

# Cerebrovascular News

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## Chairman's Message

By [Robert E. Harbaugh, MD, MA](#)

### Partnership Is Paramount for Endovascular Advancement

I want to devote this column to an issue that I think is of paramount importance to the specialty of cerebrovascular surgery: the relationship between the AANS/CNS Section on Cerebrovascular Surgery (CV Section) and the American Association of Therapeutic and Interventional Neuroradiology (ASITN). We recently completed a very successful joint meeting, co-chaired by Greg Thompson, MD, and Buddy Connors, MD. This meeting is emblematic of the benefit to be obtained from the CV Section and the ASITN working together. It also represents what we can hope for if interventional neuroradiology and cerebrovascular surgery collaborate with mutual respect and collegiality at each of our institutions. I am convinced that this kind of collaboration is the best option to develop the field of endovascular treatment of cerebrovascular disease.



*Robert Harbaugh, MD*

Despite the obvious benefits of collaboration, the relationship between the CV Section and the ASITN needs constant attention if it is to flourish. Our relationship was tenuous just before the meeting in Phoenix. I believe that the ASITN came to this meeting considering the option of severing its ties with neurosurgery. Some members of the ASITN are adamantly opposed to further collaboration with neurosurgery, and their rhetoric was one factor that generated concerns about a neurosurgical "plot" to take over the endovascular treatment of cerebrovascular disease.

Another (and I think more substantial) concern involved several examples from around the country where an endovascularly trained neurosurgeon entered practice and commandeered the lion's share of cerebrovascular cases from excellent interventional neuroradiologists. In one case cited by the ASITN leadership, an endovascular neurosurgeon was trained by a superb interventional neuroradiologist, went into practice at the same institution and was immediately doing nearly all of the aneurysm work. Another case involved the recruitment of an endovascularly trained neurosurgeon without consulting a well established interventional neuroradiology group at the same institution. The interventional neuroradiologists found out about the search through the recruitment advertisements. The combination of these kinds of events with vituperative comments from some of their members led the ASITN leadership to seriously consider the possibility that organized neurosurgery was involved, on a national level, in a plan to exclude interventional neuroradiologists from the marketplace.

I spent much of our joint meeting assuring the ASITN leadership that no such plan exists. As chair of the AANS Endovascular Task Force and chair of the CV Section, I would know of such a plan if one existed, and I know of no such plan. Neurosurgery is committed to training neurosurgeons in endovascular techniques and in making endovascular exposure part of neurosurgical residency requirements, but we would much prefer to do this with our colleagues in interventional neuroradiology rather than

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against them.

At the end of the Phoenix meeting the Joint Council of Cerebrovascular Disease (the officers of the ASITN and CV Section) met and committed our organizations to continued collaboration. We are considering a "retreat" to generate recommendations for collaborative arrangements between interventional neuroradiologists and neurosurgeons. Dissemination of these recommendations by organized neurosurgery to neurosurgical practices around the country might help prevent some of the events that have generated the ASITN's concerns. I am also hopeful that the ASITN leadership will join the CV Section leadership in a commitment to work together on the NATURE trial, a North American randomized trial of clipping versus coiling for the treatment of intracranial aneurysms. It is clear to me that our patients, the specialty and both organizations will benefit from continued close collaboration between the CV Section and the ASITN. The CV Section leadership is committed to making this happen.

## Notes From the Editor

By Robert M. Friedlander, MD, MA

### A Case for Collaboration

It is becoming increasingly clear that the fostering of a collegial partnership between open vascular neurosurgery and interventional neuroradiology will be essential for the proper and most effective advancement of patient care. The relationship between the representative organizations, the AANS/CNS Section on Cerebrovascular Surgery (CV Section), and the American Society of Interventional and Therapeutic Neuroradiology (ASITN), has progressively matured. This relationship has matured in the face of both potential, and real, rivalry. It has not all been "rosy," but the relationship has developed in a very positive, and for the most part cooperative, manner.

However, the relationship clearly has a long way yet to go. If at the end of the journey we are all to feel satisfied from an ethical, moral, and professional stance, I propose that the CV Section and the ASITN need to accomplish the following goals:

1. We need to foster collaboration in order to develop adequate clinical trials, which will provide valid results regarding safety and equally important efficacy/durability of the therapeutic interventions.
2. Regarding patient selection, both sides have to be willing to randomize appropriate patients (this might mean giving up some patients).
3. Publication of trial results needs to be viewed objectively, clearly pointing out both the strengths and weaknesses of the study. Great care is required when communicating with the public media regarding study findings.
4. The professional associations need to closely work together, and not undermine each other's efforts.

As we progress to determine how to perform adequate clinical trials, as well as exactly what to evaluate, I believe that the above opinions represent key goals. I hope that in the next few months, we all come together to continue to develop methods to address the crucial questions facing our subspecialty.

