Monday, September 11, 2006

2006 CANP Diagnostic Slide Session
Chair: Dr. Edward S. Johnson

20:00-20:10 WELCOMING REMARKS

20:10 C1: E.S. Johnson, B.M. Wheatley and S.N. Ahmed
20:20 C2: V. Parafeynikov and J. M. Bonnin
20:30 C3: L.-N. Hazrati, B. Young and J.M. Bilbao
20:40 C4: A. Ziadi, A. Moghrabi and Y. Robitaille
20:50 C5: B. Curry and D. Hogan
21:00 COFFEE BREAK
21:10 C6: C.L. Coire
21:30 C8: B. Lach and M. Hassounah
21:40 C9: A.S. Easton
21:50 C10: S. Krawitz and M.R. DelBigio
22:00 C11: J.L. Keith and D.A. Ramsay
CASE No 1

E.S. JOHNSON¹, B.M. WHEATLEY² and S.N. AHMED³ (Departments of Laboratory Medicine and Pathology¹, Surgery², and Medicine³, University of Alberta).

At the age of 54 years, this 73 year old woman presented with a complaint of longstanding dizziness with recent onset of left tinnitus and gait unsteadiness. A CT scan showed a large left temporal lobe cyst, which was treated by CT guided stereotaxic needle drainage. Analysis of the aspirated fluid revealed a glucose content of 1.2 mmol/L (serum glucose 5.4 mmol/L, normal 3.5-9.0), a protein of 1.3 gms/L, and acellular debris on cytology. A year later, a MRI scan showed that that cyst had resumed its previous size. Onset of seizures occurred at age 65 years. Anticonvulsant medication was commenced, but discontinued by the patient. Seizures recurred at age 69 years. Subsequent evaluation by EEG-telemetry disclosed complex partial seizures with left frontotemporal onset. Seizure semiology predominantly consisted of lip smacking, loss of awareness, and clonic activity in the right hand. Some seizures were associated with selective post-ictal aphasia (she was able to speak fluent Ukrainian but not English). These seizures lasted one to two minutes, with rare progression to generalized convulsions. Serial MRI scans showed, other than slight enlargement of the cyst, no change from previous studies. At age 73 years, the patient underwent surgical decompression of the cyst by resection of the mesial temporal wall via a left lateral temporal corticectomy. No communication with the temporal ventricular horn was noted.

Materials Submitted:
1. Slide transparency of MRI, T1 window, age 72 years
2. Hematoxylin and eosin stained section of mesial temporal lobe resection

Questions:
1. Diagnosis?
2. Pathogenesis?
CASE No 2

V. PARAFEYNIKOV and J. M. BONNIN (Department of Pathology and Laboratory Medicine, Indiana University School of Medicine).

On the day before admission, this 20 month-old girl suffered an episode of convulsions followed by complete loss of consciousness. She had a history of febrile seizures in the past but was otherwise healthy. The developmental milestones were normal and there was no previous history of head trauma. CT and MRI of the head showed a well-defined 19 x 17 mm enhancing mass involving the gray matter of the left parieto-occipital region. There was no perilesional edema or deviation of the midline structures. An EEG revealed mild asymmetry of the posterior dominant rhythm but no focal epileptiform or ictal activity was recorded during monitoring. Laboratory data were non-contributory. The patient was placed on steroids for several days and subsequently underwent a left occipital craniotomy with gross total resection of the mass. This was easily attained owing to the well-demarcated and discrete nature of the lesion. On the day after surgery, the patient had an episode of generalized seizures.

Material Submitted: Hematoxylin and eosin stained section.

Question: Differential diagnosis
CASE No 3

L.-N. HAZRATI, B. YOUNG and J.M. BILBAO (Department of Pathology, Sunnybrook Health Sciences Centre and Department of Laboratory Medicine and Pathobiology, University of Toronto).

