Conditions Requiring Emergency Ophthalmologic Consultation

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Ophthalmologic complaints in the Emergency Department (ED) are estimated to represent 3% of all visits [1]. Emergency physicians are well prepared to diagnose and manage the majority of these visits. Corneal abrasions, conjunctivitis, and conjunctival or corneal foreign bodies comprise 75% of ED visits [2]. The challenge for the emergency physician is to decide which cases require the expertise of an ophthalmologist and in what time frame. Optimally, the decision should be evidence based and in accordance with clinical guidelines developed collaboratively between emergency physicians and ophthalmologists. Hopefully, in the not too distant future, this will be the case. This article reviews the instances where emergency consultation with an ophthalmologist is warranted, with specific reference to each article contained in this issue of Clinics.

Emergency ophthalmology consultation caveats

The availability of on-call specialists to the ED on a 24-hour a day basis is not uniform across EDs in the United States. Specialty eye hospitals and tertiary care centers, which also function as Level 1 Trauma Centers, for the most part, do have around-the-clock ophthalmology coverage. Many other hospitals, however, do not have this level of coverage or lack subspecialty services in ophthalmology. Ophthalmology has subspecialties, including oculo-plastics, neuro-ophthalmology, and retina. A general ophthalmologist may feel uncomfortable with a particular request for consultation and ask that the patient be referred to a facility with a higher level of care and ophthalmologic subspecialization. This is particularly true for cases involving possible postoperative complications from eye surgeries. It is therefore
important for emergency medicine practitioners who find themselves in such a situation to have referral hospitals that can be contacted to accept patients in transfer.

**Emergency diagnoses requiring emergency ophthalmology consultation**

The following box contains a list of diagnoses or conditions that generally warrant an emergency ophthalmologic consultation (Box 1).

There are also cases where emergency ophthalmologic consultation is reasonable, and these include patients with one good eye experiencing vision changes, patients with a complicated ocular history, as well as cases where the ED practitioner is unsure of a diagnosis and is concerned about vision loss. A telephone discussion to determine the timing of the consultation with the ophthalmologist will usually answer such questions.

**Trauma**

Emergency physicians are well versed in the management of trauma. The basic ABC principle (Airway, Breathing, Circulation) in ED trauma management takes precedence over eye injuries. Evaluation for life and limb-threatening injuries is the first priority. Most patients with multiple trauma and an eye injury will require ophthalmologic consultation, but the timing of this consultation is dependent on the severity of other injuries. Most often, this consultation occurs at some point during the in-patient stay after life threatening conditions have been addressed. This article reviews the conditions that usually require ophthalmologic consultation from the ED.

**Box 1. Conditions that generally warrant an emergency ophthalmologic consultation**

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<th>Trauma</th>
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<td>Ruptured globe</td>
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<td>Lid laceration through margin, nasolacrimal system, or cannaliculus</td>
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<td>Endophthalmitis</td>
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<td>Angle closure glaucoma</td>
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<td>Severe uveitis</td>
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<td>Corneal ulceration</td>
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<td>Acute vision loss</td>
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<td>Central retinal artery occlusion</td>
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<td>Optic Neuritis</td>
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<td>Orbital cellulitis</td>
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CT scan is the imaging modality of choice in defining the extent of blunt and penetrating trauma to the eye and orbit. Orbital fractures are not an emergency unless there is vision loss or globe injury. Retrobulbar hemorrhage may occur with nondisplaced orbital fractures and may result in acute vision loss. Penetrating injuries with globe rupture also require CT scanning for retained foreign bodies, but sensitivity is only 75% [3]. These entities are discussed in detail in the article by Linden and Bord elsewhere in this issue.

Direct trauma to the eyelid involving the nasolacrimal system, lid margin, or tarsal plate requires specialized repair by either a plastic surgeon or an ophthalmologist, depending on institutional preference and availability. The timing of this repair should occur after any life or limb-threatening injuries are addressed.

Endophthalmitis

Endophthalmitis represents inflammation of the aqueous or vitreous humor. It may result from infection, trauma, or as a postoperative complication. This is generally a difficult diagnosis to make in the ED. Suspicion of the diagnosis requires emergent ophthalmologic consultation for diagnostic evaluation, hospital admission, and surgery as necessary.

Acute angle closure glaucoma

Acute angle closure glaucoma (AACG) is generally painful and occasionally associated with headache, nausea, vomiting, and abdominal pain. The diagnosis may be difficult to establish when abdominal complaints are prominent [4]. Intraocular pressure generally rises beyond 50 mm Hg and may induce optic nerve atrophy if untreated. The emergency physician can certainly initiate therapy and consult an ophthalmologist. The issue is then response to treatment and monitoring of the intraocular pressure. Generally, patients with a new diagnosis of AACG are admitted to the hospital and an ophthalmologist oversees medical therapy. Cases refractory to medical therapy may require surgical intervention. AACG is discussed in detail in the article by Lowenstein and Dargin elsewhere in this issue.

