Meghan McGowan
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Notes for SOTM

Symptoms to diagnose

- Sudden numbness or weakness of the face, arm or leg, especially on one side of the body
- Sudden confusion, trouble speaking or understanding
- Sudden trouble seeing in one or both eyes
- Sudden trouble walking, dizziness, loss of balance or coordination
- Sudden, severe headache with no known cause

People with high blood pressure may have

- Severe headache in the back of the head or top of the neck
- Dizziness or fainting
- Tingling or numbness in an arm or leg or an inability to move an arm. Symptoms may come and go
- Periods of confusion and disorientation

Research:

[From Tom Hennigan]

Meghan,
I don't know how much you know nor what you need to know, but I'll go through the whole thing.

A couple basic things about the brain: first, the circulation for each side of the brain goes up the side of the neck and then into the brain where it breaks into smaller and smaller blood vessels and feeds the heart. There is also a single artery, the vertebral artery, that goes up spine to feed the back of the brain. Second, for the most part, one side of the brain operates the opposite side of the body. So the right side of the brain works the left side of the body, such as the arm or the leg, and the left side of the brain makes the right side of the body do the same. One exception is comprehension. If you say something to me, my brain has to understand what you said, formulate a response, and then send the response out to be spoken. That part of the brain is almost always located in the left side of the brain. So, if that portion of the left brain suffers a stroke, the person can lose the ability to understand and respond. If that exact same area of the right brain has a stroke, there isn't nearly so much ability lost.

There is not very much difference between a stroke and heart attack, except of course, the organ involved. In both cases however, blood flow through an artery has stopped, and that part of the organ that is fed by that artery starts to die. There are three main types of stroke, or ways that the blood stops flowing to the brain. One is if the blood vessel bursts, because of like an aneurysm. Then, Then, not only does that part of the brain not get blood and dies, but blood is pumping out into the skull and can actually crush the brain and the person can die quickly. A second is if a person has narrowing of an artery and then a blood clot forms and blocks blood flow, and a third is if there is a blood clot that

starts to form elsewhere, say in the heart or a neck artery, and then breaks loose and travels along the artery until it gets stuck somewhere in the brain and cuts of circulation. Of these three different types, the burst artery is the worst because you can easily die from it, and the last one can be the best because it has a chance of having the traveling clot break into tinier pieces and unblock the artery so you have the best chance of complete recovery. The burst artery is not so common as the latter two are with the blood clots. That's also why doctors frequently have patients take an aspirin a day, because the aspirin makes it harder to form the clots that cause heart attacks and strokes.
In terms of diagnosing a stroke, we usually rely on the patient's symptoms and our physical exam. If a patient complains of having one sided weakness or numbness, and their exam demonstrates this, we will generally diagnose a stroke. The work up then usually entails doing a CAT scan of the brain, and then later on an MRI. The CAT scan is somewhat similar to very specialized X-Rays, where the MRI involves the use of strong magnets to make images. We do a CAT scan immediately, which will show if there is a bleeding stroke, but it will not usually show the other two types of strokes for a few days. The MRI will show a stroke almost right away, but it takes a long time to get it done.

What has really changed in the last ten years is how we treat a stroke. Ten years ago, if someone came in with a stroke, all we could do is stand there and not do anything. Now there are drugs called "clot busters" that dissolve clots. If someone comes into the emergency department with symptoms of a stroke for less than two hours and we can get a CAT scan within one hour, we can try to give them the clot buster (t.p.a.) through the vein. The danger of the drug though is that in about 10% of people who get it, they develop bleeding in the brain and can die from it. So the drug can help, but it can also be dangerous. Also, it has to be given within three hours of when the stroke started, so if someone comes in five hours after the symptoms first started, it is too late.

Strokes can be of different sizes and symptoms. Some people may develop a stroke in the part of the brain that controls the left foot, or the mouth, or the speech center and so lose that function but everything else is fine. I'm currently reading a book written by someone who had the "locked in syndrome", where his stroke knocked out all his muscles except his left eyelid. People didn't initially know that he could hear and understand him but that he couldn't respond to them, so they thought he was brain dead. They finally figured out about his ability to blink and he actually wrote this book (The Diving Bell and the Butterfly) by having someone reciting the alphabet and when they said the letter he wanted, he would blink his eye. Then they would start on the second letter and he'd blink and then the third etc., and eventually he had his book written.

