

Ocular Injuries and Cultural Influences in Afghanistan During 5 Months of Operation Enduring Freedom

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ABSTRACT

In support of Operation Enduring Freedom, American, North American Treaty Organization (NATO) Coalition, and Afghan forces worked together in training exercises and counterinsurgency operations. While serving at the NATO Role 3 Multinational Medical Unit, Kandahar, Afghanistan, numerous patients with explosive blast injuries (Coalition and Afghan security forces, and insurgents) were treated. A disparity was noted between the ocular injury patterns of US and Coalition forces in comparison with their Afghan counterparts, which were overwhelmingly influenced by the use, or lack thereof, of eye protection. Computed tomography imaging coupled, with a correlative clinical examination, demonstrated the spectrum of ocular injuries that can result from an explosive blast. Patient examination was performed by Navy radiologists and an ophthalmologist. A cultural analysis by was performed to understand why eye protection was not used, even if available to Afghan forces, by the injured patients in hope of bridging the gap between Afghan cultural differences and proper operational risk management of combat forces.

KEYWORDS: *ocular injury; culture; explosive blast injury*

Introduction

Since 2001, the United States, along with several North Atlantic Treaty Organization (NATO) countries, has been providing guidance to the country of Afghanistan via what eventually evolved into the International Security Assistance Force (ISAF). Part of this entailed training and modernizing the Afghan police, army, and security forces to prevent the return of the Taliban government that was removed from power. At the NATO medical facility in Kandahar, the patients treated may be from ISAF, local nationals, or Afghan military working alongside Coalition forces. Some of the most severe cases of survivable trauma have been reported during the combat operations in Afghanistan, such as triple amputations secondary to injuries caused by improvised explosive devices (IEDs), with some patients requiring massive blood transfusions to keep the in-hospital mortality rate as low as 4.45%.¹

US Army personnel are required to wear issued eye protection² to mitigate combat theater eye injuries seen during the initial phases of this IED-laden war.³ However, although members of the Afghan military are issued eye protection when working alongside the ISAF, it is infrequently worn, as evidenced by the extensive eye injuries seen in conjunction with blast victims at

the NATO Role 3 Multinational Medical Unit (MMU) at Kandahar Air Field (KAF), Afghanistan. This article examines the cross-cultural dynamics that must be deployed to understand the importance of eyes in Afghan culture and the effect of culture on use of eye protection among Afghan security forces, and demonstrates several of the resultant ocular injuries.

Methods

Local national patients seen at the NATO Role 3 MMU in Kandahar, Afghanistan, who suffered blast-related injuries were screened for orbital injuries and seen by a US Navy radiologist and a ophthalmologist. Computed tomography (CT) scans were compared with clinical findings retrospectively. A literature review, which included anecdotal observations, was performed to understand how eyewear is perceived in Afghan culture and its effect on eye protection compliance among Afghan security forces. A cross-cultural synopsis was compiled to attempt to link the clinical importance of eye protection with the Afghan traditions.

Results

Clinical presentation of ocular injuries was evaluated by a US Navy ophthalmologist on admission to the NATO Role 3 MMU at KAF. Coalition and Afghan security forces with eye injuries most commonly had injury due to foreign bodies that resulted in corneal abrasions and lacerations. An open globe was considered present when full-thickness injury to the cornea, sclera, or both existed. Many open globes presented and several emergent ophthalmologic surgeries were performed, primarily on Afghan security forces—patients who, in retrospect, were found to not have worn eye protection.

Aggressive and proactive ophthalmologic evaluation in the setting of combat trauma revealed that of the 276 combat casualties requiring surgical intervention from September 2012 through January 2013, there were 45 patients seen at the NATO Role 3 MMU KAF for ocular injury. Of the 276 combat casualties, 48 were Afghan patients, the remaining 228 were Coalition forces or contractors. Of the 45 patients with ocular injuries due to IED blast and indirect gunfire, 24 were wearing eye protection. Although the eye protection was usually either damaged severely or the blast wave blew the eyewear off the patient's face, only one patient who was wearing eye protection had an open globe, with rocks embedded into the deep temporal sclera. Despite these orbital injuries, after

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treatment, the patient maintained 20/20 vision. However, of the 21 patients who had not worn eye protection, there were nine with open globes who had poor outcomes, and three of these required primary enucleation.