This 76-year-old woman with autoimmune neutropenia and anemia, hypothyroidism, hypertension and orthostatic hypotension for five years, underwent a cystectomy after a long history of recurrent complicated fungal cystitis and renal failure. Post-operatively, she developed left arm weakness and was witnessed to have recurrent episodes of catatonic seizures. She had no history of epilepsy or migraines, although she recalled multiple episodes of "black-outs that occurred when she went from lying to standing position". Weakness in her limbs worsened rapidly and involved also her lower limbs forcing the patient to use a walker and subsequently a wheelchair. Her voice was noticed to have become more "quiet". Of note, her father had a "stroke" and her mother did have unexplained "blackouts", similar to her episodes. Her physical examination showed normal reflexes, a positive Babinski sign bilaterally and clonus in her left foot. Electrophysiological studies revealed asymmetrical axonopathy. Brain imaging showed a mild general atrophy, and scattered nonspecific white matter changes, most likely related to mild microangiopathic disease. She eventually died of complications of aspiration pneumonia.

Materials Submitted:
1. LFB-H&E stained section at the level of the lenticular nucleus.
2. Immunostained section of the pons.

Question: Diagnosis?
CASE No 4

A. ZIADI, A. MOGHRABI and Y. ROBITAILLE (University of Montreal, Dept. of Pathology and Cell Biology, Ste-Justine Hospital, Montreal, Quebec, Canada).

This 7 year old girl without past medical history went to the emergency ward in November 2005 for headaches and vomiting of about 1 month's duration, which had worsened for the past 2 weeks. Neurological examination showed ataxia and mild right upper arm weakness with brisk deep tendon reflexes. An MRI showed an ill-demarcated mid-pontine space-occupying lesion measuring 3.3 x 3.1 x 3.9 cm. It appeared diffuse, hypodense on T1, and hyperdense on T2 weighted cuts. Posteriorly, the lesion was exophytic with invasion of the right middle cerebellar peduncle. There was very extensive sub-arachnoid seeding with prominent sub-pial spread at all spinal levels, heaviest in cervico-thoracic regions. Small nodules consistent with metastases were found in the hypothalamus, optic chiasm, pituitary gland and cerebellum. A leptomeningeal biopsy was performed at T4.

Material submitted: Pre-biopsy representative MRI available on CANP website.

Questions:
1. Differential Diagnosis
2. Histogenesis and therapy
CASE No 5

B. CURRY and D. HOGAN (Departments of Pathology and Laboratory Medicine, Clinical Neurosciences and Internal Medicine, University of Calgary)

An elderly lady was referred to the Cognitive Assessment Clinic (CAC) 13 months before death, at the age of 81 years, with a 1 year history of difficulties with short term memory and decreased concentration. Assessment showed that she had poor insight into her problem, with decreased verbal fluency and abstract thinking; she was disoriented to day and date; MMSE score was 22/30. Neurological and clinical examination were normal apart form BP of 170/80. She had been treated for hypertension and high cholesterol for a number of years; she had an angioplasty 4 years previously. Lab tests, apart from raised serum bilirubin, were normal. CT scan showed generalized atrophy with no focal lesions. At the time of first assessment there was still no functional effect on daily life; she still had her own bank account; she entertained; she enjoyed playing bridge and golf. At follow up 3 and 6 months later, there was no obvious deterioration; repeat MMSE (at 6 months) was 23/30. Her 4th scheduled visit was to be 12 months from the initial assessment. However at 10 months she started complaining of headaches; these were treated with Tylenol 3. At eleven months she departed on vacation with her husband. When she returned there had been significant deterioration in her cognitive abilities, she was withdrawn, suffered unexplained falls and was admitted to hospital for treatment of a urinary tract infection. Before her 12th month visit to the CAC, she had been admitted to a chronic care facility. Several weeks later she stopped eating, drinking, talking and required assistance with her ADL’s. She was admitted to FMC approximately 4 weeks prior to death with decreased level of consciousness; she was dehydrated, had no verbal response, limited gaze towards right; she moved all limbs in response to pain stimulus. Lab tests showed only raised white cell counts (13,100). She was re-hydrated and treated for a UTI and left lower lobe pneumonia. MRI showed mild ventricular dilation, some changes suggestive of possible small cerebral vessel disease and generalized atrophy. Despite antibiotic therapy she continued to deteriorate; a PEG was inserted to assist with feeding. EEG showed diffuse slowing; no periodic complexes. Serial CT’s showed progressive enlargement of her ventricles. CSF showed raised white cell count and protein with normal glucose. Blood and CSF cultures were negative. Following an infectious disease consult she was started on amphotericin B. Her respiratory status continued to deteriorate, she died in hypoxic respiratory failure, 13 months after her initial visit to the CAC.

