Practical Approach to medical emergencies of the head and neck.

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Learning objectives

There is a wide variety of infectious and inflammatory disorders of the head and neck that may manifest emergently.

The analysis of the clinical and radiological manifestations allowed radiologists to identify the primary cause of the disease and the possible complications that can justify a conservative or surgical treatment.

Computed tomography (CT) imaging has emerged as a powerful method of choice to deal with these emergencies, even in the pediatric population, although differential diagnosis and also method of evaluation may differ.

The present work describes the clinical and imaging manifestations, differential diagnosis, and treatment of nontraumatic emergent conditions related with head and neck.
Background

Patients go to emergency room with a wide variety of nontraumatic infectious and inflammatory conditions of the head and neck.

Knowing the normal anatomy and radiological findings of head and neck emergencies allows radiologists to make an early diagnosis, assess the extent of the disease and identify possible complications that may require an early surgical treatment.

We expose classic clinical cases of the most common urgent pathologies of the head and neck such as: pre and postseptal cellulitis, otomastoiditis complications (subperiosteal, epidural and cerebral abscesses, subdural empyema, meningitis and venous sinus thrombosis), malignant external otitis, oral cavity infections, Ludwig angina, tonsillar and peritonsillar abscess, retropharyngeal abscess, descending necrotizing mediastinitis, parotitis, infectious cervical lymphadenopathy and epiglottitis.
Imaging findings OR Procedure details

ORBITAL CELLULITIS

Periorbital (preseptal) and orbital (postseptal) cellulitis are differentiated by their location in relation to the orbital septum. In these conditions CT is important to differentiate preseptal from postseptal cellulitis because they will require different treatment.

Periorbital Cellulitis Fig. 1 on page 13
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. Patients show eyelid swelling, erythema, chemosis and possible limitation of eye movement in the absence of proptosis. According to this, CT demonstrates diffuse soft-tissue thickening and enhancement areas anterior to the orbital septum.

Periorbital cellulitis is normally treated with oral antibiotics.

Orbital Cellulitis Fig. 2 on page 13 Fig. 3 on page 14
Orbital cellulitis involves the postseptal soft tissues, which can be divided into intraconal, extraconal and subperiosteal locations. Orbital cellulitis and subperiosteal abscesses frequently occurs as consequence of paranasal sinusitis (ethmoidal). Related symptoms are similar to those observed with periorbital cellulitis, although, proptosis may also occur. CT findings include sinus opacification, retrobulbar stranding and extraconal lentiform fluid collection adjacent to the orbital wall with mass effect upon medial rectus muscle and stranding and streaking intraconal fat. When cellulitis is caused by ethmoid sinusitis we must assess by using bone window, dehiscence of the lamina papyracea and administer intravenous contrast to discard subperiosteal abscess.

Classical complications of orbital cellulitis may include superior ophthalmic vein and cavernous sinus thrombosis, loss of vision, meningitis and intracranial abscess formation.

Orbital cellulitis is treated with intravenous antibiotic therapy; however, if a subperiosteal abscess is present, surgical drainage may be necessary in impaired area.

Other orbital pathologies Fig. 4 on page 15 Fig. 5 on page 16 Fig. 6 on page 17 Fig. 7 on page 18 Fig. 8 on page 19 Fig. 9 on page 20
Orbital abscess, dacryocystitis, iatrogenic, inflammatory pseudotumor, Wegener Granulomatosis, mucocele.

SEVERE OTALGIA
Urgent CT is required in severe otalgia caused by acute otomastoiditis with suspected clinical complications and malignant external otitis.

**Acute mastoiditis and its complications**
Acute mastoiditis appears as a result of mastoid antrum obstruction. Patients affected have prolonged symptoms of media otitis with retroauricular pain, erythema, swelling and auricle protrusion.

CT should be performed early in the course of the disease to classify the mastoiditis as incipient or coalescent and to further detect intracranial complications. On the basis of the clinical features and imaging findings, disease will be managed administrating antibiotics intravenously or by using drainage plus antibiotic therapy. Magnetic resonance imaging (MRI) may help due to its high sensitivity for detecting extraaxial fluid collections and associated vascular problems.

**Incipient Mastoiditis** Fig. 10 on page 21
CT demonstrates middle ear fluid and opacification of the mastoid air cells, without osseous resorption. It is usually solved by using antibiotic treatment.

