

Headache Toolbox

Thunderclap Headaches

The abrupt onset of severe headache, unlike any experienced before, can be a terrifying experience, and most often requires urgent medical attention. Although many times no cause is found, the first worst headache can be the signal of something very serious.

Thunderclap headaches are severe headaches coming on full force in less than a minute, lasting at least 5 minutes, and often appearing without any trigger. They can be divided broadly into two groups, those caused by vascular or blood vessel problems, injury, or uncommon structural problems in the brain, and those that have no clear cause and, following medical evaluation, are felt to be benign, or not dangerous. Abrupt severe headaches triggered by activity, including sexual activity or straining to have a bowel movement, or headaches coming on after an injury, are particularly suspicious as possibly being dangerous. Any thunderclap headache accompanied by fever, weakness, loss of vision or sensation, or accompanied by confusion or changes in speech or thinking, needs immediate evaluation. The possible problems that can result in thunderclap headache are many, and the consequences can be so severe that this Headache Toolbox is longer than most in order to describe this type of headache and its many causes.

BLOOD VESSEL TEAR (DISSECTION), RUPTURE, OR BLOCKAGE

A decrease in blood flow to the brain can cause a severe headache, and often is accompanied by weakness, numbness, or changes in vision or sensation. Quick decreases in blood flow can come from blood vessels rupturing, a stroke, a head injury, or a structural weakening of blood vessel walls as can occur with an aneurysm. It is not clear when a thunderclap headache occurs whether it is this kind of dangerous type, and because of this, urgent evaluation is recommended.

Dissection, which is a tear in the wall of a blood vessel, and aneurysm, which is a weakening in the wall of a blood vessel, can both cause sudden painful headaches. Dissection can be triggered by an injury, including a fall or neck whiplash. Dissection or aneurysm bleed can come on after exertion such as lifting weights. Both conditions can also occur in individuals who have an inherited weakness in their blood vessels that increases the likelihood of such a dissection tear or aneurysm. However, sometimes a dissection or aneurysm can occur for no known reason.

STROKE CAUSED BY BLEEDING

The rupture of a blood vessel in the brain can result in a bloody stroke, called a hemorrhagic stroke. These strokes are more likely to occur with uncontrolled high blood pressure.

However, an otherwise healthy weight lifter can develop a sudden headache that does not go away after stopping the activity, coming from a brain bleed called a subarachnoid hemorrhage, or from the tear in the blood vessels of the neck resulting in a dissection, described in the last paragraph. A person who develops a severe headache with sexual activity or orgasm can also have a bleed, aneurysm, or dissection. If headaches occur repeatedly with sexual activity over a long period, this problem is much less likely to be dangerous.

STROKE CAUSE BY BLOCKAGE

A sudden blood vessel blockage caused by a blood clot or thrombosis, or from a cholesterol build-up, can result in a different kind of stroke. Ischemic strokes are caused by a lack of blood flow, but are without bleeding. Any stroke can cause immediate severe head pain, often with other symptoms such as weakness, problems with speech, sensation, consciousness, or vision. A thrombosis can occur in the veins surrounding the brain, brought on by an injury or fall, or made more likely by certain medications such as estrogen or testosterone, or by an inherited tendency to form blood clots.

HEAD INJURY CAUSING THE LATER ONSET OF A SEVERE HEADACHE

Depending on the age of the individual, a severe headache can occur hours to days after a mild-to-moderate head injury. This can result in what is called an epidural hemorrhage or bleed, most common in younger patients, or a subdural hematoma or bleed, more common in older people. A thrombosis or clot in the veins surrounding the brain can also be triggered by an injury. This is why people, even those who have already been to the emergency department, had a CT, and had normal neurological examinations, need to be re-evaluated immediately if they develop a new or worse headache, or any new weakness, decreased awareness, speech problems, or unusual symptoms in the days following an injury.

