tionship of cerebral vasospasm to SAH visualized on computerized tomography. Unfortunately, Howington, et al., never specify not only the size of subarachnoidal blood clot and thickness of clot in the cerebral fissures and vertical cistern; they also do not indicate any topographical relationship between the site of the major cerebral subarachnoid blood clots and the location of severe vasospasm in any of their 36 patients who used cocaine.

Among the 47 cases of verified ruptured saccular aneurysms reported by Fisher, et al., they investigated the relationship of the amount and distribution of subarachnoid blood detected by computerized tomography to the later development of cerebral vasospasm. When the subarachnoid blood was not detected or was distributed diffusely, severe vasospasm was almost never encountered (one of 18 cases). In the presence of subarachnoid blood clots larger than 5 × 3 mm (measured on the reproduced images) or layers of blood 1 mm or more thick in fissures and vertical cisterns, severe spasm followed almost invariably (23 of 24 cases). There was an almost exact correspondence between the site of the major subarachnoid blood clots and the location of severe vasospasm. Every patient with severe vasospasm manifested delayed symptoms and signs. Excellent correlation existed between the particular artery in vasospasm and the delayed clinical syndrome. Severe vasospasm involved the anterior cerebral artery in 20 cases and the middle cerebral artery in only 14. As the grading system used at that time (the Fisher, et al., article was published in 1980) was partly subjective, the findings should be regarded as preliminary at the time of their publication. The results, if confirmed, indicate that blood localized in the subarachnoid space in sufficient amounts at specific sites is the only important causative factor in vasospasm. It should be possible to identify patients in jeopardy from vasospasm and institute early preventive measures.

An analysis of the results of Howington and colleagues, this study has also demonstrated with statistical significance that cocaine use directly affects outcome in the management of aneurysmal SAH. When the GOS is separated into scores that cocaine use has such a negative effect on the management of aneurysmal SAH, the group had a negative outcome. Because cocaine use has such a negative effect on the management of aneurysmal SAH, the authors believe that one should consider it equal to the presence of a major systemic illness when determining Hunt and Hess grade and predicting outcome. If it were established that cocaine use was equal to the presence of a major systemic illness, for argument sake, it will then be difficult to justify and explain why such an equivalence to a major systemic disease can also have positive outcome for the patients. Although the number of patients with positive outcome is as small as only three, in reality it is comprised of 8.3% of a total of 36 patients who tested positive for cocaine use on admission to the emergency department in their study during a 6-year period. Under these circumstances, it seems possible to interpret by using the theory that X and Y (two variables) may be highly correlated due to their common correlation with a third variable Z, and in the presence of Z, X has no predictive value.

It is known that the vasoactive properties of cocaine include but are not limited to the many case reports of cocaine-associated SAH. There have been few studies dealing with the drug’s influence on aneurysmal SAH. I want to congratulate Dr. Howington and his coworkers for the good of their work, and sincerely hope that in the near future they can present a focused prospective study to further evaluate cocaine use as a predictor of outcome in aneurysmal subarachnoid hemorrhage.

**References**


**Cavernous Hemangiomas**

To The Editor: We read with interest the recent article by Puca and coworkers (Puca A, Colosimo C, Tirpakova B, et al: Cavernous hemangioma extending to extracranial, intracranial, and orbital regions. Case report. *J Neurosurg* 101:1057–1060, December, 2004) that described an interesting and rare disease in a young woman. The authors discussed many important aspects of extraxial cavernous hemangiomas in detail but did not clearly address the effi-
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cacy of radiation therapy in such cases. At the end of the Discussion, they referred to an article that claims the effects of this modality are unpredictable in these patients. Furthermore, the authors mentioned nothing about radiosurgery for extraxial cavernous hemangiomas.

Abstract
Extraxial cavernous hemangiomas are rare intracranial lesions that can be located in different cranial compartments. Extension across different tissue planes such as the subcutaneous tissue, skull, orbital cavity, intracranial dura mater, and extracranial trigeminal divisions within the same patient has not been previously reported.

This 32-year-old woman suffered left exophthalmos, left sixth nerve palsy, and trigeminal neuropathy. Magnetic resonance imaging studies revealed an extensive multicompartmental lesion, with enhancement following Gd administration.

A left orbitopetoral approach allowed removal of several cavernomatous lesions located in the orbit, frontotemporal dura, and lateral wall of the cavernous sinus. A histologically based diagnosis of extraxial cavernous hemangioma was made. In the postoperative period the patient experienced a regression of her symptoms.

The authors report on a case of cavernous hemangioma with a unique extension to different intracranial/extracranial compartments. Although radical removal of the lesion was not feasible, partial excision allowed for satisfactory clinical control of the patient’s symptoms.

A basic literature search reveals 11 previous reports that describe radiosurgical therapy for this form of cavernous hemangiomas. All of these articles indicate that radiosurgery is very effective against these lesions. The volumes of the tumors in these 11 cases ranged from 1.5 to 11.1 ml, and the margin treatment doses ranged from 12 to 19 Gy. In most cases, magnetic resonance imaging revealed tumor regression after radiosurgery. Recently, we documented our experience with radiosurgical treatment of cavernous sinus cavernous hemangiomas. Five patients with these lesions underwent gamma knife surgery, and the results were very impressive in all cases. The tumor volumes in our series ranged from 3.8 to 6.2 ml, and the mean follow-up time was 32 months. Follow-up examinations revealed almost complete disappearance of two of the tumors and a partial response in the other three cases. None of the patients treated with radiosurgery with extraxial cavernous hemangiomas in the literature, including our five patients, developed complications related to this mode of therapy. In 55% of the cases, the patient’s neurological condition improved.

We stress that radiosurgery is an effective treatment for extraxial cavernous hemangiomas and should be carefully considered in these cases. In contrast to intracerebral cavernous hemangiomas, extraxial cavernous hemangiomas show rapid and significant shrinkage after radiation.

Selcuk Peker, M.D.
M. Necmettin Pamir, M.D.
Marmara University
Istanbul, Turkey

References

RESPONSE: I thank Drs. Peker and Pamir for their comments regarding my article. In their letter, Peker and Pamir stressed the role of radiosurgery in the treatment of cavernous sinus cavernous hemangiomas. Peker and Pamir had recently described five personal cases and discussed 11 more patients reported by other authors, who had been treated by radiosurgery for cavernous sinus cavernous hemangioma. Among these patients (see Table 1 of our article), only four showed a marked radiological response, whereas nine experienced an improvement of their neurological symptoms. In some cases, radiosurgery had been delivered without a previous histological diagnosis of cavernous hemangioma.

A radiological diagnosis of cavernous hemangioma is difficult because of their rarity and similarity with other benign lesions; a definitive diagnosis can be made in most cases only on histological study.

Surgery has to be considered as the primary form of treatment in symptomatic extraaxial cavernous hemangioma, because it permits a histological diagnosis and an immediate decompression of nervous and vascular structures; working around the capsule of these lesions and performing an en bloc removal allows a good control of blood loss.

In our patient, the multicompartmental extension of the disease precludes the possibility of radical treatment; however, excision of the orbital and frontotemporal components resulted in a satisfactory and long-lasting control of this patient’s symptomatology.

Radiosurgery has proved to be an effective alternative form of treatment for extraaxial cavernous hemangiomas; it should be indicated, in my opinion, in cases of symptomatic residual or recurrent lesions that are not good candidates for surgery.

Alfredo Puca, M.D.
Catholic University

References
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