

# Abstracts of the 8th Annual Scientific Meeting of the Hong Kong Neurosurgical Society

## 1 December 2001

1.

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### **CRANIOPAGUSTWINS: NEUROSURGICAL CONSIDERATIONS AND OUTCOME OF SEPARATION SURGERY**

**ABSTRACT:** *Introduction:* Craniopagus twins occur rarely with a frequency of 1 in approximately 2 million live births. The highly complex manner in which the two skulls and brains are conjoined has resulted in high mortality and morbidity whenever surgical separation is attempted.

*Methods:* In October 2000, a pair of 8-month-old female craniopagus twins was referred to us for separation. They were of the total vertical craniopagus type 2, i.e. joined at the vertex within a single cranial cavity, with two separate but intimately apposed brains, and facing in opposite directions. Radiologic imaging included 3-D CT scans, MRI, MRA, MRV scans and angiography. Preoperative planning was undertaken with a virtual reality simulation system as well as prototyped nylon polymer models.

*Results:* Radiographic studies showed that both left cerebral hemispheres were herniated across the midline and were hydrocephalic. There was a circumferential shared superior sagittal sinus, but separate arterial circulation. Scalp expanders were first placed for each twin and gradually expanded over 6 months. During the actual operative procedure in April 2001, a computerized image-guidance system was used to facilitate safe dissection and navigation between the two brains. Surgery was completed after approximately 100 hours, with two live babies with minimal neurologic deficits.

*Conclusion:* This presentation will illustrate the various techniques employed in the preoperative planning and intraoperative stages of the separation surgery as well as the 6-month outcome.

2.

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### **MENINGOENCEPHALOCELE: EXPERIENCE IN QUEEN MARY HOSPITAL**

**ABSTRACT:** *Introduction:* Meningoencephalocele is a rare disease entity which most neurosurgeons do not have vast experience with. The disease is further subclassified according to its anatomical location and each entails a rather distinct management approach. In this review, we are going to share our 10 years' experience in managing these patients together with a discussion of some of the interesting cases.

*Methods:* To review the number of cases encountered and their surgical outcome over the past 10 years; presentation and discussion of a few rare congenital encephaloceles were also included.

*Results:* From 1991 to 2001, in Queen Mary Hospital, Hong Kong, we encountered 10 patients with various types of meningoencephaloceles. The majority of the patients were of Chinese origin and there was only one Vietnamese patient among the group. There were 7 patients with cranial vault encephaloceles, 2 with basal encephaloceles, and 1 with frontoethmoidal type. Eight out of ten patients underwent surgery. Two patients needed CSF diversion surgery after the repair of encephaloceles. One patient required second operation for residual encephalocele. One out of ten patients was found to have associated "Morning Glory syndrome". The patient with frontoethmoidal encephalocele was assessed to have global development delay but without other associated anomalies. Two patients defaulted further follow-up and the remaining six patients have normal intelligence and development.

*Conclusion:* Congenital meningoencephalocele is a rare disease entity which most neurosurgeons do not have vast experience with. Though our experience was limited, the overall outcome of all patients treated was satisfactory. While simple anomalies can often be addressed by neurosurgeon alone, the more complex meningoencephalocele, without doubt, would benefit from a multidisciplinary management approach. With more understanding of the embryology and etiology of the different types of meningoencephaloceles, and with the advances in neuroimaging, morbidity and poor outcomes have been lessened.

3.

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#### ULTRASOUND-GUIDED BIOPSY FOR BRAINSTEM GLIOMA IN CHILDREN

**ABSTRACT:** *Objectives:* Brainstem glioma is a common midline posterior fossa tumour in children. Histological diagnosis is needed before radiotherapy in most patients. Ultrasound-guided biopsy through a burr hole over posterior fossa is a safe approach in this role. This technique allows precise localization of pathology, real-time assessment of anatomical consequences of intervention and immediate identification of intraoperative complication.

*Methods:* In the past 7 years (from 1995 to 2001), 3 paediatric patients with brainstem glioma were diagnosed at our institution using ultrasound-guided biopsy through a posterior fossa burr hole. Histological confirmation was obtained in all cases. Adjuvant radiotherapy was applied after the procedure.

*Results:* There was no procedure-related complication. The neurological status was similar to that of preoperation. Histology was anaplastic astrocytoma in all three cases. Survival time ranged from 5 months to 1 year. There was no operative mortality. One patient succumbed after 5 months from progressive disease. Two of them were discharged home well.

*Conclusion:* Histological diagnosis is needed for most brainstem glioma before further management. Ultrasound-guided biopsy through posterior fossa burr hole is a simple and safe procedure, allowing precise localization of pathology, real-time assessment of intervention consequences, concomitant aspiration of cysts, and immediate identification of early complications.

4.