REVERSIBLE CEREBRAL VASOCONSTRICTION SYNDROME

In this often difficult to diagnose disorder, there is a temporary narrowing or spasm of a blood vessel surrounding the brain. The resulting loss of blood flow, although not usually permanent, causes a sudden, very painful headache, often, but not always, accompanied by other symptoms such as temporary changes in vision, consciousness, strength, or sensation. The cause of this phenomenon may be related to an individual's blood vessels

being prone to spasm, or the spasm may come from a medication such as birth control pills, or from marijuana, cocaine, or stimulants. Reversible cerebral vasoconstriction syndrome (RCVS) can be difficult to diagnose without immediate magnetic resonance angiography (MRA), really an MRI of the blood vessels, or CT angiogram (CTA), basically a CT of the blood vessels, imaging of these blood vessels. Once the problem has resolved, the blood vessels can appear completely normal. Medications may be used to decrease the tendency for blood vessels to spasm, but the effectiveness of these treatments is not completely known. Avoiding substances that increase the likelihood of spasm may be the best option.

INFLAMMATION OF A BLOOD VESSEL (VASCULITIS)

Vasculitis or blood vessel inflammation comes from an autoimmune attack, that is, the body attacking its own blood vessels. The onset of this type of headache typically takes a little longer than the usual thunderclap headache, but there can be the abrupt loss of vision or other neurological signs that suddenly occur. If a person is over the age of 50 and has new pain or headache on one side of their head or behind the eye, or if it hurts to chew, it is important to have these symptoms evaluated promptly. The diagnosis of the most common form of vasculitis, giant cell arteritis or temporal arteritis, is made with blood testing and a biopsy, and is treatable with steroid medications. Not treating giant cell arteritis can result in permanent loss of sight.

PREGNANCY AND SUDDEN NEW HEADACHES AND PITUITARY APOPLEXY

In pregnancy, sudden new headaches may signal different disorders, particularly late in pregnancy. Dangerous and unexpected elevations in blood pressure can signal a condition called eclampsia, also requiring immediate evaluation and treatment. During pregnancy or soon after delivery, the pituitary gland, controlling many important hormones, can bleed causing changes in blood pressure, vision, and severe pain. This cause of thunderclap headache is called pituitary apoplexy.

EVALUATION OF A SUDDEN NEW HEADACHE

Unfortunately, sometimes in the early stages of a change in blood flow or a brain injury, a sudden severe headache alone may be the only warning sign. This sudden extreme pain, without other symptoms, can serve as a warning of a larger bleed or stroke to come. Clues that this is a dangerous headache include any neurological changes such as weakness, visual changes, trouble thinking, or unusual sensations, but the biggest clue is the onset of the headache like a thunderclap. If a patient is evaluated promptly, the problem can often be

diagnosed with a CAT scan (CT) and spinal tap or lumbar puncture (LP), in which a sample of spinal fluid is withdrawn from the back and analyzed for the presence of blood. Alternatively, MRI and MRA or CTA may be used if done later in the headache. The care provider will be looking for something wrong with the blood vessels such as the problems previously listed such as an outpouching of a blood vessel (aneurysm), a tear in a vessel (dissection), an inflammation of blood vessels (vasculitis), a small amount of blood (sentinel bleed) or other irregularity. With blockages, the brain surrounding the clot will have an absence of blood flow and will be a different color.

A new sudden headache does not always signal a dangerous disorder. If evaluated and no cause is found, effective treatment can be started for what is then called primary thunderclap headache, which is considered benign. If these headaches predictably occur at certain times, such as with sexual activity, then taking a medication such as a non-steroidal anti-inflammatory (NSAID), in particular, indomethacin, may be all that is needed. If the headaches are more frequent, a headache preventive medication taken on a daily basis may be useful. This might be a medication from the antihypertensive (blood pressure) class.

MIGRAINE WITH AURA VS STROKE

Migraine headaches that come on suddenly are sometimes called crash migraines, and in about 20% of people these are accompanied by aura, in which there is temporary numbness, changes in vision, and in a smaller number of people, weakness. The first time this occurs it may be considered a possible stroke, as the symptoms often mimic a blood vessel blockage or bleed. When this new, sudden severe migraine occurs, and particularly if it is accompanied by neurologic changes, the individual will require medical evaluation to tell the so-called crash migraine with aura apart from the serious urgent conditions mentioned previously.

Thunderclap headaches can be divided into two groups – those that signal a dangerous medical condition, most commonly coming from the blood vessels, and those that happen many times and are somewhat predictable, without any signs of weakness, loss of consciousness, visual or speech loss, or numbness and which are considered benign. Since the first time thunderclap headaches occur it is difficult to determine if they are the dangerous type, all first time thunderclap headaches should lead a person with them to seek healthcare evaluation to look for the presence or absence of serious risky causes.

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