**Coalescent Mastoiditis** Fig. 10 on page 21
Coalescent mastoiditis is diagnosed when temporal bone CT demonstrates erosion of the mastoid septa or mastoid walls.
Treatment of coalescent mastoiditis requires intravenous antibiotics and drainage of the subperiosteal abscess.

**Extracranial Complications** Fig. 11 on page 22

*Subperiosteal and Bezold Abscesses*

If acute coalescent mastoiditis is suspected, radiologists should examine the external mastoid cortex for osteolysis and subperiosteal abscess evidences and CT with contrast should be used to discard it. With bone window we evaluate petrous bone status, if the cortical septa is broken and paying special attention to the existence of air bubbles in middle and posterior cranial fossa forcing us to discard intracranial complications.

When osteolysis occurs at the mastoid tip, the phlegmonous debris may extend inferiorly into the soft tissues of the neck forming an abscess determined as the Bezold abscess.

**Intracranial Complications** Fig. 12 on page 23
The most common early symptoms are increased otorrhea, fever and headache, with later altered mental status, cranial nerve palsies and nuchal rigidity.
Epidural Abscess and Dural Venous Thrombophlebitis

The most common intracranial complication arising from middle ear infection, epidural abscess, usually results from spread by contiguity following bone destruction in coalescent mastoiditis. The posterior fossa location is even more common due to osseous destruction over the sigmoid sinus plate. This complication can be clinically silent and CT is required for its confirmation. The epidural abscess may lead to sigmoid sinus thrombosis and the thrombus may propagate to the jugular vein or other dural sinuses. Indirect imaging signs include low attenuation of the sinus on unenhanced and contrast-enhanced CT scans, absence of normal flow void on spin-echo MR images and absence of flow-related enhancement on gradient-echo MR images. Direct evidence of dural sinus thrombosis consists of thrombus identification within the sinus. MR angiography is very useful for the definitive diagnosis.

Required treatment will be a mastoidectomy with surgical exposure of the dura and granulated tissue removal.

Subdural Empyema

It appears, using imaging, as extracerebral space expansion with adjacent sulci compression and usually develops in an interhemispheric fissure and along tentorium cerebelli. It never manifests as a clinically silent and this patients usually have meningismus, focal neurologic findings or focal seizures. It is a serious complication that requires a prompt neurosurgical drainage.

Petrositis or petrous apicitis

It is considered a strange complication of otomastoiditis that occasionally may be manifested with a classic triad of sixth nerve palsy, deep facial pain, and ipsilateral otorrhea (Gradenigo syndrome). CT demonstrates erosive changes of the petrous apex with abnormal enhancement of adjacent meninges.

Necrotizing External Otitis (Malignant Otitis Externa) Fig. 13 on page 24

Malignant otitis externa usually occurs in old age patients with a history of diabetes mellitus or immunocompromised and caused by Pseudomonas aeruginosa pathogen. It commonly spreads from the external auditory canal to soft tissues adjacent to the temporal bone, including temporomandibular joint, middle ear, mastoid air cells and skull base. Patients typically manifest otalgia, otorrhea and headache. Granulated tissue is seen within the external auditory canal during a physical examination and an elevated erythrocyte sedimentation rate is found by laboratory analysis.
Under suspicion CT must be performed to discard cortical erosion of the external auditory canal and mastoid. Second MRI may be required to assess spreading deep cervical spaces and skull base.
CT and MR imaging demonstrate soft tissue lesions within the external auditory canal and osseous erosion of the canal itself. Fluid may be seen in the middle ear and mastoid air cells. Soft tissue extension inferior to the temporal bone is normally observed as abnormal signal intensity or abnormal attenuation and obliteration of fat within stylomastoid foramen. Osseous erosion of the central skull base may also be seen. MR imaging is the preferent technique for the detection of soft tissue or bone marrow signal intensity abnormalities and facial nerve involvement.
Treatment involves a intravenous antibiotic therapy, debridement and biopsy of granulated tissue and abscesses drainage.

**TRISMUS - ODYNOPHAGIA** Fig. 14 on page 25

Those patients that present trismus and odynophagia required urgent CT with contrast to rule out pharyngeal abscess. These conditions are abscesses of the oral cavity, pharynx (tonsillar / peritonsillar, retropharyngeal), masticator space, visceral space and Ludwig Angina. Radiologist must evaluate the spread of infection into the deep spaces of the neck and orbit, airway compromise, internal jugular vein thrombosis, intracranial or mediastinal extension (danger space).

**Oral cavity** Fig. 15 on page 26 Fig. 16 on page 27

*Oral cavity infections* frequently appear as a result of odontogenic infection but in the 20% of cases the cause is unknown.

