



Journal Homepage: -www.journalijar.com
**INTERNATIONAL JOURNAL OF
 ADVANCED RESEARCH (IJAR)**

Article DOI:10.21474/IJAR01/3220
 DOI URL: <http://dx.doi.org/10.21474/IJAR01/3220>



RESEARCH ARTICLE

ANEURYSMAL SUBARACHNOID HEMORRHAGE AND ITS PRACTICAL IMPLICATIONS IN A PERIPHERAL SET-UP.

Shabadi Vijaykumar S., Sachin S. Shabadi, and Chandramohan J.
 Consultant Neurosurgeon, Bagalkot, Karnataka, India 587101.

Manuscript Info

Manuscript History

Received: 04 December 2016
 Final Accepted: 06 January 2016
 Published: February 2017

Abstract

Background: Aneurysmal subarachnoid hemorrhage is the most common cause of non-traumatic SAH. It's a challenging condition to treat. It involves methodical assessment and timely management of multiple factors which will have prognostic significance on the patients.

Methods: A brief overview of different types of aneurysms, risk factors, clinical signs and symptoms of SAH, the diagnostic and management protocol in a peripheral set up has been presented.

Conclusion: Sub arachnoid hemorrhage due to ruptured aneurysm is a neurosurgical emergency requiring prompt detection and timely referral to a Centre of neurosurgical expertise. Basic knowledge about the presentation of SAH is critical in the management of this condition at a peripheral set up.

Copy Right, IJAR, 2017.. All rights reserved.

Introduction:-

Sub arachnoid space lies between the arachnoid and pia mater of brain. All the major blood vessels supplying the brain lie in this space. Any bleeding in this area is defined as sub arachnoid haemorrhage. Worldwide trauma is the most common cause of SAH. Among the non-traumatic (spontaneous) causes of SAH, ruptured aneurysms are the most important cause of this condition, with high mortality rates. Awareness regarding the presentation and management is critical for quick diagnosis and management of SAH secondary to ruptured aneurysm in order to have good outcomes.

Causes of SAH:-

Causes of sub arachnoid haemorrhage
Trauma
Aneurysms
Arterio-venous malformation
Brain tumours
Cortical venous thrombosis
Coagulopathy
Vasculitis syndromes including Moya-Moya disease
Drug abuse : cocaine

Corresponding Author:-Vijaykumar S. Shabadi.

Address:- Consultant Neurosurgeon, Bagalkot, Karnataka, India 587101.

Cerebral aneurysms:-

An aneurysm is an abnormal localized dilation of any vessel. Intracranial aneurysms are classified as saccular, fusiform, or dissecting. Approximately 90 percent are saccular (berry aneurysms). Saccular aneurysms are responsible for most of the morbidity and mortality caused by subarachnoid hemorrhage.

Saccular aneurysms develop from defects in the internal elastic lamina of cerebral arteries, rendering them less resistant to changes in intraluminal pressure. These changes most frequently develop at sites of vessel bifurcation, where blood flow is most turbulent and shear forces against the arterial wall are greatest. Saccular aneurysms most frequently form in the first- and second-order arteries originating from the cerebral arterial circle (Circle of Willis) at the base of the brain. Multiple aneurysms develop in 30 percent of affected patients.

Fusiform aneurysms develop from ectatic, tortuous cerebral arteries, most often in the vertebral-basilar system, and can reach several centimeters in diameter. Patients with fusiform aneurysms characteristically present with symptoms of cranial-nerve or brain-stem compression, but the symptoms are not commonly associated with subarachnoid haemorrhage.

Dissecting aneurysms are the result of cystic medial necrosis or a traumatic tear of an artery. Like dissecting aneurysms elsewhere in the body (e.g., dissecting aortic aneurysms), they form as blood courses through a false lumen while the true lumen is collapsed upon itself.

