

ICSC01 Head Injuries in Sport

Section 4 – Intracranial Bleed & Haematomas

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Video Lesson: 16:49

Intracranial bleeds and hematomas are a consequence of head injuries but not really of concussions, although it can be a consequence of the head injury that we can't diagnose. We will talk about the definition, mechanism of injury, histological processes, and potential problems as last time. Firstly, its definition. I found this from Wikipedia, and it was quite a good definition, so I am not going to really change anything. This is nothing abnormal or nothing unusual for a lot of you. ICH is also known as intracranial bleed, because of bleeding in the skull obviously but I am going to talk about it as a bleed rather than a hemorrhage. I just don't like the term. The subtypes, you can get into intraventricular bleeds and intraparenchymal bleeds, but these tend to be not associated with injury, so I am just going to talk about the ones that are associated with injuries. The bleeding can occur when obviously, a blood vessel leaks or is ruptured, which are two different things from a medical point of view and it can result from physical trauma, but also can occur in hemorrhagic strokes, people with high blood pressure. I am only going to talk about trauma-related ones today.

These bleeds, they are much more likely at high-speed impact. So, a low-speed impact has less of a chance of doing this but it is still a bit unclear because I will talk a bit about some of the ones that we see, which are unfortunate, I will just mention them, but downhill mountain biking, motor vehicle racing is common, and equestrian events. It is quite common because of the link that how far they fall, ice hockey and it can occur in other sports but less common in more common sports, if that makes any sense.

Complications make it a serious medical emergency. This is important for everybody to remember. It is a buildup of blood within a fixed volume of the skull. It occupies space and it makes a difference both to the brain tissue and whether somebody can in fact survive, so increasing intracranial pressure is not a good place to be. The ICP increase can cause the brain to be pushed out of the foramen magnum, which puts more pressure on the mid-brain and brainstem, and an increase in blood pressure is one of the signs that we see but also a decrease in heart rate and these two are important symptoms or signs I should say because they can lead to death.

Early symptoms and signs similar statistics to those of a concussion. You can't tell the difference. I cannot tell the difference as a medical practitioner, and I dare say that you won't either. If you can, then you are better than I am. There is nothing to distinguish them, so any head injury, whether it is a concussion, a mild traumatic brain injury, or severe traumatic brain injury has to be treated with respect. It is a medical emergency, and we need to treat these on a presumptive diagnosis. You don't need to do a CT scan to start appropriate treatment for these people. If you know the force of the injury, then you've got a better chance of making this decision early. You should have a high level of suspicion when there is a serious head injury or concussion or would you think is a concussion, so early recognition and prompt management are vital. We need a referral to an appropriate facility. The CT scan is in fact the definitive tool for a diagnosis of an intracranial hemorrhage. Sometimes MRI scan can also be used but a CT scan shows the difference in the bleeding area and the brain tissue better than it sometimes an MRI, so a CT scan is the way to go.

Symptoms. Same as for concussion. Headache, dizziness, amnesia, disorientation, tinnitus or ringing in the ears, lightheadedness, emotional changes, sometimes you might see some changes and irritability, I [inaudible]. I had one athlete who is we really had to get him off the field because he was quite irritable and although he was sort of thinking okay, he is very irritable. We must take that into account. Double vision, memory loss. They are all symptoms. Signs include loss of consciousness. These people with a bleed will often have a loss of consciousness because the injury is a high-speed injury. Vomiting is common, and they are always drowsy and want to go to sleep. Fainting, loss of balance, slurred speech, slower reaction [inaudible]. The other stuff

is there as well but if you can, you need to look at the blood pressure and the pulse, even adjusting the pulse will give you some idea. What about the classification? Well, when we look at these, it is a focal brain injury. Traumatic ones are what we call a focal brain injury. Something that is a localized spot in the brain that may or may not directly involve the brain. Tissue, it might just push it out of the way. There are three different categories. The Extradural, Subdural, and Subarachnoid Hemorrhages. I will talk it to them one by one.

An extradural is sometimes called an epidural, although that's normally left to a hemorrhage that would occur in the spinal cord occurs between the dura mater and the skull. It is caused by trauma, but it is an artery. Laceration of an artery means that they bleed quickly, so there is a rapid increase in the size of the bleed which means they rapidly go downhill. It is very uncommon because you almost need to have a skull fracture because of mostly the middle meningeal artery but you still see in 1% to 3% of these significant head injuries. Vomiting, agitation, and loss of consciousness are common. The clinical onset occurs over minutes sometimes hours quite often minutes but they have a history of head trauma but then a lucid period and then the increasing symptoms, these are the ones that go off quickly, so you got to keep an eye on them. You must keep an eye on these guys because if they have got one of these, they can go off very quickly. It doesn't cross suture lines on a CT scan, and you can see it on the CT scan quite easily, but we need to evacuate that bleeding. It can push the brain out of the foramen magnum and the brain doesn't like going there. Its potential complication is death but normally it is pretty good, and these are often recognized quite early and treated early. We certainly hope so.