Oral cavity infections can be manifested as an abscess in submandibular and sublingual spaces or in the root of the tongue. Infections of the second or third molar teeth likely involve the submandibular space and if the anterior teeth are involved, the infection typically is confined to the sublingual space.

Periodontal abscesses are the common manifestation of dental disease and are associated with multiple potentially life-threatening complications.

Patients with odontogenic abscesses present fever, tooth pain, facial swelling, dysphagia, trismus and possibly dyspnea.

Contrast material-enhanced CT is the preferred modality for evaluation of oral cavity infections and suspected periodontogenic abscess because it demonstrates a periodontal lucency that extends into adjacent soft tissues through a focal cortical break or fistula, with an extraosseous fluid collection that shows rimlike enhancement.
CT images obtained with bone window settings should be included in the study because they may reveal the cause of periapical abscess and mandibular cortical dehiscence or erosion and to discard mandibular osteomyelitis. Signs of mandibular osteomyelitis such as permeative bone changes, osseous destruction and periosteal reaction should be carefully assessed to further ensure that the correct long-term antibiotic treatment is employed.

Periodontogenic abscess is treated with tooth extraction, abscess drainage and intravenous antibiotic therapy.

*Ludwig Angina* [Fig. 17](#) on page 28

One complication of odontogenic infection is Ludwig angina that is a life-threatening condition, with around 10% mortality.

In 90% of diagnosed cases, odontogenic infection is the cause, usually from the second and third mandibular molars, but also may result from a penetrating trauma.

It is a necrotizing infection of the floor of the mouth that involves the submandibular spaces bilaterally and may spread into other fascial spaces of the neck, leading to airway compromise and mediastinitis.

Predisposing factors include poor dental hygiene, diabetes, compromised immune status and intravenous drug abuse. Patients present symptoms such as odontogenic abscess, jaw and neck swelling, dysphagia elevation of the tongue and stridor. During physical examination, the submandibular tissues are firm and hard, and crepitation may be present.

Imaging is performed to assess airway patency and determine if gas-forming organisms, an underlying dental infection, or a drainable abscess is present. CT and MR images show local skin thickening, increased attenuation of subcutaneous fat, muscle enlargement and loss of fat planes within the submandibular space. CT images also may determine soft tissue emphysema and focal fluid collections within fascial spaces of the neck. Complications of Ludwig angina include mandibular osteomyelitis, spread of infection into the deep fascial spaces of the neck and thrombophlebitis of the internal jugular vein (Lemierre syndrome). An early identification and treatment are vital. Treatment is focused on airway security and also includes intravenous antibiotics and surgical decompression of the submandibular space.

*Pharyngeal space*

*Tonsillitis and peritonsillar abscess* [Fig. 18](#) on page 29 [Fig. 19](#) on page 30
As a complication of untreated or incompletely treated tonsillitis, a peritonsillar abscess may arise between the tonsillar capsule and pillar. Patients with a peritonsillar abscess present with fever, severe unilateral sore throat, dysphagia and pharyngotonsillar exudates; otalgia and trismus are also common. The diagnosis of a peritonsillar abscess is based on clinical findings, and the role of imaging is to help differentiate tonsillitis from peritonsillar abscess.

Contrast-enhanced CT findings in the presence of a peritonsillar abscess include diffuse enlargement and enhancement of the tonsil, with an associated fluid collection exhibiting rimlike enhancement. Surrounding tissues will be poorly defined by infection extension into the parapharyngeal, masticator or submandibular space.

Treatment will be based on antibiotic therapy and surgical drainage of the collection.

**Retropharyngeal space** Fig. 20 on page 31

Infections of the retropharyngeal space often result from an infection dissemination from retropharyngeal lymph nodes, which drain the middle ear, sinuses, and upper respiratory tract. Such infections are caused by tonsillitis, pharyngitis, otitis and oral cavity infection. If left untreated, the affected lymph node may rupture into the retropharyngeal space, creating a retropharyngeal abscess. Direct spreading to adjacent diskitis or osteomyelitis and inoculation from a penetrating trauma may also lead to retropharyngeal abscess. Patients with retropharyngeal abscess display fever, sore throat, neck pain and a limited movement. The cervical pain can be confused with cervical spine pathology; lateral neck radiographs can guide diagnosis showing prevertebral or retropharyngeal soft tissue thickening or air within the prevertebral soft tissues. The radiologist should be alert for the interpretive pitfall of soft tissue "pseudothickening," which results from neck flexion or incomplete inspiration and is especially common in pediatric patients.

