Pediatric ENT Emergencies

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KEYWORDS

• Foreign bodies • Trauma • Peritonsillar abscess • Mastoiditis
• Retropharyngeal abscess • Tonsillectomy • Epistaxis

KEY POINTS

- Importance should be paid to the airway in children who present with ENT complaints.
- Most nasal and ear foreign bodies can be removed in the emergency department.
- Risks of retained nasal foreign bodies include infection, nasal septum perforation, and aspiration.
- Lodged disk battery and magnets always require emergent removal.
- Complications of posterior pharyngeal trauma are rare but include deep pharyngeal infection, mediastinitis, and deep neck vessel trauma.
- The most common postoperative adverse effects of tonsillectomy include inadequate pain control with poor intake and wound bleeding.
- Posttonsillectomy bleeding occurs at two times, early within the first 24 hours, and later at postoperative days 5 to 8.

FOREIGN BODIES

Young children are constantly exploring their surroundings and are more apt to place objects in locations that can pose a threat to well-being. This includes the nasal passages, the external ear canals, and the mouth. Although foreign bodies in the ears and nose are not usually an emergency, there are instances when it can be an emergency situation. Foreign bodies in the throat or airway can pose a complete airway obstruction immediately and is a true emergency (**Table 1**).

Nasal Foreign Bodies

Nasal foreign bodies are most common in children between the ages of 2 and 5 years, and include any object small enough to fit up the nostril, such as food, buttons, toys, and erasers. Although nasal foreign bodies only make up about 0.1% of emergency department (ED) visits, most of these can and should be removed in the ED.[1] Nasal

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Emerg Med Clin N Am 31 (2013) 795–808
http://dx.doi.org/10.1016/j.emc.2013.04.005 **emed.theclinics.com**
0733-8627/13/$ – see front matter

Table 1
Common pediatric ears, nose, and pharynx foreign body management

Location	Common Foreign Bodies	Removal Technique	Indications for Referral
Ear	Beads, paper, toys, pebbles	Irrigation with water Grasping foreign body with forceps, cerumen loop, right-angle ball hook, or suction catheter Acetone to dissolve Styrofoam foreign body	Need for sedation Canal or tympanic membrane trauma Foreign body is nongraspable, tightly wedged, or touching tympanic membrane Sharp foreign body Removal attempts unsuccessful
Nasal	Beads, buttons, toy parts, pebbles, candle wax, food, paper, cloth, button batteries	Patient "blows nose" with opposite nostril obstructed Grasping with forceps, curved hook, cerumen loop, or suction catheter Thin, lubricated, balloon-tip catheter[3] Parent's kiss; positive pressure may also be delivered by bag mask[5]	Bleeding disorder Removal attempts unsuccessful Septum or bone destruction, granulation tissue from chronic foreign body or button battery
Pharynx	Plastic, balloons, pins, seeds, nuts, bones, coins	Magills if able to see, such as a balloon, but often need to be removed endoscopically, requiring sedation and, thus, referral	Inadequate visualization Need for sedation Signs of airway compromise

Data from Heim SW, Maughan KL. Foreign bodies in the ear, nose, and throat. Am Fam Physician 2007;76(8):1185–9.

foreign bodies usually present with the complaint of "my child put something in his/her nose," but can also present with pain or discomfort, foul smelling nasal discharge, recurrent epistaxis, or rhinorrhea/congestion alone; a key historical piece of information is unilateral drainage. The most concerning object that children can insert into their nares is a button battery. The availability of these has soared in the past few years. Button batteries are now found in many toys, flashlights, handheld games, watches, remote controls, and talking or musical greeting cards. In the case of alkaline batteries, they can corrode and release caustic material, which leads to damage of the nasal tissue, necrosis, and subsequent nasal septal perforation. Nasal septal perforation has been reported to occur in as little as 7 hours.[2] Another common nasal foreign body that has a high rate of complications is magnets. If there is a magnet in each nare, or a magnet on one side and a ferrous object on the other, these can cause pressure, leading to mucosal breakdown and ultimately a septal perforation if not removed. Other more common complications of nasal foreign bodies include local irritation, pain, ulceration, infection, and epistaxis.

