

# Aortic surgery and stroke

## Background

Stroke is one of the major complications of aortic surgery. When a patient undergoes surgery to the aorta, the risk of a stroke, or a similar neurological event, can range from 1% to 10%. The risk increases with many factors, including age, atherosclerosis, vascular diseases, anatomy of blood vessels, and the extent of surgery. Approximately one-third of strokes occur during the operation, while the majority of post-operative strokes occur within the first one to two days following surgery and rarely after the first week. Strokes can result in significant disability requiring long-term care.

## Definition

A stroke, also known as a “cerebrovascular accident”, is defined as a rapid loss of brain function due to disruption of blood supply to the brain. The majority of strokes are “ischaemic,” which means that there is reduced blood flow; strokes can also be “hemorrhagic”, caused by a bleed into the brain.

The loss of brain function can be either transient or permanent. A transient stroke, known as a “transient ischaemic attack” (TIA), resolves within 24 hours. Loss of brain function can result in an extensive variety of symptoms, such as impairment of movement, sensation, vision or cognition.

## Mechanisms

Ischemic strokes are caused by a change to normal blood flow to the brain due to a blood clot or debris from atherosclerotic vessels (embolism), or by reduced blood flow (hypoperfusion). Both can affect significant portions of the brain, depending on the severity. Hemorrhagic strokes result from bleeding in the brain, and is more common in the elderly, patients with high blood pressures, or those with a prior history of small aneurysms or abnormal connection between arteries and veins.

Strokes that occur after surgery are most likely due to the formation of blood clots that originate in the heart. Risk factors for this include prior stroke, significant atherosclerosis of the aorta and other blood vessels, advanced age, female sex, diabetes, high blood pressure and abnormal post-operative heart rhythm (such as atrial fibrillation). The presence of an individual risk factors is not thought to be a deterrent to surgery, however the risk increases cumulatively with more than one.

## Medical management

Adequate blood pressure control is a necessity in all patients. Anti-cholesterol drugs, such as statins, may also be given to lower cholesterol levels and control inflammation. Long term check-ups are required.

## Prevention

The team involved in your care would take a variety of measures to reduce the risk of a stroke. This involves a detailed preoperative assessment with thorough medical history and special investigations to quantify the risk and take appropriate steps. Such steps include meticulous surgical techniques, strict blood pressure control, reducing aortic manipulations, careful removal of debris and air bubbles, ensuring adequate cerebral perfusion and early detection of problems.

## Treatment

The treatment and prognosis after a stroke occurs depends on its severity. At times, a protracted recovery course is expected, with varying degrees of improvement. Patients will be looked after by expert neurology and intensive care teams during hospital stay. In the long term, a rehabilitation specialist, physiotherapist, occupational therapist, dietician, speech therapist and special nursing care may all be involved in managing the patient.

For more information, visit the following websites:

<http://www.nhs.uk/Conditions/Stroke/Pages/Introduction.aspx>

<http://www.mayoclinic.com/health/stroke/DS00150>

<http://www.mayoclinic.com/health/stroke/DS00150>

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