Severe uveitis

Anterior uveitis (iritocyclitis) is inflammation of the iris (iritis) and ciliary body (cycitis) and accounts for the majority of uveitis in Western countries [5]. It typically occurs in patients between the ages of 20 and 50 [5]. Inflammatory cells and flare in the anterior chamber associated with conjunctival injection primarily involving the limbus help confirm the diagnosis. The etiology of anterior uveitis is broad and may include infection, rheumatologic disease (HLA-B27 particularly), idiopathic, or even a malignancy which may mimic anterior uveitis. Given the broad differential diagnosis associated with this condition, consultations with specialists in rheumatology,
infectious diseases, oncology, and ophthalmology may be warranted. A complete discussion of uveitis is found elsewhere in this issue in the article by Klig, entitled “Ophthalmologic Complications of Systemic Disease”; the article by Mahmood and Narang, entitled “Diagnosis and Management of the Red Eye”; and the article by Mueller and McStay, entitled “Ocular Infection and Inflammation”.

Corneal ulceration

Degradation of the corneal stroma leads to ulceration of the cornea and is associated with numerous types of infection, systemic diseases, and glucocorticoid usage, and may lead to permanent vision loss. The depth of the ulceration may lead to corneal perforation with extension of the infection into the anterior chamber. Corneal ulcerations tend to heal with scarring, resulting in corneal opacification and decreased visual acuity. Ophthalmologic consultation and diagnosis of the etiology of the ulceration may decrease permanent damage to the cornea and resultant vision loss. The article by Klig, entitled “Ophthalmologic Complications of Systemic Disease”; the article by Mahmood and Narang, entitled “Diagnosis and Management of the Red Eye”; and the article by Mueller and McStay, entitled “Ocular Infection and Inflammation” found elsewhere in this issue discuss this topic in greater detail with reference to the etiology of the corneal ulceration.

Acute visual loss

Acute visual loss is a concerning complaint and can be difficult to diagnose. Presenting symptoms can be numerous and seemingly unrelated to the eye. It can be a painful or painless condition. The four major diagnoses addressed in this article include temporal arteritis, optic neuritis, central retinal artery occlusion, and retinal detachment.

Temporal arteritis

Temporal arteritis is a diagnosis that is in the differential diagnosis for acute vision loss. The gold standard for diagnosis is a temporal artery biopsy positive for giant cell arteritis. The end result of this condition is retinal ischemia and vision loss. Fundoscopic abnormalities or optic atrophy are not helpful in establishing or eliminating the diagnosis [6]. Suspection of the diagnosis with prompt referral to an ophthalmologist is important, as the administration of high dose steroids may help prevent further vision loss [7]. Improvement in vision loss was present in only 4% of patients in one retrospective study [8].

Optic neuritis

Patients with optic neuritis generally present with pain on eye movement associated with unilateral vision loss, visual field defects, and change in
color perception. Pain resolves as visual loss commences [9]. MRI reveals demyelinating lesions and may be helpful in establishing the diagnosis of multiple sclerosis. The vision loss is progressive and may occur rapidly over several hours or more slowly over days. Treatment with steroids generally leads to improved vision over several weeks [10]. Consultation with neurology as well as ophthalmology is generally warranted, given the likelihood of other conditions, such as multiple sclerosis, as well as other etiologies of acute vision loss.

Central retinal artery occlusion

Central retinal artery occlusion (CRAO) results in a sudden painless loss of vision. The primary cause of CRAO is embolic disease, but there are numerous other conditions that may cause CRAO as well. Immediate ophthalmologic consultation is warranted as vision may be preserved with treatment. Irreversible vision loss generally occurs after 4 hours of ischemia [11]. Visual acuity at presentation is predictive of final visual acuity. However, in a 1980 experimental study of ischemic time after retinal artery occlusion, restoration of blood flow at 100 minutes was associated with preservation of vision [12]. That being said, the medical and surgical treatments for CRAO have marginal benefit overall in preserving vision. Unfortunately, spontaneous resolution of an embolus is quite rare [13].

Retinal detachment

Retinal detachment is characterized by the separation of the retina from the underlying retinal epithelium. The incidence of retinal detachment is roughly one to two cases per ten thousand people [14,15]. Patients complain of new floaters, squiggly lines, or cobwebs that appear abruptly, associated with visual field loss. Examination with an ophthalmoscope is generally insufficient as the detachment may be at the periphery of the retina where the retina is the thinnest. The classic finding of a white billowing retinal separation is helpful if present, but the presence of a new visual field deficit with new “floaters” requires a dilated examination by an ophthalmologist [16].

The above causes of acute visual loss are all covered in more detail in the article by Vortmann and Schneider elsewhere in this issue.

Orbital cellulitis

Cellulitis involving the orbital tissues is usually an extension of an infection involving the sinuses. Patients may present with significant pain, swelling, and even proptosis, with increased risk of permanent ocular damage and vision loss. Potentially fatal complications of orbital cellulitis include meningitis and cavernous sinus thrombosis. CT scan can define the limits of infection and the presence of an abscess. Admission and emergent ophthalmologic consultation are warranted. This is discussed in detail elsewhere in this issue by Mueller and McStay.
In summary, this article has attempted to provide guidelines to the emergency physician regarding when to call for emergency ophthalmology consultation. It is not intended to provide an exhaustive list of every possible problem that may be encountered in the ED requiring the expertise of an ophthalmologist.

References