, accounting for as many as 35% of cases. ACE inhibitor–mediated angioedema is not a true allergy; instead, ACE inhibitors increase bradykinin activity, which results in transient vasodilatation and extravasation of fluid into the extracellular space. Most patients develop angioedema shortly after beginning ACE-inhibitor therapy; however, the reaction may occur months, or even years, after starting therapy (31,32). Treatment of angioedema involves discontinuing the medication and initiating steroid and antihistamine therapy with supportive care for airway protection. When it is severe, surgery may be necessary to restore airway patency. Imaging findings vary, but they most commonly consist of infiltrative, transspatial edema with circumferential mucosal thickening and varying degrees of airway narrowing (Fig 17). However, unilateral, focal, and masslike areas of involvement have been described (31).

Calcific Longus Colli Tendonitis
Patients with calcific longus colli tendonitis present with acute onset of neck pain and stiffness that is thought to be in response to deposition of hydroxyapatite crystals. Fever or odynophagia
Figure 18. Longus colli tendonitis. Axial contrast-enhanced CT images obtained with bone (a) and soft-tissue (b) window settings show amorphous calcification within the longus colli tendon (arrow in a) and associated edema and fluid within the prevertebral soft tissues (arrow in b). No peripheral enhancement is seen.

Figure 19. HIV-related benign lymphoepithelial lesion. Axial contrast-enhanced CT image shows a well-circumscribed round cystic lesion in the right parotid gland (arrow) with thin rimlike enhancement. Multiple lesions typically are seen, but they may occur singly.

Also may be present. Because the clinical manifestation of calcific longus colli tendonitis is similar to that of retropharyngeal abscess, contrast-enhanced CT of the neck often is performed to differentiate between these conditions. In calcific longus colli tendonitis, amorphous calcification is seen near the insertion of the longus colli tendon in close proximity to the anterior arch of the C1 vertebra, a finding indicative of deposition of hydroxyapatite crystals, as well as edema and hypodensity of the longus colli muscles (Fig 18) (33). An associated effusion typically extends inferiorly from level C1 to C5–6. The fluid originates in the prevertebral space, but it may extend to the retropharyngeal space. In contrast to retropharyngeal abscess, no appreciable rimlike enhancement is seen, and the fluid collection tapers inferiorly (33–35). Calcific longus colli tendonitis is self limited and responds to nonsteroidal antiinflammatory drugs. Recognition and accurate diagnosis of calcific longus colli tendonitis is important to avoid unnecessary and potentially harmful deep neck surgery.
Benign Lymphoepithelial Lesions
Benign lymphoepithelial lesions usually manifest as a masslike, painless enlargement of one or both parotid glands in patients with HIV infection. Cervical lymphadenopathy and tonsillar hypertrophy often are present. Lymphoepithelial lesions may serve as the index lesion for the diagnosis of HIV infection, and they are chronic and progressive in the absence of retroviral therapy. Rarely, a lymphoepithelial lesion may transform into B-cell lymphoma. Typical contrast-enhanced CT findings of benign lymphoepithelial lesions include numerous mixed cystic and solid lesions in one or, more commonly, both parotid glands. If the lesions are predominantly solid, another diagnosis such as Sjögren syndrome should be considered. At contrast-enhanced CT, the cystic components are surrounded by a thin rim of enhancement, and the solid components demonstrate heterogeneous enhancement (Fig 19). On occasion, only a single cystic lesion may be present. Reactive cervical lymphadenopathy may be present with no necrotic change (36,37).

Orbital Pseudotumor
Orbital pseudotumor is an idiopathic inflammatory process that manifests with acute onset of orbital pain. Other symptoms include proptosis, diplopia, restricted mobility, and decreased visual acuity. At contrast-enhanced CT and MR imaging, a poorly marginated enhancing mass with a generally infiltrative appearance is seen (Fig 20). Orbital pseudotumor predominantly involves the orbital fat, extraocular muscles, and lacrimal gland, and the superior and medial musculature are most commonly affected. Involvement of the sclera and optic nerve is less common. Tolosa-Hunt syndrome occurs when the cavernous sinus is involved by orbital pseudotumor. Approximately one-fourth of cases of orbital pseudotumor are bilateral, and there is no age or sex predilection. Although orbital pseudotumors have a dramatic and rapid response to high-dose steroid therapy, recurrence is common, occurring in as many as 25% of patients (38,39).

Figure 20. Orbital pseudotumor. (a, b) Axial contrast-enhanced CT image (a) and axial gadolinium-enhanced MR image (b) show enhancement of the right lacrimal gland and intraconal fat (arrows). (c) Coronal contrast-enhanced CT image shows involvement of the lateral rectus muscle, which demonstrates asymmetric enhancement and enlargement. (d) Coronal gadolinium-enhanced MR image shows masslike soft-tissue attenuation within the orbital apex and surrounding the optic nerve complex (arrow).
Neoplasms
Patients initially present to the emergency department with a variety of head and neck neoplasms and symptoms such as a palpable mass, cosmetic deformity, swelling, and compromised airway. Initial imaging of primary head and neck tumors and metastatic lymphadenopathy may take place in the emergency setting (Figs 21, 22). Most of these tumors represent advanced head and neck squamous cell carcinoma, although lymphoma accounts for a substantial number of cases. It often is difficult to distinguish a necrotic tumor or nodal conglomerate from an abscess; however, the presenting symptoms and patient history may
help differentiate between the two conditions. As the use of neck and cervical CT becomes more common in the emergency setting, the role of radiologists in the detection of incidental neoplasms of the head and neck will continue to expand. Tumors of the upper aerodigestive tract usually are readily discernable at imaging, as are lesions of the thyroid, parotid, and submandibular glands. In addition, diffuse, enlarged lymph nodes may be seen in preclinical stages of lymphoma, breast carcinoma, and other malignancies. Regardless of the indication for an imaging examination, integration of a step in which the interpreting radiologist actively searches for an incidental neoplasm—preferably by using a well-practiced and detailed inspection algorithm—always is valuable.

Summary

CT is the first-line imaging modality for infectious and inflammatory conditions of the head and neck in the emergency setting. Because the use of cervical and neck CT has become common in the emergency setting, knowledge of the imaging findings of common acute conditions of the head and neck is essential. An understanding of less common but potentially life-threatening conditions also is important to ensure prompt diagnosis and optimal treatment.

References

Page 1336
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Page 1339
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Page 1344 (Figure on page 1344)
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Page 1346
Tuberculous lymphadenopathy, also known as scrofula, has become prevalent among patients with human immunodeficiency virus (HIV) or acquired immunodeficiency syndrome, and it may be caused by *Mycobacterium tuberculosis* or nontuberculous *Mycobacterium* (30). Scrofula may involve a single lymph node, but it often manifests as bilateral painless cervical lymphadenitis.

Page 1348
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