ICSC01 Head Injuries in Sport
Section 3 – Facial Injuries
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Video Lesson: 53:18

Injuries to the ear, mouth, and eye. We are going to talk about some of the common things that we see when dealing with injuries in that area. My name is Dr. Warren McDonald. I am a sports and exercise physician from Australia. I have worked in both Olympic sports with water polo in particular and was lucky enough to go to Olympic Games with the Australian Olympic team. I have also worked extensively in rugby, and I am currently the chief medical officer of Rugby Australia. Just for clarity, I have no competing interests or conflicts that I am aware of in undertaking this presentation.

During this presentation, we will cover some of the common injuries we see in the ear, the mouth, and teeth, as well as the eye and surrounding tissues. Let us start with the ear. In simple terms, just recalling our ear anatomy, the ear is divided into the outer ear, the middle ear, in which we will talk about the tympanic membrane a little bit later on, and then the inner ear, which is responsible for the fine-tuning of hearing and for balance as well. We are going to discuss how we assess an ear and obviously, the first thing to do when you have got an injury to the ear is to look at the outer ear and see if there is any obvious trauma, which we will talk about in a few minutes.

Do not forget to look at the surrounding tissues. There may well be some bruising or other injuries in the area. Then potentially, if it is appropriate, feel the earlobe. I have to say if there are any areas of significant pain and again the surrounding tissues, looking for both pain swelling but also sometimes you can feel crepitus which is a crackling sensation if there is a significant injury to the region. Special tests of the ear are really best left to doctors, particularly looking inside the ear with the use of an otoscope, and obviously, more sophisticated tests of hearing and balance require much more significant investigation. But I think if you have got a significant injury to an ear, do not forget that they could well be associated injuries, and in particular, thinking about concussion. Any trauma that is severe enough to damage the ear could also cause injury further inside the skull.

In the outer ear, we will often see things like hematomas and lacerations. In the middle ear, we will commonly see, there is rupture of the tympanic membrane or the eardrum. Inner ear injuries are much less common but it should not be missed. Let us start with the outer ear and think about hematomas of the outer ear or auricular hematomas. A hematoma is simply a collection of blood, and given the anatomy of the ear, the pathology associated with this is an accumulation of blood very close to the cartilage of the ear.

There is not a lot of space within the ear obviously, so the significant bleeding can both be a sign of damage to the cartilage or potentially cause damage to the cartilage. The mechanism of injury is either a direct blow or recurrent rubbing of the ear which can happen in quite a few different sports. Things like wrestling, the martial arts, boxing, rugby, and particularly those players that play in the front row or second row of the rugby scrum can get significant rubbing of these, and then other sports like water. polo.

Usually, if a player has injured their ear, they may present acutely after a direct trauma or they might present sometime later after an accumulation of rubbing or blows. Signs and symptoms of an irregular hematoma and, well, it is quite a painful swollen mess, and it can be quite tense when you touch it. It is quite done stretching the tissues above it. There is often a very small soft spot or at least an area of softness that indicates that there is fluid within the ear. You obviously need to make sure that the middle ear and inner ear have not been damaged if there is trauma, and likewise, make sure that you have not missed trauma or there has no associated trauma to the face or to the skull or elsewhere.

Sometimes, and in fact, quite commonly in sports people who have been around for some period of time, there will be a combination of new injury and old injury and the recurrent bleeding of a hematoma may compromise the cartilage over time leading to permanent damage, and that is known as a cauliflower ear. The diagram at the top here shows an acute hematoma, but the diagram at the bottom shows damage to the tissue and the cartilage that is quite permanent and that is known as a cauliflower ear. How do we treat a hematoma? Well, it usually requires aspiration if you can get it early. Aspiration using sterile technique. If you can pick the softest spot, you can often drain the blood from the region quite straightforwardly. Often there is not a large volume of blood that comes out, but removing that blood makes a significant difference to the appearance of the ear almost immediately. The biggest or the hardest part is actually maintaining pressure once you have aspirated the bleeding because they are notorious for regathering. You can see the bottom diagram here shows a person who has had their ear drained with a compression bandage over the top and this needs to be left in place for well, preferably a few days to prevent re-accumulation of the hematoma which is very common and come, unfortunately.