A subdural is almost more difficult because it is a tearing of a bridging vein and because of that, it is a low-pressure system, it doesn't occur as fast. They may still have a loss of consciousness, but they are usually associated with cerebral cortex injury because it is underneath the dura mater, and so, they can be associated with long-term problems, but the problem is that they don't hit you in the face like an extradural. Depends on the side of the injury as well but they quite often get knocked out or have a loss of consciousness and they get better for a while but then over hours, they just become worse and worse. This is the reason why we tend to get people to who've had a head injury really watch for 4-8 hours. If you go to the hospital, they will nearly always keep somebody in 4 hours, sometimes 8 hours, because we don't want these subdural to come up later when somebody's asleep because this is the sort of person who can fall asleep after they have had a head injury and they just never wake up. We would like to prevent that. A crescent-shaped hemorrhage compressing the brain on the CT, shows quite well on a CT scan.

The management, same thing. We need a surgical evaluation. The problem is that these can still produce a significant pressure effect on the brain with all its problems. It just is not as fast as an extradural. Unfortunately, there are people quite often who'll be left with long-term consequences of this because some of the brain tissue because it is almost within the brain. Some of the brain tissue can be affected by this and so, although, the herniation through the foramen magnum is not as common, we still need to make sure that these people are treated properly so that we minimize the amount of long-term brain damage they have.

Subarachnoid hemorrhage. This is uncommon with a head injury. It is mostly older middle-aged people and it is bleeding into the subarachnoid space obviously, subarachnoid hemorrhage, but they quite often start with a sudden severe headache often at the back of the head and quite often nausea, yes, but vomiting is prominent and neck stiffness is actually very common in these. Confusion, a lowered level of consciousness, and seizures occur but these are normally the severe ones, not the ones you see very often. The rapid headache sometimes called the thunderclap headache is the prime thing with these. It is diagnosed clinically, again, confirmed with a CT, occasionally by lumbar puncture. If somebody's got a sudden severe headache, we would prefer not to do a lumbar puncture because it changes the pressure inside the CSF area, and therefore, if somebody has a significant brain bleed or a bleed around the brain, then it can cause more problems. The CT scan is fairly typical when you see these, you can diagnose them very and they look very

different on the CT scan.

Management. It is actually treated by surgery of neurosurgery or angiography because it is an arterial defect but because of the way the arterial defect is, it is a form of stroke, considered a form of stroke, and so, the spontaneous ones require further investigations as the source of the bleeding by either putting a clip in with neurosurgery or a stent in through angiography, these can be treated very extremely. Well, again, you've got to have the correct facility.

Basic Emergency Care. This is the same as everything. Now, in Australia, we use this DRABCD. Danger. You look for any dangers surrounding the player/athlete. This is stuff that you should do. It should be just there all the time. Response. You need to respond early. Now, you need to know your sport, if you are dealing with a sport, because, in some situations, you can come onto the field straight away and in some situations, you must wait until the referee or [inaudible] calls you onto the field. Let's say you need to know your sport but if you see it happen or see you are potentially worried about these things, the earlier, the better. You need to respond very early. Airways. Always with cervical spine control. We need to maintain an airway because if somebody doesn't have an airway, they are not going to survive anyway. We need to make sure that if we don't know if it is a high-speed impact, we don't know what the problem is, then we maintain cervical spine control. It doesn't fix and prevent all cervical spine injuries, but we want to try to make sure that we don't do any further damage. Breathing. Circulation or Compressions. It depends on where you are. Some jurisdictions called circulations; some people called compression. The D is the Defibrillator or Drugs. If somebody has collapsed and you don't know whether they have had a head injury or if they don't have a pulse, then a defibrillator is important. It may be some drugs that are important as well and this is where the emergency services or paramedics are excellent at looking after they sort of [inaudible], but you also need to remove and refer them to an appropriate facility. A facility that can look after them because if we suspect that they have got an intracranial hemorrhage, then you really need it somewhere we can get something mechanical done about that because it is a mechanical problem.

Luckily, FICS Doctors are trained and certified as primary contact practitioners which means you have a duty of care. This means that if you are the only person there, you are the one to take control and provide basic life support. If there are other people around, we need to work as a team. We need to make sure that the athlete is looked after appropriately. It might be somebody in the crowd who's emergency trained, it might be a sports trainer or something like that, or an athletic trainer who's working with you. It might be a physiotherapist or another chiropractor or a doctor. Doctors don't necessarily know all of these things, but you need to train in this to keep up to date. If there is any question, whether it is an intracranial hemorrhage, it needs a prompt referral, early diagnosis, and treatment are the key to looking after these people. We really need to make sure that these people get the appropriate help quickly.

This is an interesting one. Return to Sport. The problem with any sort of intracranial hemorrhage is It is likely to cause long-term problems. We need to take a considered approach within an appropriate time frame. Again, this is a team approach to do the best thing for the athlete to make sure that they don't end up in the same situation again. Sometimes they won't be able to return to the sport because it is too dangerous and you need to make sure that they don't return rapidly because that make compromise their long-term health. One of the things that, as I said, with concussions before is that we need to make sure that they are completely back to normal before they return to sport. Now, sometimes, after an intracranial bleed does never occur but we need to make sure that they are ready to return to the sport because we don't want to put them in danger of other injuries as well. I hope this is helpful and thank you very much for listening to me.

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