

Intracerebral hemorrhage

10%–20% of strokes

high frequency and 30-day mortality, which is close to 50%.

MECHANISMS OF INTRACEREBRAL HEMORRHAGE

- **Hypertension: main cause → 72-81%**

- Other modifiable risk factors for ICH included excessive smoking, alcohol intake, central obesity, low cholesterol levels, unhealthy diet, and sedentary lifestyle.

- lipohyalinosis of small intraparenchymal arteries.

- Microaneurysms of Charcot and Bouchard

Vascular Malformations

- saccular or mycotic aneurysms,
 - arteriovenous malformations,
 - cavernous angiomas
- frequently located in the subcortical white matter of the cerebral hemispheres
- The clinical presentation of the ICH in this setting has a few distinctive characteristics: the hematoma is generally smaller, and symptoms develop more slowly than with hypertensive ICH; the presence of associated subarachnoid hemorrhage on CT scan suggests an aneurysm or AVM as the cause of a lobar ICH; and ICHs associated with small vascular malformations generally tend to occur in younger patients than those with hypertensive ICH, and have a female preponderance.

A clinical profile thus can be suggested for cases of ICH due to small vascular malformations. These occur in generally young, predominantly female patients who present with a syndrome of lobar ICH in which CT may document a superficial lobar hematoma with adjacent local subarachnoid hemorrhage, or MRI demonstrates the characteristic features of a small AVM or cavernous angioma. Lack of documentation of the vascular malformation on angiography is the rule—especially in the slow-flow cavernous angiomas—and definite diagnosis requires either MRI or the histological examination a sample of the hematoma and its wall.

Intracranial Tumors

glioblastoma multiforme

Metastases from melanoma, bronchogenic carcinoma, choriocarcinoma, or renal cell carcinoma

- (1) The presence of papilledema on presentation,
- (2) the location of ICH in sites that are rarely affected in hypertensive ICH
- (3) the presence of ICH in multiple sites simultaneously,
- (4) a CT scan characterized by a ring of high-density hemorrhage surrounding a low-density center in a noncontrast study,
- (5) enhancing nodules adjacent to the hemorrhage on contrast CT or MRI,
- and (6) a disproportionate amount of surrounding edema and mass effect associated with the acute hematoma.

Bleeding Disorders, Anticoagulants, and Fibrinolytic Treatment

Hemophilia

Idiopathic thrombocytopenic purpura

Acute leukemia, especially the acute lymphocytic variety

Acute promyelocytic leukemia

Treatment with oral anticoagulants

streptokinase and tissue plasminogen activator (tPA).

Cerebral Amyloid Angiopathy

recurrent and multiple simultaneous, predominantly lobar, hemorrhages in elderly patients

Granulomatous Angiitis of the Central Nervous System and Other Vasculitides

polyarteritis nodosa.

Sympathomimetic Agents

The decongestant and appetitesuppressant, phenylpropanolamine

Cocaine

Hemorrhagic Infarction

- cerebral embolism,
- borderzone infarcts that had resulted from global hypoperfusion
- Cerebral infarction secondary to venous occlusion (e.g., thrombosis of superior sagittal sinus or cortical veins)

Head Trauma

basal frontal, anterior temporal, and occipital areas, resulting from the coup and contrecoup mechanisms of injury. Thus, traumatic brain hemorrhages are frequently multiple.

CLINICAL FEATURES OF INTRACEREBRAL HEMORRHAGE

intracranial hypertension

location of the hematoma.