## New Business

By Robert M. Friedlander, MD, MA

*Vote at the CV Section Business Meeting, Wednesday, April 30 at 5:30 p.m.*

At the Executive Council meeting in Phoenix on Feb. 18, the AANS/CNS Section on Cerebrovascular Surgery recommended that the following items be presented for vote at the CV Section's business meeting on April 30, immediately following the section's scientific session (5:30 p.m.) during the AANS Annual Meeting.

1. Name change from the AANS/CNS Section on Cerebrovascular Surgery to the AANS/CNS Cerebrovascular Section.
2. Approval of a new officer position, vice-chair, which will have a one-year term.  
*Description of the new position:* Mature, with experience in an executive position in national, regional, or state neurosurgical or professional societies. CV Section Executive Committee experience is desirable, but not necessary. Must be articulate, knowledgeable in parliamentary procedures with proven communicative abilities as shown by speeches, lectures, publications, etc. Familiarity with operating in the consensus mode and has demonstrated proven abilities to work harmoniously with colleagues and associates. Must be able to relate effectively to all internal and external interfaces of the CV Section.
3. Nominations for officers:  
Chair-Elect - Philip Stieg, MD  
Vice-Chair - Marc Mayberg, MD  
Secretary - Joshua Bederson, MD  
Member at Large - Felipe Albuquerque, MD

## What Would You Do?

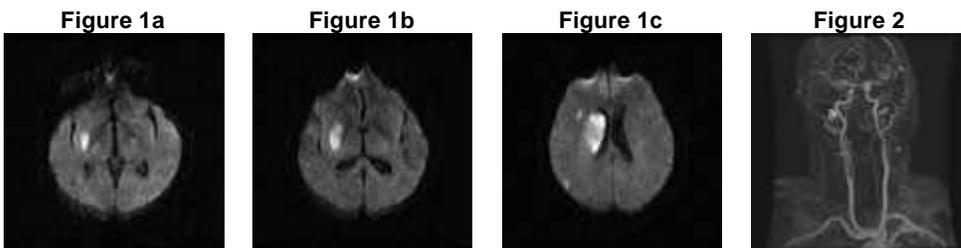
The patient is a 62-year-old, right-handed Caucasian male who awoke at 4:30 a.m. unable to get out of bed due to the new onset of left lower extremity weakness. He returned to sleep. Four hours later his strength had significantly improved, though his family noted persistent left leg weakness and dysarthria. Two hours later the left lower extremity weakness clearly worsened. He was transported to the emergency department where a head CT scan showed hypodensity in the right caudate. His physical exam was notable for a right carotid bruit, dysarthria, a left facial droop, mild left hip flexor weakness, mild pronator drift, and an unsteady gait. Mental status was intact.

Past medical history is remarkable for coronary artery disease. He had suffered an inferior myocardial infarction, and underwent a coronary artery bypass graft 10 years ago. He is hypertensive and has elevated cholesterol. Both are well controlled and are being appropriately treated. He has been taking aspirin (325 mg) every day for the past 10 years. His cardiologist has cleared him for the procedure you recommend.

Brain MRI on diffusion-weighted imaging demonstrates an area of acute infarction in the right basal ganglia (Figure 1, a-c). Additionally, two small areas of infarction were identified in the right frontal and right parietal lobes (Figure 1c). The MRA demonstrates 70 percent stenosis of the right internal carotid artery (Figure 2). The left internal carotid artery is clear. The findings are reconfirmed by ultrasound.

What would you do?

Click image to view larger picture.



Please take a few moments to submit your response to this edition of What Would You Do? This case closes July 31.

What would you do?

- Anticoagulation, and follow up imaging at regular intervals.
- Anticoagulation followed by repair of right internal carotid artery lesion.

40                      60                      80

Urgently (<24 hours)                                                                 

Acutely (within 2-3 days)                                                                 

Delayed (4-6 weeks)                                                                 

How should it be repaired?

Right carotid endarterectomy:                                                                 

    General anesthesia?                                                                 

    Regional anesthesia?                                                                 

Right carotid stent:                                                                 

    General anesthesia?                                                                 

    Regional anesthesia?                                                                 

Additional comments:

## What Would You Do? Expert Opinions

*Please note that the discussion of the results to this and all "What Would You Do" cases does not represent the opinion of the AANS/CNS Section on Cerebrovascular Surgery nor does it represent standard of care. No formal medical recommendation regarding any specific case can be provided by the below summary of opinions.*

### The Case

This case was presented in the Winter 2002 issue of *Cerebrovascular News*, available at <http://www.neurosurgery.org/cv/newsletter/winter02/wwyd.html>.

The patient is a 7-year-old African-American male. He first presented to medical care eight months ago with a mild right hemiparesis. A computed tomography scan revealed no abnormalities. Magnetic resonance imaging showed a small left internal capsular/thalamic lacunar infarct, without hemorrhage. The MR angiogram showed multiple aneurysms, and cerebral angiography was done. Approximately 23 fusiform intracranial aneurysms were demonstrated, ranging in size from 2 mm to 15 mm. In addition, there were angiographic stigmata consistent with "arteritis" with beading, and zones of mild focal stenosis.