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#### THE BATTLE AGAINST THE "ABNORMALLY PROGRAMMED BRAIN'S CELL" IN OUR KIDS: A RETROSPECTIVE SURVEY FOR PAEDIATRIC BRAIN TUMOUR IN TUEN MUN HOSPITAL OVER THE PERIOD BETWEEN 1992 TO 2001

**ABSTRACT:** Paediatric brain tumour poses a different spectrum of pathology as compared with adult patients. We had collected 48 patients with 49 tumours over the period between 1992 and 2001. The epidemiology, site & type of different tumour, treatments & outcome of each patient will be analysed. Results will be presented as percentage of occurrence for each tumour. Further discussion with the emphasis on the outcome for several common types of tumour will also be presented.

5.

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#### VERTEBRO-BASILAR ARTERY DISSECTIONS: A SERIES OF NINE CASES ILLUSTRATING TREATMENT MODALITIES

**ABSTRACT:** Vertebral artery dissections (VADs) are increasingly recognized as a cause of subarachnoid haemorrhage (SAH) or cerebrovascular ischaemia. These dissections may occur in the extracranial or intracranial segments of the vertebral artery and the latter may extend into the basilar artery. Treatment protocols for this potentially fatal condition have not been clearly stratified in the literature. With the introduction of endovascular treatment modalities in the

management of cerebrovascular disease, several options have become available to the physician in the treatment of VADs. We wish to report a series of patients with VADs and use these cases to illustrate the different treatment modalities available in contemporary neurovascular medicine.

6.

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#### DIFFICULT ANEURYSMS: RATIONALE, MATERIALS AND STRATEGY IN ENDOVASCULAR THERAPY

**ABSTRACT:** *Objectives:* To discuss the rationale and treatment options in the endovascular management of difficult aneurysms.

*Materials & Methods:* A retrospective review on the endovascular management of difficult aneurysm was carried out. The rationale and feasibility would be discussed.

*Results:* From March 1999 to July, 2001, 22 patients with total of 24 difficult aneurysms were treated endovascularly. All aneurysms were embolized with GDC coils together with the use of various sophisticated techniques including 3D coil, balloon remodelling technique, coil on intracranial stent, parent vessel occlusion and Trispan GDC coils. There were 15 anterior circulation aneurysms, 4 posterior circulation aneurysms, 1 pseudoaneurysm and 4 dissecting aneurysm. Successful coiling was achieved in 20 aneurysms with stretching of coils in 2 patients and thromboembolism in one patient which require urgent thrombolysis. All patients recovered without neurological deficits. One patient developed transient blindness after the procedure. There were no procedure related mortality. There was one rebleed 3 months after the initial coiling which required a second coiling.

*Conclusion:* Wide neck aneurysms and dissecting aneurysms has long been a great challenged to the neurosurgeons. With the use of the new techniques, endovascular treatment is a safe and feasible alternative to the neurosurgical clipping. However, the long term follow up is required to assess the permanent occlusion rate of the aneurysm.

7.

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#### APOLIPOPROTEIN E GENOTYPE AND OUTCOME IN ANEURYSMAL SUBARACHNOID HAEMORRHAGE: PROGRESS REPORT

**ABSTRACT:** *Background:* From our previous study of the association between Apolipoprotein E  $\epsilon$ 4 and the outcome of patients with subarachnoid haemorrhage, we concluded that Apolipoprotein E  $\epsilon$ 4 is associated with a poor neurological outcome after subarachnoid haemorrhage. An incidental finding of a higher frequency of Apolipoprotein E  $\epsilon$ 4 in subarachnoid haemorrhage patients was found in the same study. In order to further investigate this finding, we performed a control study of Apolipoprotein E  $\epsilon$ 4 frequency in patients admitted to our hospital with head injury.

*Methods and Materials:* Patients recruited into this study were matched according to the sex and age of the subarachnoid haemorrhage patients in our previous study. Saline mouth wash was collected for each patient for genotyping. In case of comatose patients, venous bloods were taken instead of mouth wash. Frequency of Apolipoprotein E  $\epsilon$ 4 between this group of patients and our previous studied subarachnoid haemorrhage patients were then compare to see if there is a significant difference.

*Discussion:* Result of this study and the implication of a multi-centre prospective clinical study will be discussed.

8.