Mycotic aneurysms, also known as infective or microbial aneurysms, are rare inflammatory neurovascular lesions that account for 0.7–6.5% of all intracranial aneurysms. The term mycotic is a misnomer since most of these aneurysms are caused secondary to bacterial infection. These aneurysms are unique in their natural history and frequently develop at terminal arterial branches. They usually develop in patients with endocarditis and other infective conditions.

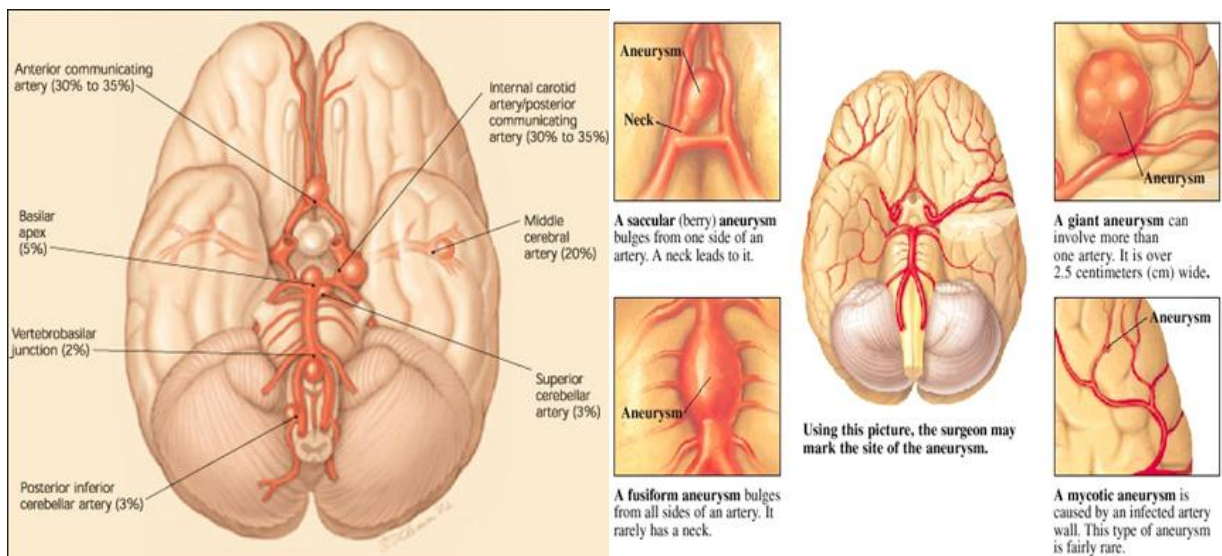


Figure 1:-showing common location of aneurysms and morphology

Risk Factors:-

The most important risk factors for aneurysmal SAH are **hypertension** and **cigarette smoking**. Other risk factors include heavy alcohol use, and personal or family history of aneurysm, autosomal dominant polycystic kidney disease and other connective tissue disorders.

SAH can occur at any age, but it tends to happen at a younger age than other types of stroke. It has a peak incidence among persons 40 to 60 years of age, with a mean age of about 53 years. Women are affected about 70% of the time.

Clinical Signs and Symptoms of Subarachnoid Hemorrhage:-

Subarachnoid hemorrhage can be easily diagnosed in patients who present with classical symptoms of thunderclap headache, vomiting and loss of consciousness than in patients who present in good condition.

