



## IMAGING OF SUBARACHNOID HEMORRHAGE: A REVIEW ARTICLE

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### ABSTRACT

Bleeding into the subarachnoid space is termed subarachnoid hemorrhage (SAH). It may be spontaneous or traumatic in onset, and may be trivial or massive in volume. Subarachnoid space can be the primary site of bleed or may be secondary involved by extension of intracerebral hemorrhage (ICH). It occurs in various clinical contexts, the most common being head trauma. However, the familiar use of the term SAH refers to nontraumatic (or spontaneous) hemorrhage, which usually occurs in the setting of a ruptured cerebral aneurysm or arteriovenous malformation (AVM).

**Keywords:** subarachnoid hemorrhage, intracerebral hemorrhage, cerebral aneurysm, arteriovenous malformation.

## INTRODUCTION

Subarachnoid hemorrhage (SAH) is bleeding into the subarachnoid space—the area between the arachnoid membrane and the pia mater surrounding the brain.[1] SAH may occur as a result of a head injury or spontaneously, usually from a ruptured cerebral aneurysm. Spontaneous SAH is due to a ruptured arterial aneurysm in 70-80 percent of patients and an arteriovenous malformation in about 10 percent. In the remaining approximately 15 percent, no underlying cause is found on angiography, which is more likely when the subarachnoid blood is confined to the perimesencephalic area. patient with a nonaneurysmal perimesencephalic SAH have a very good long-term prognosis.[2]. The risk of further bleeding is thought to be no higher than that in the general population. Variations in venous anatomy found with this pattern of SAH suggest a venous origin.[3]. Nearly half of people with a SAH due to an underlying aneurysm die within 30 days and about a third who survive have ongoing problems 10–15 percent die before reaching a hospital.[4]

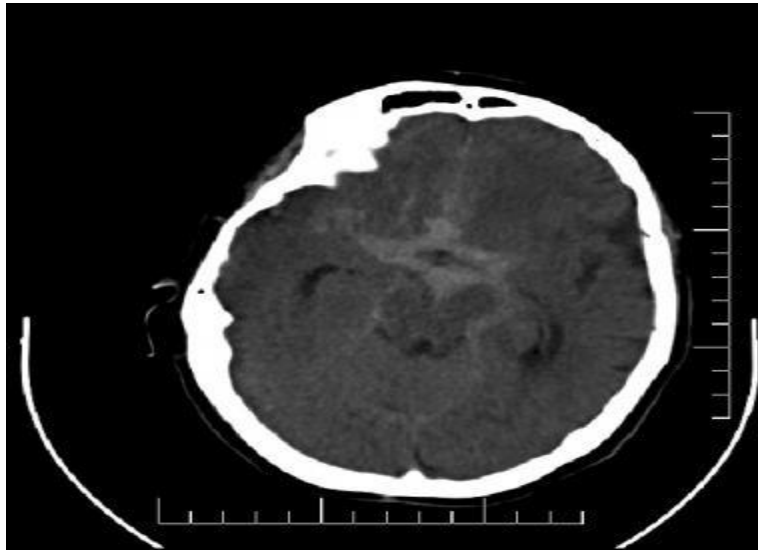
### **Clinical features:**

Sudden, severe “explosive” headache, vomiting, altered sensorium are common presentations. Usually the headache is described as “worst headache of the life”. The usual age of presentation is 55-60 years; 20% of cases during sleep and 50% of patients have warning symptoms.[5] The risk factors are modifiable and non-modifiable. Among the latter group familial predisposition, presence of heritable connective tissue disorder like Ehler-Danlos disease, autosomal dominant polycystic kidney disease (ADPKD) and neurofibromatosis-I. Modifiable risk factors are hypertension, cigarette smoking, cocaine abuse, oral contraceptives, alcohol consumption, pregnancy, etc.[6]

