

**1ST ANNUAL**



**NEUROLOGICAL SURGERY CONFERENCE  
ON INTERNET**

**5 January 2005**

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CONFERENCE OF

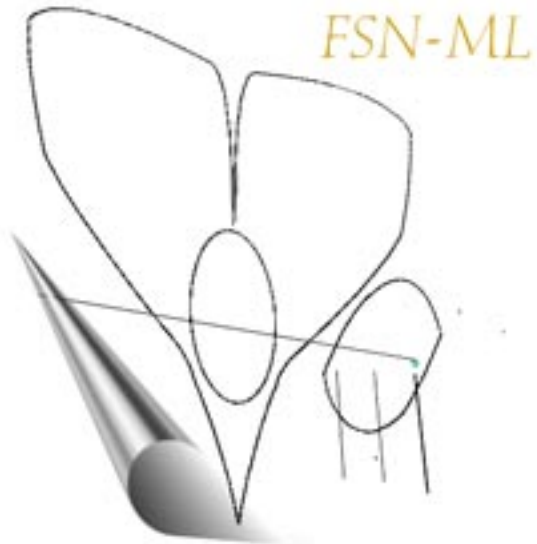
**SKULL-BASE-SURGERY, NEUROSURGERY RESEARCH, FUNC-  
TIONAL & STEREOTACTIC NEUROSURGERY, SPINE FORUMS**