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#### INTERVENTIONAL NEURORADIOLOGY: EARLY EXPERIENCE IN TUEN MUN HOSPITAL

**ABSTRACT:** Over the last decade, there has been major advancement in terms of endovascular technique, device technology and knowledge of the functional anatomy of vascular lesions in the field of interventional neuroradiology. Now that endovascular therapy has evolved as an adjunct or primary modality in the management of vascular and neoplastic lesions in the central nervous system and head & neck region. Interventional neuroradiology service was introduced to Tuen Mun Hospital in late 1997. Up to August 2001, there has been 133 endovascular therapeutic procedures being performed in 98 patients. Among these procedures were 37 embolization of cerebral arteriovenous malformations, 23 embolization of dural arteriovenous fistula, 13 endovascular coiling of cerebral aneurysms, 37 embolization of meningiomas and base of skull tumours, 12 embolization of maxillofacial vascular malformations and 11 embolization of uncontrolled bleeding from maxillofacial lesions. The preliminary results of these therapeutic procedures with respect to outcome, procedure related morbidity and mortality will be discussed.

9.

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#### PATHOLOGY OF EPILEPSY SURGERY: REVIEW OF CASES OF TUEN MUN HOSPITAL

**ABSTRACT:** A number of surgical procedures, most notably temporal lobectomy, are effective modalities of treating epilepsy. The pathology of all surgical specimens for treatment of epilepsy in Tuen Mun Hospital was reviewed. There were three cases of temporal lobectomy which, although small in number, harboured lesions representing some of the major categories of disease recognised as causes of epilepsy, namely, cortical dysplasia, anoxic damage and chronic encephalitis. In addition, there was a case of resection for dysembryoplastic neuroepithelial tumour, a tumour classically associated with epilepsy and responding well to surgical treatment. The features in each of the four cases conformed to those described in the literature. Common causes of epilepsy and pathologic findings in some reported series of surgical resection are enumerated. Points of interest pertaining to the diseases illustrated by these cases are summarised.

10.

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#### TARGETING SUBTHALAMIC NUCLEUS (STN) FOR DEEP BRAIN STIMULATION: A CORRELATIVE STUDY ANATOMY VERSUS PHYSIOLOGY

**ABSTRACT:** Subthalamic nucleus (STN) is a small ovoid nucleus with a volume of about 150 to 200 mm<sup>3</sup>. It carries key effects of controlling the cardinal symptoms after chronic high frequency stimulation in patients with Parkinson's disease. Precise localization and placement of the electrode is crucial to effective management.

Direct visualization (Direct Targeting) of STN by high resolution MRI has greatly improved the accuracy over the indirect targeting by ventriculography-based measurements. Intra-operative testing by macrostimulation essentially guaranteed a successful outcome. However, in patients with predominantly bradykinesia, gait disturbance and axial symptoms, macrostimulation testing may not demonstrate

the desirable effect. Microelectrode recording (MER) is able to locate the STN by recognizing its specific discharge pattern intra-operatively.

Five patients with predominantly akinesia, gait disturbance and axial symptoms were studied for the anatomical discrepancy between MRI direct targeting and MER-guided targeting for deep brain stimulation of STN. Six electrodes were placed and the mean discrepancy between the MRI and MER-guided target was 1.25 mm.

*Conclusion:* Although discrepancy between MRI and MER-guided targeting is small, image-guided stereotaxis alone is only adequate for placing the electrode within several millimetres of the target. Electrophysiological study (microelectrode recording) is important to adjust and confirm final placement. MER-guided procedure gives the team the confidence of 100% success.

11.

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#### A PILOT STUDY ON USING WIRELESS PALM POWERED PERSONAL DIGITAL ASSISTANT TO FACILITATE TELERADIOLOGY IN NEUROSURGICAL CONSULTATION

**ABSTRACT:** To assess the feasibility of wireless pocket teleradiology, brain computed tomography scan images of neurosurgical emergency cases were received on a personal digital assistant (PDA) via mobile phone. Viewing times from turning on the PDA to viewing the entire set of images ranged from 4 to 20 minutes, depending on the route of data flow. Reliability in obtaining a wireless internet connection was good, but not perfect. The quality of images was satisfactory except that using the route of PalmVNC which wants for further upgrade. The results show that a remote emergency consultation link can be built with readily available technology.

12.

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#### GROUP II METABOTROPIC GLUTAMATE RECEPTOR AGONIST DCG-IV ATTENUATES TRAUMATIC NEURONAL INJURY IN RAT'S HIPPOCAMPS AFTER SECONDARY BRAIN INJURY

**ABSTRACT:** *Aim:* We examined the effects of group II metabotropic glutamate receptor (mGluRs) agonist DCG-IV on diffuse brain injury (DBI) and secondary brain insult (SBI).

*Methods:* Based on Marmarou's rodent model of diffuse brain injury, hypotension was made by blood withdrawing as secondary brain insults (SBI). Male SD rats were randomized into sham, head injury with SBI and DCG-IV treatment three groups. The level of cyclic AMP and Glu in hippocamps was observed by microdetermination. The alterations of Group II mGluRs mRNA expression and pathology of Hippocamps were observed under light microscope (x 400) with digoxin-labeled oligonucleotide probe in situ hybridization method and computer aided image analysis. The number of injured neurons of hippocamps in each DCG-IV groups was also counted under microscope.