Removal of nasal foreign bodies is divided into two categories: positive pressure and mechanical extraction.[3] Positive pressure refers to using pressure to "blow" the object out. The simplest strategy for this is to have the child blow the object out while obstructing the opposite nostril. This can take a lot of coaxing and is often futile in the

younger population, but worth trying. It may be more successful to pinch off both nares, instructing the child to blow as hard as he or she can, then letting pressure off the affected nostril. Making it a game or a challenge for the child may get them more involved, thereby increasing success at removal. Make sure the child inhales through their mouth before blowing, so as not to suck the foreign body further back into their nasal passage. Another pearl that may aid in removal is the instillation of a vasoconstrictor before any attempts at removal. This can include a nasal decongestant drop or spray, such as phenylephrine or oxymetazoline hydrochloride, or nebulized epinephrine.[4] A point of caution: although this may make removal a bit easier by drying up secretions, reducing mucosal swelling, and decreasing traumatic epistaxis, it also may increase the risk for the foreign body to be displaced further into the nasal cavity and possibly aspirated.[3] If the blowing technique is not fruitful, there is still the option of using positive pressure. A common technique for this is termed the "parent's kiss." This is a technique whereby the patient's parent is instructed to blow into the child's mouth, while occluding the unaffected nostril, thereby increasing pressure and in essence blowing the child's nose for them (**Fig. 1**). The use of the child's parent is to allow the child to relax and anticipate a "kiss" from them. It is important to instruct the parent on technique, including a good seal before attempting. One concern that has been noted is the concern for barotrauma, although pressure is low, around 60 mm Hg, which is comparable with a sneeze.[5] Two other positive pressure techniques that are similar include using air from a mechanical device, either an Ambu bag or air or oxygen from the wall at 10 to 15 L/min and instilling it into the unaffected nare using a tight-fitting tube or catheter.[3] Finally, the same can be done using a bulb syringe and sterile saline to flush out the foreign body. This method, although effective, can be a little harder to tolerate. All of these positive pressure techniques include the risk of aspiration, so it is best to

Fig. 1. Parent's kiss.

reserve these techniques for nasal foreign bodies that can be visualized and are not too far posterior.

Mechanical extraction includes a wide range of techniques. For most of these, proper preparation is necessary. Preparation of the nose includes proper visualization, possibly the use of a local decongestant if there is not a high risk of it moving further posterior, and analgesia. Some authors recommend using topical 1% lidocaine, up to 0.3 mL/kg, 10 minutes before attempting removal. One way to do this is with a nasal atomizer; however, the clinician must be careful to ensure that the patient does not sniff the foreign body further into the nasal cavity. Lidocaine can be uncomfortable initially to the nasal mucosa, so risk and benefits must first be considered. Restraints in the form of extra holders, a sheet, papoose or, in certain situations, procedural sedation may be necessary. Common tools for mechanical extraction include straight or alligator forceps. These work well for objects that have a surface on which to grab. That being said, they are a poor option for round objects, such as beads, often pushing them in further while trying to grab the object. Catheters with a balloon on the end, such as a small urinary or vascular catheter, can be used. This is inserted into the nasal passage past the object. The balloon is then inflated and the catheter, along with the object, is expelled. This method works well for objects that are further posterior. There have been reports of foreign body removal using cyanoacrylate glue. A small amount is put onto a stick, such as the back of a throat swab, and held to the foreign body until the glue dries. As the swab is carefully removed, the object comes with it. This only works on dry and usually anterior foreign bodies. Care must be taken not to push it back further while waiting for the glue to dry.[3] Magnets are good tools to use when presented with a metallic foreign body that is anteriorly located. Finally, objects can be removed with rigid instruments. A bead with a hole in the middle can be grabbed with a small surgical hook or bent paperclip. A rigid metal ear curette works very well to scoop an object out of the nose. A typical disposable plastic one bends and is likely to be unsuccessful. This method, although effective, can be a bit traumatic to the nasal mucosa if done aggressively, or if the child is fighting back.