Sponsored by the *Annals of Neurosurgery*

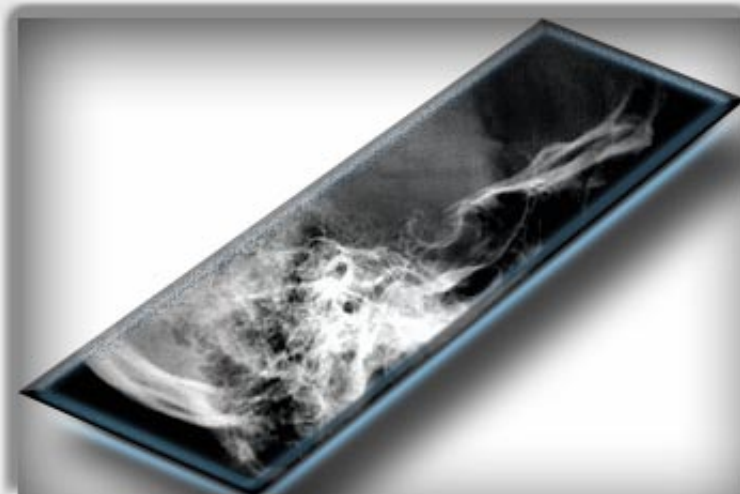


# Spine - Mailing List

A Multi-disciplinary Electronic Mailing List

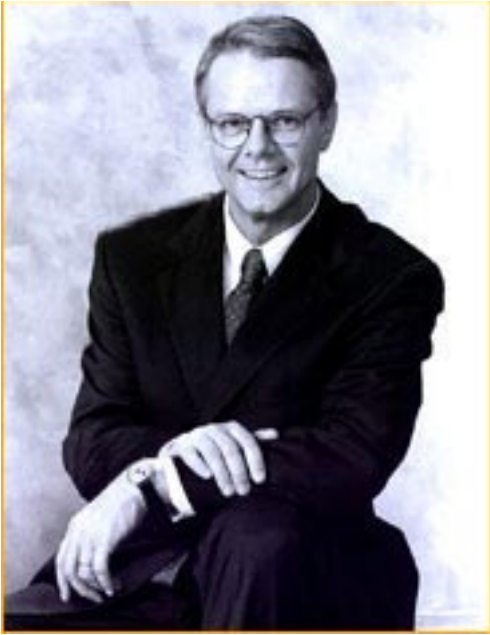


## Skull Base Surgery



Mailing List

## FOREWORD



**T**he other day, I had the rare opportunity to watch a 16 mm movie regarding the life and times of Harvey Cushing that was sponsored by the American Association of Neurological Surgeons. There was footage within this movie of Cushing in the operating room performing his 3000th brain tumor operation. In the days of Cushing, neurosurgery education was comprised of hands-on experience in the OR and on the wards and clinics, of didactic teaching sessions with one's mentor, and of learning within written texts of neurosurgery. While we still value all of these methods of teaching, the computer age has ushered in a valuable new way for neurosurgeons and neurosurgical trainees to learn their craft. I believe the First Annual Neurosurgery Conference on the Internet represents one of the outstanding opportunities for neurosurgeons and trainees to share their experiences and knowledge in the basic science of neurosurgery and in the clinical research realm. I wish you all an excellent session, and hope there will be many more to come.

Yours sincerely,

JAMES RUTKA, MD, PhD, FRCSC, FACS, FAAP  
Dan Family Chair in Neurosurgery  
Professor and Chairman, Division of Neurosurgery  
The University of Toronto  
Toronto, Canada

## MESSAGE FROM PROGRAM ORGANISER

Dear Colleagues and Friends,

It is my great pleasure to invite you to participate in the 1st Annual Neurosurgery Conference on the Internet, which will take place January 5, 2005. This is the first informative and comprehensive program featuring a broad range of neurosurgical presentations.

All health care professionals such as neurosurgeons, neurologists, oncologists, radiologists, and scientists, are encouraged to participate in this new venue for clinical presentations.

I feel sure you will all enjoy the venue and encourage you to actively participate in this innovative conference. This is the first meeting that will not be limited by location, weather, language or time. I do believe that this conference will introduce Neurosurgery to the world of the Internet.

We look forward to welcoming you all to the 1st Annual Neurosurgery Conference on the Internet!

GEORGE JALLO, MD

Johns Hopkins Medical Centre  
Baltimore

## MESSAGE FROM CO-ORGANISER



Welcome to the 1st Annual Neurosurgery Conference on the Internet!

The abstracts of the presentations can be found in this program-booklet. The abstracts will also be published in the Annals of Neurosurgery ([www.annals-neurosurgery.org](http://www.annals-neurosurgery.org)).

The presentations can be viewed or down loaded from the conference website at [www.nurgery.org](http://www.nurgery.org). The presentations will be in the form of Microsoft® PowerPoint® slides.

To participate in discussions you would need to join one of the following mailing lists: Neurosurgery Research, Skull-Base-Surgery, Functional & Stereotactic Neurosurgery or Spine. The mailing lists are open to medical and ancillary professionals. To join e-mail you details to [g\\_narenthiran@hotmail.com](mailto:g_narenthiran@hotmail.com) and the membership is free.

We thank those who have contributed presentations and to all those who will take part in this unique, exciting and stimulating conference!

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## ABSTRACT 1

### TREATMENT OF SPINAL DURAL ARTERIOVENOUS MALFORMATIONS: A SINGLE CENTER EXPERIENCE.

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**AIM:** Spinal dural arteriovenous malformation is the most common type of arteriovenous malformations (AVM) involving the spine, usually presenting with a slowly progressive myelopathy and/or radiculopathy. The management of these rare lesions either consists of catheter embolization or surgical intradural interruption of the draining vessel. The decision between these techniques is often controversial. The present study assessed the outcome of patients with spinal AVMs that were treated with surgery, endovascular embolization or a combined treatment strategy. **METHODS:** Our series consisted of 12 patients with dural AVMs of the thoracic or lumbar spine that were treated in our institution between 1994 and 2004. Six patients were treated with embolization alone. Three patients underwent laminectomy and surgical interruption of the AVM. Three patients were treated by endovascular techniques followed by surgery. Patient age ranged from 20 to 76 years (mean 59 years). Functional outcome was assessed using the modified Aminoff-Logue grading scale with a mean follow-up of 6 months. **RESULTS:** The 3 patients who had undergone surgery had successful occlusion of the AVM and had marked clinical improvement. Of the 6 patients who had only endovascular treatment 4 of them had successful occlusion and clinical improvement; the other 2 patients required re-embolization in a second session due to extensive fistulas. Two of the 3 patients with extensive lesions who were first treated endovascularly followed by surgery had good outcome. **CONCLUSIONS:** We conclude that both surgical and endovascular treatment of spinal dural AVMs resulted in a good and lasting clinical outcome in the majority of cases. Embolization should be attempted at the time of diagnostic angiography if the lesion is endovascularly accessible. An interdisciplinary approach is often necessary to address the technical complexity of this rare disorder.