*Results:* SBI induced increases in cyclic AMP and glutamate levels in hippocamps were significantly reduced by a group II agonist DCG-IV. The number of damaged neurons in hippocamps after SBI was also decreased with DCG-IV treatment. Administration of a group II mGluR agonist DCG-IV 30 min after SBI in rats significantly improved subsequent behavioural recovery.

*Conclusion:* This study indicates that group II mGluR agonists protect against SBI induced neuronal injury in hippocamps by attenuating glutamate release and cAMP levels and suggest a potential role for these agents in the treatment of clinical SBI.

13.

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#### MINIMALLY INVASIVE SURGERY FOR THALAMIC TUMOURS: WITH 34 CASES REPORTS

**ABSTRACT:** *Objective:* To evaluate the effectiveness of image-guided minimally invasive surgery for patients with thalamic tumours.

*Patients & Methods:* A total of 69 patients with a thalamic tumour were treated at Beijing Tiantan Hospital between November 1997 and January 2000. The initial common clinical symptoms and signs were headache, seizure and motor weakness. Among these cases, 34 patients (Male: Female = 21:13, ranging from 10 to 54 years old) were enrolled in our study to be operated on with assistance of image-guided neuronavigation system (Surgiscope, Elekta Co. and Steathstation, Metronic Co.). According to 3D-reconstruction MR images, a detailed and accurate surgical plan was got before the surgery. During the operation, the Surgiscope system could direct to find and removal the previous identified tumour target with a deviation less than 2 mm. For some tumours enlarged irregularly, endoscope was used to avoid injury of surrounding tissue and vessels. The clinical characteristics, surgical skills and postoperative outcomes of these patients were also analyzed retrospectively.

*Results:* Out of these 34 cases, the histological diagnosis was astrocytoma in 12 patients, anaplastic astrocytoma in 11, glioblastoma in 4, carvenous angioma in 4, metastasis in 2, and brain abscess in 1. Tumour size in diameter varied from 1.2 to 4.5 cm. With using of keyhole microsurgical skills, a total resection was received in 29 cases and subtotal in 5 cases. There was no operative death. The temporary postoperative complications caused by brain edema or vascular spasm were found in 13 patients (38.2%), but the permanent complications only in 5 cases (14.7%). A combination of radiotherapy and chemotherapy was recommended for those patients with malignant thalamic tumour after surgery.

*Conclusion:* For thalamic tumours, especially for those malignant gliomas without clear boundary, the image-guided microsurgery can be performed with low morbidity and a favourable prognosis.

14.

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#### COMBINED TRANSCRANIAL TRANSSPHENOIDAL APPROACH FOR LARGE OR GIANT PITUITARY ADENOMA

**ABSTRACT:** During the period between August 2000 and November 2001, six patients harbouring large or giant pituitary adenoma were operated on by a combined transcranial-transsphenoidal approach in our institution. All patients presented with visual field loss. Four of them had either giant tumours (>5 cm in diameter) and two had large (>2.5-5 cm) recurrent pituitary adenomas confirmed by the MRI scan. Combined transcranial-transsphenoidal excisions were performed and gross total removal was achieved in all cases except two where residual tumour was left in the cavernous sinus of the patient. There was no operative mortality or major morbidity. Visual field defects improved in all patients. Despite the small number of patients involved in this study, this preliminary result shows that combined transcranial-transsphenoidal approach can be a safe and useful approach for large and giant recurrent pituitary adenomas.

15.

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#### THE MICROSURGICAL MANAGEMENT OF INTRACRANIAL AND EXTRACRANIAL TUMOURS

**ABSTRACT:** *Objectives:* A retrospective study has been made on the preoperative embolization of supplying arteries and microsurgical management of 60 cases of tumours with intracranial and extracranial extension treated in our hospital between the year 1992 till now in order to improve the clinical outcome of these diseases.

*Methods:* There were 42 males and 18 females aged between 11 months ~68 years (mean 32.2 years) in this series. 30 cases were located in anterior cranial fossa, 16 in middle cranial fossa and 14 in posterior fossa. 48 cases were underwent DSA and 45 proceeded to preoperative embolization of supplying arteries of tumours. The embolized arteries included superficial temporal artery, posterior auricular artery and meningeal artery and other branches of the external carotid artery. Microsurgical techniques and different approaches have been utilized to remove tumours.

*Results:* 42 cases had total removal and the remainder had subtotal resection. The postoperative morbidity is zero. Follow up study ranged from 7 months to 7 years. 34 cases could resume normal life, 18 cases were dependent and 8 had recovery to some extent.