If the patient is septic and present odynophagia is necessary to perform contrast-enhanced CT to discard retropharyngeal abscess that appears as a low-attenuation fluid collection that distends the retropharyngeal space with peripheral rimlike enhancement.

Once the diagnosis of retropharyngeal abscess is confirmed, we must continue the study until the chest to evaluate potential complications such as inferior extension through the anatomic danger space into the mediastinum, compromised airway, aspiration of pus with pneumonia or empyema, 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.

Aggressive treatment with intravenous antibiotics and airway management and surgical drainage are required.

**Descending necrotizing mediastinitis** Fig. 21 on page 32
Is a rare but emerging complication of periodontal infection which a mortality rate between 25%-40%. Infection commonly spreads from the oral cavity or oropharynx to the mediastinum by the retropharyngeal space (danger space), but it also may spread by way of the carotid space. Contrast-enhanced CT determine the most accurate and rapid detection of descending necrotizing mediastinitis and it often discard both the source of infection and the route of desimination. CT findings include mediastinal fluid collections, increased attenuation of mediastinal fat, gas locules within the mediastinum, and pericardial or pleural effusions. An aggressive treatment is essential and includes airway management and broad-spectrum antibiotics together with early mediastinal exploration, debridement and drainage.

**PAROTIDITIS** Fig. 22 on page 33

Acute suppurative parotiditis usually is unilateral and it manifests with a sudden onset of pain and swelling. Patients display a toxic appearance, high fever, and tenderness of the involved gland. It is more common among old age patients who are debilitated or patients postoperated that suffered from intubation and they are dehydrated. Contrast-enhanced CT will be performed to discard compromised airway and involvement of the deep spaces. Contrast-enhanced CT will show that parotid gland is diffusely enlarged and enhancing with ill defined margins and internal areas of low attenuation indicating intraparotid abscess formation. Complications of 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. Parotiditis treatment includes hydration and antibiotic therapy. Drainage may be required if an abscess has been developed.

**CERVICAL MASS** Fig. 23 on page 34

In those patients that present neck mass, inflammatory signs and general malaise differential diagnosis will be applied according to mass location. If the mass is lateral located most likely will be caused by infection; however if the patient has a history of head and neck malignancy should be aware that it may be an infected lymph node metastases. Do not forget to identify common congenital lesions, such as branchial cleft cysts and thyroglossal duct cysts, and their complications, which may include superinfection.

**Infectious Cervical Lymphadenopathy**

Tuberculous lymphadenopathy, also known as scrofula, has become more prevalent among patients with human immunodeficiency virus (HIV) or acquired immunodeficiency syndrome, and it may be caused by Mycobacterium tuberculosis or nontuberculous Mycobacterium. It often manifests as bilateral painless cervical lymphadenitis. Pulmonary tuberculosis and constitutional symptoms are usually absent.
Using imaging, enhancing and necrotic lymph nodes are seen in multiple nodal chains within the neck, which may calcify in the chronical phase of infection.

**Branchial Cleft Cysts**

The most common branchial cleft abnormality is the second branchial cleft cyst. This is typically recognized in 10-40 years old patients, with the classic location anteromedial to the sternocleidomastoid muscle, anterolateral to the carotid arteries and posterior to the submandibular gland. Cysts are often recognized as secondary to swelling but they may manifest as a painful, fluctuant mass when infected.

**Thyroglossal Duct Cysts**

The thyroglossal duct connects the foramen cecum at the base of the tongue to the thyroid. Duct typically involutes however, if involution fails, a cyst may arise anywhere along the surface of the functioning secretory epithelium. Most thyroglossal duct cysts are closely associated with hyoid bone typically within 2 cm of the midline. Patients show a neck mass that moves cephalad during swallowing, extension of the tongue or with symptoms of infection, including swelling, pain, erythema and fever. US demonstrates a circumscribed lesion in the characteristic location, with intralesional echogenicity depending on the proteinaceous content of the cyst. The presence of a thick external wall or internal septa is suggesting a superinfection. Evidences of superinfection at contrast-enhanced MR imaging and CT, include an irregular thick enhancing rim with surrounding inflammatory change.

**AIRWAY ABNORMALITIES - STRIDOR**  
Fig. 24 on page 35

There are two main emergency that cause stridor, epiglottitis and angioedema. The glottic or tracheal stenosis can be also presented with stridor and dyspnea, and some examples are secondary to a giant goiter, edema post-radiotherapy, glottic tumor debut or tracheal stenosis derived from congenital membranes or post-tracheostomy.