Ear Foreign Bodies

Foreign bodies in the ear canal are also a frequent presentation to the ED. Reports have shown the median age to be 7 years, with most children younger than 8 years of age. Beads are common offenders, with other common objects including pebbles, toys, and paper. Insects are also quite common, mostly in patients older than 10 years of age, and are not placed but rather crawled into the ear canal.[6,7] Although there is no risk of aspiration as with nasal foreign bodies, foreign bodies in the ear can be quite uncomfortable, and certain objects, such as a button battery, can be damaging. When attempting removal of foreign bodies in the ear canal, proper preparation is a must. The ear canal can be very sensitive, so proper analgesia or a topical anesthetic is optimal, as is proper positioning and control. Tools for removal include magnets, hooks, or forceps. Finally, irrigation has great success with removing objects from the external ear canal. There are many irrigation devices on the market, but one can be made easily using a syringe and 18- to 20-gauge angiocatheter. This method should be avoided if there is concern for perforation of the tympanic membrane. Irrigation should be used cautiously if the foreign body is organic (ie, corn, bean, and so forth) in nature, because these objects are likely to swell in the presence of water, making it very difficult to remove. Occasionally, patients may present with the sensation of intense pain and movement in their ear canal as a result of an insect in the external ear canal. Removal requires killing the insect before attempting removal. One of the best

ways to euthanize the insect is to instill alcohol, mineral oil, or lidocaine into the ear canal. This should be avoided if there is a perforation in the tympanic membrane.[8] Ear, nose, and throat (ENT) consultation or referral should be considered for objects that have been in the canal for greater than 24 hours, objects that are laying on the tympanic membrane, or certain types of objects. These include objects that are spherical or sharp-edged shape, disk batteries, and vegetable matter, because these are most likely to be difficult to remove and necessitate otomicroscopy-guided foreign body removal. The disk battery necessitates ENT consultation in the ED, and should not be left for removal at a later time.[6]

Airway Foreign Bodies

Pharyngeal foreign bodies are a true emergency because they can cause complete obstruction of the airway. Common objects include food, balloons, plastic bags, or toys. Patients may present with increased work of breathing, stridor, or respiratory failure. In a patient with complete obstruction, immediate airway maneuvers must be initiated. This includes the Heimlich maneuver, jaw thrust, and nasal or oral airways. If these techniques do not improve respiratory status, direct laryngoscopy may be necessary with removal of the foreign body using a Magill forceps or passing an endotracheal tube past the obstruction. If these attempts fail, emergent cricothyrotomy or tracheostomy is necessary.

Partial obstructions are much more common. Partially obstructing objects including toys, seeds, nuts, bones, food, and coins usually present with a cough or gag, or may present with stridor and mimic croup.[8] The key history from parents is that symptoms developed acutely with no preceding illness, often while the child was playing or eating. However, at times the inciting event may not have been witnessed and may not have occurred acutely; these patients may present with persistent wheezing unresponsive to usual treatments or recurrent stridor, this scenario requires a high index of suspicion to diagnose. If the object is radiopaque, it can be visualized with radiography. If it is not, one must have a high clinical suspicion to pursue the work-up. If the patient is able to maintain his or her own airway, offer oxygen and look into the mouth making sure not to agitate the patient. If an object is visible and able to be grasped, remove it; otherwise, keep the child in a position of comfort and have them taken to the operating room for further evaluation with direct visualization.

TRAUMA

Oral Injuries

Traumatic injuries to the mouth or posterior pharynx may present as decreased oral intake, drooling, or bloody emesis. A common scenario is a child running with an object, such as a pencil or toothbrush in their mouth, falling or hitting something, and forcing it into the posterior pharynx.[8] Although quite uncommon, there are reports of children being brought to the ED with a foreign body (pencil, toothbrush, and fence posts) still lodged in the posterior pharynx. This is a true airway emergency, and the patient must be kept as calm as possible to avoid further trauma and airway compromise. ENT should be consulted immediately and preparations made to have emergency airway equipment available at the bedside to secure an airway if necessary. For injuries that involve posterior pharyngeal trauma without an immediate airway compromise, the most concerning injury is trauma involving the lateral soft palate and tonsil pillars because of the location of the internal carotid artery (**Fig. 2**).