*Conclusion:* The preoperative embolization of supplying arteries of tumours made it possible to decrease bleeding during operation and increase the possibility to remove tumours totally. Microsurgical and piecemeal techniques as well as combined approaches from different department may result in improved clinical results.

16.

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#### COMPUTER IMAGE GUIDED TRANSSPHENOIDAL SURGERY FOR PITUITARY TUMOURS

**ABSTRACT:** Transsphenoidal surgery is preferred to transcranial surgery in the treatment of sellar lesion because it reduces the morbidity of the craniotomy. Traditionally intra-operative fluoroscopy was used to confirm our transsphenoidal approach but it provide information regarding the position of instrument in an antero-posterior and rostro-caudal direction only but no information in a medial-lateral direction. It also increases cumulative X-ray exposure to the surgeon.

Frameless computer navigational system has been recently used in our center in transsphenoidal surgery. It is a optically base system in which the computer tomography or magnetic resonance imaging data are superimposed three dimensionally onto the surgical field as seen through the microscope using head-up display technology. It does not require any opto-kinetic link such as a head-frame, mechanical arm, ultrasonic or magnetic field. It provides three dimensional, accurate and user-friendly guidance in the surgery. It also reduces the risk of the radiation exposure to the surgeon.

We used the MKM microscope system in 20 cases of transsphenoidal surgery. Retrospective data regarding the operative time, setup time, accuracy and treatment cost were obtained from the transsphenoidal surgery and from the traditional fluoroscopic surgery and the result was compared.

17.

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#### IS COMPUTED TOMOGRAPHIC ANGIOGRAPHY (CTA) FOR INVESTIGATION OF ISOLATED THIRD NERVE PALSY GOOD ENOUGH?

**ABSTRACT:** *Introduction:* A significant portion of patients with an isolated third nerve palsy do not have a structural lesion. Nevertheless, since using clinical signs to differentiate between intrinsic and structural lesion was not totally reliable, angiography is recommended to exclude the diagnosis of expanding posterior communicating artery and basilar artery aneurysm. With the introduction of computed tomographic angiography (CTA), we had employed that as a first line investigation for patients with isolated third nerve palsy since 1994.

*Methods and Results:* All CTA performed between 1/1998 and 7/2001 were screened. 35 patients with isolated third nerve palsy were identified and reviewed.

All extrinsic lesions causing third nerve palsy were identified using CTA. They included posterior communicating artery aneurysm (5) and pituitary apoplexy (2). 5/35 (14%) patients harboured an intracranial aneurysm were diagnosed by CTA. Digital subtraction angiography did not confer any benefit in this group of patients.

*Conclusion:* A good quality CTA is good enough for (1) confirming an aneurysm for surgical treatment; (2) excluding an intracranial aneurysm as a cause for the III nerve palsy.

18.

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#### SPINAL AVM ASSOCIATED WITH KLIPPEL-TRENAUNAY SYNDROME (KTS): REPORT OF 2 CASES

**ABSTRACT:** Klippel-Trénaunay syndrome (KTS) is a rare congenital disorder. The cardinal features of KTS includes cutaneous vascular naevus, limb hypertrophy, and venous malformation. However, a wide variety of other anomalies are also found in this group of patients. Spinal arteriovenous malformation is an uncommon association with KTS and related presentation is rare with only sporadic reports.

We report two cases of KTS who presented with symptoms later found related to their spinal AVMs as part of KTS.

19.

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#### COMPARISON OF SITTING AND PARK BENCH POSITION IN VESTIBULAR SCHWANNOMA OPERATION: ANALYZE OF 30 CASES

**ABSTRACT:** This study retrospectively review our experience in vestibular schwannoma operated since 1996. All patients underwent tumour resection in sitting or Park bench position via suboccipital retromastoid approach. Intraoperative neurophysiological monitoring is performed in all patients, including auditory brain stem respond and facial nerve stimulation test. Navigation system is used in most cases. Surgical techniques were discussed. Operative complications, such as air embolism, pneumocephalus or tumour bed bleeding were discussed. Anatomical facial nerve preservation rate and facial nerve function were reviewed, in relation to the size of tumour. The rate of preservation is increasing and postoperative morbidity of sitting position is decreasing in the recent cases. Functional hearing preservation was also achieved in some case.

20.

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#### RESULTS OF SURGICAL REMOVAL OF FUNCTIONAL PITUITARY TUMOUR IN QUEEN MARY HOSPITAL: A TEN-YEAR REVIEW

**ABSTRACT:** *Aim:* To evaluate the results of surgical outcome for the management of functional pituitary tumour.

*Methods:* A retrospective study.

*Inclusion criteria:* All patients with functional pituitary tumours being removed in Queen Mary Hospital between the year 1991 to 2001. They underwent either transsphenoidal pituitary microsurgery or transcranial tumour removal or both. Only patients with macro- or micro- adenoma secreting prolactin, growth hormone or ACTH are included.