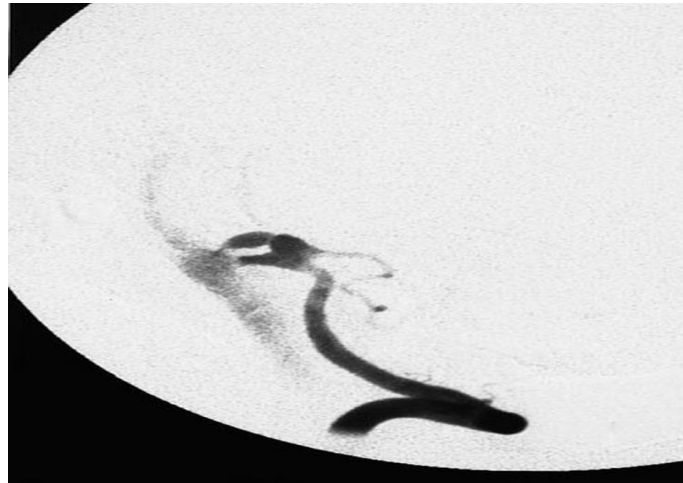
### **Diagnosis:**

- ❖ Lumbar puncture
- ❖ Computed tomography (CT)
- ❖ Magnetic resonance imaging (MRI)
- ❖ Conventional cerebral angiography
- ❖ CT angiography (CTA)
- ❖ Magnetic resonance angiography (MRA)
- ❖ Transcranial Doppler ultrasound

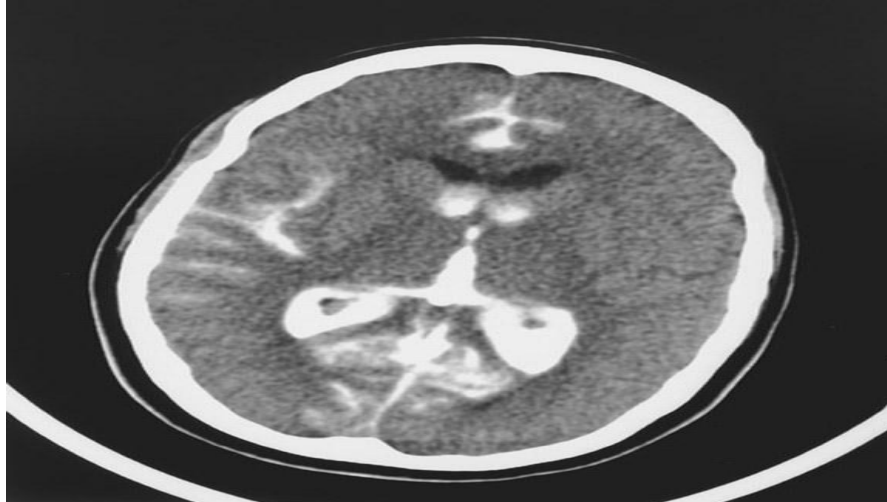
**Imagings:**



**Figure 1:** Subarachnoid hemorrhage (SAH). A nonenhanced computed tomography scan of the brain that demonstrates an extensive SAH filling the basilar cisterns in a patient with a ruptured intracranial aneurysm.



**Figure 2:** An angiogram showing the onset of an aneurysmal rupture, with extravasation of contrast material into the subarachnoid space from the anterosuperior aspect of a bilobed aneurysm in a posteroinferior cerebellar artery.



**Figure 3:** A computed tomography scan obtained after angiography of a rupturing bilobed aneurysm of the posteroanterior cerebellar artery. This image shows a subarachnoid hemorrhage and contrast medium filling the right sylvian fissure, the interhemispheric fissure, and the lateral and third ventricles.

## CONCLUSION

In this article, we discussed about detail about subarachnoid hemorrhage with its imaging findings.

## REFERENCES

1. Abraham, MK; Chang, WW (November 2016). "Subarachnoid Hemorrhage". *Emergency medicine clinics of North America*. 34 (4): 901-916.
2. Rinkel GJ, Wijndicks EF, Hasan D, et al. Outcome in patients with subarachnoid haemorrhage and negative angiography according to pattern of haemorrhage on computed tomography, *Lancet*. 1991;338(8773):964-968.
3. van der Schaaf I C, Velthuis B K, Gouw A et al 2004 Venous drainage in perimesencephalic haemorrhage. *Stroke* 35:1614–1618.
4. van Gijn J, Kerr RS, Rinkel GJ (2007). "Subarachnoid haemorrhage". *Lancet*. **369** (9558): 306–18. doi:10.1016/S0140-6736(07)60153-6. PMID 17258671.
5. Parkarinen S. incidence, etiology and prognosis of primary SAH. *Acta neurol scandina*. 1967;48:1-128.
6. ICMR , epidemiological study on SAH in india (1972-75) ICMR bull, new delhi, 1987.