The other one, returning to sports, obviously, the ear needs to be protected and this is best done either with a bandage but to protect it from either rubbing again or often get further blows, then an appropriate helmet should be worn. In a sport like water polo shown at the top here, those headgears are mandatory and must be worn and they have protection for the ears. In other sports like rugby or rugby league, as shown in these players here, there are a variety of headgear that can be worn in those sports and others that will protect the ears from further damage. I would recommend that players that have trauma to the year wear them for some period of time.

Of course, the ear can also be lacerated with a trauma and it is not that common an injury, but the skin of the ear is very thin and especially at the front of the ear. Direct blow or contact with a sharp object will lead to a laceration which can be full thickness and involve the cartilage of the ear or just involve the skin of the ear as we can see in the lower picture there, and that usually presents quite acutely with a painful bleeding earlobe.

As the skin is very thin in some parts, you need to ensure that the underlying cartilage is intact and it has not been damaged but the ear can be sutured quite straightforwardly. But the complication is that you need to be aware of the infection and then slow or poor healing can also eventuate, so they need to be managed and monitored quite closely as they recover. Obviously, any significant laceration should be assessed by a doctor to ensure that the wound is healing and whether it needs to be sutured or when fact, in some situations when there is a very significant injury, surgery may be required. It is best not to return to sport until after the laceration is well and truly healed.

Moving from the outer ear to the middle ear, one of the classic injury in this region is a rupture of the tympanic membrane or a rupture of the eardrum. Just recalling our anatomy, the tympanic membrane is a thin layer of tissue stretched across the ear canal. You can see where it is located on the diagram here at the end of the ear canal. Then when we look inside, it is a very thin layer of tissue that is a crucial component of the process of hearing and also provides a barrier for water or fluid to enter into the inner ear from the outside. How does that get injured? Well, the tympanic membrane is usually damaged following a blow to the side of the head and especially if the ear is hit with a cupped hand. What that does is force a rush of air into the middle ear region and that will rupture the tympanic membrane.

I mentioned water polo earlier on, and it is an injury that we not uncommonly see in water polo but can happen in plenty of sports as well where a cupped hand over the ear will cause problems. The diagram on the right here is showing where the membrane has ruptured. That can be quite painful and cause a loss of hearing and sometimes a sensation that air is moving through the ear as well. The mechanism blow to the

head and then immediate symptoms come on with pain and potentially a loss of hearing, not necessarily complete loss, but some loss of hearing potentially ringing in the ears which is known as tinnitus and sometimes bleeding from the ear as well. The player should be assessed by a doctor in this situation to view the tympanic membrane which they can do with an otoscope. You can see here that this diagram on the right shows the rupture or the tear in the tympanic membrane and you can usually see that relatively straightforwardly.

Usually, it heals fairly well, if allowed to. It usually heals over a period of a few days to weeks and antibiotics may be required because obviously, you do not want this potentially a risk of infection getting beyond the tympanic membrane in particularly into the middle ear. But yeah, you do need to make sure that it does heal and is given the appropriate chance to do so.

What do we do if we are faced with one of what we suspect is a ruptured eardrum and they should be assessed by a doctor in the first 24 hours after injury? Just get the assessment right and confirm the diagnosis and then commence treatment. Then once the ruptures heal, they can return to sport, and again, the use of headgear is very helpful and I know I have mentioned water polo a couple of times, but the design of the water polo cap is designed as such to protect from this injury so that the player because of the nature of the sport and the fact that the blows to the head and the ear are not uncommon, then the water polo caps are designed to actually prevent that this injury from happening.

