## Aneurysmal Subarachnoid Hemorrhage Prevention

- Bilateral Thalamic Edema caused by tentorial galenic dural arteriovenous fistula and Sinus Thrombosis: Successful endovascular therapy
- Japanese Nationwide Questionnaire Survey on the Treatment and Management of Subarachnoid Hemorrhage Due to Ruptured Cerebral Aneurysm
- Impact of Hemorrhage Extent on External Ventricular Drain-Associated Infections in Aneurysmal Subarachnoid Hemorrhage
- Continuous Intravenous Nimodipine Infusion With Ethanol as Carrier in Aneurysmal Subarachnoid Hemorrhage Does Not Result in Measurable Cerebral Ethanol Levels
- Proportional Stroke Mortality in Espírito Santo, Brazil: A 20-Year Joinpoint Regression Study
- Delayed cerebral ischemia after aneurysmal subarachnoid hemorrhage: a narrative review
- Sympathetic nerve block as an add-on therapy for intervention and prevention of cerebral vasospasm after subarachnoid hemorrhage
- CGRP-Targeted Migraine Therapies in Patients With Vascular Risk Factors or Stroke: A Review

Preventive strategies can significantly reduce the risk of aneurysm formation, growth, and rupture.

# **1. Primary Prevention (Reducing Aneurysm Formation and Growth)**

#### A. Lifestyle Modifications

- Control Hypertension
  - $\circ\,$  Maintain BP <130/80 mmHg.
  - Use antihypertensive agents (e.g., ACE inhibitors, ARBs, calcium channel blockers).
- Smoking Cessation
  - $\circ\,$  Strongly associated with aneurysm formation and rupture.
  - Use nicotine replacement therapy, counseling, or medications (e.g., varenicline, bupropion).
- Alcohol Moderation
  - $\circ$  Limit to ≤1 drink/day (women) or ≤2 drinks/day (men).
- Healthy Diet and Exercise
  - $\circ\,$  Reduce cholesterol and saturated fat intake.
  - $\circ$  Exercise ≥150 min/week of moderate-intensity activity.
- Avoid Illicit Drugs (e.g., Cocaine, Methamphetamines)
  - $\,\circ\,$  These substances cause acute hypertension surges and increase rupture risk.

# 2. Secondary Prevention (Preventing Rupture in Known Aneurysms)

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#### A. Risk Stratification of Unruptured Aneurysms

#### • Size and Location

- Aneurysms >7 mm (especially in the posterior circulation) have a higher rupture risk.
- Patient-Specific Risk Factors
  - Family history of aSAH.
  - Previous aneurysm rupture.
  - Multiple aneurysms.
- Imaging Surveillance
  - Small aneurysms (<5 mm): Periodic surveillance (MRA or CTA).</li>
  - $\circ\,$  Growing aneurysms: More aggressive monitoring or treatment.

#### **B. Medical Management**

- Blood Pressure Control
  - Maintain strict control, particularly in those with known aneurysms.
- Statin Therapy
  - $\circ\,$  May improve vascular integrity, though data on preventing rupture are inconclusive.
- Avoid Anticoagulants and NSAIDs
  - $\circ\,$  These medications may increase bleeding risk if an aneurysm ruptures.

#### **C. Interventional Options**

#### • Endovascular Coiling vs. Surgical Clipping

- Coiling: Preferred for posterior circulation aneurysms and older patients.
- Clipping: Preferred for younger patients or aneurysms with broad necks.
- Flow Diverters
  - $\circ\,$  Used for large or complex aneurysms to redirect blood flow and promote thrombosis.

### **3. Screening Recommendations**

- Family History (First-Degree Relatives with aSAH)
  - $\circ$  Screening with MRA or CTA is recommended in individuals with ≥2 affected relatives.
- Connective Tissue Disorders
  - Patients with polycystic kidney disease, Marfan syndrome, or Ehlers-Danlos syndrome should be considered for screening.

### Key Takeaways

- **Control hypertension and quit smoking** the most important modifiable factors.
- Monitor unruptured aneurysms based on size, growth, and risk factors.
- Consider surgical or endovascular intervention in high-risk aneurysms.
- Screen high-risk individuals (e.g., those with a strong family history).

Surgical clipping and endovascular coiling are both effective in preventing aneurysmal subarachnoid hemorrhage, but the choice between these interventions remains controversial.

A systematic review and meta-analysis were conducted, including relevant two-arm clinical trials up to September 2023, sourced from Scopus, PubMed, Web of Science, and the Cochrane Library. The primary outcomes were complete occlusion rates during mid-term and long-term follow-ups. Standard mean differences and risk ratios were used to analyze variations in outcomes. Python meta-analysis with sensitivity testing and regional subgroup analysis was used to resolve heterogeneity.

The analysis included 139,485 participants. Clipping demonstrated significantly higher complete occlusion rates in midterm follow-up (RR = 0.83, 95% CI [0.75, 0.91], p = 0.0001) but was associated with a higher risk of procedural complications such as bleeding and ischemic stroke. Coiling showed a higher risk of retreatment (RR = 3.46, 95% CI [1.21, 9.86], p = 0.02), yet it had lower procedural complications (RR = 0.54, 95% CI [0.38, 0.78], p < 0.0009), shorter hospital stays (MD 4.36, 95% CI [2.96, 5.77], p = 0.0001), and better post-procedural outcomes as indicated by lower modified Rankin Scale scores (RR = 0.73, 95% CI [0.55, 0.97], p = 0.03). Long-term occlusion rates were comparable between the two methods.

While clipping achieves higher mid-term occlusion rates, coiling is associated with fewer complication rates, shorter hospital stays, and potentially better long-term outcomes. Treatment decisions should be individualized, considering patient-specific characteristics and procedural feasibility <sup>1)</sup>.

#### 1)

Hammed A, Al-Qiami A, Alomari O, Otmani Z, Hammed S, Sarhan K, Derhab M, Hamouda A, Rosenbauer J, Kostev K, Richter G, Braun V, Tanislav C. Preventive clipping versus coiling in unruptured intracranial aneurysms: A comprehensive meta-analysis and systematic review to explore safety and efficacy. Neurol Sci. 2025 Jan 30. doi: 10.1007/s10072-024-07963-1. Epub ahead of print. PMID: 39883353.

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