**Epiglottitis**

Acute epiglottitis is one of the most serious emergent conditions of the pediatric head and neck because of its association with airway compromise. Fever, sore throat, drooling, posturing with neck extension, and respiratory distress are common clinical symptoms related with this condition. The diagnosis of acute epiglottitis typically is based on clinical examination, but imaging may be also performed if the diagnosis is unclear. If the patient’s condition permits, lateral neck radiography is the preferred modality. Thickening of the epiglottis (the "thumb sign") and aryepiglottic folds is the characteristic finding. Contrast-enhanced CT reveals an enlarged, edematous epiglottis with mucosal enhancement and narrowing of the airway as well as extension of the inflammatory process into the adjacent deep spaces of the neck. The entire supraglottic larynx, tongue base, and tonsils often are edematous, and a phlegmonous collection may be seen within the adjacent soft
tissues. Other possible causes of this finding include the ingestion of a caustic substance or foreign body, angioedema, hemorrhage, epiglottic cyst, and postirradiation edema and fibrosis. CT may be used to assess the progression of disease and possible complications such as necrotizing epiglottitis and epiglottic or deep neck abscess. Epiglottitis is treated with direct laryngoscopy, intubation in a controlled setting, broad-spectrum antibiotics, and steroids.

**Angioedema**

Angioedema is transient swelling. It may involve any portion of the body, but it normally 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. Angiotensin-converting enzyme (ACE) inhibitors are the most common cause of angioedema, and are not a true allergy; instead, ACE inhibitors increase bradykinin activity, which results in transient vasodilatation and extravasation of fluid into the extracellular space. Angioedema can be developed after ACE-inhibitor therapy started; however, the reaction may also occur months, or even years, after starting therapy.

Imaging findings are variable, but they most commonly consist of infiltrative, transspacial edema with circumferential mucosal thickening and varying degrees of airway narrowing. However, unilateral, focal, and masslike areas of involvement have been described.

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.
Images for this section:

Fig. 1: Upper image display edema, left periocular pain and eye greenish discharge after left periocular trauma. CT image shows thickening of the left preseptal and periorbital soft tissues without collection.

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Fig. 2: Orbit non-enhacement CT displays opacification of ethmoid cells and right sphenoid sinus with disruption of the lamina papyracea. Involvement of postseptal fat, displacement of the right medial rectus muscle without evidence of abscess.

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Fig. 3: Swelling, edema, erythema and proptosis of right orbit. Orbital enhancement CT image reveals ethmoid cells opacification. Note preseptal and retroseptal cellulitis associated, disruption of the lamina papyracea with small subperiosteal abscess extending into the orbit. Illustration obtained from diagnostic imaging Head and Neck. Harnsberger). 2004-2006): spread of infection from the ethmoid sinuses through the lamina papyracea into the medial orbit. Subperiosteal abscess results, putting the optic nerve at risk.

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Fig. 4: Swelling, eyelid erythema, frontal headache and fever. Orbit enhancement CT image demonstrate right frontal sinus opacification. Note abscess in the upper outer angle of the orbit that seems to communicate with frontal sinus (gas within the collection). It is also observed that abscess displaces the eyeball inferiorly. Periorbital cellulitis and ocular proptosis are also present.

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**Fig. 5:** Patient with uncontrolled diabetes. Fever, pain, erythema and swelling of the lacrimal sac with purulent secretion. Orbit CT before and after contrast administration: nasolacrimal duct collections suggesting of bilateral dacryocystitis. In this particular case of dacryocystitis, the recommended treatment will be based on intravenous antibiotics and surgical drainage.

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Fig. 6: Frontal and orbital iatrogenic abscesses caused by the installation of a halo jacket for post-traumatic cervical fracture.

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**Fig. 7:** Infiltrative or mass-like soft tissue with enhancement involving the superior-internal area of orbit, lacrimal gland and diffuse multicompartmental extraconal. The biopsy result was orbital pseudotumor that is nonspecific inflammation involving any area of orbit.

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Fig. 8: Images showing orbital invasion of Wegener granulomatosis. Denote periocular thickening and enhancement caused by episcleritis and intraocular by uveitis. Opacification of all sinuses and nasal septum and turbinates destruction. Distortion and bowing of papyracea lamina. Meningeal affected by linear thickening and enhancement.