The damage to the inner nearly not right along is much less common in sport but may result if you are unlucky enough to damage the components of the inner ear. It can result in either permanent hearing or balance disturbance. The very structure can be damaged by trauma including the semicircular canals and the small bones of the inner ear and that can happen with a direct blow, usually a very, very significant blow. People will present with hearing loss or balance disturb in following such trauma. They may also have tinnitus. They may have problems with vertigo with the world spinning around them. So, this needs to be assessed by a doctor and they possibly need to undertake significant scanning and potentially hearing tests as well.

The other thing to remember is that if a trauma has been significant enough to damage the inner ear, then again, other injuries may be associated with it such as concussions so the player certainly needs a thorough assessment to make sure that you have covered all the possible diagnosis. These players or these participants should be referred to a doctor immediately, and return to sport should not occur until all symptoms of settled. Unfortunately, with a damage to the inner ear, that will take some time for both the assessment and then treatment to occur. It is not uncommon for these people to be out of sport for months at a time.

Moving on from the ear to the mouth. The significant features we are going to talk about here, we are going to talk about some simple lacerations but also injuries to dentition as well. So, when you are assessing the mouth or the mouth region, then you should look obviously at the mouth both inside and out. I am not a fan of anyone putting their hands inside someone's mouth without a pair of gloves on but you should assess and look to see where the injury has occurred in the mouth, whether it be the tongue, the cheek, or the other parts of the mouth, whether it is the lips or the teeth that are injured. You can then sort of gently just feel the area to see if there is significant pain. Usually, I do not recommend touching the teeth unless you really know what is going on.

If a player or an injured athlete is complaining that they feel like their teeth are loose for example, then do not go touching them to see that. Let that be in the hands of a professional. Then the special tests of looking at someone with a mouth injury, see if they can move their jaw, both open and close their mouth. Can they move it from side to side? Does it feel normal? Does their bite feel normal? Are there any unusual clicks or

any other sensations that they are feeling? Of course, the mouth is part of the upper airway so do not forget to keep an eye on someone with significant mouth trauma to keep an eye on their airways, their breathing, and their circulation. If they have taken a significant blow to the mouth, do not forget that they can have injuries to the nose or to the eyes, or other parts of the face as well so they do need to be assessed thoroughly.

We are going to have a quick chat about the lacerations within the mouth. We will have a look at teeth injuries and then we will talk about fractures to the face and to the jaw as well in covering this. Then to finish off, we are just going to have a quick chat about temporomandibular joint injuries as well. Lacerations inside the mouth or around the mouth are usually a result of direct trauma or potentially by biting the tongue or soft tissues or from a fall such as from a bike. A child riding a bike or anyone riding a bike, they are going to fall off and unfortunately have direct trauma to the mouth.

Lacerations can occur in both the lips and the soft tissues, such as the inner cheek or the tongue itself and you can see on the diagram on the right shows a quite deep and nasty laceration inside the inner lip. But the good news is, the mouth has a very good blood supply. Lacerations in the mouth will usually, they will bleed profusely but they will also heal very well as well. It is an upside and a downside to that. The initial presentation of someone is obviously that they will, following a fall or trauma of some sort, they are complaining with pain, bleeding, swelling, and a potentially altered speech. They might not be able to talk normally because of either the pain or the swelling in and around their mouth.

See if they can open their mouth, their jaw and move side to side. If a patient happens to be unconscious for whatever reason is part of the trauma, do not put your fingers inside their mouth at any stage. Even if they are semi-conscious, you should avoid that because there is a risk that they can go into trismus and lock their teeth on your fingers and that is not a good outcome for either person. Assess what you can and obviously be aware of other injuries. You can see that the diagram here shows a significant laceration to the tongue, but that would have been caused by the teeth, for example, jamming down, biting the tongue. It is possible that the teeth are also injured as well. We will talk more about teeth injuries in a minute. If there are certain blows that are that significant that cause injuries in this region, do not forget that they can be associated with things such as concussion as well.