In a series of 335 patients looking at posterior pharyngeal penetrating injuries, the authors found two (0.6%) with injury to the internal carotid artery and none with

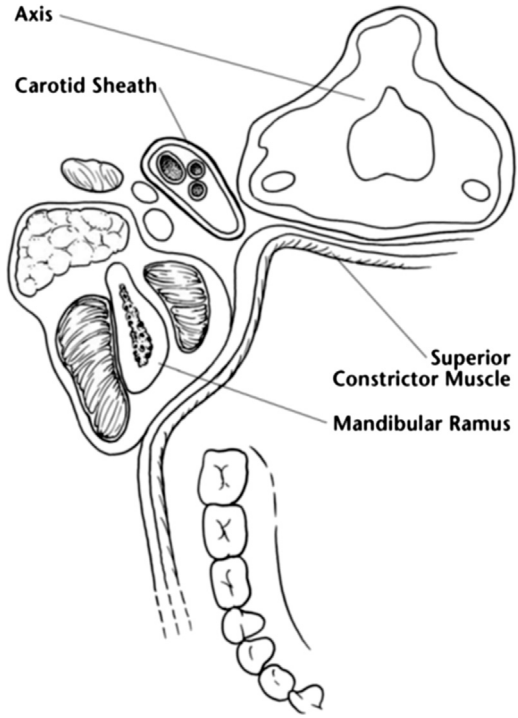

Fig. 2. Proximity of carotid sheath to posterior pharynx. (*From* Randall DA, Kang DR. Current management of penetrating injuries of the soft palate. Otolaryngol Head Neck Surg 2006;135(3):356–60; with permission.)

neurologic sequelae.[9] In another review, Randall and Kang[10] describe concerns and management of these injuries. The authors recommend that lacerations be left to heal without closure unless there is concern for a foreign body or there is a large laceration or hanging flap. With the abundance of oral flora, many clinicians have become concerned about the development of infection leading to the practice of prescribing prophylactic antibiotics. Although there is no great evidence for or against this practice, it is recommended to consider prophylactic antibiotics aimed at oral flora for lacerations greater than 1 to 2 cm. The management of lateral injuries over the internal carotid artery has evolved. With the concern for an intimal tear leading to a thrombus and ultimately stroke, management in the past has included imaging, anticoagulation, and in-hospital observation. In the review by Randall and Kang,[10] they found report of only 32 cases of carotid thrombus with neurologic impairment, making this exceedingly rare. A total of 244 patients were identified using retrospective data that sustained an “at risk” injury to the lateral palate. Of these, there were no patients that developed neurologic complications. They therefore concluded that the risk of this injury is less than 1%, and recommend instead close observation with further work-up for any neurologic changes. The reported lucid period is thought to last 48 to 60 hours, which had led to the recommendation of a 3-day in-hospital observation. With the frequency of this injury and the reported rarity of any sequelae, unless there are social or other issues that may preclude this, observation can be done at home.

Nasal Injuries

The nose is an area of frequent blunt trauma. Families are frequently worried about a nasal fracture, which rarely requires emergent evaluation or management. However, a hematoma of the nasal septum may cause significant consequences if not recognized and managed appropriately. The definition is a blood collection between the nasal septal cartilage and its surrounding perichondrium. The proposed mechanism is rupture of the small blood vessels supplying the nasal septum resulting from trauma causing a hematoma to form, thus separating the septal perichondrium from cartilage. Cartilage destruction may follow as a result of ischemia and pressure necrosis with resultant septal perforation and saddle-nose deformity, if it is not detected and managed. Diagnostically, one looks for a boggy, bluish mass bulging from the septum. The septum may be gently palpated with a blunt instrument or cotton swab. Topical anesthetics can aid with this examination. Treatment includes incision and drainage with packing, which is best performed under anesthesia or sedation, usually by ENT.[11] Antibiotics should also be initiated to cover nasopharyngeal flora. The most common complication of septal hematomas is abscess formation, which if not recognized may lead to such problems as intracranial extension, orbital cellulitis, meningitis, or sinus thrombus.