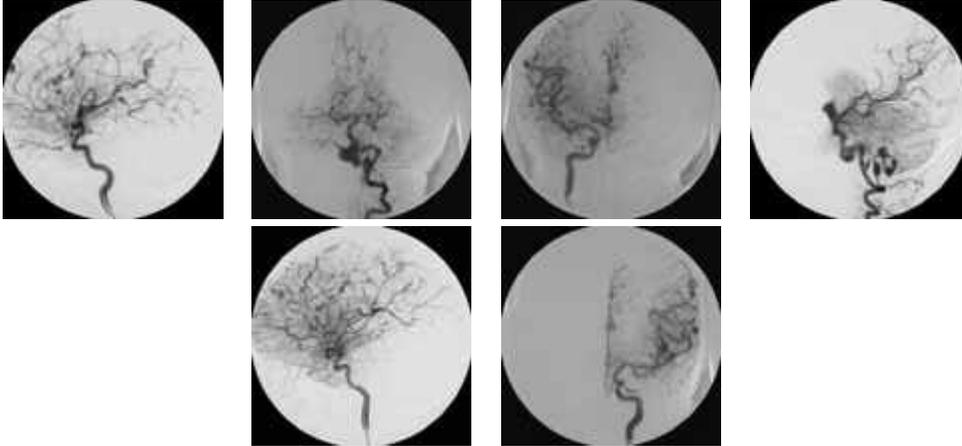
He has no family history of intracranial aneurysms, polycystic renal disease, or other cardiovascular disorders.

Investigations reveal no abnormality of his systemic circulation or heart or great

vessels. He does not have polycystic disease. He is small for his age -- in the third percentile for height. Skin biopsy reveals no abnormality of collagen synthesis, and a procoagulant screen was negative. He tested negative for human immunodeficiency virus, and has no other systemic illness. A cerebral angiogram repeated five months after the first reveals approximately 50 percent enlargement of the aneurysms of the basilar trunk and pica.

What would you do?

Click image to view larger picture.



### Expert Opinion

Opinions on the management of this case have been provided by the following experts: [Kai U. Frerichs, MD](#); [Sean D. Lavine, MD](#) and [E. Sander Connolly Jr. MD](#); and [Robert F. Spetzler, MD](#)

This child has multiple intracranial aneurysms involving all vascular territories in both proximal and distal vessels, and suffered a small stroke. Two of the posterior circulation aneurysms have recently enlarged. Many of the aneurysms appear to be fusiform.

Factors influencing aneurysm development in children are different from adults. Most adult aneurysms form as a result of hemodynamic stress. In children, there is a relatively higher incidence of infectious and traumatic aneurysms. This may be due to a higher susceptibility of the vascular tree of children to extrinsic insults. Certain genetic disorders and associated syndromes can be associated with both a short stature, as reported in this patient, and cerebral aneurysms. In the majority of cases, dwarfism is caused by genetic and metabolic disorders, many of which are readily recognized. Other causes of proportional short stature include malnutrition.

This patient apparently has no other systemic illnesses, including kidney disease and large vessel or heart abnormalities, eliminating aortic coarctation and polycystic kidney disease, among others, as an etiology.

Workup for problems with collagen synthesis was apparently negative which should eliminate Ehlers-Danlos syndrome, and other collagen deficiency states associated with cerebral aneurysms, some of which can be associated with dwarfism. Fibromuscular dysplasia (FMD) can be associated with both cerebral aneurysms and beading of arteries, but the beading typically occurs more proximal in the internal carotid arteries in FMD. Furthermore, there is presumably no renal involvement or hypertension in the history. Although there have been case reports of both extra- and intracranial aneurysms in children with FMD, the distribution, type and number of aneurysms observed in this boy would be exceedingly unusual. The beading of intracranial arteries in hereditary hemorrhagic telangiectasia can be associated with

intracranial aneurysms, but not with dwarfism. In addition, epistaxis and skin lesions are absent from the history. Polyarteritis nodosa rarely involves the cerebral vasculature, but there have been several case reports of even multiple aneurysms and strokes associated with this disease. Other disorders associated with multiple aneurysms include lupus erythematosus, pseudoxanthoma elasticum, moyamoya disease, tuberous sclerosis, Marfan's syndrome, alpha-1 antitrypsin deficiency, and lupus erythematosus.

Traumatic aneurysms account for about 5 percent to 15 percent of pediatric aneurysms and frequently are located peripherally and adjacent to the falx. Major vessels along the skull base, however, may also be affected. A beading pattern as observed in this patient, however, would be unusual. In addition, the head CT shows no evidence of traumatic injury that one would expect.

