Ask the Expert: The Importance of "Showing" a Brain Injury

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Video Link: http://www.brainline.org/content/multimedia.php?id=2974

Question: As a brain injury litigator, how do you explain to jurors what happens to the brain when it's traumatized?

Answer:
Michael Kaplen: Well this is something that people love to learn about. Everybody wants to know what happened to the brain, and why is that brain injured. It's fascinating, not only in courtrooms to jurors to learn that, it's also fascinating for the person to learn why their brain was injured. And any time I meet with people, they are always fascinated to learn why the injury took place. Well first we have to understand something about the human skull, to understand how the brain gets injured. We have to understand that the human skull does not provide very great protection for the brain.

If you look at the skull, it looks like it probably does provide a lot of good protection. It's a hard surface, and you would say wow, how can somebody get injured when they have this hard covering protecting the brain. And what we'd have to do is look inside to see what the inside of the skull is all about. And we'll see that we really don't have such great protection for the brain. The brain rests within the skull. So first let's look at the skull and what it looks like in the inside. We see a lot of sharp ridges in the brain, skull. We see a lot of sharp ridges, we see a lot of protrusions, we see a lot of areas that the brain could brush up against and get bruised and injured. If we touch it with our fingers, we realize that this isn't soft at all, and the brain can get cut within here. And as the brain moves, it is subject to great stress. We learn that the most vulnerable place is the frontal area of the brain, where the frontal lobe sits, and the side area of the brain where the temporal lobe sits. And we see that there is a sharp ridge on both sides of the brain, that subjects, of the skull, that subjects the brain to great injury. So how does this happen. We have the switch to the next brain, our clear brain.

First let's talk about the brain itself. The brain is not a hard substance, it's soft, it's kind of like a Jell-O or a tofu type of material. And it's subject to movement, it moves. It's not a solid object, so that when the brain rocks back and forth within the skull, it moves. And it starts striking these inside ridges, and it brushes up against it, and is traumatized. Each part of the brain moves in, at a different speed, although the whole brain is encased in cerebral spinal fluid, and is floating within the skull. When you move forward and backward in a whiplash type of injury, the entire brain isn't moving at the same speed. Each surface moves at a different speed, and the teeny nerve fibers within the brain, the axons, stretch at different speeds, and they break at different, from different forces that are applied. And in addition to that, there are chemical changes that take place over days that cause further injury to this brain.

This injury that we see may not become apparent right away, because these changes take days or weeks to become apparent to the individual and to the medical profession. Oftentimes when the CAT scan or an MRI is taken, it's not to determine these fine and different changes to the brain, but to determine if there's any bleeding initially upon impact, whether a doctor has to go into the brain and take out the blood. Because another problem that happens is that this brain is encased in this solid case, and there is no place for the brain to go. So that if there is bleeding in the brain, there is no place for the brain to expand to, and damage happens because the brain will swell. And you might have heard the term midline shifting. Well we see the brain has a midline, the structure in the center of the brain, and you have a left and a right part of the brain. When you have a midline shift, everything gets shifted over, in that case to the right, this case to the left. So you have this midline shift caused by the pressure. But what the doctors need to do then is go in and relieve this pressure, sometimes by putting a hole, drilling a hole in to relieve the pressure, sometimes by doing a craniotomy and removing a portion of the skull so that the brain has a chance to move and expand.

But there are problems and injuries to the brain that can't be picked up on the MRI and the CAT scan, and those are the microscopic changes within the brain tissue itself, the nerves that can't be seen, because the testing that we have is not sophisticated enough to see those changes. We know they exist, we know they exist because on pathological studies, autopsy findings we see that often in individuals who passed away from different causes, unrelated to their brain trauma many years later. And an autopsy is done, and a pathologist would dissect the brain and he will see, or she will see changes in the brain, and then go back to the family and they ask a history. Was this person ever in an accident? Did this person ever hit their head? And sure enough they find out that they did, and they can see these changes that weren't picked up by diagnostic testing.