Lastly, someone can have what is called a T.I.A. (transient ischemic attack) also known as a mini stroke or a warning stroke. That's when the patient has symptoms of a stroke such as weakness etc, but then it goes away after a few minutes or hours. It is just like a stroke except that it clears totally. Officially it is called a T.I.A., but a good term is a warning stroke, because it warns you that you have a blockage developing in the arteries of the brain and it needs to be dealt with quickly.

Unfortunately, we are very good at dealing with heart attacks and preventing heart attacks with surgery and other things, but we don't yet have those techniques available for strokes. Thirty years ago we basically watched people have heart attacks and hoped they lived because we couldn't do anything else. That's changed since then, but we're still pretty much still at that stage with strokes.

http://stroke.emedtv.com/stroke/diagnosing-stroke.html

- Beginning to diagnose a stroke, a healthcare provider will ask questions about the patients medical history
- When patient first arrives at hospital, healthcare provider will first ask what lead up to the stroke symptoms, and if they have a history of cigarette smoking, transient ischemic attacks, high blood pressure or diabetes.
- The two most common tools are CT scans and MRI's.
- Things that may be used to treat a stroke are blood thinning medications and surgery.

http://www.americanheart.org/presenter.jhtml?identifier=2878

- "A stroke is the disruption of the blood supply to, or within, the brain. When the blood supply is cut off, the brain does not receive the oxygen and nutrients it needs. The result is injury to the brain cells. The brain is the nerve center of the body. If the cells are injured or die from lack of oxygen, the body functions controlled by those brain cells are affected. Unlike other cells in the body, brain cells do not regenerate."
- Four main types of stroke:
    - Cerebral Thrombus
        - a blood clot which forms in a brain artery and blocks the flow of blood to the brain.
    - Cerebral embolus
        - a blood clot/air bubble/glob of fat which forms elsewhere in the body and then travels to a brain artery and gets caught, which cuts off the supply of blood.
    - Cerebral hemorrhage
        - The rupturing of a brain artery which causes bleeding in the surrounding area of the brain.
    - Subarachnoid hemorrhage
        - A blood vessel on the surface of the brain ruptures and bleeds into the space between the blood and skull.

http://www.cincinnatichildrens.org/about/history/breakthrough.htm

- 2007: Robert B. Hinton, Jr., MD, and colleagues are the first to show the high heritability and likely genetic underpinnings of Hypoplastic Left Heart Syndrome (HLHS), a rare but deadly heart malformation.

http://inventors.about.com/od/timelines/a/ModernInvention.htm

- 2001:

- AbioCor artificial heart invented by Abiomed - the Abiocor represents groundbreaking medical
- Artificial liver invented by Dr. Kenneth Matsumura and Alin Foundation.

- 2002
  - Foveon Camera Chip invented by Richard Merrill.
  - Date Rape Drug Spotter invented by Francisco
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http://news.ucsf.edu/releases/two-ucsf-scientists-to-receive-prestigious-dementia-research-honor/

- Bruce Miller, MD and Lennart Mucke, MD receiving honor April 15 2010 for dementia research, and money to continue discoveries within the field of dementia/Alzheimer research.

http://americanheart.mediaroom.com/index.php?s=43&item=950

- February 24th 2010 it was announced Donna M. Ferriero would be receiving the the Thomas Willis Award for being a leader in the field of neonatal brain surgery.

http://www.mise.org/mise/index.jsp?p=da_2000

- 2000:
  - Houston surgeons successfully transplant nerves from a living human donor to her eight-month-old
  - Robotic surgeries perform successful heart bypass and abdominal procedures.
  - A powerful new blood clot-busting drug reduces treatment time for heart attack victims from 90 minutes to 5 seconds.
- 2001
  - Studies of omega-3 fatty acids (found in fish such as salmon) show these substances can prevent heart disease and stroke
  - A miniaturized, totally self-contained artificial heart is developed
  - Measurement of C-reactive proteins (a blood chemical that provides a good measure of the degree of inflammation in heart vessels) may help predict heart attack risk.
- 2002-2003
  - Drug-coated "stents" (used to open blocked arteries) improve success of cardiovascular procedure known as angioplasty.
  - Surgeons successfully repair deadly heart-valve defect in five-month-old fetus that is still inside its mother's womb.
  - New blood test can tell normal from cancerous DNA, which may improve diagnosis of cancer.

http://health.msn.com/womens-health/articlepage.aspx?cp-documentid=100120096

- 2005
  - HPV vaccine created to help stop cervical cancer

http://www.webmd.com/stroke/guide/stroke-treatment-overview

Treatment for a stroke

- Depending on the type of stroke [ischemic or hemorrhage] the treatment varies