Infectious aneurysms account for about 5 percent to 15 percent of pediatric aneurysms. The most common offenders are staphylococcus and streptococcus species but can involve other organisms and fungi. Children infected with human immunodeficiency virus (HIV) have an increased incidence of multiple aneurysms and AIDS related vasculopathy and stroke associated with severe immune suppression. Short stature in these patients also is not uncommon. This patient, however, is testing HIV-negative.

Without a definitive diagnosis, I would be hesitant to consider invasive treatment for the posterior inferior cerebellar or basilar aneurysm, which have enlarged but have remained asymptomatic. These vessels could be quite friable and the morbidity from either clipping or stenting may be very high. Ideally, a diagnosis can be obtained either from CSF studies or from an excisional biopsy of one of the peripherally located aneurysms. If these are infectious aneurysms, they may require antibiotic therapy, in case of an autoimmune process, steroids may be the appropriate therapy.

Kai U. Frerichs, MD  
Boston, Mass.

Given the patient's age and progressive presentation, these intracranial aneurysms are most likely the result of some active arteropathy or arteritis. The etiology of this vasculopathy is most likely infectious, but autoimmune or neoplastic etiologies cannot be ruled out. The fact that he initially presented with left internal capsule infarction despite the lack of evidence of disease involving the left intracranial aneurysm leads one to hypothesize that the source of the aneurysms may be distant or embolic. Alternatively, the process may be entirely intracranial, but, if so, capable of involving small angiographically occult perforating vessels as well as larger named branches of the circle of Willis.

Whatever the case, biopsy of a peripheral aneurysm, like the one on the right callosomarginal artery, would be quite useful in determining the etiology of this vasculopathy. Antibiotics, immunosuppression or chemotherapy could then be instituted to help stabilize or possibly reverse the process. Direct or endovascular repair is not advisable until the pathophysiological process is identified, as long as the patient has not bled. Diseased vessels may not support a clip, coil or even a stent. In addition, there is no guarantee that repair by one of these techniques, even if temporarily successful, will result in permanent local or generalized cure.

Sean D. Lavine, MD  
New York, N.Y.

E. Sander Connolly Jr., MD  
New York, N.Y.

This is a most difficult case and certainly not intervening at all remains a very reasonable option.

I have seen approximately eight to 10 cases of vascular dysplastic disease resulting in enlarged vessels and aneurysmal dilatations without an identifiable cause over the past

20 years. It is noteworthy that a significant number stabilize and remain symptomatically and angiographically unchanged over a decade. In one such patient, endovascular occlusion of a dysplastic intracranial aneurysm resulted in a giant basilar artery aneurysm formation over the following three years. Thus, occluding vessels to treat an enlarging lesion is fraught with risk of additional vascular stress to the remaining dysplastic vessels in patients with this disorder.

Certainly I would explore the option of endovascular treatment of the enlarging basilar artery aneurysm. Unfortunately, we do not have the injection of the other vertebral artery, and I suspect that there will be vessels emanating from the enlarging basilar artery aneurysm. I have used bypass in conjunction with vessel occlusion or wrapping of aneurysms to address the specific symptomatic or enlarging aneurysms. I think it is reasonable to attempt treatment in this fashion -- if enlargement is documented or the patient becomes symptomatic -- with the hope that the disease becomes dormant as it has in other patients.

Robert F. Spetzler, MD  
Phoenix, Ariz.

## Preview of the 2003 AANS Annual Meeting

[Deepa Soni, MD](#) and [Robert M. Friedlander, MD, MA](#)

### Preview of the 2003 AANS Annual Meeting in San Diego, Calif.

The rapidly approaching 71st Annual Meeting of the AANS has a full and exciting program planned in the area of cerebrovascular disease. The meeting will be held in sunny San Diego April 26-May 1. In keeping with this year's theme, "Cultural Connections: Bringing Global Perspective to Neurosurgery," the cerebrovascular program addresses a diverse and international array of topics.

The cerebrovascular activities actually begin on Friday, April 25, with the Japanese-American Neurosurgical Friendship Symposium. Akio Morita, MD, will kick off the vascular sessions with his talk "Clinical Survey of Unruptured Aneurysm." Kiyonobu Ikezaki, MD, will deliver a talk titled "Surgical Methods for Moyamoya Disease." Akira Ogawa, MD, will discuss "Indications for Bypass Surgery and Selection of Procedure." In the afternoon session, Takashi Yoshimoto, MD, and Robert Spetzler, MD, will moderate a session entitled "Endovascular Surgery in Neurosurgery." Finally, we will hear from Waro Taki, MD, and Akira Takahashi, MD, in their talks entitled "Management of Dural AVM" and "Clipping Versus Embolization for Aneurysm," respectively.

