Football Helmet Face Mask Removal

Douglas M. Kieiner, PhD, ATC/R, CSCS
Sports Medicine—Athletic Training Program, University of North Florida

Each year numerous head and neck injuries occur to football players of all skill levels. These injuries are among the most feared because they can cause paralysis or death. Proper on-the-field management of these injuries is needed to avoid further injury. Medical personnel should take extreme caution when evaluating and treating an unconscious football player, since the extent of the injury is unknown.

Any unconscious athlete should be suspected of having an accompanying spinal injury until it is proven otherwise. If the athlete is not breathing, or if there is a possibility of respiratory arrest, it is imperative that the medical personnel work quickly and effectively to remove the face mask in order to administer the proper emergency care.

Helmet Removal

Concerning how to treat a football player with a suspected spinal injury, both the National Athletic Trainers’ Association and the American College of Sports Medicine have recently developed statements advising against removal of football helmets. Athletic therapists, or other first-responders, should remove only the face mask in order to gain access to the airway. Preventing the head and neck movement that would occur during helmet removal is very important because any unnecessary movement may cause further damage to the cervical spine.

It has been noted that the protocol for football helmet removal often differs between athletic therapists and emergency medical technicians (EMTs). EMTs are frequently confronted with motorcycle accidents involving loosely fitting helmets and are instructed to remove them. However, unlike motorcycle and even other sport helmets, football helmets fit snugly and prevent head movement within the helmet.

Unlike other helmets, the face mask of a football helmet is attached to the helmet with four plastic straps that allow for face mask removal. This design enables medical personnel to gain access to the airway and vital areas of the face, examine the athlete, and administer emergency care without having to remove the helmet. Furthermore, since football players wear large shoulder pads, removing the helmet without simultaneously removing the shoulder pads would interfere with attempts to maintain in-line neutral stabilization of the spine.

To avoid potential conflicts between athletic therapists and EMTs as a result of their different protocols, athletic therapists should take the initiative before a problem arises by scheduling a meeting with the local providers of emergency medical services. It is suggested that team physicians, athletic therapists, coaches, and concerned parents meet with emergency care providers such as EMTs to develop a protocol for the safe transportation of athletes who have suffered catastrophic injuries.

Only a qualified physician should remove the helmet of a football player who is thought to have a spinal injury—and only after x-rays have been obtained at the hospital. In the past, attention has focused on the topic of helmet removal versus face mask removal. However, now that helmet removal is widely disregarded and face mask removal is the well accepted protocol, scientific investigations are beginning to identify which tools and face mask removal techniques are most efficient.

Face Mask Removal

The face mask is attached to the football helmet by four plastic straps (Figure 1). The lower two
straps may be cut or removed, allowing the face mask to be retracted with the two top straps acting as a hinge. This design enables the athletic therapist to gain access to the airway without having to remove the helmet. The plastic straps can be removed with special tools, which should be readily available during practices as well as games.

There are several theories on face mask removal. It has been suggested that the face mask need not be removed, and that when cardiopulmonary resuscitation (CPR) is indicated, a CPR pocket mask should be inserted between the face mask bar and the athlete’s face. Although there is some support for this theory (Ray et al., 1995), several potential problems exist:

1. It may be difficult to attempt this maneuver, particularly with the detachable one-way valve found on many CPR pocket masks. For one thing, the pocket mask might not fit under the face mask, particularly if the face mask is damaged, distorted, or has not been fitted correctly.
2. The EMTs may want to intubate the athlete or they may have a protocol that does not allow for transportation under these conditions.
3. This method does not allow for easy evaluation of other vital signs, particularly if the athlete is wearing a face shield.

Another theory is that the face mask should only be removed when CPR is called for. This can present a problem because time becomes more critical once the athlete is in respiratory arrest. Therefore it is suggested that athletic therapists not wait until the athlete stops breathing to begin the necessary task of face mask removal.

Still another theory is that the face mask should always be removed as quickly as possible any time an athlete is suspected of having a head or neck injury, even if the athlete is still conscious. Since the face mask might need to be removed for evaluation of vital signs, or for transportation, and possibly for CPR, the thinking is that it may as well be removed sooner rather than later. This protocol may also avoid a potential problem concerning emergency medical personnel. That is, once EMTs arrive on the scene and see that the face mask has already been removed, giving them unobstructed access to the face, they may agree to transport the athlete without removing the helmet.

**Tools for Face Mask Removal**

Several tools that can be used to remove the straps securing the face mask to the helmet are mentioned in the literature (Rehberg, 1995). But little research has been done on the forces and movements that occur to the neck when removing the face mask in an experimental setting, and on the valuable time it takes to remove the face mask.

The Trainers Angel™ is currently the most widely used tool for face mask removal, but it has recently been scrutinized in scientific investigations. Of 50 certified athletic trainers surveyed by Kleiner and Knox (1995), 54% reported that the Trainers Angel™ is the tool they carry for face mask removal. Other tools mentioned in that survey were, a scalpel or knife, DuraShears or “paramedic scissors,” and screwdrivers, each used by 12% of the athletic trainers. The remaining 10% reported “other” or “none.”

The same athletic trainers were also observed for the technique they use with the Trainers Angel™. Despite the fact it was their tool of choice, only 12% actually used it according to the technique recommended by the manufacturer. Furthermore, 60% had difficulty cutting through the straps or had to use both hands with the Trainers Angel™, and most of them were unable to cut the strap thoroughly on their first attempt. It was also reported that 68% of the athletic trainers had never practiced using the Trainers Angel™.

The researchers concluded that while the Trainers Angel™ may be a satisfactory tool, it should have better instructions for use. They further recommended that athletic trainers practice the skill of face mask removal.

Since head and neck movement should be minimized during face mask removal, and the task should be accomplished as quickly as possible, the tools for face mask removal should be efficient in both regards. Several tools have recently been evaluated in a series of experiments conducted by this author. The first of these (Knox et al., 1995) evaluated a Phillips screwdriver, the Trainers Angel™, and a modified anvil pruner. A fourth tool, a utility knife, was removed from the experiment after the first two subjects injured themselves while trying to cut the face.