Every IED-blast victim at NATO Role 3 KAF received a CT scan of the head and face to evaluate for underlying or extent of damage, which ranged from obvious trauma to subtle injuries only diagnosable in the emergent trauma setting via radiologic consultation, due to resuscitative time constraints. The more-obvious injuries are often apparent to the medic before arrival at the NATO Role 3 MMU, with blast-associated foreign bodies, including large pieces of metal, ball bearings, rocks, and even fecal material, embedded into the globe or retrobulbar space (Figure 1). Increased morbidity and mortality may also accompany the more serious ocular injuries, with the orbit serving as a gateway to the calvarium, with resultant intracranial hemorrhage (Figure 2). More-subtle injuries required radiology consultation, with CT scans demonstrating a foreign body in the orbit with damage to the globe and extra-ocular muscles, including lens dislocations (Figure 3). The less-obvious injuries highlight the importance of advanced imaging for detecting complex ocular injury and the extent of injury sustained secondary to lack of eye protection. Furthermore, when open globe was noted on clinical examination, CT imaging was essential to exclude more extensive retrobulbar or intracranial injury. Finally, given the wide range of associated injuries in the emergent setting, a thorough ophthalmologic examination may be limited because of resuscitative or surgical interventions; however, once stabilized, a complete evaluation can identify superficial injuries that require treatment to prevent adverse outcomes (Figure 4).

On the same day, two patients arrived separately at the NATO Role 3 at KAF: one an Afghan security forces soldier and the other a US Navy Explosive Ordnance Disposal (EOD) Sailor. The Afghan soldier suffered from an IED blast, had not worn eye protection, and suffered from extensive foreign bodies

FIGURE 1 Photograph and computed tomography three-dimensional reformatted image demonstrating, in a 35-year-old Afghan patient who had not worn eye protection, a 4cm piece of curvilinear metal from the blast of an improvised explosive device. The object penetrated the right orbital floor and contacted the medial aspect of the right globe.

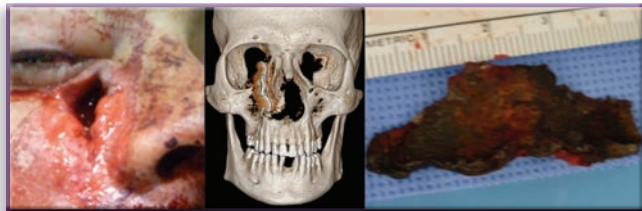


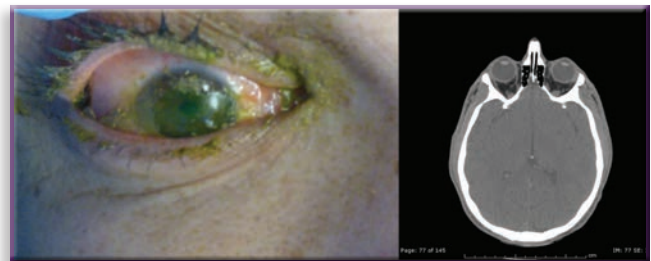
FIGURE 2 Subtle, yet severe, injury in a 27-year-old Afghan patient. The injury was due to the blast of an improvised explosive device that forced foreign bodies through the left nare, right nasal cavity, and superomedial right orbit, with intracranial hemorrhage (blue circle). Initial limited emergent ophthalmology examination demonstrated mild subconjunctival hemorrhage without evidence of open globe.



FIGURE 3 Computed tomography (CT) scan of an Afghan patient without eye protection after exposure to an improvised explosive device blast. Limited clinical examination demonstrated an open globe; axial, noncontrast CT imaging shows left lens dislocation (gold arrow) with foreign bodies (blue arrows) overlying the bilateral sclera.



FIGURE 4 Eye protection prevented serious ocular injury from an improvised explosive device blast in this 27-year-old Servicemember, although the eye protection was ejected by the blast wave. Fluorescein staining shows complete loss of all corneal epithelium, but the patient had normal vision. Scleral foreign bodies are seen on computed tomography scan of the head, which shows no acute orbital injury.