The AANS meeting starts with two full days (April 27-28) of practical clinics. On Saturday Daniel Barrow, MD, and Jacques Morcos, MD, will co-direct the all-day clinic "Cerebrovascular Disease 2003: Indications, Treatment Options, and Complications." On Sunday morning the very popular half-day clinic "Multidisciplinary Management of Cerebrovascular Critical Care," co-directed by Perry Ball, MD, and Joshua Bederson, MD, will be offered, as well as the clinic "Practical Aspects of Endovascular Techniques for the Practicing Neurosurgeon," directed by Michael Horowitz, MD, and Robert Rosenwasser, MD. Finally, on Sunday afternoon the half-day clinic entitled "Technical Management of Intracranial Aneurysms: Site Specific Surgical Anatomy, Operation, Intervention, and Complication Management" will be directed by Arthur Day, MD.

The official scientific program begins bright and early on Monday, April 28, with the popular breakfast seminars. On Monday, four "vascular" breakfast seminars will be offered. First, Gary Steinberg, MD, moderates the session "Multidisciplinary Management of Cerebral AVMs." Additionally, "Modern Perspectives of Treatment Paradigms for Vasospasm," led by Robert Macdonald, MD; "Stroke Centers: Strategies for Developing an Effective Program in Your Practice," led by Demetrius Lopes, MD; and "Management of the Asymptomatic Vascular Lesion" moderated by Christopher Loftus, MD, will be offered.

Monday morning's Plenary Session begins with two talks of interest to cerebrovascular neurosurgeons including: "Eleven Years' Experience of GDC Embolization of Cerebral Aneurysms," with Robert Rosenwasser, MD, as the discussant, followed with the Richard C. Schneider Lecture by Madjid Samii, MD, "Skull Base Surgery Today— After 35 Years of Experience." Scientific Session V will be held on Monday afternoon, and it is completely devoted to 10 interesting vascular topics, ranging from carotid angioplasty to multimodality vascular imaging studies. In addition, Michael Scott, MD, will lead a discussion entitled "The Prognostic Factors of Childhood Moyamoya Disease" in the afternoon during Scientific Session IV, the pediatric session.

On Tuesday morning five breakfast seminars devoted to vascular topics start the day. First, Albert Rhoton, MD, will moderate the session "Cerebral Venous System: Surgical Considerations." Arthur Day, MD, will moderate a session entitled "Consultants Corner: Difficult and Controversial CV Cases." Daniel Barrow, MD, will lead a seminar entitled "The Anatomy and Treatment of Dural AVMs." Finally, the seminars "Perioperative Management of Subarachnoid Hemorrhage: Improve Post-Operative Outcomes" and "How I Do It: Vascular Microsurgery," will be led by Neil Martin, MD, and Robert Spetzler, MD, respectively.

The Scientific Plenary Session II on Tuesday concludes by honoring Stewart Dunsker, MD, with the Cushing Medal, followed by the Cushing Oration delivered by Henry Kissinger, PhD. On Tuesday afternoon Charles Prestigiacomo, MD, will address an important part of vascular history when he delivers his talk "Historical Perspectives on the Microsurgical and Endovascular Treatment of Cerebral Aneurysms."

Wednesday begins with four fascinating breakfast seminars: Daniele Rigamonti, MD, will moderate "Treatment Dilemmas of Cavernous Malformations"; Lorenzo Munoz, MD, will lead "Treatment Options and Complications in Posterior Circulation Aneurysms"; Hunt Batjer, MD, will moderate "Coil Versus Clip"; Christopher Loftus, MD, will moderate "High Risk Carotid Patients: Surgery Versus Endovascular Therapy"; and Warren Selman, MD, will moderate "Brain Attack: Revolutionary Strategies in the Prevention and Treatment of Strokes."

Highlights of Wednesday's Plenary Session include the Rhoton Family Lecture by Rear Admiral James Johnson, followed by "Matrix: Bioabsorbable Polymeric Material Coils for the Treatment of Brain Aneurysm: Preliminary Clinical Results" with Alex Alejandro Berenstein, MD, as the discussant. M. Gazi Yasargil, MD, will deliver the first Theodore Kurze Lecture.

The AANS/CNS Section on Cerebrovascular Surgery session will be held on Wednesday afternoon, and will feature 10 vascular talks addressing such topics as designing vascular clinical trial in treatment of cerebral aneurysms. Participants of the clinical trial session are John Marler, MD, Robert Harbaugh, MD, and Alexander Norbash, MD.

The conference concludes on Thursday with two breakfast seminars of high interest to cerebrovascular neurosurgeons. Ralph Dacey, MD, will moderate "Advanced Techniques and Complications in Aneurysm Clipping," and Evandro De Oliveira, MD, will lead the discussion on "Correlative Microvascular Anatomy as a Guide to Better Surgery." A special vascular course, "International Trends in the Treatment of Cerebral Aneurysms," will be led by Roberto Heros, MD, also on Thursday morning.

Finally, do not miss the cerebrovascular posters. They will be displayed daily, and the authors will make their posters presentations on Monday from 2:00 to 2:45 p.m.