Epistaxis

Nosebleeds are a common presenting complaint to the ED. The nose is especially vulnerable to bleeding because of its rich blood supply. Most episodes are minor in nature and easily treated at home. However, epistaxis can be profuse and life-threatening. The most common cause of nosebleeds is the result of digital trauma, blunt trauma, or mucosal irritation from upper respiratory infections. Epistaxis can be classified as either anterior or posterior according to the location of bleeding. Anterior bleeding accounts for most epistaxis episodes and usually arises from Kiesselbach plexus in the anterior nasal septum. Posterior bleeds originate from the sphenopalatine artery in the posterior nasal cavity and nasopharynx and tend to bleed more profusely. Posterior bleeds can result in airway compromise, hemodynamic instability, and aspiration.

The initial evaluation of the patient with epistaxis involves the assessment of the airway, breathing, and circulation. It is important to quickly identify patients with hemodynamic instability and to stabilize. Physical examination should be geared toward identifying the location of the bleed to allow proper management. This can be accomplished with suctioning, topical vasoconstrictors, and a nasal speculum with good light source. Treatment of mild epistaxis that is anterior usually involves supportive care, limiting digital trauma or blowing, nasal saline, moisturizing ointments, and reducing mucosal irritation. If actively bleeding, patients or parents should be instructed to apply direct pressure for 5 to 15 minutes without interruption with head bent forward to prevent aspiration. If direct pressure does not resolve the bleeding, one should consider topical vasoconstrictors and limited cautery with silver nitrate. If an anterior bleed cannot be resolved with these measures, then nasal packing should be the next line of treatment. Packing can be removed within the next 30 minutes and the site reexamined. Posterior bleeds are more difficult to control and usually do not respond to the same measures of treatment as anterior bleeds. Posterior nasal packing or a balloon may be necessary to tamponade the bleeding. Otolaryngology should be involved in the care of patients with posterior bleeds for emergent and definitive management. In addition, children with a posterior nasal packing or epistaxis balloon should be treated with a course of antibiotics that provides

staphylococcal and streptococcal coverage to decrease the incidence of sinusitis or toxic shock syndrome.

INFECTION

ED visits for acute infections, such as otitis media, sinusitis, or pharyngitis, although quite common are rarely an emergency. It is the less common infections that can be a true ENT emergency and are the focus of this next section.

Mastoiditis

Otitis media is a common pediatric ailment, but left untreated it can progress to mastoiditis in a small percentage of cases. Mastoiditis was the most common complication of acute otitis media in the preantibiotic era. The mastoid sinuses are air cells in the mastoid process of the temporal bone. Relatively small at birth, the complete sinus does not fully develop until age 3, which is why mastoiditis is rare, although not impossible, before 3 years of age. The diagnosis is typically clinical; physical examination reveals a downward and outward protrusion of the auricle with erythema and swelling over the mastoid process. Treatment involves admission and treatment with broad-spectrum antibiotics. If treatment is delayed, the patient will likely require surgery to decrease secondary complications, such as hearing loss, labrynthitis with associated dizziness, or cranial nerve VII involvement with facial nerve paralysis. Mastoiditis can also spread to the brain leading to meningitis or cerebral sinovenous thrombosis.[12] Cerebral sinovenous thrombosis secondary to mastoiditis predominantly affects the transverse sinus. Diagnosis takes a high degree of suspicion, but associated symptoms include headache, papilledema, vomiting, and cranial nerve VI paralysis. Treatment revolves around treating the infection and anticoagulation therapy to restore blood flow and prevent further sequelae. A study by Vieira and colleagues[13] found that even though recanalization is the goal with anticoagulation therapy, a large portion did not recanalize and that recanalization did not correlate with a better prognosis in the long term. Transverse sinus thrombosis from mastoiditis frequently recovers without sequelae regardless of whether or not there was recanalization.