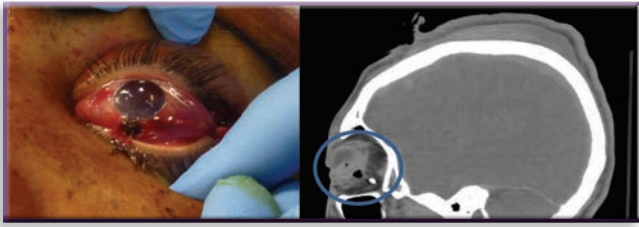


penetrating the orbit, entering the calvarial vault and causing significant intracranial hemorrhage. The EOD Sailor was also exposed to a significant explosion with the blast wave. Shrapnel crushed his ballistic-grade-issued eyewear and peppered his face with foreign bodies; however, his orbits and intracranial contents remained intact with the exception of acute corneal abrasion with stromal edema in one eye (Figure 5). This is representative of the wide spectrum of injury that can occur in the setting of IED and eye protection, depending on protective eyewear.

Discussion

Western influence in the development and growth of Afghanistan over the past 10 years has crossed many cultural bounds. Coalition Servicemembers embedded with Afghan security forces have overcome numerous struggles to develop an autonomous functional state military and police. However, as evidenced in the examples reported in Results, the proper use of eye protection has remained a problem despite other vast improvements in marksmanship, tactics, and joint operations. Understanding the traditions of Afghan culture is paramount to effecting a change in mannerisms, including the importance of the eye in daily living.

FIGURE 5 Afghan patient after exposure to the blast of an improvised explosive device blast. Patient was not wearing eye protection. Clinical examination demonstrated vitreous and retina extruding inferiorly (blue arrow). There is a penetrating foreign body rupturing the left globe (which, ultimately, was enucleated) causing retrobulbar hemorrhage (blue circle).



There is limited prior research regarding eye protection and Afghan culture; however, some studies have noted that the use of eyewear among men represents a sign of weakness, even if for visual acuity.⁴ Furthermore, Arab culture places great importance on eye contact, with direct eye contact being used among men to assess truthfulness of what is being said.⁵ In fact, some Coalition forces specifically did not wear sunglasses when working in Afghanistan in order to build trust and not appear unfriendly.⁶ This cultural awareness has even reached US Army training doctrines, which instruct our Soldiers to maintain eye contact and not wear sunglasses, even if a meeting is occurring in bright sunlight.⁷ Unfortunately, our approach in training Afghan security forces has not yet successfully addressed the importance of eye protection.

The incidence of ocular injuries among Afghan security forces brought into NATO Role 3 MMU, KAF, approached 100%, ranging from less-significant corneal abrasions to traumatic enucleations and open globes. IEDs result in extensive soft-tissue injuries, especially affecting body parts not protected by body armor, such as the extremities and face. Since these IEDs are often filled with metallic fragments, such as ball bearings, the soft-tissue injuries can be massive and life threatening (Figure 6). Mitigating the ocular injuries suffered by the Afghan security forces via eye protection could have long-lasting positive effects on not just the immediate recovery but also on maintaining a functional fighting force with decreased long-term disabilities (Figures 7 and 8).

Coalescing the need for eye protection into daily protocol for Afghan security forces suggests the need for a cultural shift, which presents several challenges. Changing Afghan culture must address religious influences and local tribe custom. As a multiethnic society, Afghanistan is a meshwork of several tribes scattered regionally across the country; the largest tribe is the Pashtun, the tribe of the current, elected Afghan president. In addition, Islam plays a pervasive role in Afghanistan in that the country is almost entirely Muslim, divided between the majority Sunni and the minority Shi'a.⁸ Thus, addressing the perception of eye wear is complicated by individuality germane to region, tribe, and religion. The crux of the problem lies in defining the cultural importance of the eyes, and there are few published data on this.