#### Notes:

## ABSTRACT 2

### WEB-BASED DATABASE OF FUNCTIONAL NEUROSURGERY TARGETS

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The aim was to establish a database of functional neurosurgery targets used by different functional neurosurgeons on the World Wide Web (web). We created a database using 'FileMaker Pro 6 Unlimited' on a Desk-top computer running 'Windows XP Professional' operating system; 2Ghz Pentium 4 Processor; 512Mb RAM. The database contains 25 fields. We obtained a broadband Internet line with a static IP address (81.137.249.16) from 'British Telecom'. We published the database on the world wide web with the help of the 'Web plug-in' provided with the FileMaker Pro 6 Unlimited. The database is accessible on the web at [http:// 81.137.249.16](http://81.137.249.16) . This database system was set-up without help from professional Information Technology personnel. FileMaker Pro 6 Unlimited provides a means of setting up web-based databases which could be utilised for multi-institutional data collection

Notes:

## ABSTRACT 3

### ACCELEROMETRY DURING ABLATIVE THALAMIC SURGERY FOR PARKINSONIAN TREMOR

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We conceived, designed and constructed a “home-made” accelerometer and used it to assess tremor in patients during thalamotomy. Our series included 8 patients: 3 women and 5 men, with an age range of 32 to 68 years with a mean of 52 years. The three parameters: frequency (Hz), amplitude, and occurrence of tremor were studied during electrical stimulation of the target and compared with neurological direct observation. The optimal lesion site was taken to be where the tremor was suppressed with the lowest electrical stimulation. These results demonstrated an earlier reaction of the accelerometer system at lower stimulation thresholds when compared to direct observation of a trained neurologist. Intraoperative accelerometer monitoring provides an adjunct to improve reliability of assessment of target stimulation while documenting lesion effects, supporting the neurologist and not replacing her and not affecting the duration of surgery.

#### Notes:

## ABSTRACT 4

### RELATIONSHIP BETWEEN CRANIAL DEFECT AND PHYSIOLOGY OF CEREBROSPINAL FLUID AN EXPERIMENTAL STUDY IN RABBITS

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The aim of this study was to investigate the impact of cranial defect on physiology of cerebrospinal fluid.

Eleven rabbits underwent a meticulous study of cerebrospinal fluid circulation as assessed by cisternography using 300 microcurie/0.1 cc Tc99mDTPA prior to and following creation of cranial defect. The rate of clearance of the pharmaceutical agent from cerebrospinal fluid was studied for each rabbit preoperatively and 24 hours, 7 days, 3 months postoperatively.

The correlation between the results was assessed with Wilcoxon Signed Ranks test and no statistical difference was found between the preoperative and postoperative values. These data suggest that the cerebrospinal fluid kinetics do not significantly change in large cranial defects.

Notes:

## ABSTRACT 5

### MANAGEMENT SEVERE SUBDURAL HEMATOMA IN NEONATE: INTRATECAL INFUSION STREPTOKINASE FOR CLOT LYSIS.

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**Objective and Importance:** The subdural hematomas among full-term infants have the potential to cause death or lifelong disability. A number of etiological factors have been proposed, including impairments in coagulation, hypoxic-ischemic injury, venous sinus thrombosis, maternal infection and birth-related trauma. We report a case management and outcomes of newborn treated for subdural hematoma by drainage and subdural streptokinase lavage.

**Clinical presentation:** A 1 month-old full-term baby presented with dyspnoea and seizures. CT of the brain found an extensive panhemispherical subdural hematoma on the left with thrombosis of the sigmoid and transverse sinuses.

