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Highlights of the First Congress of the World Federation of Interventional and Therapeutic Neuroradiology, October 11–13, 1991, Zurich, Switzerland

Allan J. Fox¹

The First Congress of the World Federation of Interventional and Therapeutic Neuroradiology (WFITN) took place in Zurich from October 11 through October 13, 1991, concurrent with the meeting of the European Society of Neuroradiology, and following that of the International Congress of Head and Neck Radiology. Of 826 delegates present for the exciting week, 548 individuals registered for the inaugural gathering of the WFITN. This certainly was a testament to the growing importance of this young subspecialty as well as a reiteration of the need for this type of international forum.

The scientific program arranged by the Congress Presidents Anton Valavanis and Jacques Moret included a mixture of invited presentations by leaders in the field, more than 70 scientific papers and more than 40 poster presentations covering all the major topics of endovascular and percutaneous interventional neurotherapeutic procedures assisted by imaging. Meeting halls were filled to overflowing, and, for some sessions, extra seating needed to be urgently brought in.

Opening Address

The opening address by the first President of the WFITN, Alex Berenstein, was a short, clear, and eloquent statement of the *raison d'être* of this Federation: to be an open forum for all practitioners of this field, regardless of country or specialty of origin, to set high standards for training and practice, and to assist regions in need for augmentation of skills and experience in interventional neuroradiology. He predicted that, as the field comes of age, a bridge will develop between the associated specialties, mainly diagnostic neuroradiology and neurosurgery. Training programs will also evolve for individuals to gain competence in the important aspects of imaging, neurologic assessment, and neurologic care in addition to the techniques of neurointervention. There may be bypassing of some of the current basic prerequisites of diagnostic radiology, such as barium enemas, or of neurosurgery, such as craniotomy. Embolization procedures have evolved in safety, efficacy, and cost effectiveness while, at the same time, there has been a maturation of scientific endeavor and creativity.

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Cerebral Aneurysms

The program began with a special focus session on endovascular treatment of cerebral aneurysms with presentations by Debrun, Moret, Guglielmi, and Eskridge, respectively, covering the topics of extradural aneurysms, endovascular occlusion, electrothrombosis with detachable coil, and angioplasty. During the discussion period, Yasargil commented upon Moret's series of endosaccular occlusion of aneurysms (112 patients treated, including 28 cases treated within 3 days of acute hemorrhage). He expressed disappointment with the current results, especially in the acute group which showed a greater than 20% mortality. Some of these patients may not have been candidates for surgical clipping, even in the most skilled hands, justifying a somewhat higher mortality than that usually quoted of surgery. However, the enthusiastic presentation heard just a couple of years ago, suggesting that balloons were a good substitute for clips, was absent. Regarding confidence in the balloon system, Moret himself now adds platinum coils to his armamentarium of aneurysm-filling materials.

The exciting series of 39 patients treated by Guglielmi and colleagues with the electrolytic Guglielmi detachable (GDC) coil was well received. Almost half of the patients presented with hemorrhage, and more than two thirds with large "necks"—almost all of these with small necks have been completely obliterated by coils, sometimes with more than one stage of treatment. Assessment was by angiography and MR (platinum produces no serious metallic artifacts on MR). There was one death (by aneurysm rupture) in this series, one permanent deficit (hemianopsia), and two asymptomatic coil migrations.

Clearly, there is great enthusiasm for the potential of the coil technique, and no fewer than six proffered papers from different parts of the world demonstrated utilization of pushable nonretractable coils in various types of aneurysms. There appears to be excitement about the potential of the coil technique but disappointment with the increasing number of reports of complications (and neck regrowth) using endosaccular balloons, and some impatience with the slow expansion of clinical trials using the GDC coil. One hundred eight cases (the total from the six papers) were reported as treated by pushable coils, with a variety of aneurysm sizes, clinical states, efficacies of aneurysm packing, and outcomes. Some small aneurysms apparently have been obliterated, some coils have become migrating emboli (by those trying to block more of the aneurysm necks), and substantial neck remnants remain in larger aneurysms (especially in the hands of those fearing and

preventing coil migration). Berenstein, who has now treated 11 aneurysms by the GDC coil as part of an expanding multicenter trial, has achieved complete obliteration in almost all cases without serious complication. He expressed an emotional assessment of the new device as the most important advance in the field since the mid-seventies. Characteristics of GDC coils in experimental aneurysms, as well as histopathology, were presented by Graves.