How do we intervene? Do not forget the airways, breathing and circulation need to be assessed in these patients to make sure that the big picture items are intact. Usually, I mentioned before, this is a nice diagram here of someone who has had their inner lip sutured. Because of that good blood supply, you would expect that to heal very nicely for that person. They should not return to sport in general, until it has completely healed. But generally, the healing does occur in a relatively quick time. I am a big believer that people playing sports should wear mouth guards particularly if there is a high risk of contact. These injuries often occur because the tooth goes through the lip or whatever. Certainly, the tongue injury I showed on the last slide could have been prevented in a contact sport situation by wearing mouthguard.

Moving up to just the other injuries around the mouth and the face. The zygomaticomaxillary complex or the area of the cheek can certainly be damaged in with trauma. Fractures of the cheekbone occur from a direct blow, which can be a fall, but it could also be a fist such as a punch, it can be a hockey stick injury or a cricket ball hitting them on the appropriate region. Do not forget that a fracture is a crack through the bone and that it can be either displaced or non-displaced, they can be separated or not and it can extend into the orbit of the eye from its location.

Generally, fractures to the cheek occur from a direct blow to that region. They present with a very painful tender area. Perhaps there is going to be some swelling, some bruising as we can see in the picture here on the right. It may be looking a bit flat compared to the other side, so they may be asymmetry between the

two sides. There may be some crepitus or crackling of the skin when touched, and there may be, again, unusual, again, extension of symptoms to involve the eye. There may be double vision, there might be numbness of the cheek because of the involvement of the nerves underneath that have some swelling and therefore some pressure on them. Movements of the eyes may be limited and asymmetry as I mentioned. The player needs a thorough assessment in that situation for the generalized facial illness and injuries, I should say, and do not forget the ABC, the airways, the breathing, and the circulation.

Anyone with a significant injury needs to be referred to a doctor for review and then X-rays and scans. Often, I will need more than just plain X-rays because the intricacies of the bones in that region sometimes make it hard to determine whether there is a fracture. So, things like CT scans may be more appropriate. At the top there, I have got other injuries such as eye injuries and other fractures and concussions as we have mentioned. Depending on how bad those injuries are, the treatment ranges from rest at the time or on some occasions, surgeries are required if there is a displaced fracture to relocate the fracture and then allow it to heal over time. When returning to sports, that should only happen when all injuries are healed.

Other fractures around the maxillary and the facial bones, well, yeah, they usually occur from a direct blow, and again, the things I mentioned before. A fall, a fist, a hockey stick, or a cricket ball or baseball. Again, remembering that there might be greater fractures extending to the whole face and affecting the palate or the orbit as well. True facial fractures as shown in the diagram down below, usually require a large amount of force. Things like falling from a height, falling from a bike onto your face can cause these sorts of injuries. They are significant injuries and usually need to be, well, in the vast majority of cases, will need surgical treatment. Someone who has really damaged the maxillary or the facial bones will have a lot of pain and a very tender touch. There may be swelling, there may be flatness in the cheek, there may be crepitus, there may be double vision, numbness again, and movements of the eyes might be limited, there might be asymmetry in movements in the eyes, and the patient's face might look asymmetrical or unusual, and there may be a malocclusion. When they bite down, it just does not feel like their teeth a lining up the way it should be. These people need to be thoroughly assessed for facial injuries and again, with significant trauma to the face. Remember that their airways and their breathing, in particular, may be compromised. So, they often want to sit up these people and are probably better managed sitting up because lying down will potentially compromise their airways. But that is obviously only if they are alert enough and awake to be able to assist you in that situation.

Significant fractures and other injuries like to the eye, to other fractures in the face or elsewhere, concussion in the airways and breathing, they need to be referred to a hospital for doctor's review and X-rays and scans and further management. In many cases, they need ambulance transfer for significant injury. They cannot return to sport and would not be returning to sport until after all their injuries are healed, which may be many months down the track. Mandibular fractures are more common and we see the fractures of the mandible of the lower jaw. In many sports, and again, on the other pictures here we see sports like boxing, the rugby sports, any other contact sports.

