

Is neurosurgery referral warranted for small brain aneurysms?

■ EVIDENCE-BASED ANSWER

The risk of rupture of a small cerebral aneurysm (<10 mm) is very low in asymptomatic patients who have never had a subarachnoid hemorrhage. Because the risk of morbidity and mortality from surgical intervention significantly exceeds that of nonsurgical monitoring for this group, primary care physicians do not need to refer patients with this condition to a neurosurgeon for clipping (strength of recommendation [SOR]: **B**, based on cohort and case-control studies). For patients managed conservatively, annual office follow-up and imaging evaluation should be considered, and is necessary if a specific symptom should arise (SOR: **C**, based on expert opinion).

■ EVIDENCE SUMMARY

Intracranial aneurysms are not rare. Based on autopsy data, prevalence has been estimated to be 0.2% to 9.9% of the population.¹ Ten to 15 million Americans may have unruptured intracranial aneurysms, most of which remain undiagnosed.²

Conditions leading to the diagnosis of unruptured intracranial aneurysms include:

- headache (in 36% of patients)
- ischemic cerebrovascular disease (17.6%)
- cranial nerve deficits (15.4 %)
- aneurysmal mass effect (5.7%)
- ill-defined "spells" (4.8%)
- convulsive disorder (4.2%)
- subdural or intracerebral hemorrhage (2.7%)
- brain tumor (1.7%)
- nervous system degenerative disease (0.5%).²

No randomized controlled trials have examined whether unruptured intracranial aneurysms should be treated surgically. In the absence of a

clinical trial, the evidence to answer this question is based on observational, cohort, and case-control studies, where the risks of the natural history of the condition are weighed against the risks of surgical intervention.³

One study of the natural history of unruptured cerebral aneurysm included 130 patients with 161 unruptured intracranial aneurysms who were followed for a mean of 8.3 years.^{4,5} This prospective investigation found that 15 patients suffered an intracranial hemorrhage. There were no ruptures of the 102 aneurysms that were ≤10 mm in diameter at the time of discovery.^{4,5}

In the largest cohort study to date, patients without a history of subarachnoid hemorrhage had an overall risk of rupture of 0.05% per year over 7.5 years. This study also found that surgery-related morbidity and mortality at 1 year among patients aged <45 years was 6.5%, compared with 14.4% for those aged 45 to 64 years, and 32% for those aged >64 years.²

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What is a Clinical Inquiry?

Clinical Inquiries answer real questions that family physicians submit to the Family Practice Inquiries Network (FPIN), a national, not-for-profit consortium of family practice departments, residency programs, academic health sciences libraries, primary care practice-based research networks, and individuals with particular expertise.

Questions chosen for Clinical Inquiries are those considered most important, according to results of web-based voting by family physicians across the U.S.

Answers are developed by a specific method:

- First, extensive literature searches are conducted by medical librarians.
- Clinicians then review the evidence and write the answers, which are then peer reviewed.
- Finally, a practicing family physician writes a commentary.

Aneurysm with daughter sac



Daughter sac formation has been associated with an increased risk of aneurysm rupture.

ILLUSTRATION BY TODD BUCK

■ RECOMMENDATIONS FROM OTHERS

The Stroke Council of the American Heart Association recommends that observation is generally appropriate for incidental, small (<10-mm) aneurysms in patients without previous subarachnoid hemorrhage. However, special consideration for treatment should be given to young patients in this group, small aneurysms approaching the 10-mm size, and aneurysms with daughter sac formation (**Figure**). In addition, patients with a family history of aneurysm or aneurysmal subarachnoid hemorrhage deserve special consideration for treatment.

For patients managed conservatively, periodic follow-up imaging should be considered; imaging is necessary if a specific symptom should arise. If changes in aneurysmal size or configuration are observed, special consideration for treatment should be made.⁶

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■ CLINICAL COMMENTARY

Asymptomatic cerebral aneurysms are potentially disastrous, since rupture can result in permanent neurologic disability or death. The diagnosis causes anxiety and fear in many patients. I try to explain to them, in clear and simple language, the minimal risk of rupture if the aneurysm is observed vs the higher risk of surgical intervention. I allow patients to express their fear and anxiety. I also elicit their input into the decision to refer. If their fear and anxiety cannot be allayed, I will refer them to a neurosurgeon. I invite them to return after the referral to discuss any further course of action.

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What findings distinguish acute bacterial sinusitis?

■ EVIDENCE-BASED ANSWER

No combination of clinical findings can reliably distinguish acute viral rhinosinusitis from acute bacterial rhinosinusitis in primary care. Although unreliable, the best clinical predictor of acute bacterial sinusitis is the combination of unilateral nasal discharge and unilateral pain (positive likelihood ratio [LR+], 4.5; negative likelihood ratio [LR–], 0.25) (strength of recommendation [SOR]: **B**).¹ History of purulent rhinorrhea (LR+, 1.5–1.9), maxillary tooth pain (LR+, 2.1–2.5), and purulent secretions in the nasal cavity (LR+, 2.1–5.5) may increase the likelihood of acute bacterial rhinosinusitis. Illness that starts as the common cold and pain on bending forward were not predictors of acute bacterial rhinosinusitis (SOR: **B**).^{2,3,4}

■ EVIDENCE SUMMARY

In one series, 87% of patients with the common cold had an abnormal computed tomography (CT) scan of the sinuses 48 to 96 hours after onset. Abnormalities visible on the CT scan persisted in 20% of patients at 2 weeks, yet epidemiological

TABLE

Clinical prediction rule for acute bacterial rhinosinusitis

Symptoms	PPV
Local pain, unilateral predominance	41%
Purulent rhinorrhea, unilateral predominance	48%
Purulent rhinorrhea, bilateral	15%
Presence of pus in the nasal cavity	17%
Clinical prediction rule: 3/4 positive: positive likelihood ratio = 6.75, negative likelihood ratio = 0.21	
PPV, positive predictive value	

studies have shown that acute bacterial rhinosinusitis develops in only 0.5% to 2% of upper respiratory infections in adults. In primary care, only half of patients with a clinical diagnosis of acute bacterial rhinosinusitis have it proven upon aspiration.⁵

Two studies compared clinical findings with sinus puncture, the reference standard for acute bacterial rhinosinusitis. Berg found 4 independent predictors of aspirate purulence in Swedish emergency room patients with “paranasal” symptoms lasting <3 months (**Table**).¹ Together, unilateral purulent nasal discharge and predominantly unilateral pain predicated purulence on aspiration (sensitivity 79%, specificity 83%, positive predictive value [PPV], 80%). Clinical exam by an otolaryngologist had a PPV of 72%.

While emergency and primary care patients may differ, this study's rate of aspiration-proven sinusitis (43%) is closer to that seen in primary care (50%) than in referral practices (70%–80%). This study's limitations included unclear referral criteria, overlapping clinical predictors, and lack of culture data.

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