Two alternative detachable coil systems were presented: a clamp-type apparatus developed by Marks, and a laser-activated detachment by Geremia. An ingenious detachable balloon, with two lumens with valves, has been developed by Makita. This system allows for placement with an extruding directible guidewire although, once retracted, the guide cannot be pushed out of the balloon again.

Debrun summarized the long-term follow-up of balloon treatment for 59 extradural carotid aneurysms, mostly effected by parent artery occlusion, pointing to the established safety and efficacy of this approach. Eskridge reviewed the rationale for, and his substantial experience (now 39 cases) with, intracranial balloon angioplasty for cerebral vasospasm. He currently recommends angioplasty of proximal (not beyond M-2, A-1, and P-2 segments) cerebral vessels only, within 18 hours of onset of symptoms (or immediately after the onset of symptoms in patients who become symptomatic despite aggressive medical therapy for asymptomatic vasospasm), using systemic heparinization during the angioplasty, and being careful to use balloons no larger than the expected normal diameter of the artery. His series includes 28 patients with improvement during or following angioplasty, one death from artery rupture by the balloon, one stroke from a major branch occlusion, two deaths following angioplasty by rupture of unclipped aneurysms, and four deaths in patients who did not improve from a grade V state.

As a late addition to the program, Shcheglov updated his Kiev aneurysm series treated by detachable balloon. This remarkable series now has over 867 cases treated, with more than 90% treated with parent artery preservation. Shcheglov was also active in the commercial exhibit area. As a joint venture with Valavanis and a Swiss company, he is marketing the Neurocan 2001 Supersystem, an ingenious dummy containing aneurysms as part of a pulsating perfusion system for catheter training. Rather than x-rays, the device utilizes an optical system to image the simulated and balloon catheters. This is a testament to the freedoms and opportunities now found in the medical sector of the former "Eastern bloc," including the USSR.

Vasospasm

The enthusiasm for balloon angioplasty for vasospasm was expressed by four papers on the subject, including a review by Alexander of Zubkov's large series from St. Petersburg (formerly Leningrad) over more than a decade since the initiation of this technique. The conclusions include immediate angioplasty for vasospasm seen initially after hemorrhage, later angioplasty for delayed onset vaso-

spasm, with treatment effected by carotid or axillary puncture (other operators use the femoral approach). Caveats presented included the use of urokinase and papaverine infusion for spastic distal cerebral vessels after proximal vessel dilation presented by Kaku, and avoidance of elongation of the balloon (which implies a dangerously high intraballoon pressure) suggested by Brothers.

Pediatrics

Lasjaunias reviewed various applications of interventional techniques in the pediatric population, stressing that children are *not* miniature adults, from the point of view of the pathologies, techniques, and indications for treatment. Also stressed are the situations where there should not be intervention, and those where treatment is mandatory. Especially of concern are hydrocephalic neonates with vein of Galen fistulas. In these cases, embolization should be effected first, or instead of, ventricular shunting. The basis for this is the fact that cerebrospinal fluid is absorbed mostly in cerebral veins in neonates, not via arachnoid granulations or dural sinuses, and the physiologic basis for the hydrocephalus is the increased pressure within the cerebral venous system secondary to the fistula. The outcome of good neurologic results is much higher with the primary endovascular approach, in comparison with the dismal results of reported series of surgical approaches, including shunting.

Thrombolysis

There is a continuing great interest in cerebral revascularization by lysis of thromboembolic occlusions. An exciting breakthrough was outlined by Schumacher, who reported on improvement and even complete reversal of acute blindness from central retinal artery occlusion. This technique, first reported at the January 1991 WIN meeting in Val d'Isère but overlooked in preparation of the notes (1), utilizes a Tracker catheter in the ophthalmic artery, with infusion of urokinase until there is both reopening of the retinal choroidal perfusion and improvement in vision. One case, with internal carotid occlusion, was treated by perfusion of the external carotid collaterals to the ophthalmic.