**Intervention:** She underwent urgent surgery – external drainage and 25,000 units streptokinase infused at 0.5 ml/h for three days. For the following 72 hours, the drains conducted away a brown colliquation with fresh blood admixed (about 160 ccm). The external drain was removed and subduro-subgaleal shunt were placed. The neuroimaging (CT and MRI) revealed a residual fluid collection in subdural space and recanalisation of the sigmoid and transverse sinuses.

**Conclusion:** Subdural infusion of streptokinase may have equal safety and efficacy in lysing and following drainage subdural hematoma in newborn. Moreover, this method is effective for treatment trombosis sigmoid and transverse sinuses also.

#### Notes:

## ABSTRACT 6

### RATE OF EXTERNAL VENTRICULAR DRAIN MALPOSITION

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The aim was to ascertain the rate of malposition of external ventricular drain (EVD) in our centre. The policy of our unit is to undertake insertion of EVDs in our operating theatres (i.e. as opposed to in intensive care units). We checked the operation log-book of our operating theatres for a 1 year period (14 February 2003 - 13 February 2004) to find out i. the number of EVDs inserted and ii. the number patients who had insertion of more than one EVD. Then we checked the notes and imaging studies of the patient to check for the reason for the repeated insertion of EVDs. Over that 1 year period 84 patients had insertion of EVD (frontal, parietal and occipital) and 13 of them had more than one EVD; 8 of the 13 were for malposition of EVD (as ascertained from the notes or from computed tomography (CT) of head). Therefore there was a minimum of 9.5% complication from malposition of EVD with a minimum complication rate for insertion of EVD being 15.5% The often quoted value for complication for EVD insertion is as 'around 3%'. Findings from our study illustrates the need for audit of basic neurosurgery procedures and to quote 'in-house' values of complication than those published by other centres.

#### Notes:

## ABSTRACT 7

### COMBINATION OF FRAMELESS NAVIGATION AND INTRAOPERATIVE NEUROPHYSIOLOGY FOR MOTOR CORTEX STIMULATION

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Motor cortex stimulation is one of the few available options for management of central deafferentation pain syndromes. Originally described only several decades ago for the treatment of thalamic and trigeminal pain syndromes, this non-destructive procedure is gradually gaining popularity among neurosurgeons and pain specialists. Recently, we began using a combination of computer-guided navigation and intraoperative electrophysiological monitoring for localization of the motor cortex in patients with medically intractable pain following a stroke or surgical intervention. The pain involved one side of body or face contralateral to the infarction or ipsilateral to surgical procedure; the patients did not respond to medical management including a trial of intrathecal opioids. The motor cortex was initially identified using a functional MRI on 3-Tesla scanner; this information was then used during intraoperative computer-aided navigation with a frameless guidance system. In order to further verify location of the motor cortex, we used epidural recording of the somatosensory evoked potentials after a small craniotomy was made under general anesthesia. Reversal of the polarity of the N20 peak indicated the line separating the primary motor and sensory cortical areas. The quadripolar electrode(s) (Medtronic) was then positioned over the motor cortex. During the trial, the pain relief was obtained with bipolar stimulation below the threshold of motor stimulation. There were no stimulation-induced paresthesias, the pain relief from the stimulation was almost immediate and lasted for few minutes after the stimulation was stopped. After a weeklong trial the electrode(s) was internalized under the general anesthesia. Using this combination of functional MRI, image-guided computer navigation, and intraoperative electrophysiological testing, we were able to precisely localize the primary motor cortex and subsequently achieve excellent pain relief in patients with medically intractable deafferentation pain. We present the details of our technique, report an illustrative case and discuss general aspects of the motor cortex stimulation procedure. The motor cortex stimulation may be an option for patients with chronic pain syndromes due to strokes, post-surgical procedures and other deafferentative conditions.

Notes:

## ABSTRACT 8

### ANTIBIOTIC-IMPREGNATED SHUNT CATHETERS DECREASE THE INCIDENCE OF SHUNT INFECTION IN THE TREATMENT OF HYDROCEPHALUS

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**BACKGROUND:** Most shunt infections occur within 6 months of shunt placement and chiefly result from perioperative colonization by skin flora. Antibiotic-impregnated shunt (AIS) systems have been designed to prevent such colonization. In this study, we evaluate incidence of shunt infection after introduction of an AIS system in a pediatric hydrocephalus population.