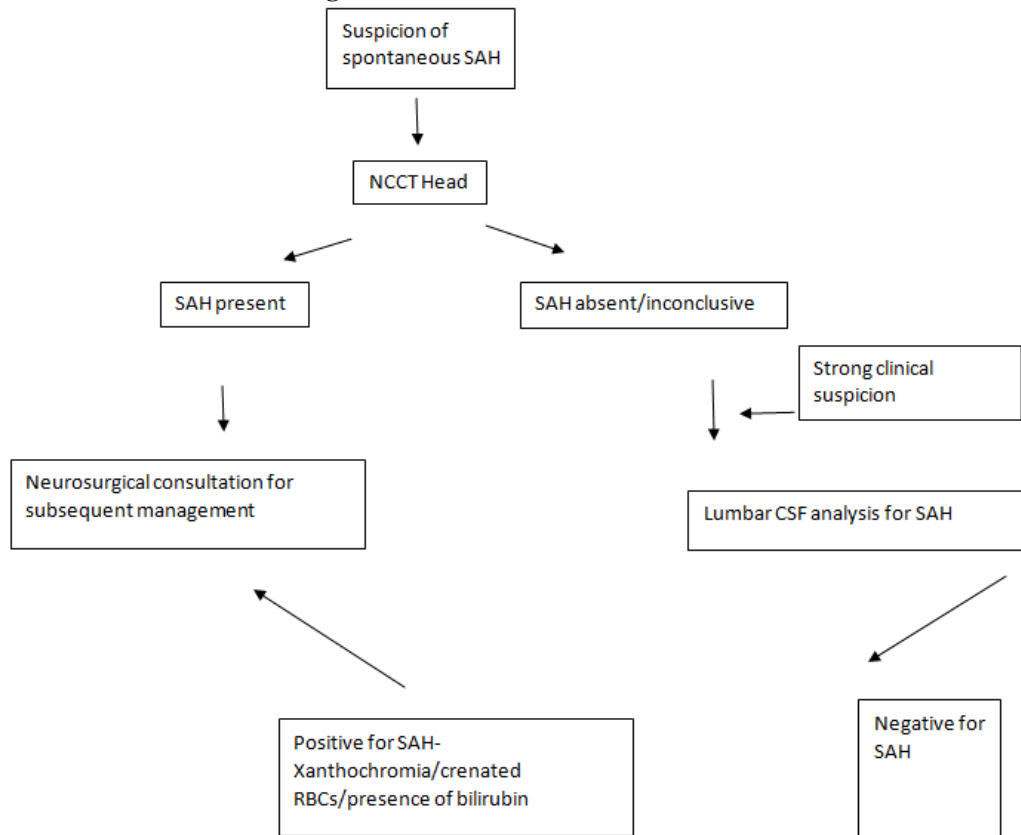
Symptomatology of Sub arachnoid hemorrhage:-

Patient experiences the worst headache of his or her life
Recent warning or atypical headaches (often severe, feel different to the patient, and may have lasted for days at a time; may occur days to weeks before the event)
Meningismus
Focal neurological deficits(III cranial nerve palsy in case ruptured posterior comm. artery aneurysm)
Syncope, change in consciousness, or altered mental status
Vomiting
Neck pain/stiffness

- Among patients who presented to the emergency department with sudden, severe headache, which the patients often called the worst headache of their lives, 15% had SAH
- Among patients with sudden, severe headache and a neurologic deficit, 25% were found to have SAH.
- Among patients with acute severe headache as the only symptom, 12% had SAH

Despite considerable advances in diagnostic, surgical and perioperative management, the overall outcome after SAH remains poor. Thirty-five percent of patients die within 3 months of the bleed (12% before receiving medical attention) regardless of medical and surgical therapy. In addition, approximately 40% of survivors will have residual neurological deficits including cognitive disturbances

Diagnosis of sub arachnoid hemorrhage:-



CT Head:-

It is investigation of choice in the diagnosis of SAH. SAH appears as hyperdensity(bleed) usually in the basal cisterns. It also helps in predicting the location of aneurysm.

Lumbar CSF Analysis:-

Ideally done at-least 6 hours after the ictus so that the RBC are lysed . Presence of xanthochromia and crenated RBCs are suggestive of SAH.

MRI Brain:- Few sequences like FLAIR help in the detection of blood. However MRI is not widely available.