Two reports concerned the immediate treatment by thrombolysis of middle cerebral trunk occlusions that occurred as complications of catheter use for diagnostic angiography or endovascular therapy procedures. One author stated that they have now instituted generous heparin utilization during procedures, suggesting that these complications can be prevented by high levels of vigilance in catheter technique, flushing, and state of coagulation. As part of the discussion, Svendsen mentioned his experience in using a microcatheter and guide wire to break up such middle cerebral trunk clot with good outcome, implying that a thrombolytic agent may not be necessary, a point of controversy with the presenting authors.

Atherosclerosis

Two large series of angioplasty for atherosclerosis were presented by Kadish (164 stenoses) and Kachel (135 stenoses) confirming the anatomic efficacy of this technique with a 3% mortality in the first series and 0% in the second. However, with the short time for each presentation, it was difficult to correlate clinical details with these results. The classification of prior ischemic events into transient ischemia, recovered strokes, or strokes with residual deficit in each series was not delineated. The outcomes presented implied neurologic recovery in the first paper, and 100% symptom-free patients in follow-up (mean 5 years) in the second paper. The details of the methods and results of these two series are eagerly awaited in the Western literature (both series are from former Eastern bloc medical centers). In view of the anatomic efficacy, and safety of these procedures, as reported, the time appears ripe for a controlled, randomized trial of this treatment in atherosclerotic disease, and comparison with endarterectomy, which has recently been verified for severe stenosis by controlled clinical trials.

Cerebral Arteriovenous Malformations

Formal presentations on the endovascular treatment of cortical arteriovenous malformations (AVMs) and deep and posterior fossa AVMs were presented by Valavanis and Picard, respectively. Subsequently, there were 11 proffered papers by various groups on the treatment of brain AVMs, including two on gamma knife therapy. Lemme-Plaghos reported on 35 patients who underwent gamma knife radiosurgery following embolization, with 17 having sufficient time for follow-up. Only five of the 17 showed complete obliteration of the AVM, whereas it was thought necessary for six to undergo additional radiosurgery. Cautions included waiting a number of months after embolization to allow residual nidus to show a faster artery-to-vein transit time, and to be aware of potential recanalization when using particulate emboli.

Dion presented 101 cases, mostly complicated AVMs (type IV and V according to Spetzler's classification), who underwent surgery after embolization. All but eight were completely resected. There was severe long-term surgical morbidity in 2% and surgical mortality in 4% (embolization itself caused severe morbidity in 2%, mortality in 1%). The one death was due to hemorrhage that occurred in a delayed way after embolization, and prior to scheduled surgery; the surgery went ahead urgently, but the patient died after surgery.

Updated series using EVAL and Ethibloc for brain AVM embolization were presented by Goto and Negoro. Both of these embolic agents are being recommended for embolization before surgery. While the two materials appear to be easier to handle than acrylic glues (much like the collagen-PVA-ethanol mixtures proposed some years ago), from the series presented, it is uncertain whether or not the efficacy or safety of embolization with these materials is proved or not in comparison to glue.

The other series included one from Lariboisière Hospital, France with a mortality of 5% in 185 patients, most of whom were embolized to enable surgery or radiotherapy, and another from La Coruña, Spain with a 9% mortality in 104 patients. It is difficult, however, to compare overall efficacy of these and other groups because the AVMs were of different types. They were in various locations, had varying indications for treatment, and had been exposed to different adjunctive therapies. Garcia-Monaco presented a group of brain AVMs which presented with acute hemorrhage and were treated endovascularly. This is certainly a high risk situation, and he presented favorable results, although it is difficult to judge whether or not the patients were better off being treated while "hot," or waiting until they had recovered from the acute bleed. It seems that most embolizers are using "induction" approaches as a justification for treatment of brain AVMs. Embolization seems to work well, with reasonable safety, and, therefore, appears to be the right thing to do, despite a lack of more definitive scientific verification. During the discussion period, Dr Yasargil expressed cautious praise for embolization of brain AVMs prior to resection. He noted that embolization, in his experience, is very useful some of the time.