During convoy operations providing medical education to the Kandahar Regional Military Hospital, local doctors and senior enlisted Afghan National Army sergeants, one of whom, incidentally, was wearing reading glasses, were queried about their understanding of eye protection use and Afghan culture. Although they had seen and treated first-hand the traumatic

FIGURE 6 Scout image, or topogram, of a patient after exposure to an improvised explosive device blast. Image reveals numerous ball bearings (blue circle) embedded throughout the soft tissues of the pelvis with postsurgical dressings (blue rectangle) in the abdomen and fractured left femur (blue arrow).



FIGURE 7 Left globe rupture and retrobulbar hemorrhage (blue arrow) in a 30-year-old Afghan patient after exposure to an improvised explosive device blast while not wearing eye protection.

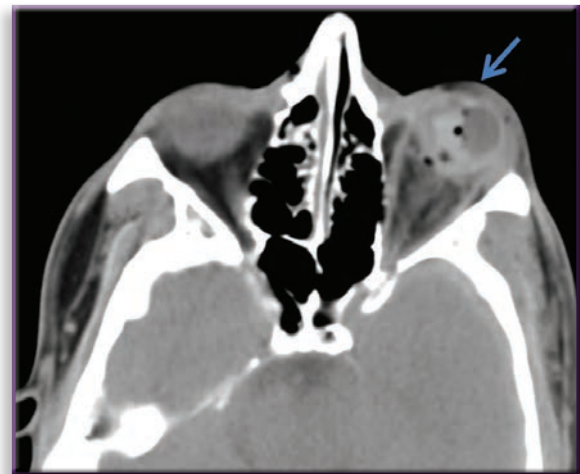
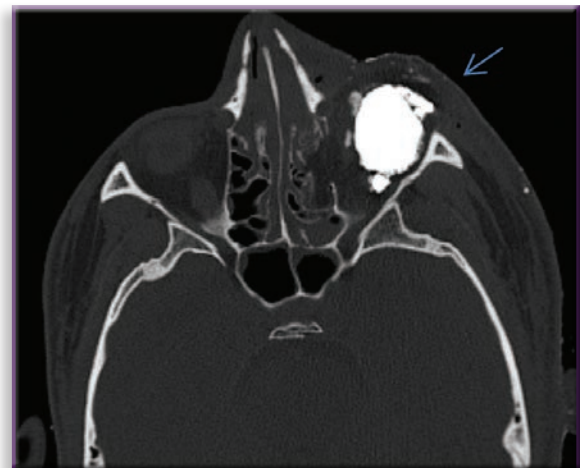


FIGURE 8 Noncontrast computed tomography image demonstrating a large rock (blue arrow) embedded in the left orbit of an Afghan patient who was not wearing eye protection when exposed to an improvised explosive device blast. The rock obliterated the left globe.



sequelae blast injury can have upon unprotected eyes among their Afghan soldiers, even they had mixed opinions, varying from lack of access to eye protection to the aforementioned cultural stigma of eyewear. The US Military has attempted to address the cultural gap in Afghanistan, including the perception that eye contact is a sign of reliability and trustworthiness.⁹ Although the measures of success during military operations in Afghanistan are challenging to assess, from a medical perspective, the effect eyewear has had upon the Afghan security forces during this IED-laden war demonstrates the need to bridge this cultural void to mitigate long-term disabilities among the Afghan population.

Conclusion

More than 10 years of training and fighting alongside Afghan security forces have led to many changes in the medical treatment of war casualties, with extensive improvements mitigating the loss of life and limb of Coalition forces. Improvements in eye protection use among US Military Servicemembers have also resulted in decreased incidence of ocular injuries. However, Afghan security forces continue to suffer extensive and possibly life-threatening orbital injuries that could be avoided if eye wear was deployed properly. Addressing the cultural differences between Coalition and Afghan forces could improve eye protection compliance and mirror the marked decrease in ocular injuries due to IED blast among Coalition forces during the remainder of Operation Enduring Freedom. Bridging the cultural gap for eye protection use in Afghanistan could occur with increased multinational military partnerships, but this may take several years of cross-cultural dynamism to yield a lasting change.

Disclaimers

The views expressed in this article are those of the author and do not necessarily reflect the official policy or position of the

Department of the Navy, Department of Defense, or the US Government.

Disclosures

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Author Contributions

All authors approved the final version of the manuscript.

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