Mandibular fractures are not that uncommon but it can also occur from a blow from a ball as well, whether it be a baseball, cricket ball, or any other way, other hard ball that strikes the right place. Most commonly, the jaw will fracture at what we call the angle of the jaw or up at the condyle at the temporomandibular joint. The mandible fractures it often fractures in more than one place. You need to thoroughly assess the mandible if you suspect there is a fracture. The mechanism of injury usually results from a direct blow or from a fall. A painful, tender swelling and malocclusion are common. When assessing these, there may be bruising on the floor of the mouth. You will see malalignment of the teeth and that is what the diagram on the right is showing. The teeth do not line up completely as they should. There is a significant malalignment there on the mandible. There might be tingling or numbness of the lower lip and of the chin as well. Do not

forget your first aid approach, the ABC. The airways may be compromised and again, what we spoke about with the other facial fractures, they might feel more comfortable sitting forward which helps maintain their airway if they are conscious.

The complications or potential problems, airway complications can be considered. Concussion needs to be considered and other head and neck injuries. They need urgent referral to a hospital. An ambulance might be required to do that quickly. They need X-rays and scans and they may need surgery. Obviously, the X-ray on the right-hand side, the white arrow shows the line of the fracture. That is relatively easy to see. Often, they are not quite so easy so sometimes you need further scanning such as a CT to ensure that there are no fractures there. They should not return to sports until all the injuries are healed, and that they may be for some months before everything is settled.

Temporomandibular joint injuries are not uncommon in sports. There is a range of injuries from the very mild to the very severe. Generally, any blow to the mandible can injure the temporomandibular joint but the range of injuries can vary from a dislocation of the joint, bleeding into the joint, which is a hemarthrosis to a meniscal displacement to an intracapsular fracture out of the head of the condyle. The diagram on the right there shows a small fracture through the condyle and within the joint.

The mechanism of injury is usually a blow to the jaw. The person will present with pain, tenderness, limited opening of the jaw, they potentially cannot open it properly, they might have malocclusion, their bite does not feel right, they might be unable to close their bite. If they cannot properly close their mouth, that might indicate dislocation and there might be asymmetry as well. When you are assessing them, you need to assess the tender areas and movement of the jaw and the occlusion of the teeth, and you can remember that there may be other injuries associated with it as well. These people should be referred to us for assessment which may include X-rays or scans.

Dislocations or fractures occasionally may need surgery, many times, they do not. But remember that these people again should not return until it is completely healed, which may take some weeks. I know I have spoken a few times around fractures around the mouth area. You can see that the majority of the cases involve the condylar process. That is the most common reason for fractures. Then around the angle of the jaw is the second most common. These are the areas where it will commonly fracture, and as I said, always consider that there might be more than one place where this happens.

Dental injuries are very common in sporting instances and they can range from anything from a small chip of a tooth to loosening of teeth or complete avulsion of a tooth. An avulsion is where the tooth is completely removed from its socket and that is what you can see clearly here on this upper diagram. The lower diagram shows a picture from an Australian rules football where you can see quite clearly the tooth sort of sitting and have been accidentally blown. It received a blow to the face that it actually popped right out of the mouth and will need to be found.

Usually, teeth injuries occur with a collision with an [inaudible] or trauma from an equipment of some sort such as a hockey stick or a fall onto the face from a bike. They will present with pain, bleeding, swelling, and an uneven bite. The signs and symptoms are usually pretty obvious, and especially if you have lost a tooth as that last diagram showed, then the first thing is to find the tooth. Even if that takes some time, it is worth doing. If a tooth can be found and replaced into its socket, then that will potentially have the best outcome. So, if someone loses a tooth, it is worth spending the time to try and find it. When touching the tooth, you should have some gloves on. It is best to just handle the tooth by the tooth proper, not by the root of the tooth, which is the area that goes into the jawline. Basically, the tooth should be, if it is intact and if it is possible, then as this diagram at the top is showing, it is ideal if it can be replaced quickly, then do so. Wash the tooth down and then replace it before getting to emergency care. If it cannot be easily replaced, then a

couple of options. One is to pop it into milk or there are some special solutions that are produced. The worst thing you can stick it in is water. Saliva is better. You can sit in the, I would say, at the cheek of the person whilst they are transferred to emergency dental care. Now, obviously, you do not want the person to swallow the tooth, and that is the point that is made here in the script here. If a tooth or fragment of a tooth cannot be found, then do not forget that it not only might be swallowed but it could be aspirated as well. Obviously, if a tooth gets into the lungs, then that can be a real problem. So, if you cannot find a fragment of tooth or a full tooth that is gone missing, then the person should have a chest X-ray and especially in children to make sure that the tooth is not somehow made its way into the lungs.