For additional information about the 71st AANS Annual Meeting, go to <http://www.neurosurgery.org/aans/meetings/2003/index.html>.

## **A Review:**

### **Sixth Annual Joint Meeting of the AANS/CNS Section on Cerebrovascular Surgery and the American Society of**

## Interventional & Therapeutic Neuroradiology

By [By Murat Gunel, MD](#)

The Sixth Annual Joint Meeting of the AANS/CNS Section on Cerebrovascular Surgery (CV Section) and the American Society of Interventional and Therapeutic Neuroradiology (ASITN) was held in Phoenix from Feb. 15-19. There were 127 outstanding poster presentations, and 100 oral papers were discussed. The result was a scientifically rich meeting highlighted by many lively discussions.

An afternoon session on Saturday, Feb. 15, overlapped with the American Stroke Association (ASA) meeting and was jointly organized by the CV Section, the ASITN, and the ASA. Practical courses were held the next day, including "Special Techniques in Microsurgical Aneurysm Surgery at the Barrow Neurological Institute," as well as "Acute Stroke Interventional Management," "Critical Care Management in the Neurological ICU" and "Endovascular Management of Aneurysms." The Opening Reception followed these courses in the afternoon.

The first scientific symposium focused on the prospective and randomized trials in treatment of cerebrovascular aneurysms. Among the discussants, David Piepgras, MD, updated the data from the International Study on Unruptured Intracranial Aneurysms, and the rest of the morning was devoted to the discussion of the controversial results of the International Subarachnoid Aneurysm Trial. The argument was then made for a randomized clip versus coil trial.

Following the outstanding luncheon segments, Randall Higashida, MD, gave the ASITN Presidential Address, which was mainly devoted to future imaging and endovascular therapeutic technologies. The afternoon scientific session was on the topic "Controversies in the Treatment of Vascular Malformations"; discussions included arguments regarding the best treatment strategies for midgrade cerebral AVMs and the role of embolization for cerebral AVMs in general. Sander Connolly, MD, argued that the best treatment for mid-grade cerebral AVMs is surgery as opposed to radiosurgery as presented by Bruce Pollock, MD. John Spellman, MD, discussed the role of embolization for cerebral AVMs and Jacques Morcos, MD, defended the point of view that embolization has limited indications. Michael Marks, MD, gave an overview with the approach that target embolization is the key to therapy.

On Tuesday, "Treatment of Acute Stroke and Carotid Atherosclerosis" was the topic for the scientific symposium, which was divided into two sessions. Presentations on the treatment of acute ischemic stroke included speeches by James Grotta, MD, Gary Nesbit, MD, and Warren Selman, MD. The treatment of carotid occlusive disease was discussed by John Connors, MD, Randall Higashida, MD, Christopher Loftus, MD, and Lee Guterman, MD. The afternoon session began with the CV Section Presidential Address by Robert Harbaugh, MD, followed by a scientific symposium focused on neuromonitoring and neuroprotection, neuroanesthetic concerns and critical care and treatment of vasospasm. Joshua Bederson, MD, and William Lanier, MD, moderated this symposium. The topic "Neuroanesthetic Concerns and Critical Care" was presented by Tod Sloan, MD, and William Young, MD, whereas Christopher Ogilvy, MD, Robert Rosenwasser, MD, and Wade Smith, MD, discussed "The Current Treatment of Vasospasm."

The Wednesday morning scientific symposium was devoted to intracranial atherosclerotic disease and included speeches from Daryl Gress, MD, on the natural history and medical management along with Gregory Thompson, MD, who discussed patient selection for revascularization. Then John Connors, MD, presented the topic "The Options and Results of Endovascular Therapy for Intracranial Atherosclerotic Disease." The grand finale for the meeting was the Luessenhop Lecture by Robert E. Spetzler, MD, on the topic "Surgical Management of the Perforators: The Real Key to Operative Success."

Next year's meeting is scheduled to be in San Diego, Calif., February 1-4, once again overlapping with the ASA meeting.

## Endovascular Corner

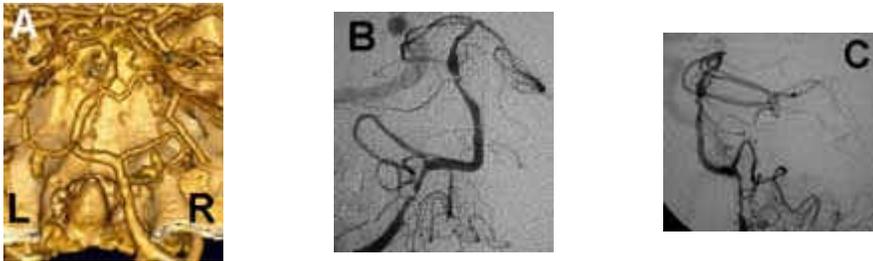
### A Case of Urgent Basilar and Vertebral Artery Revascularization With Angioplasty and Stenting

By [Kai U. Frerichs, MD](#)

A 67-year-old man experienced the sudden onset of a left oculomotor palsy, dysarthria and left ptosis. Magnetic resonance imaging (MRI) revealed a left paramedian midbrain stroke extending into the left thalamus. Intravenous heparin and aspirin was started by the neurology team. A computed tomography angiogram (CTA) appeared to indicate mild to moderate stenosis of the distal basilar artery (Figure A).

