Angiogram-Negative Subarachnoid Hemorrhage

Idiopathic or Aneurysmal Hemorrhage?

This case presentation is intended to assess current practice habits for common neurosurgical challenges when class I evidence is not available.

The Case
The patient is a 50-year-old woman with a witnessed sudden onset of severe pancranial headache, nausea and vomiting that progressed to a decreased level of consciousness. She was brought to the emergency room by ambulance within an hour of ictus. Clinical examination demonstrated a Glasgow coma score of 11 (Best Eye, 3; Verbal, 3; Motor 5), with symmetric and reactive pupils and a subtle right hemiparesis. Bloodwork, including coagulation studies, was normal. The CT showed subarachnoid blood centered in the perimesencephalic cistern, but extending into the Sylvian fissures and ambient cisterns bilaterally (see figure). Enlargement of the lateral, third, and fourth ventricles suggested an acute communicating hydrocephalus. This was treated by placement of an external ventricular drain, after which her clinical condition stabilized with a normal level of consciousness and no focal deficits. CT angiography and a subsequent catheter angiogram demonstrated no obvious vessel abnormalities.

Considerations
Despite similar early clinical and radiographic appearances, the incidence, etiology, and natural history of perimesencephalic subarachnoid hemorrhage is significantly different from that of aneurysmal rupture. Perimesencephalic hemorrhage occurs with an annual incidence of 0.5 cases per 100,000 people and is responsible for 15 percent of all spontaneous subarachnoid hemorrhages (2). Its etiology is still uncertain, but current theories include both arterial and venous causes (6). Outcome after perimesencephalic hemorrhage is clearly better than after aneurysmal hemorrhage, with long-term follow-up studies demonstrating equal life expectancy and no higher risk of rebleeding compared with the general population (2, 3).

Differentiating perimesencephalic etiology from other causes of subarachnoid hemorrhage in the acute stage, however, remains a difficult problem, and there is no consensus on the management of spontaneous subarachnoid hemorrhage with a normal initial angiogram. Repeat angiography finds roughly 18 percent of occurrences in those whose initial cerebral angiogram was negative, with the vast majority of initial false negatives occurring with a nonperimes-
Responses: Minimally Symptomatic Cervical Spondylotic Myelopathy


THE CASE
Conservative Management or Surgery for a Patient With Minimally Symptomatic Cervical Spondylotic Myelopathy?

SURVEY RESULTS SUMMARY
The majority (85 percent) of the respondents to this online survey would manage this patient surgically rather than follow him conservatively. For those choosing to not operate, 50 percent would recommend clinical follow-up alone while the other 50 percent recommended both imaging and clinical follow-up.

Of those advocating surgery, slightly more than half would recommend a posterior approach. Specific comments related to the posterior approach included recommending laminectomy alone, laminoplasty over three levels, and laminectomy with fusion. A minority opinion was for both an anterior and posterior decompressive procedure, with one suggestion specifically of disc removal and interbody fusion augmented with plating at C4–C5 and C5–C6 as well as a C3–C6 laminectomy.

CASE COMMENTARY
Respondents to this survey were clearly in favor of surgical decompression in patients such as this, with mild and minimally symptomatic cervical spondylotic myelopathy.

This was an interesting survey result given the variable natural history of this condition and indeed the substantial clinical equipoise when it comes to managing this type of patient population.

Late stage cervical myelopathy rarely improves with treatment. Early stage treatment, such as in the patient presented here, often reverses symptoms and prevents progression. I prefer simple decompression unless a fusion is clearly indicated, but I X-ray yearly and fuse in the few cases that develop deformity with time.

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This patient has obvious myelopathy by clinical and radiographic criteria and has suffered from “worsening” neck pain for two years. It is inappropriate to consider him minimally symptomatic. Furthermore, the term minimally myelopathic represents a contradiction in terms, as any myelopathy is significant. He should be offered surgical treatment before his myelopathy progresses, as it is likely to do within his lifetime. Furthermore, this is precisely the type of patient who is at risk for central cord injury with mild trauma. An anterior cervical decompression and fusion would serve to treat his myelopathy, protect him against future cord injury and address his two-year history of neck pain.

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REFERENCES

encephalic hemorrhage pattern. In patients with a typical perimesencephalic pattern, however, the false negative rate of initial angiography is less than 1.5 percent (4, 5, 8). MRI of the brain and spinal cord have revealed nonaneurysmal causes (pituitary adenoma, spinal arteriovenous malformation) in 4 percent of angiogram-negative SAH cases, but none of these occurred in cases with a typical appearance on CT of perimesencephalic hemorrhage (7).

Ruptured posterior circulation aneurysms can present with a radiographic pattern of perimesencephalic hemorrhage in more than 15 percent of cases. Conversely, there is a 5 percent to 10 percent likelihood of finding a posterior circulation aneurysm in any patient with a perimesencephalic hemorrhage pattern (1). The specific hemorrhage pattern and its differential diagnosis, therefore, should guide decision-making in these cases. NS

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