To all significant teeth injuries like the ones that I have shown here, they require immediate specialist treatment. You need to get them to a dentist as quickly as you possibly can. But it is worth the effort because you cannot quite often save the tooth and, basically, that will then require weeks and sometimes months of treatment, to get things back to normal. But basically, once the teeth have been healed, then they can return to sport.

Moving right along the eyes. The eye anatomy is very complex. I am not going to go into much detail, but it obviously sits in the bony orbit, which is shown at the bottom here. But the eye itself is a very delicate and complex organ whose purpose is to provide vision. That is a key feature obviously. One of the keys of assessment is making sure that the person has the ability to see out of the eye. If you have got someone with an eye injury, then obviously you need to look at the eye and at the surrounding tissues to ensure to discover what you can. You can feel around the eye to see if there is significant tenderness or numbness and then you can move the eye to see that its movements are full and equal. The eyes move together usually, but if there is asymmetry in movement, then that is important and we will discuss that in a couple of minutes. Is there any pain with the movement of the eye, and importantly, does light bother the eye as well? The other important thing you might just see here on the diagram on this page is the person here has one red injured eye. The other eye, again, we cannot see clearly, but it looks relatively normal in what we can see. There is an old saying in medicine, "Beware of the one red eye."

If someone presents with one red or potentially injured eye, they really need to be thoroughly assessed so that we understand the pathology that is going on. There are a range of pathologies, and as a result, we need to fully assess them. There is the specialist test around, can the person see out of both eyes, can they see in all directions, and can they see all of the visual fields at a full? Each eye needs to be examined individually. Is their vision blurred at all? Are there unusual spots? Obviously, looking inside the eye requires specialist equipment such as an ophthalmoscope and also some specialist drops some time to help you such as anesthetic drops, but also down here I am showing fluorescein drops or fluorescein strips, which are very important in helping assess the other services of the eye which again, we will talk about it in a second. Do not forget the associated injuries such as fractures of the nose or the face and concussions, which can also occur as well. There will be a consideration of a few different injuries here, things like corneal abrasion, subconjunctival hemorrhage, hyphema, retinal detachment, and orbital fractures as well. So, let us have a look at these. Corneal abrasions are very common. The cornea is the outer layer of the eye. Basically, it is a common injury in which that outer layer of the cornea is scratched and that can occur with a multitude of things. It could be a foreign body, it can be a fingernail accidentally in a sporting context. It can be things such as metal fragments in people who are working with metal or whatever it might be.

Usually, the person presents with pain, irritation in the eye, a sensation that there is something in the eye, and they might have blurred vision. For anyone who has had something in their eyes, it can be quite an annoying sort of sensation, and you can see on the diagram, the fluorescein drops which are typically orange, sort of show a scratch running across the eye. They should be referred to a doctor for assessment because this is potentially a serious injury and you do not strongly recommend against messing around with eyes.

They have one job and if people are not able to see properly then, they need to be assessed as soon as possible. Basically, the complications of corneal abrasion, usually they will heal, they will often need antibiotics drops to prevent infection and maybe those drops to actually see the inflammation. If it does not heal, just occasionally, you will get scarring if not treated appropriately, but the vast majority will heal quite comfortably with the right treatment. They should be referred to a doctor on the same day to be seen as soon as possible and then usually they can return to their sport after a few days after all symptoms have settled.