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Fig. 9: Non-enhanced CT shows nonenhancing, soft tissue density expansile mass filling ethmoid sinus. It thins and remodels papyracea lamina bowing it into orbit and also bulging frontal sinuses. MR demonstrates a large, heterogeneous (hyperintense on T1-weighted and hypointense on STIR sequence) nasoethmoidal mucocele.

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Fig. 10

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**Fig. 11:** Images demonstrate mastoid air cell, additus ad antrum and tympanic cavity of the right ear opacification. There is thinning of the cortical bone of the lateral mastoid wall. EAC ocupation is present and pre and retroauricular soft tissue are affected. After contrast administration is confirmed the presence of subperiosteal abscess that caused elevation of the ear. Neither sigmoid and transverse sinus thrombosis nor intracranial complications of middle and posterior cranial fossa are observed.

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Fig. 12

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Necrotizing External Otitis (Malignant Otitis Externa)

- *Pseudomonas aeruginosa*
- Old age patients with diabetes mellitus or immunocompromised

- **CT** → erosion of the external auditory canal and mastoid
- **MR** → spreading deep cervical spaces and skull base

**Fig. 13:** MR T1 with contrast and STIR sequences: soft tissues of EAC thickened, edematous and enhancement. Temporo-mandibular joint, right nasopharynx and perivascular involvement. Meningeal enhancement and invasion of clival bone.

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TRISMUS - ODYNOPHAGIA  Inability to open the mouth, painful swallowing

Analytical and physical examination  

TC + C

What conditions REQUIRING URGENT TC?
- Oral cavity Abscess
- Pharyngeal abscess: tonsillar / peritonsillar, retropharyngeal
- Masticator space abscess
- Visceral space abscess
- Ludwig Angina

ATTENTION
- Deep neck spaces and orbit
- Airway compromise
- Jugular vein thrombosis
- Intracranial extension
- Mediastinal extension: DANGER SPACE

Fig. 14

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ORAL CAVITY INFECTIONS

Submandibular abscess

Contrast material–enhanced CT is the preferred modality for evaluation of oral cavity infections and suspected periodontogenic abscess because it demonstrates a periodontal lucency that extends into adjacent soft tissues through a focal cortical break or fistula, with an extraosseous fluid collection that shows rimlike enhancement.

Axial bone CT of the mandible shows different cases of molar tooth socket with medial wall dehiscence indicating infection with submandibular and oral cavity soft tissues involvement.

Fig. 15

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Fig. 16

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CT shows local skin thickening, increased attenuation of subcutaneous fat, muscle enlargement and loss of fat planes within the submandibular space.

Thrombophlebitis of the internal jugular vein (Lemierre syndrome).

Fig. 17

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PHARYNGEAL SPACE

TRISMUS
Fever, severe unilateral sore throat, dysphagia

Contrast-enhanced CT

Tonsillar abscess

Peritonsillar abscess
Surrounding tissues will be poorly defined by infection extension into the parapharyngeal, masticator or submandibular space.

Bilateral cervical lymphadenopathy

Fig. 18
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**Fig. 19:** Right peritonsillar abscess with pharyngeal space dissemination, oropharyngeal obliteration. Laryngeal edema with permeable glottis. Smooth retrofaryngeal fluid layer. Bilateral lymphadenopathy.

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Fig. 20

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**Fig. 21:** Neck enhanced CT image shows perforated esophagus neoplasm with extensive cervical emphysema together with soft tissue edema expanding from parapharyngeal and retropharyngeal spaces and anterior mediastinum. Oropharyngeal obliteration without significant airway involvement. Note also left jugular vein thrombosis. In the surgery, necrosis of the left sternocleidomastoid muscle probably associated with necrotizing miositis was seen.

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Fig. 22: Marked diffuse enlargement of the right parotid gland. Glandular parenchyma demonstrates diffuse enhancement, and irregular areas of low attenuation are seen, a finding indicative of intraparotid abscesses. Subcutaneous fat involvement. It is compatible with acute parotitis.

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Fig. 23

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Fig. 24

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Conclusion

To take home...

- Imaging plays a critical role in the diagnosis of head and neck conditions in the emergency setting, as well as in detecting any associated life-threatening complications.
- Contrast-enhanced CT is the first-line imaging modality for infectious and inflammatory conditions of the head and neck.
- Knowledge of the imaging findings of common acute conditions of the head and neck is essential.
- Never forget to report on the state of the airway, spread deep cervical and spaces and mediastinum.
References