*Results:* Multiple factors including the extent of operation, the pre and post-operative hormonal level, the presence of visual field disturbance, the results of MRI studies during follow-up and the presence of complications are discussed in this paper.

21.

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#### REVIEW OF THE MANAGEMENT OF DELAYED ISCHEMIC NEUROLOGICAL DEFICIT AFTER ANEURYSM SAH IN QUEEN MARY HOSPITAL

**ABSTRACT:** This is a retrospective review of the management of delayed ischemic neurological deficit (DIND) after aneurysm subarachnoid haemorrhage in QMH. All patient suffered from SAH from 1996 to 2001 will be included in the study. The incidence of DIND and various modalities of diagnosis will be reviewed. Prophylactic treatment of DIND which consists of nimodipine and hypervolaemic therapy were given to all patients. Once the diagnosis was confirmed Triple-H (Hypertensive, hypervolaemic, haemodilution) therapy and angioplasty would be given. The patients' outcome would be assessed.

22.

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#### AN OCCLUDED SEGMENT OF CEREBRAL ARTERY IN MOYAMOYA DISEASE MIMICKING AN ANEURYSM

**ABSTRACT:** *Objective and Significance:* This is the first report of an occluded segment of cerebral artery in Moyamoya disease mimicking an aneurysm radiologically.

*Clinical Presentation:* A 70-year-old woman presented with symptom of headache and clinically classified as Hess and Hunt Grade I subarachnoid haemorrhage.

*Intervention:* Angiographic evidence of Moyamoya disease and repeated evaluation showing left middle cerebral artery aneurysm. Surgical exploration revealed a blind end sac of segment M2 of left middle cerebral artery, which mimicked an aneurysm radiologically.

*Discussion/Conclusion:* In a patient with Moyamoya's disease, a suspected aneurysm on conventional angiogram might represent a stump end of an occluded vessel. Despite advances in modern radiological imaging, can we afford not to intervene surgically?

23.

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**SYRINGOMYELIA IN PATIENT WITH CONGENITAL HYDROCEPHALUS**

**ABSTRACT:** *Objective and Significance:* Blockage of ventriculo-peritoneal shunt in a patient with coexisting syringomyelia leading to cord compression symptoms had rarely been reported in literature.

*Clinical Presentation:* An 18-year-old female, with history of congenital hydrocephalus, underwent ventriculo-peritoneal (VP) shunt insertion at the age of six and remained neurologically stable afterwards. Syringomyelia involving the whole spine was diagnosed on MRI in 1997 and since she remained asymptomatic, no intervention was offered. However, with a recent episode of blocked VP shunt, she was rendered paraplegic and her situation was not improved with revision VP shunt.

*Intervention:* Suboccipital craniectomy and C1 posterior laminectomy for decompression of the posterior fossa was performed.

*Discussion:* The "sucking" and "sloshing" mechanism proposed by B. Williams is well illustrated in this patient in explaining the acute exacerbation of the neurological symptoms caused by the failure of CSF drainage in this patient.

From the management point of view, should posterior fossa decompression be offered as prophylactic treatment in patients with CSF diversion in-situ diagnosed to have coexisting syringomyelia?

24.

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**NEUROSURGICAL REVASCLARIZATION FOR MOYAMOYA DISEASE: THE PRINCE OF WALES HOSPITAL EXPERIENCE**

**ABSTRACT:** *Introduction:* Moyamoya disease in children and young adult patients often presented with cerebral ischemia or infarction. Surgical revascularization may improve the cerebral perfusion in this group of patients.

*Methods and Results:* From 1993 to 2000, 7 Moyamoya patients have received revascularization operation in the Prince of Wales Hospital. They were 4 children (3 males and 1 female, age 2 to 8 years) and 3 young adults (all female age 20 to 29 years). All of them presented with transient ischemic attack (TIA) or cerebral infarction. Seven Encephaloduroarteriomyosyngiosis (EDAMS) operations were performed on 4 children and 1 adult patient (bilateral operations in 2 children), two superficial temporal artery (STA) - middle cerebral artery (MCA) anastomosis were performed on 2 young adult patients. No surgical related complication was noted. There was no more TIA after the surgery. Imaging and blood flow studies showed improvement in cerebral perfusion. However, disease progression was observed in one patient, who eventually need a contra-lateral revascularization surgery.

*Conclusion:* EDAMS and STA-MCA by-pass surgery are effective in improvement of cerebral perfusion in Moyamoya disease with cerebral ischemia. Long-term follow-up is required for this group of patients.

25.