Subconjunctival hemorrhages are also very common. The conjunctiva is in the outer layer of the eye away from the cornea. A trauma can lead to bleeding under the conjunctiva and that can happen from either a direct blow, a scratch, a finger in the eye, or a range of things can cause that to occur. Often, it will present as a bright red area, much like what I am showing here in this diagram, a small area of bleeding. Sometimes they just happen spontaneously as well, which often scares people, but is usually, thankfully, not too much to be concerned. But they are not always quite simple as this nice little simple red area. They can be quite extensive as the diagrams here show and so much larger. If they are small, it is usually of no concern. But if they are large, they can cause visual symptoms and photophobia, which is irritation from light, and they should be assessed in that situation. The other important issue is if you cannot see behind a hemorrhage, then it may indicate that there is further injury to the bony structures, particularly the zygomatic bone or the zygomatic arch, but also the orbit as well. What do I mean you cannot see behind it? Well, on the diagram on this page shows the subconjunctival hemorrhage and you can see as we move away from the iris, we cannot ever see this clearer at the back of this eye in this region here. We can just see blood all the way around. So, that is always a concern. There is also obviously a fair bit of bruising around this person's orbit. The concern is that there is something else going on or significant with this person.

You have got to be aware of fractures and significant injury in the eye. A doctor's referral for anyone with some subconjunctival hemorrhage if their vision is impaired, you cannot completely see behind the hemorrhage. The good news, unless there is some other significant injury, if it is just a simple subconjunctival hemorrhage, then they can usually return to the sport very, very quickly. In fact, almost immediately. So, that is the good news. A hyphema is an unusual injury but it does occur occasionally where you get bleeding into what we call the anterior chamber of the eye. It is right at the front of the eye, and you can see the picture here shows a fluid level. It shows just fluid sitting in that anterior chamber starting to really block out the iris of the eye. That potentially comes from a blow. It is usually a blow to the orbit or blunt trauma. Sometimes they can be a lot smaller, and I will show you a smaller one on the next page. But these need to be referred immediately to an eye specialist for review. You certainly do not mess around with these. If you see this injury, this person needs to be treated appropriately because if you do not get it right and treated appropriately, then you can have permanent visual problems in this person.

You can see in this case, there is a much smaller fluid level than on the last diagram but again, that person still needs to be referred. It is bleeding, as I said that has gone in there, and if it is not treated appropriately, then they can end up with significant scarring in that anterior chamber and can further damage the cornea. You do not give them aspirin, you do not give them anti-inflammatories because they can both increase the risk of bleeding. They need bed rest. It is what they need but they also need referral to an ophthalmologist to be seen urgently, and then further treatment will be guided by the ophthalmologist depending on their particular preferences. But in most cases, the bed rest will allow the bleeding to settle, and without any scarring, it will allow people to move forward.

Retinal detachments are an uncommon injury, but a very, very significant injury and there are a couple of keys here that sort of make you think, wow, is this person telling me that their retina is detaching? Now, the

retina obviously is the sensitive part of the eyeball where the light is directed, and from the retina, the signals are taken to the optic nerve and to the brain for interpretation of our sight. If the retina detaches from the orbital wall, then we break this mechanism, we damage the mechanism and therefore, we can end up with permanent visual impairment. The pathology here is, as I said, the retina is stripped or lifted off the posterior wall of the orbit and it can follow a blunt trauma or a perforating trauma, and sometimes it occurs sometime after a trauma as well. It is almost like the area becomes weakened and then a relatively small event can accelerate what is happening there to go forward.

There are a couple of key things that the patient will tell you in this situation. They often report that they potentially had a trauma, but then they will report flashing lights in their eye, and which worries them. Sometimes, they will say it feels like there is a curtain coming down across the field of vision and that is a bit of a giveaway. If you look at the diagram on the lower diagram here on the right, you can see that the picture above is relatively normal, what normally the inside of the eye will look like. But on this occasion, it just looks abnormal at least you can imagine. It looks like the tissue back there, the retina, is actually sort of sitting and almost sort of waving in the background.