Cerebral Angiography:-

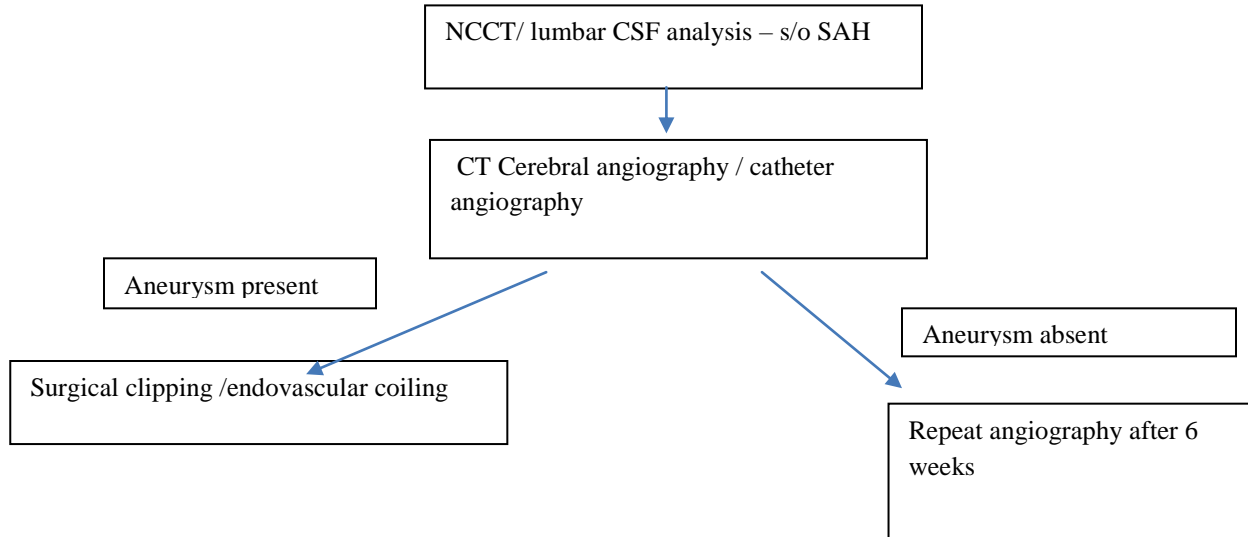
CT Angiography or catheter angiography helps in knowing the location and morphology of the aneurysm which helps in the treatment of it.



Figure 2 (A):- NCCT Head showing blood in the basal sub arachnoid cisterns(arrow) ; 2 (B) – CT Angiography showing rupture anterior communicating artery aneurysm(arrow)

Management of SAH:-**Basic medical management**

- Monitor Vital signs, neurological assessment , fluid intake and output
- Bed rest until the aneurysm is obliterated
- Elevation of the head of the bed by 30 degrees
- Avoidance of unnecessary stimulation
- Graduated compression stockings or intermittent pneumatic compression devices on the lower extremities
- Adequate Analgesia
- Anticonvulsants for the treatment of seizures
- Anti-hypertensives to reduce blood pressure predominantly within the first 4 days after subarachnoidhemorrhage when the aneurysm is not obliterated
- External Ventricular drain in case of acute hydrocephalus
- Timely referral to a center of neurosurgical excellence

Management of SAH at a neurosurgical center:-**Surgical management of Aneurysms:-**

Intracranial aneurysms can be managed by open cranial surgery (**Clipping of aneurysm**) or through endovascular route(**Coiling of aneurysm**). The selection of appropriate approach depends on various factors like morphology of aneurysm, location of aneurysm, ease of access and other factors.