Orbital (Septal) Cellulitis

Orbital (septal) cellulitis is an infection of the soft tissues of the orbit behind the orbital septum. In contrast, preseptal cellulitis is an infection of the eyelids and periocular region anterior to orbital septum. Treatment of periorbital cellulitis usually only requires antibiotics and rarely progresses into septal cellulitis unless the thin septum is incomplete (**Fig. 3**).[14,15] Orbital cellulitis is usually secondary to extension of infection from a sinusitis, with the exception of penetrating trauma or hematogenous spread. That said, an odontogenic abscess can extend into the maxillary sinus and continue to penetrate superiorly into the orbit, just as infection from a nasal foreign body can extend into the orbit. Anatomically, the orbit has the frontal sinus above, the maxillary sinus below, and the ethmoids medial to it, with ethmoiditis being the most common cause for extension, only having the lamina papyracea between them. Because orbital cellulitis is usually secondary to sinusitis, the causative bacteria are typically respiratory and presentation commonly occurs in older children. In contrast, periorbital cellulitis is typically seen in younger children. Clinically, orbital cellulitis presents with unilateral swelling, tenderness, and erythema. The patient may also have fever and be ill appearing. These patients may also have signs of increased intraocular pressure, including visual changes, pain on extraocular movements, decreased range of motion,

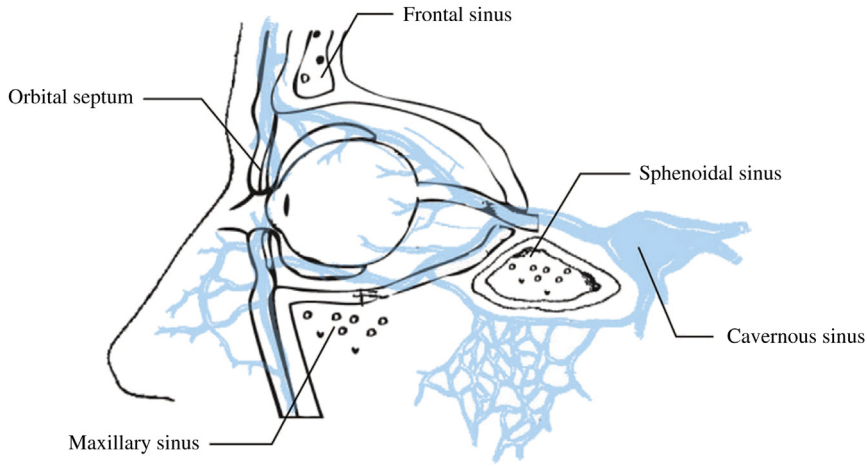

Fig. 3. Orbital and periorbital anatomy. (*From* Hauser A, Fogarasi S. Periorbital and orbital cellulitis. Pediatr Rev 2010;31:242–9; with permission.)

chemosis, afferent pupillary defect, and proptosis. Orbital cellulitis does not extend above the brow, as can periorbital cellulitis.[15,16] Contrast-enhanced computed tomography (CT) scan of the sinuses and orbits with axial and coronal thin cuts is the diagnostic test of choice to confirm and further delineate the degree of involvement (**Fig. 4**). If there is concern for cavernous sinus thrombosis or further soft tissue details are necessary, magnetic resonance imaging is the next imaging technique of choice.[16] Treatment includes admission and intravenous antibiotics targeted at *Staphylococcus aureus*, *Streptococcus pyogenes*, and typical respiratory pathogens. Indications for surgery include presence of a large abscess or clinical signs of increased pressure, such as decreased range of motion or significant visual acuity loss (20/60). Surgery is also indicated for failure to improve after 48 hours despite aggressive medical

Fig. 4. Orbital cellulitis with abscess. (*Courtesy of* Lisa Martin, MD, Columbus, OH.)

management.[16] Complications of orbital cellulitis include osteomyelitis, cavernous sinus thrombosis, proptosis, and ophthalmoplegia. Late findings include loss of vision, subdural empyema, extradural or intracerebral abscesses, and meningitis.

