

Spontaneous Intracerebral Hemorrhage



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KEYWORDS

• Intracerebral hemorrhage • Intracranial hemorrhage • Hemorrhagic stroke

KEY POINTS

- Poorly controlled hypertension is the most common risk factor for spontaneous intracerebral hemorrhage (ICH).
- Patients with spontaneous ICH may present with headache and vomiting, but are at risk for early deterioration including loss of consciousness, coma, and death.
- The location, appearance, and size of the hemorrhage on computed tomography scan, in conjunction with the clinical picture, can help point toward its etiology and prognosis.
- Once hemorrhage has occurred, management focuses on prevention of hematoma expansion, perihematoma edema, obstructive hydrocephalus, and brain herniation.
- Primary emergency management focuses on blood pressure and empiric intracranial pressure management, reversal of existing coagulopathies, and identification of indications for early neurosurgical intervention.

INTRODUCTION

Spontaneous intracerebral hemorrhage (ICH) is a medical emergency with potentially devastating morbidity and mortality. After ischemic stroke, ICH represents the second most common type of stroke (15%).¹ Bleeding within the brain can arise from multiple different etiologies (**Box 1**), each of which can be considered its own separate disease.

RISK FACTORS AND PATHOPHYSIOLOGY

Although several other risk factors exist, by far the greatest risk factor for spontaneous ICH is hypertension (**Box 2**).^{2–7} Over the course of time, chronic stress on the vascular walls leads to the fragmentation, degeneration, and eventual rupture of small penetrating vessels within the brain parenchyma. Hypertensive hemorrhages tend to occur

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Box 1
Etiologies of spontaneous intracerebral hemorrhage
Hypertension
Amyloidopathy
Vascular malformation
Hemorrhagic brain tumor
Hemorrhagic conversion from prior ischemic stroke
Cerebral venous sinus thrombosis

in specific locations, including the deep structures of the basal ganglia and thalamus, as well as the pons, midbrain, and cerebellum.^{8,9}

Complications from ICH occur in part owing to the limited space within the skull that is filled by brain tissue, blood, and cerebrospinal fluid. Increasing intracranial pressure (ICP) leads to decreased cerebral perfusion, as well as mechanical compression of brain contents that may ultimately lead to brain herniation. Blood may also leak into the cerebrospinal fluid drainage system and cause obstructive hydrocephalus.

CLINICAL PRESENTATION

Patients may present to the emergency department (ED) in a variety of ways, from those arriving on their own complaining of headache and vomiting, to those found obtunded and brought in by emergency medical services personnel. Even if focal neurologic deficits are not present immediately, a worsening level of alertness and potential loss of consciousness may develop quickly as the hematoma expands and causes compression of the surrounding brain parenchyma. The specific location of the ICH (ie, putamen, thalamus, caudate, lobes, cerebellum, pons) may correspond with particular neurologic signs and symptoms. For instance, thalamic hemorrhages may be associated with hallucinations or confusion, cortical hemorrhages with aphasia or neglect, and those in the posterior fossa with cerebellar or brainstem deficits. Early seizures in the first few days may also occur (14% incidence),¹⁰ more commonly with lobar hemorrhages.

Box 2
Risk factors for spontaneous intracerebral hemorrhage
Hypertension
Cigarette smoking
Antithrombotic therapy
African American
Diabetes
Older age
Heavy alcohol intake
Chronic kidney disease
Male sex
Poor diet

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