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**REVIEW OF LOCAL DATA FOR MICROVASCULAR DECOMPRESSION**

**ABSTRACT:** Microvascular compression syndromes of the cranial nerves most commonly present as trigeminal neuralgia and hemifacial

spasm. Medical treatment is regarded as the first line treatment for both conditions.

However, significant portions of patients do not response to the medical treatment or their symptoms become refractory. This group of patients will then be considered for more invasive treatment modalities including cryotherapy, alcohol injection, radiosurgery, balloon microcompression or rhizotomy, but these treatments are both neural destructive and may leave to the patients with significant side effects (e.g. paraesthesia).

An alternative invasive but non-destructive treatment option for both trigeminal neuralgia and hemifacial spasm is that of microvascular decompression. We report our experience and the outcome of patients treated with MVD at our unit.

26.

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**EVALUATION OF VAGAL NERVE STIMULATION FOR THE TREATMENT OF REFRACTORY EPILEPSY**

**ABSTRACT:** *Background:* A third of local patients attending neurological clinics have intractable seizures. Vagal nerve stimulation (VNS) is an adjunctive treatment for patients with refractory partial-onset seizures. It has a broad spectrum of anti-epileptic activity at frequencies between 10-60 Hertz as suggested by its effect in a number of animal models such as pentylentetrazol and electroshock-induced seizures. We conducted a prospective, observational trial on the long term efficacy and safety of VNS in Chinese patients.

*Methods:* Adult patients with clinical evidence of chronic pharmacoresistant epilepsy underwent pre-surgical evaluation between 1996 and 2000. MRI and video-EEG were performed. Patients were included if they had a minimum of two seizures per month and discordant or non-localizing clinical, EEG and imaging data. The titanium-encased generator (Neurocybernetic Prosthesis system, Cyberonics, Inc.) was implanted subcutaneously in the left infraclavicular fossa under general anaesthesia. High intensity stimulation was used. The primary outcome was the percentage reduction in frequency of disabling seizures which involved loss of consciousness.

*Results:* 13 patients were implanted: 6 males, 7 females, mean age at implantation was 24.6 years. Percentage seizure reduction was 36% at 6 months and 43% at 24 months respectively; the mean duration of follow-up after implantation was 41.5 months (median 48, range 11-67 months). The device was removed in five due to lack of efficacy.

*Discussion:* In this group of patients with highly resistant seizures there was a significant reduction in seizure frequency which was sustained over a long period; however only one became seizure free. Implantation procedure was uneventful; the NCP generator was well tolerated and have few significant complications side in this group of Chinese patients although the sample size is too small to detect significant adverse events.

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**CURABLE PARAPLEGIA AS A MANIFESTATION OF EXTRA-MEDULLARY HAEMATOPOIESIS IN THALASSAEMIA**

**ABSTRACT:** Extramedullary haemopoiesis (EMH) resulting in spinal cord compression is a rare manifestation of thalassaemia. A 17-year-old man with thalassaemia intermedia who presented with progressive paraplegia and sphincter disturbance is described. Magnetic resonance imaging revealed an epidural lesion extending from T5 to T8 with cord

compression. The patient made a complete recovery following surgical decompression and postoperative radiation therapy. Histological examination of the lesion confirmed the diagnosis of extramedullary haemopoiesis.

The diagnosis of spinal EMH is suggested by a history of chronic haemolytic anaemia, evidence of EMH elsewhere, symptoms of cord compression and radiographic evidence of an intraspinal epidural lesion. A high index of suspicion with early treatment is essential to avoid irreversible neurological sequelae. The role of magnetic resonance imaging in diagnosis and follow-up cannot be overemphasised. In the event of acute neurological deterioration, we advocate surgical decompression with postoperative radiotherapy and blood transfusion.

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#### MULTI-DISCIPLINARY APPROACH TO THE MANAGEMENT OF SOLID HAEMANGIOBLASTOMA

**ABSTRACT:** *Background:* Haemangioblastomas account for 1.5 to 2.5 percent of all intracranial tumours and for 7 to 12 percent of primary posterior fossa tumours. Above 30 percent of tumours are solid which appears beefy red from rich vascularity. The solid tumours also tend to involve the brain stem more often than cystic ones. Therefore, operation for the solid haemangioblastoma is challenging and always complicated by intraoperative haemorrhage. Presurgical embolization is now used as an adjunct in surgical resection of these highly vascular tumours.

*Patients and Methods:* Three cases of solid haemangioblastomas were managed over a 4-year period from 1998 through 2001 at the Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong. All tumours were situated in the cerebellum and were around 3-4 cm in diameter. All patients underwent presurgical embolization with complete embolization in one case and nearly total obliteration in the rest. They had microsurgery one to two days after embolization with operation times around 8 hours in average. Only one patient required blood transfusion during operation. The clinical outcome was good in all cases.