Materials Submitted:
1. H&LE stained section of cerebellum
2. Unstained section of superior and midtemporal gyrus

Question: Diagnosis?
CASE No 6

C. I. COIRÉ (Department of Pathology, Trillium Health Centre, Mississauga, Ontario, Canada)

This 58-year-old man sought medical attention because of increasing left-sided headaches. These were not associated with nausea or vomiting, but were significant enough to have caused him to stop working. Past medical history was unremarkable. The neurological examination was normal. A CT scan and MRI of the brain revealed a lesion in the trigone of the left lateral ventricle, 2.5 x 2.7 cm, fairly homogeneous and with only focal enhancement. A stereotactic brain biopsy was done and a diagnosis given. The lesion was followed with MRI scans at six month intervals and remained stable for three years, except at the one year interval MRI scan when it was thought that some growth had occurred. However, the patient became increasingly frustrated with his persistent headaches and a surgical excision of the lesion was therefore offered to him.

Materials Submitted:
1. CD with selected light microscopy images of stereotactic brain biopsy and selected images of the MRI brain scan.
2. A glass slide of the excised mass will be handed out at the meeting.

Question: Differential diagnosis based on the biopsy findings.
CASE No 7

J. FERREIRA¹, J.F. GIGUERE² and A. PERRY³ (Dept of Pathology, Hopital Maisonneuve-Rosemont, Université de Montréal¹, Neurosurgery, Hopital du Sacré-Cœur, Université de Montréal², Dept of Pathology, Barnes-Jewish Hospital, Washington University Medical Center³).

This 61 y.o woman without pertinent past medical history underwent partial resection of a conus medullaris tumor.

Material submitted: H&E stained representative section of the tumor

Question: Differential Diagnosis
CASE No 8

B. LACH¹ and M. HASSOUNAH² (Department of Pathology and Molecular Medicine, Hamilton Health Sciences, McMaster University, Hamilton, Ont., Canada¹ and Department of Neurosciences (Neurosurgery), King Faisal Specialist Hospital, Riyadh, Saudi Arabia²).

This 9 year old boy had a sudden onset of occipital headache and neck pain associated with vomiting and followed by lethargy and diplopia. Neurological examination revealed bilateral papilledema, left abducens nerve palsy and mild right hemiparesis. Neuroradiological studies revealed a 7.5 x 5 x 4 cm hemorrhagic tumor in the left parieto-occipital area. At craniotomy, the tumor was very firm and rubbery with extensive areas of old and recent hemorrhage. However, the tumor itself was not very vascular. Post-operative MRI confirmed gross total removal of the lesion. The patient had an uneventful recovery and his symptoms improved. Screening for the extracranial tumor revealed the presence of two small nodules in the posterior segment of the upper lobe of the right lung. Spinal MRI depicted faint enhancement and thickening of the cauda equina suggestive of drop metastasis. However, CSF was negative for malignant cells. The child received craniospinal radiation of 3060 cgy in 17 doses and a 5400 cgy boost to tumor bed. The lung nodules progressed rapidly and the patient developed marked pleural effusions and dyspnea. Due to rapid progression of the pulmonary lesions during the four months following the surgery, he is receiving only palliative care.

Material Submitted: One H and E slide.