Do not expect to be able to see those. That takes a specialist to be able to identify these issues. But if you think about the tissue sort of sitting forward and therefore damaging the line of the signal, then that explains why they present either with the flashing lights or with a sense that they vision curtain is coming across it. It needs an immediate referral to an eye specialist. You do not mess around with this one at all. If it is not treated immediately, it may result in permanently lost or impaired vision. Even if it is treated immediately, there can still be some loss of vision. But the sooner it is seen and dealt with, then the better. The emergency care protocol is, get them referred immediately. Unfortunately, for the vast majority of people, this needs for the future, that they need to avoid risky or contact sports. Not uncommonly, these people have to retire from the sports that they have been involved in such as contact sports because there is a risk that it could happen again. Having had one retinal detachment usually means that the person should reduce all risks that have been happening again.

Orbital fractures are not uncommon and obviously, the orbit is the bony structure around the eye. The walls of the orbit are very thin both inferiorly, the floor of the orbit, and medially. They can be quite easily fractured with a direct trauma. It results in what we call a blowout fracture. In this situation, a trauma, a blow to the eye region or the orbit, the contents of the orbit, or the eye structures can be compressed and damage the bony structures around them. Then the contents of the orbit can herniate through the fracture line and possibly be trapped by the fracture, which is quite uncomfortable.

People will usually present with these injuries following a direct blow to the eye such as with a squash ball, which is well known for potentially causing these issues. Anything else that directly blows onto the orbit or creates a blow onto the orbit will potentially cause this injury. The person will complain of pain, blurred, or altered vision, they will often be a lot of swelling around the orbit and quite scarily, these people will sometimes present where they have had a trauma, and they feel as if there is something not right. They feel sometimes like they have got to blow their nose, and then they blow their nose, they get an enormous amount of swelling around the eye and sometimes report that they feel like the eye is going to fall out of the socket. That Is a key giveaway. If someone presents with that story, then in my mind they have got a fractured orbit until proved otherwise.

The other thing I present with is restricted eye movements and that is because of, the muscles around the eye will get trapped in the fracture. If you would have a look down at the diagram at the bottom right, you can see that person is trying to look up and the one eye is going up and the injured eye is not going up there because the muscles have been trapped. The person above that, there is significant swelling and bruising around the eye here and much more than you might just expect to see with a non-fractured injury. This

person has had a CT scan which shows the fracture line where the arrows are pointing to.

You need to be a little careful here as a doctor if you order X-rays of this area because the X-rays are often inadequate to see the fracture and the CT scan as this is showing is much better required. If they have the right story and they have history of a blow to the eye, the sense that the eye is blowing up, that maybe crepitus if it feels like it is jumping out of their eyes or out of their eye socket then they do not need to do that but do if you suspect that they have got a fracture of the orbital floor or the medial wall of the orbit.

Complications that are potentially there, well, they can get infected, they will often have impaired vision if the fracture is not reduced and stabilized. Depending on how big the fracture is, these people sometimes need surgery to put it back together. They should be referred to a doctor as soon as possible for assessment and X-rays and scans as I have described. Then they can return to their sport after appropriate treatment and surgery, but it usually takes, you know, several weeks to months for this to settle down. The good news is that usually they will heal quite successfully, and people can return to their previous sports.

That is just a quick skip through some of the injuries we see around the ear, the eye, and the mouth and face. I guess we need to make sure that we take a team approach to the treatment of any athlete. In the absence of any emergency services in an event, the emergency care goals are to first stabilize the patient and provide basic life support, which is the importance thing here. You will notice that quite a few times through the presentation, I referred to going back to the simple ABC. Do not forget those things because the injuries around the head and the face can certainly cause compromise to the airways, the breathing, and circulation.

If there are other sports medicine members, who are emergency care certified workers who are working at an event, they should be the primary care providers in the event of life-threatening trauma. Then finally, any rapid return to a sport may compromise the long-term health of the athlete. It is always wise in my books to just take a little bit longer, make sure you have got them right, and then you will do the best thing you will and not harm the athletes.

If in doubt, sit them out and then see how things progress from there.

[END]