Vertebral Spine

In the didactic presentations, Belloni presented a series of 434 disks treated by nucleotome in 420 patients (a reported risk of only 1/500 for diskitis). Deramond presented a series of patients treated by acrylic vertebroplasty for hemangioma, osteoporotic collapse, and malignancy. terBrugge presented the technique and limitations of facet joint stimulation and block. Subsequent papers added to the discussion on the use of the nucleotome versus chymopapain for percutaneous disk treatment. A technique for saline injection and balloon dilatation for epidural space affected by scar was presented from Caen, France.

Head and Neck

Merland opened the session with an invited presentation outlining what is, for most neuroradiology sections, the largest application of interventional techniques: head and neck. Takahashi presented the use of estrogen/ethanol (20 mg/mL estrogen mixed with 25% ethanol) added to polyvinyl acetate as an effective embolic agent for vascular malformations, meningiomas, and other vascular-rich tumors. Dion updated the use of sodium tetradecyl sulfate and collagen for cavernous angiomas. Bailey presented an analysis of the integrity of catheters that had been in situ for months for chemotherapy infusion. Okunno presented the endovascular therapy of skull base carcinomas and lymph node metastases. Presentations by Vitek and Siekmann reiterated the safety and utility of superselective embolization to control intractable epistaxis.

Spinal Vascular

Theron reviewed the vascular anatomy of the spinal cord in relation to spinal and dural vascular lesions. Berenstein presented the current use of endovascular therapy for spinal cord AVMs, including the conclusion that embolization of deep-seated AVMs in the cord can achieve complete cure with less morbidity than surgical excision. Other presentations included a paper from New York University which indicates that a complete anatomical cure can be obtained by embolization for spinal dural arteriovenous fistulas in almost all cases. The embolization of aneurysms of the spinal arteries associated with cord AVMs, and the embolization of vertebral arteriovenous fistulas were presented by the group from Lariboisière. Stojanovic presented the embolization of mainly malignant spinal tumors.

Miscellaneous

The session ended with some additional interesting material. A series of long-term follow-up angiograms after carotid occlusion was presented from Lariboisière. The results showed that a small number of patients will demonstrate late recanalization of the carotid artery after balloon deflation, without recurrence of the original disease. Hyodo calculated the delivery dose of chemotherapeutic agents to malignant tumours, and concluded that a much

higher dose could be delivered by superselective catheter than by conventional intraarterial therapy.

Business Meeting

The business meeting of the WFITN was open to all interested individuals. The next congress will take place in Canada in 1993, under the direction of Karel terBrugge. It will hopefully be in Vancouver, Canada, as a joint meeting with the ASNR. At that time the WFITN membership will elect a new Executive Committee.

During the business meeting of the European Society of Neuroradiology, at a separate gathering, the ASNR members of the WFITN discussed the formalization of an American Society. The American Society of Interventional and Therapeutic Neuroradiology was thereby established to represent American and Canadian neurointerventionists, to develop standards for training and practice, and to promote the interests of interventional neuroradiology. A committee was formed, headed by Charles Strother, to seek the recognition of the ASITN by the ASNR, and to establish its relationship to the ASNR and other appropriate groups. Joint annual meetings with the ASNR are being sought, beginning with the meeting in St. Louis.

References

1. Fox AJ. Working group in interventional neuroradiology: 11th Annual Meeting, Val d'Isère, France, January 12-19, 1991 (meeting summary). *AJNR* 1991;12:798-804

Founding of the Mexican Society of Diagnostic and Therapeutic Neuroradiology (SMNR)

Michael S. Huckman¹

November 22nd marked the founding of the Mexican Society of Diagnostic and Therapeutic Neuroradiology (SMNR) which took place during the 11th International Symposium of Interventional Neuroradiology. The Symposium was cosponsored by the University of California, Los Angeles, and the National Institute of Neurology and Neurosurgery of Mexico City where the meeting was held. The Organizing Committee of the Symposium was: Marco A. Zenteno, MD, Chairman; Fernando Vinuela, MD, Co-Chairman; Bernardo Boleaga, MD, Co-Chairman; Patricia Silva, MD, Executive Secretary; Gabriel Garcia-Colorado, MD, Coordinator.