Putaminal Hemorrhage

Caudate Hemorrhage

Thalamic Hemorrhage

Lobar Hemorrhage

Cerebellar Hemorrhage

Pontine Hemorrhage

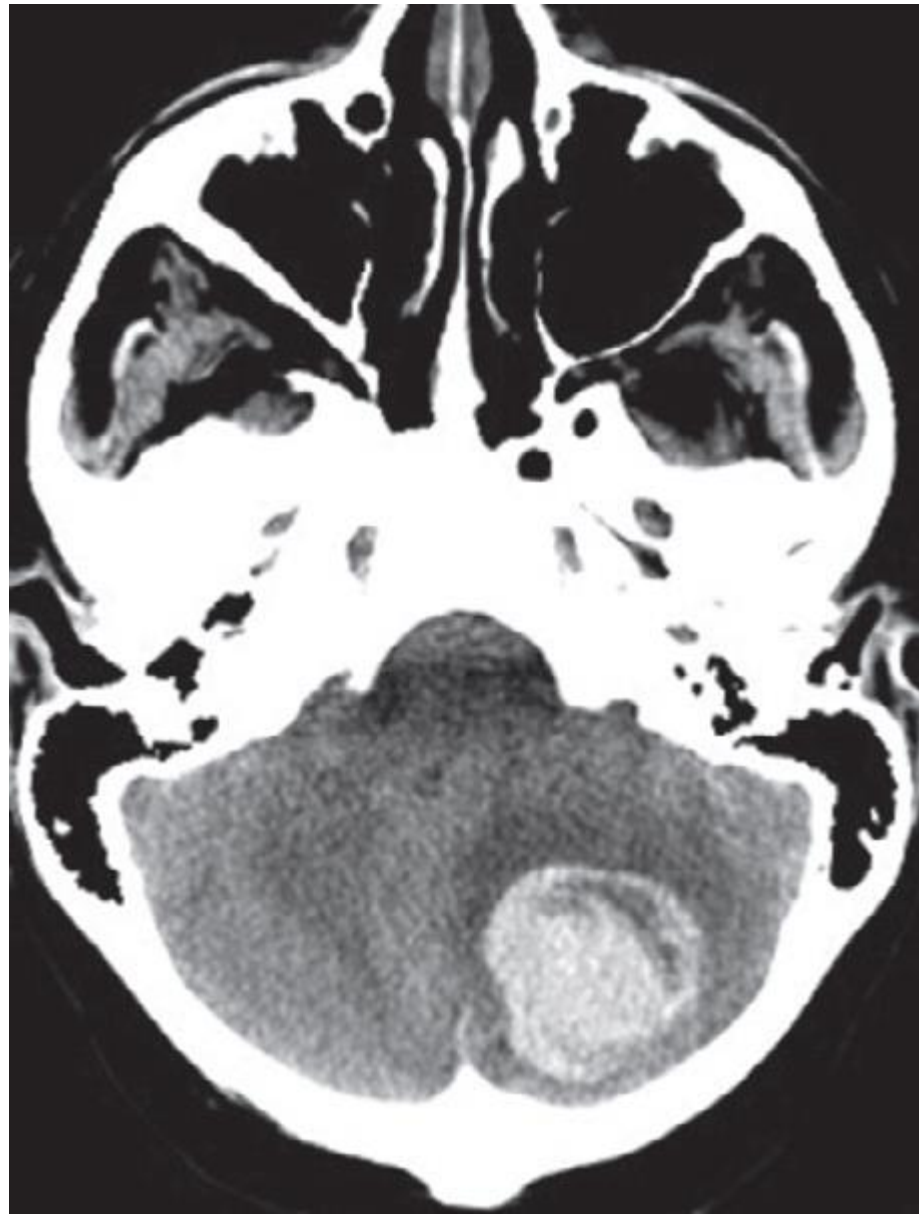
Mesencephalic Hemorrhage

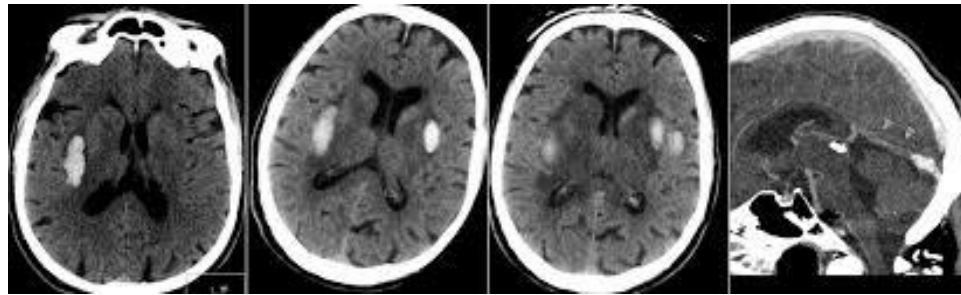
Medullary Hemorrhage

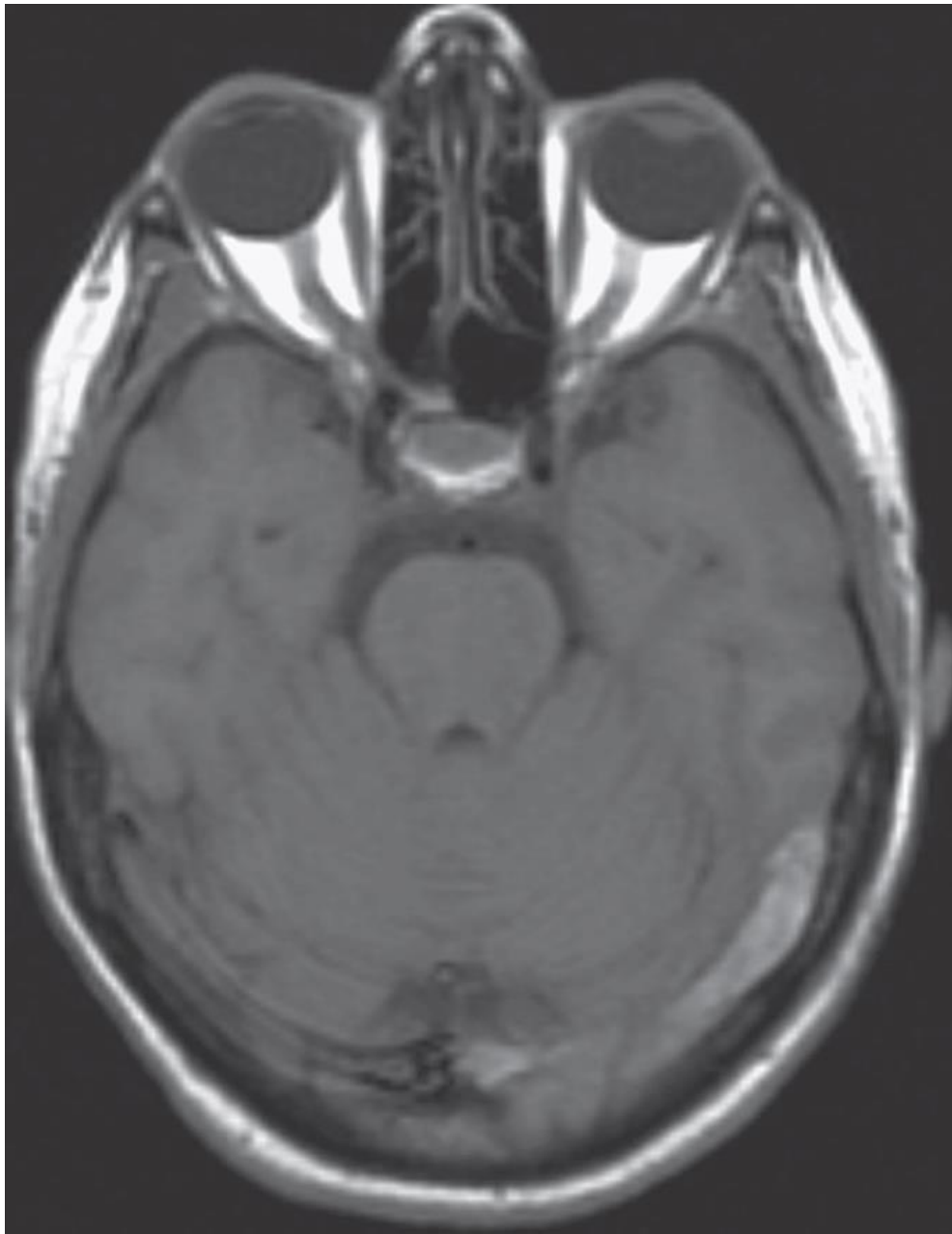
Intraventricular Hemorrhage

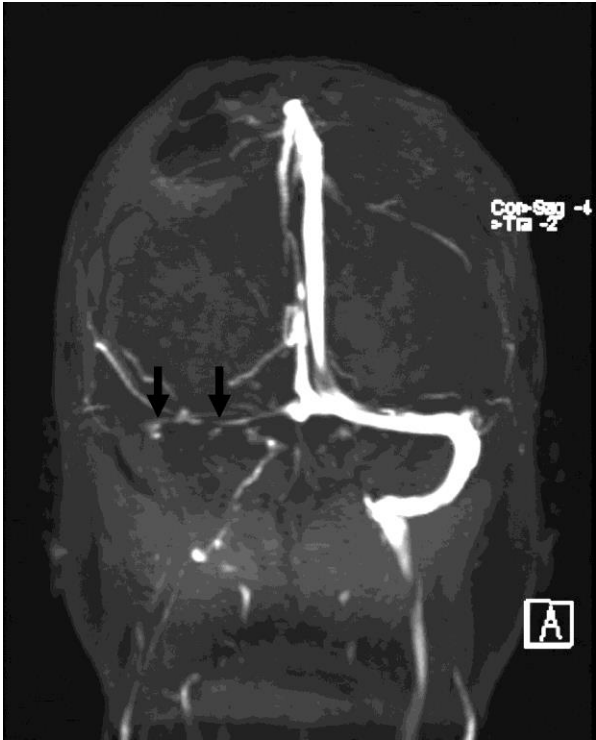


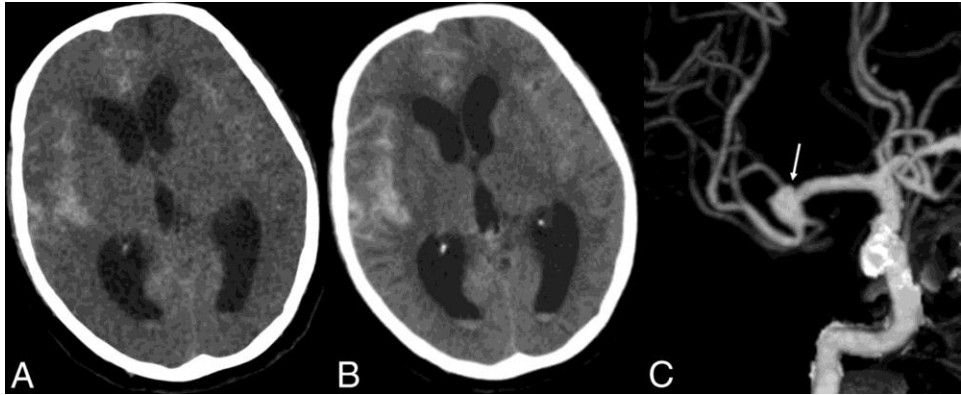












TREATMENT OF INTRACEREBRAL HEMORRHAGE

General Management of Intracerebral Hemorrhage

stabilization of vital signs and airway protection.

Glasgow Coma Scale score of 8 or less, endotracheal intubation should follow

This is best performed with the administration of short-acting IV agents such as thiopental (1–5 mg/kg) or lidocaine (1 mg/kg)

Laboratory studies, clinical examination and CT

neurosurgical consultant

General Measures for Prevention of Further Elevation of Intracranial Pressure

control of hypertension

Treatment of seizures.

In cases presenting with systolic blood pressure between 150 and 220 mm Hg, further reduction of systolic blood pressure to 140 mm Hg is safe and may improve clinical outcome

IV beta- and alpha-blocking agent labetalol, often used in combination with loop diuretics.

IV calcium channel blocker nicardipine

the routine prophylactic use of anticonvulsants in patients with ICH is not justified

Specific Treatment of Increased Intracranial Pressure

hyperventilation,

osmotic diuretic therapy

corticosteroids

Choice between Medical and Surgical Therapy in Intracerebral Hemorrhage

A direct surgical approach is considered frequently in patients with superficial (lobar) hematomas of the cerebral hemispheres or with cerebellar hemorrhage, whereas patients with deep hemorrhages (caudate, thalamic, pontine, mesencephalic, and medullary in location) are rarely if ever surgical candidates.