**METHODS:** We retrospectively reviewed all pediatric patients undergoing CSF shunt insertion at our institution over a 3-year period. During 18 months prior to October 2002, CSF shunts included standard, non-impregnated shunt catheters. During the 18 months following October 2002, CSF shunts included antibiotic-impregnated shunt catheters. Patients were followed for 6 months after surgery, and all shunt-related complications, including infection, were evaluated. The independent association of antibiotic-impregnated shunt catheter use with subsequent shunt infection was assessed via multivariate proportional hazards regression analysis.

**RESULTS:** 147 pediatric patients underwent 325 shunting procedures. 181 (56%) shunts were placed with non-impregnated catheters prior to October 2002. 144 (44%) shunts were placed with antibiotic-impregnated shunt catheters after October 2002. Sixteen (9%) patients with non-impregnated catheters experienced shunt infection, whereas only three (2%) patients with antibiotic-impregnated catheters experienced shunt infection within the 6-month follow-up period,  $p = 0.025$ . Antibiotic-impregnated shunt catheters, adjusting for inter-cohort differences via multivariate analysis, were independently associated with a 3.5-fold decreased likelihood of shunt infection.

**CONCLUSION:** The antibiotic-impregnated shunt catheter significantly reduced incidence of CSF shunt infection in children with hydrocephalus during the early postoperative period (less than 6 months). The AIS system used is an effective instrument to prevent perioperative colonization of CSF shunt components.

Notes:

## ABSTRACT 9

### TOXICITY AND EFFICACY STUDY OF LOCALLY-DELIVERED CHEMOTHERAPY IN A NOVEL RAT MODEL OF INTRAMEDULLARY SPINAL CORD TUMORS

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**Introduction:** Intramedullary spinal cord tumors (IMSCTs) are associated with significant morbidity/mortality and current treatment strategies for IMSCTs remain limited. Systemic chemotherapy has been unsuccessful for these tumors. Recent advances in local-drug-delivery systems make them ideal for IMSCTs. We report the toxicity of novel injectable chemotherapy-delivery systems Oncogel® (Taxol gel), SABER® (Carboplatin gel), and Paclimer® (Taxol-microspheres) in rat's spinal cord, and the efficacy of Oncogel-1.5% in an IM-SCT model using 9L-gliosarcoma in rats.

**Methods:** Toxicity: Fischer-344 rats (n=21) were randomized into 7 groups (3 rats/group) to receive an intramedullary injection (IMI) of either ReGel(empty gel), Oncogel-1.5%, Oncogel-6%, Saber-15%, Paclimer-2mg/kg, Paclimer-20mg/kg, or DMEM(Dulbecco's-modified-eagle-medium). Daily evaluation of hind limb motor function (using the BBB-Basso-Beattie-Bresnahan-scale) and weight gain were analyzed. Efficacy: Fischer-344 rats (n=12) were randomized into 3 groups (4/group), group 1 received an IMI of 9L cells, groups 2 and 3 received an IMI of 9L, plus Oncogel-1.5% or ReGel, respectively; animals were assessed daily using the BBB scale.

**Results:** Toxicity: Animals treated with Oncogel-6% showed acute toxicity (1 animal died on day 4, 3 animals were euthanized due to complete paraplegia on day 5), animals in other groups showed weight gain and maximal BBB scores throughout the experiment. Efficacy: Group 1 (controls) had median onset of paralysis (MOP) of 10 days, Group 2 (Oncogel-1.5%) had no significant motor deficit by day 20, Group 3 (ReGel) had MOP of  $14 \pm 1.4$  days.

**Conclusions:** Locally-delivered chemotherapy, with the exception of Oncogel-6%, was well tolerated by the animals. Oncogel-1.5% significantly prolonged onset of paralysis. Further studies are needed to determine the efficacy of SABER and Paclimer for IMSCTs.

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