Question: Diagnosis.
This man, aged 40 on presentation, a Baptist minister by occupation, became acutely unwell in November 2003, complaining of a sensation of movement while at rest, unsteadiness while walking and double vision. He was admitted shortly thereafter with progressive gait ataxia, diplopia on horizontal and vertical gaze, dysarthria and mild headache. He also had loose watery diarrhea without blood or melena. His past medical history included a hamster bite with cellulitis treated in May 2003, toxic hepatitis after a drug trial in 1994, type I diabetes mellitus for 20 years, viral meningitis in 1975, right nephrectomy in 1969 and hypercholesterolemia. He was on insulin, simvastatin and ranitidine. There was no history of excess alcohol. There was no family history of cerebellar disease or malignancy. Physical examination revealed dysarthria with scanning speech, diplopia on right lateral gaze, nystagmus bilaterally, both horizontal and vertical with a downbeat component. He had a wide-based ataxic gait. Reflexes were 1+ in lower and 2+ in the upper extremities with bilateral downgoing toes. His ataxia and diplopia improved so that he was discharged. However he was readmitted in December 2003 with progressive symptoms, new vertigo without tinnitus or deafness, nausea and vomiting. His investigations included brain MRI in January 2004 showing generalized cerebellar atrophy (MRI in November reported as normal). Gallium scan showed increased uptake in cecum and proximal colon suspicious for inflammation or neoplasia, with normal colonoscopy and ileoscopy. Ileal biopsies were histologically normal, with no evidence for celiac disease. Paraneoplastic antibodies were negative. CT scans of thorax, abdomen and pelvis were normal, showing an absent right kidney. Blood work showed normal tumor markers (CEA, AFP, beta-hCG, PSA), normal TSH and normal serology (including treponema pallidum). He deteriorated and developed opsoclonus, myoclonic jerks in the left arm, dysarthria with decreased speaking and progressive nausea and vomiting. He deteriorated and died in April 2004. A complete autopsy was performed. The general findings included three vessel coronary artery disease and multiple benign colonic polyps. A neoplasm was not identified.

Materials submitted: Hematoxylin and eosin/luxol fast blue stained section of the right lateral cerebellar hemisphere.

Question: Clinicopathological diagnosis? Possible etiological factors?
CASE No 10

S. KRAVITZ and M.R. DEL BIGIO (Department of Pathology, University of Manitoba, Winnipeg, Canada)

A two year-old boy with neurofibromatosis type 1 was found to have raised intracranial pressure and obstructive hydrocephalus. A CT of the brain showed a 3 cm heterogeneously enhancing mass within the suprasellar cistern and apparently growing upward into the septal region. A craniotomy was performed the same day for debulking of the tumour. The postoperative MRI showed residual tumour around the optic chiasm. Weekly chemotherapy commenced 3 weeks after surgery. Complications included severe hypernatremia. A follow-up MRI of the brain showed rapid growth of the residual tumour (from approximately 2 to 3 cm in diameter). This prompted more aggressive chemotherapy. The child remained alert and playful. One afternoon five weeks after the first imaging of the tumour, he was put down for a nap and was later found dead. Autopsy findings included an expanded hypothalamic and septal region, frontal cavity related to surgery, and paraspinal plexiform neurofibroma.

Material submitted: Hematoxylin and eosin stained section of the midline mass.

Questions: Diagnosis? Grade? Cause of death?
CASE No 11

J.L. KEITH and D.A. RAMSAY (Department of Pathology, London Health Sciences Center, London, Ontario, Canada).

A 65 year old right handed male was a 30 pack year smoker. He presented with an insidious onset of holocephalic headache, tinnitus and hearing loss for five weeks duration. Initial neurological examination was normal. A lumbar puncture contained approximately 25000 red blood cells, and a CT head was normal. MR imaging showed a small amount of intra-ventricular blood and an occluded right vertebral artery. No intracranial source for the subarachnoid bleeding was detected on angiography and an MR of the spine was normal. Four months later the patient presented with a several week history of gait unsteadiness, right arm and leg weakness, further deterioration of his hearing and a 20 lb weight loss. Examination revealed a right Horner’s syndrome, flattening of the right nasolabial fold, right pronator drift and weakness of the right upper and lower extremity. MR imaging then revealed a dural based mass within the foramen magnum, encasing and occluding the right vertebral artery. The patient was admitted to hospital, his level of consciousness deteriorated and he died eight days later.

Questions:
1) What is the histopathological diagnosis of the mass (slide 1)?
2) What aspects of the clinical presentation may be attributable to the findings in slide 2?