Retropharyngeal Abscesses

Retropharyngeal abscesses are a collection of fluid in the retropharyngeal space. These usually start as an upper-respiratory infection or pharyngitis, leading to inflammation of the retropharyngeal lymph nodes and eventually suppuration. Although most common in children up to 5 to 6 years of age, it can also occur in older children. This is thought to be caused by the presence of a paramedian chain of lymph nodes that run in the retropharyngeal space that usually spontaneously regress after 5 years of age.[17] Clinically, children usually present with fever, neck pain, sore throat, or difficulty swallowing. In the younger nonverbal child, fever and decreased oral intake may be the only clues to the diagnosis. As the disease progresses, patients may develop torticollis, drooling, and respiratory distress including stridor. In the ED, the first step after a thorough history and physical examination is a lateral soft tissue neck radiograph.[17] If the child is in significant distress immediate consultation with an otolaryngologist should be obtained and consideration given to a portable lateral soft tissue neck scan. Although the lateral neck radiograph has been considered a good screening tool, there is evidence to suggest that it may miss some cases, and with the availability of CT scanners, a CT should be considered in children with a high degree of clinical suspicion.[18,19] After the diagnosis has been made, ENT consultation is in order. If the child is having any airway or secondary complications, urgent surgical drainage is needed. Depending on the results of the CT, many treatment options include a period of intravenous antibiotics, followed by surgical drainage if not improving in 24 to 48 hours.[18,20]

In a study by Hoffmann and colleagues[18] the authors gave more concise guidelines, starting with surgical intervention for any abscess that was greater than 20 mm versus intravenous antibiotics for those smaller than 20 mm, with a 48-hour recheck. If not clinically better, they were then either taken back to the CT scanner or to the operating room. Complications of missed or delayed diagnosis and treatment include airway obstruction and progression of the illness causing cervical necrotizing fasciitis or mediastinitis, with the latter being the most common. Other complications include aspiration pneumonia, jugular venous thrombosis, or aneurysm of the carotid artery. As one would imagine, these are more common in the younger population where presentation and diagnosis may be delayed.[21]

Peritonsillar Abscess

Peritonsillar abscess (PTA) is another deep infection of the head and neck. It is the most common deep infection of the neck, affecting all age groups, although more prominent in the teenage to young adult years. In a study out of Calgary, Millar and colleagues[22] looked at 229 pediatric patients suspected of having a PTA. They found the highest occurrence in the 14 to 17 years of age range with a rate of 40 per 100,000 child-years at risk. The youngest child affected in their sample was 21 months of age. The abscess forms when the oral flora invades the peritonsillar space, forming an abscess between the palatine tonsil and its capsule.[23] Clinically, the patient complains of sore throat, fever, and may be drooling and have an altered “muffled” voice. On examination, the patient has pharyngeal erythema, asymmetric peritonsillar swelling, bulging soft palate, and deviation of the uvula away from the side of infection. The addition of trismus or uvular deviation is more consistent with abscess than only cellulitis or phlegmon. True diagnosis of a PTA requires the demonstration of a collection of

fluid in the peritonsillar space. This can be done either with needle aspiration, ultrasound, or a CT scan. The choice of diagnostic method is based on practitioner's local practices, comfort, and ENT consultation and CT availability. If there is no abscess (phlegmon) or after the fluid has been drained, treatment consists of hydration, pain control, and antibiotics. If the patient is nontoxic, able to tolerate oral intake, and has adequate pain control they can be treated as an outpatient with close ENT follow-up and antibiotics; otherwise they should be admitted.[22,23]

There has been controversy over the use of steroids. Although steroids have been shown to decrease pain in adults with pharyngitis, their use in PTA is unclear. A study of adult patients found the number of days to recovery to be reduced with one dose of intravenous steroids. A similar study in the pediatric population was unable to find a significant improvement with steroids when used for PTA.[22,24]