The first hour of the Symposium celebrated the adoption

of the Official Constitution of the Mexican Society of Diagnostic and Therapeutic Neuroradiology (SMNR). Introductory remarks were presented by individuals representing a number of neuroradiologic and related organizations.

Dr R. Nick Bryan, President of the American Society of Neuroradiology, extended congratulations from the ASNR and pledged future cooperation between the two societies (See Dr Bryan's remarks on page 1026). Following a speech by Dr Claude Manelfe (See Dr Manelfe's remarks on page 1025), Executive Secretary of the French Society of Neuroradiology, the SMNR was officially created and an introductory address was presented by Dr Bernardo Boleaga, SMNR's first president (See Dr Boleaga's remarks on page 1026).

Honorary witnesses to the adoption of the Constitution and the organizations they represented are: Francisco Rubio-Donnadieu, MD, Director, National Institute of Neurology and Neurosurgery; Jean Paul Braun, MD, President, European Society of Neuroradiology (ESNR); R. Nick

¹ Rush-Presbyterian-St. Luke's Medical Center, Department of Diagnostic Radiology and Nuclear Medicine, 1653 W. Congress Pkwy., Chicago, IL 60612.

Members on the National and International Scene

Mahmood F. Mafee, MD, Professor of Radiology at the Magnetic Resonance Imaging Center of the University of Illinois at Chicago, has been selected to serve as Distinguished Scientist in the Department of Radiologic Pathology of the Armed Forces Institute of Pathology in Washington, DC, from July 1, 1993 to June 30, 1994.

Notices of courses and symposia will be considered for publication in the AJNR, at the Editor's discretion, based on their relevancy to neuroradiologic imaging and if the following information is included: (a) dates and location, (b) a brief description of the course, (c) a listing of local and visiting faculty, (d) fees, and (e) number of Category 1 credits that are available. Such notices should be submitted at least 4 months before the meeting date. Assuming adequate time prior to the date of the event, the notice may appear in up to a maximum of two consecutive issues of the *AJNR*. Address announcements to Dr. Michael S. Huckman, Department of Radiology, Rush-Presbyterian-St. Luke's Medical Center, 1653 W. Congress Parkway, Chicago, IL 60612.

Books Received

Imaging in Trauma and Critical Care. Edited by Stuart E. Mirvis and Jeremy W. R. Young. Baltimore: Williams & Wilkins, 576 pp, 1992. \$140

Introduction to Vascular Ultrasonography. By William J. Zwiebel, MD. Philadelphia: W. B. Saunders, 464 pp, 1992. \$75

Ultrasound of the Eye and Orbit. by Sandra Frazier Byrne and Ronald L. Green. St. Louis: Mosby Year Book, 505 pp, 1992. \$95

Progress In Neutron Capture Therapy for Cancer. Edited by Barry J. Allen, Douglas E. Moore, and Baiba V. Harrington. New York: Plenum Press, 668 pp, 1992. \$129.50

Materials for Review

Books, AV Programs, and software intended for review should be sent to:

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AJNR Editorial Office
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Errata

An error occurred on page 1023 of the Meeting Summary, "Highlights of the First Congress of the World Federation of the Interventional and Therapeutic Neuroradiology," Fox AJ, *AJNR* 1992;13:1021-1024. Part of the first sentence in the first paragraph of the second column was incorrect. The correct sentences should be "In a cooperative study from La Coruna and Zaragoza, Spain, 104 patients with brain AVMs were embolized. The investigators reported no associated mortality."

Kenneth I. Lipow, M.D. was omitted, in error, from the list of authors of the case report, "Tentorial traversal by ependymoblastoma." *AJNR* 1991;12:181.