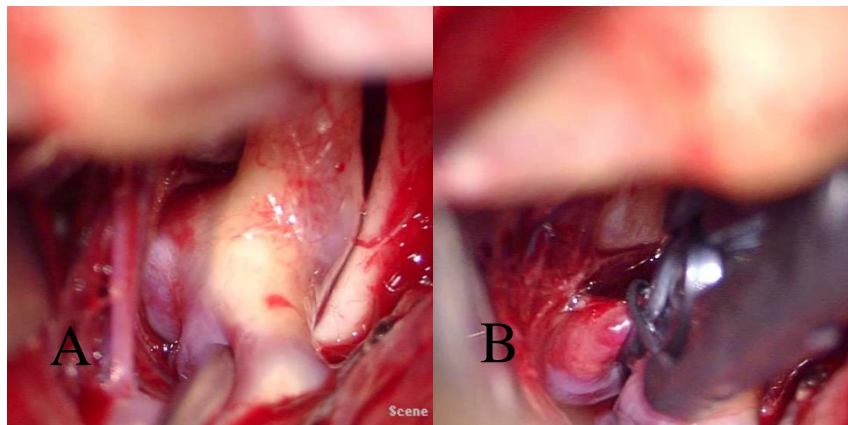


Figure 3:-Intra operative picture showing (A)right ICA aneurysm and (B) clip being applied across the neck of aneurysm

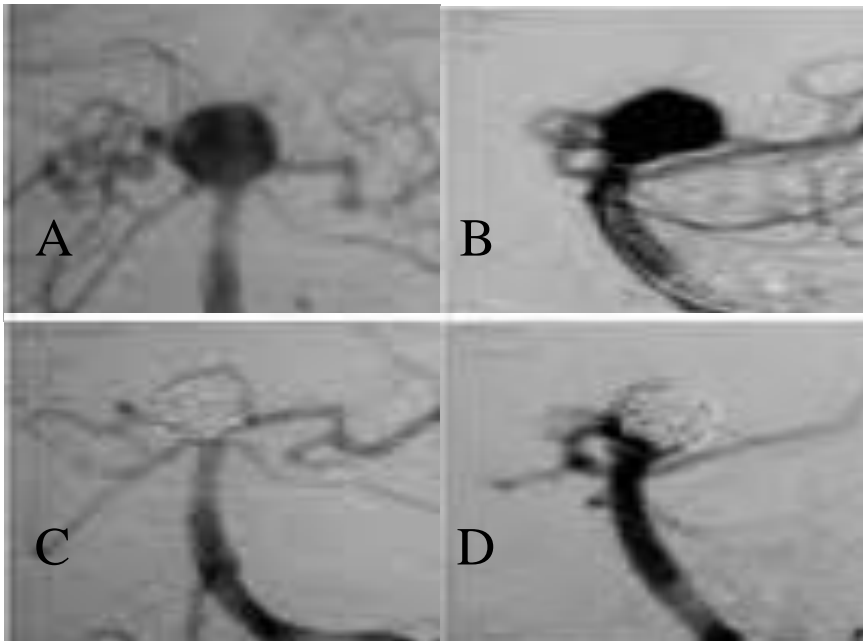


Figure 4:- digital subtraction angiography(DSA) images showing a large aneurysm arising from the Basilar artery(A & B). Images C & D show the endovascular management with coils.

Complications of SAH:-

Re-bleeding:It is one of the dreaded complications following SAH due to ruptured aneurysm, carrying high mortality rates. The risk of re-bleed is highest in the first 24 hours of rupture and gradually decreases.

Hydrocephalus:-It is the dilatation of ventricles due to obstruction of flow of CSF either across the ventricle or in the sub arachnoid space. It may be acute in onset (usually due to intra-ventricular hemorrhage) requiring urgent ventricular diversion or chronic.\

Vasospasm/DINDs : It is one of the major complications following SAH occurring due to the spasm of vessels at the base of brain. It usually develops 5 days following rupture of aneurysm. it may lead to variety of focal neurological deficits depending in the vessel affected. It is traditionally managed by HHH (hypertension, hypervolemia, hemo-dilution) therapy.

Focal Neurological Deficits:- It is usually secondary to intra cerebral hemorrhage or due to vasospasm.

Dyselectrolytemia

Conclusion:-

Sub arachnoid hemorrhage due to ruptured aneurysm is a neurosurgical emergency requiring prompt detection and timely referral to a Centre of neurosurgical expertise. Basic knowledge about the presentation of SAH is critical in the management of this condition at a peripheral set up.