*Conclusion:* Solid haemangioblastomas can be safely managed with a multi-disciplinary approach involving pre-operative embolization and

#### 29.

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#### MULTIMODALITY TREATMENT OF ARTERIOVENOUS MALFORMATION IN PAEDIATRIC PATIENTS

**ABSTRACT:** *Objectives:* In the past, paediatric patients with arteriovenous malformations have been managed primarily using single-modality approaches such as surgery, radiosurgery or embolization. The present study was conducted to evaluate the role of multimodality management of paediatric arteriovenous malformations encountered in our institution over a 7-year period from 1993 to 2000.

*Methods:* Between April 1993 to December 2000, 33 paediatric patients with arteriovenous malformations (AVM) were managed at the Department of Neurosurgery, Queen Elizabeth Hospital. The treatment modality consisted of microsurgery alone in 16 patients, radiosurgery alone in 9 patients, a combination of pre-operative endovascular embolization and microsurgery in 1 patient, microsurgery followed by radiosurgery in 2 patients, a combination of endovascular embolization and radiosurgery in 3 patients, and a combination of preoperative endovascular embolization, microsurgery and radiosurgery in 2 patients.

*Results:* There was no hospital mortality. The mean operating time was 7.3 hours, with a mean blood loss of 378 ml. The clinical outcomes for the overall series were 83.3% excellent (Glasgow Outcome Score, GOS 5), 13.3% good (GOS 4) and 3.3% fair (GOS 3). Out of the 13 patients who had seizures, 7 patients are seizure-free. Only 12 patients in our series are still on long-term anti-convulsants. Successful obliteration of AVM was confirmed by postoperative cerebral angiography or magnetic resonance angiogram in 88% of patients.

*Conclusion:* The combination of multi-modality treatment will improve the overall outcome of paediatric patients with AVMs. We emphasize the active treatment of AVMs in this age group as the biological plasticity of the developing brain allows complete recovery with integration into society.

#### 30.

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#### RESULTS OF PAEDIATRIC CEREBROSPINAL FLUID SHUNTS

**ABSTRACT:** We received the results of cerebrospinal fluid shunts performed at Tuen Mun Hospital from January 1995 through June 2001, for patients of or below age 16. Totally there are 41 patients received their first shunts during that period. 40 of those first shunts are ventriculoperitoneal shunt. The follow up period is relatively short. The patients are divided into 2 groups according to their age at the time of shunt insertion. 15 of them are at or below age 1 (Group A) at the time of shunt insertion, and 25 of them are between age 1 to age 16 (Group B). Obvious differences in primary pathologies as well as cumulative shunt survivals are observed between the 2 groups. Only 6 out of the 25 patients in Group B had their in Group B had their first shunt failed while 10 out of the 16 shunts in Group A had failed. Majority of the shunt failures were due to obstruction and infection. Risk factors for shunt infection and obstruction are also analysed.

#### 31.

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#### THE EXPRESSION AND CHANGES OF HEAT SHOCK PROTEIN 70, MDA AND HAEMORHEOLOGY IN RAT CORTEX AFTER DIFFUSE AXONAL INJURY WITH SECONDARY INSULTS

**ABSTRACT:** In the present study the role of HSP70 expression, changes of Malonaldehyde (MDA) in rat cortex and haemorheology with time after diffuse axonal injury (DAI) only and DAI with secondary insults (SI) were studied. The rat DAI and DAI with SI model were made according our previous work and animals were divided into a control and another five injury groups with time after injury. Immunohistochemical assay was used to detect the neuronal expression of HSP70 at 0.5h, 3h, 12h, 24h, 72h after DAI or DAI with SI. In the meantime, the high ( $\eta_{sp}$ ) and low whole blood viscosity ( $\eta_{cl}$ ), haematocrit (HCT) and RBC aggregation index ( $AI = \eta_{cl} / \eta_{sp}$ ) were also detected and calculated. MDA in the homogenized brain tissue was assayed by thiobarbituric acid (TBA) reaction. The results showed that HSP70 positive neurons were not detected at 30 minutes, but the number of HSP70 positive neurons begin to increase obviously at 3 hours, reach a peak at 24 hours ( $p < 0.01$ ), and decrease at 72 hours ( $p < 0.05$ ) after brain injury. The trend of expression of HSP70 was alike for both DAI only or DAI with SI. Meanwhile, MDA,  $\eta_{sp}$ ,  $\eta_{cl}$ , HCT and AI changes showed the same tendency. Compared with DAI only group, MDA and blood viscosity indexes in DAI with SI were significantly higher at respective time point ( $p < 0.01$ ). It is concluded that HSP70 expression, MDA and haemorheology indexes increased after brain injury and brain injury with SI. Free radicals and haemorheological changes play an important role in the aggravation of brain damage and HSP70 expression upregulation.