The patient initially stabilized. On hospital day four, however, his mental status began to fluctuate, but this condition was improved by increasing the mean arterial pressure. Plans were made to perform catheter angiography on the following morning, but the patient could not be aroused despite hypertensive therapy.

Click images to view larger picture.



**Figure A:** Admission computed tomography angiogram shows moderate distal basilar artery stenosis. A vessel overlies a short segment of the midbasilar artery.

**Figures B and C:** Preprocedural right vertebral artery digital subtraction angiography reveals a focal stenosis in the midbasilar artery as well as right vertebral artery in anteroposterior (**B**) and lateral (**C**) projections.

An emergent MRI did not reveal an extension of his brainstem stroke, and he was taken emergently to the angiography suite. Cerebral angiography revealed a right dominant vertebral artery. Flow-limiting, high-grade stenoses were found in a focal spot in the midbasilar artery and in a segment of the right vertebral artery (Figures B and C). This was not appreciated on the pre-angioplasty CTA (Figure A). Neither posterior cerebral artery was filling from the vertebral injection. Predilation of both lesions was carried out with balloon angioplasty followed by stenting, effectively restoring the normal lumen at each site (Figures D and E). Flow improved and the right posterior cerebral artery was now filling antegradely from the vertebral injection, although sluggishly. The left posterior artery continued to be filled by a large left posterior communicating artery. The patient awoke from the procedure and his mental status normalized. He was eventually discharged to rehabilitation.

Click images to view larger picture.



**Figures D and E:** Right vertebral artery digital subtraction angiography after angioplasty and stenting of each lesion reveals restoration of the normal vessel lumen at each site and antegrade filling of the right posterior cerebral artery in anteroposterior (**D**) and lateral (**E**) projections.

The most likely initial event for this patient was distal basilar partial or complete thrombotic occlusion with extension of clot into the left P1 segment. Occlusion of the left P1 segment appears to have caused the midbrain and thalamic infarct. The observed narrowings of the basilar and vertebral artery, however, appear to have produced the pressure-dependent alteration of mental status.

Interestingly, the initial CTA failed to reveal both high-grade stenoses. CTA is clearly beneficial for the noninvasive evaluation of intracranial aneurysm morphology, and it is beneficial in the early phase assessment of acute thromboembolic stroke during the triage phase. Where atherosclerotic lesions are concerned, however, the potential technical limitations of CTA may risk seriously underestimating the significance of the stenosis, and catheter angiography for principal diagnosis in these patients may be the study of choice.

## Technology Report

By [E. Sander Connolly, Jr., MD](#) and [Sean D. Lavine, MD](#)

On Sept. 11, 2002, a new intracranial stent received a humanitarian device exemption from the Food and Drug Administration: The Neuroform Microdelivery Stent System features an array of self-expanding nitinol stents ranging in size from 2.5 mm diameter x 10 mm length to 4.5 mm diameter x 20 mm length. These stents have been approved for use with embolic coils for the treatment of wide neck (4-12 mm or neck-to-dome > 0.5), intracranial, saccular aneurysms arising from a parent vessel with a diameter 2.0-4.5 mm.

Placement of the stent is facilitated by a use of a highly flexible, 3F (1 mm diameter) microdelivery catheter, a 2F stabilizer catheter and four radiopaque marker bands on each end of the stent. Occlusion of perforating vessels is minimized by the porous nature of the stent (Figure 1, A-C).