Complications of PTA include airway obstruction and aspiration. Infection in the peritonsillar space can erode into the carotid sheath and cause sepsis or hemorrhage.[23] Another complication that occurs when infection spreads past the tonsil is Lemierre syndrome, which occurs when infection disrupts the mucosa of the oropharynx, leading to deeper tissue infection with involvement of the internal jugular vein. This in turn causes septic thrombophlebitis of the vein and ultimately metastatic infection, usually into the lungs. The classic causal bacterium is *Fusobacterium necrophorum*, but others have also been implicated. Many times the pulmonary symptoms and sepsis arise after the pharyngeal infection has resolved, so good history and high index of suspicion are needed. Patients have a history of recent pharyngitis and present with neck pain, fever, or rigors. Other presenting signs and symptoms are usually related to site of septic emboli. Treatment of Lemierre syndrome focuses on treatment of sepsis and multiorgan dysfunction including antibiotics to cover for polymicrobial infection, including anaerobes. If no improvement is seen, thrombectomy or ligation of the internal jugular vein may be necessary.[25]

POSTPROCEDURAL COMPLICATIONS

Posttonsillectomy Hemorrhage

Tonsillectomy is the second most common procedure performed in children in the United States. Often it is done on an ambulatory basis with approximately 3% being done in an inpatient setting.[26] The procedure is done at two peaks in childhood, first from 5 to 8 years of age, then from 17 to 21 years of age. Primary reasons for tonsillectomy include recurrent tonsillar infections and sleep-related disorders, such as obstructive sleep apnea. With the increase in the number of tonsillectomies that occur and because they are primarily done as an outpatient, if a postprocedure complication does arise, it likely finds its way into an ED. Hemorrhage is a common complication after tonsillectomy, and occurs at two points: primary bleeding within the first 24 hours, and secondary when the eschar comes off at approximately 5 to 8 days postprocedure with rates up to 2.2% and 3%, respectively (**Fig. 5**).[26,27] Treatment consist of stopping the bleeding and fluid or blood resuscitation as needed. The bleeding can be stopped with direct pressure or by applying epinephrine or thrombin. If this does not work, return to the operating room may be necessary. Consultation with the ENT surgeon earlier rather than later is advised.

Posttonsillectomy Pain

Another common adverse event from tonsillectomy is pain, often leading to dehydration from inadequate oral intake. Pain is expected for the first 3 to 5 days postsurgery, and it is recommended to use pain controllers aggressively to keep pain under control.

Fig. 5. Posttonsillectomy bleeding. (*Courtesy of* Charles Elmaraghy, MD, Columbus, OH.)

Historically, ENT surgeons have avoided nonsteroidal anti-inflammatory drugs (NSAIDs) with the concern that they may increase the tendency to bleed. Instead, they have used acetaminophen or acetaminophen with codeine. In a review of trials looking at NSAID use, the authors found NSAIDs did not significantly alter the number of perioperative bleeding events requiring surgical intervention or those not requiring surgical intervention. They also found the rate of nausea and vomiting to be lower in the NSAID group.[28] With this in mind, there are also data looking at the analgesic that is commonly prescribed for posttonsillectomy pain, acetaminophen with codeine. In the summer of 2012, the Food and Drug Administration released a warning about three children who had died from codeine. They refer to a small (1%–7%) number of the population that metabolizes codeine into its active drug, morphine, at an ultra-rapid rate, thereby exposing the child to increased doses. These children not only get exceptional pain control, they are exposed to increased side effects, such as respiratory depression. This, in the face of an already swollen posterior pharynx, can lead to upper airway obstruction, respiratory depression, and death.[29]

SUMMARY

When dealing with pediatric cases in the ED, ENT cases are frequent occurrences. Whether it is from trauma, a foreign body, infection, or a complication of a previous procedure, the emergency physician needs to have an understanding of the various conditions and how to manage them. That, and the availability of a good local otolaryngologist, ensures that the emergency physician is well prepared.

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