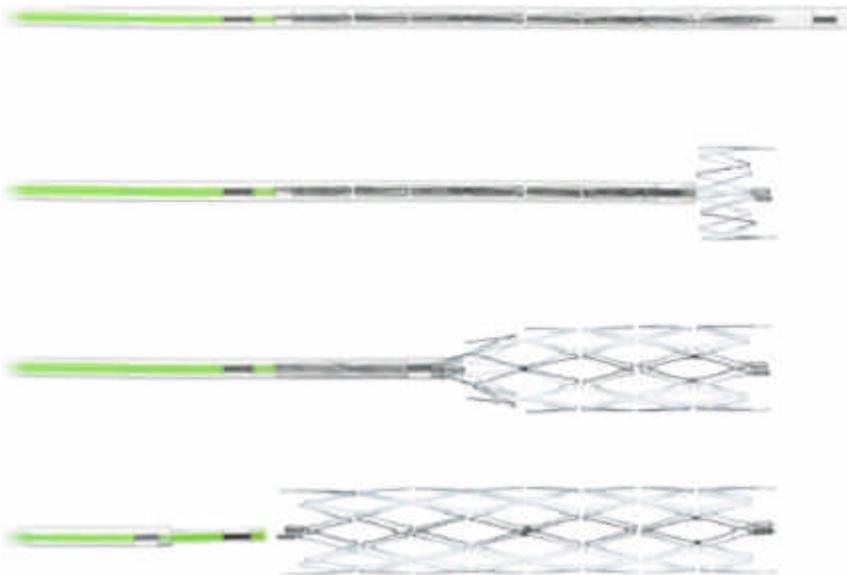


Figure 1A



Figure 1B



Figure 1C

Since release of the device in early September, several centers in the United States have begun trials, but as yet there is no data on its safety and efficacy. What is known comes from a European registry of 29 patients who had 39 stents placed to treat 30 aneurysms. Carotid ophthalmic and posterior communicating artery aneurysms accounted for nearly half of all cases (24 percent each). Mean neck-to-dome ratio was 0.67 (range 0.4 to 1.3). A stent was successfully deployed across the neck of the aneurysm in every case, and the aneurysm was successfully accessed through the stent in all but 2 cases.

While only 57 percent of aneurysms were judged to be completely occluded upon examination of discharge angiography, all aneurysms were judged > 95 percent occluded. There were no instances of stent stenosis or migration, and no cases of parent vessel thrombosis, occlusion or dissection. Twenty-six of the 29 patients had six-month follow-up interviews, with only one patient (4 percent) demonstrating neurological worsening when compared to preoperative status, but one of the three unavailable for follow-up died as a result of the procedure (3.4 percent). In fact, despite the low incidence of permanent neurological deterioration, complications were common with 57 percent (17 of 29) experiencing at least one adverse event and 17 percent (5 of 29) experiencing at least one serious adverse event. Serious events included death, aneurysm perforation, arterial perforation, subarachnoid/intraventricular/intracerebral hemorrhage, and thromboembolic stroke (Table 1).

Serious Adverse Event <sup>1</sup>	n (%)
Death <sup>2</sup>	1 (3.4%)
Aneurysm Perforation <sup>2,3</sup>	2 (6.9%)
Arterial Perforation <sup>4</sup>	1 (3.4%)
Subarachnoid/Interventricular Hemorrhage <sup>2,3</sup>	1 (6.9%)
Thromboembolic Stroke <sup>4</sup>	1 (3.4%)
Intracerebral Hematoma <sup>4</sup>	1 (3.4%)
Left Hemiparesis <sup>4</sup>	1 (3.4%)
Intraparenchymal Bleeding <sup>3</sup>	1 (3.4%)
Retroperitoneal Hematoma <sup>5</sup>	1 (3.4%)
Confusion <sup>6</sup>	1 (3.4%)

While it is unclear which of these complications was due to the use of the neuroform stent per se, anecdotal experience has shown that stent deployment, as well as coiling through the stent, can present unique challenges. It is hoped that with increased experience that complication rates will fall. Nevertheless, as this technology proliferates longer follow-up will be necessary to ensure that parent vessel stenosis or occlusion doesn't develop and that the incidence of thromboembolic stroke is not increased when compared to patients undergoing Guglielmi detachable coil treatment alone or surgical clipping. For further information on the European trial, refer to the FDA Web site: <http://www.fda.gov/cdrh/pdf2/H020002b.pdf>

## Neurosurgery Fellowships

*\$50,000 in fellowships is available for research opportunities in neuronal protection or outcomes*

Grants totaling \$50,000 for research in neuronal protection or outcomes are provided by Anspach Companies and jointly sponsored by Anspach and the AANS/CNS Section on Cerebrovascular Surgery.

- Two \$25,000 grants are available for original research in cerebral ischemia, cerebral protection, neuronal recovery, or outcomes.

- Eligible applicants must have completed their formal neurosurgical training by July 2003 and must have been in academic staff positions for no longer than four years. Physicians in U.S. and Canadian institutions may apply.
- Award recipients are selected by an independent panel of physicians. All grants are subject to the execution of a mutually acceptable agreement between the recipient and Anspach Companies. The results of research supported by Anspach Fellowships may be submitted for publication by the fellowship recipient, subject to prior review by Anspach Companies.

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To request an application, contact the Anspach Fellowship Coordinator at Bruce Leeb & Company by phone (201) 703-6100, fax (201) 703-6101, or e-mail at [info@blc1.com](mailto:info@blc1.com).

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The newsletter is distributed to all members of the AANS/CNS Section on Cerebrovascular Surgery. The purposes of the newsletter are to:

- Promote communication among section members.
- Promote communication among the section's Executive Council and the members.
- Promote coordinated activities and a common purpose within the section.
- Inform the membership of research, educational, and employment opportunities.
- Inform the membership of new technical developments in the treatment of cerebrovascular disease.
- Promote research, patient care, and educational activities of the section.

## Thank You, Sponsors

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