Case 2000-01

Submitted by: Richard L. Davis, M.D. and Jane Uyehara-Lock, M.D.
Neuropathology Unit
University of California, San Francisco
San Francisco, CA 94143-0506

Case reference number: UA99-66

Clinical History: The patient is a 30 year old male with a long history of cystic fibrosis. He underwent bilateral orthotopic lung transplants in 1997, and had several subsequent episodes of pneumonia. He was admitted in 1999 for complaints of three days of shortness of breath, fever, headache, chest pain, purulent sputum and sore throat. Despite ventilatory support, multiple antibiotics, antivirals, steroids and continuance of his immunosuppressants, his respiratory and renal functions declined and he died.

No neurologic history was noted and no detailed neurologic examination was recorded.

Necropsy findings: The diagnosis of cystic fibrosis was confirmed, and he had the noted pulmonary transplants with organizing pneumonia, evidence of rejection, both acute and chronic, organizing diffuse alveolar damage, constrictive bronchiolitis obliterans, and hyaline arteriolosclerosis of the kidneys.

At gross neuropathologic examination, white-grey firm tissue was present in the subarachnoid space of the spinal cord, in the cerebello-pontine angles, and just medial to the hippocampi. Nodular masses were present on some spinal nerve roots.

Material submitted: Color slide of spinal cord
H&E of section of spinal cord
Unstained section of spinal cord

Points for discussion: Diagnosis
Frequency of such findings

41st ANNUAL DIAGNOSTIC SLIDE SESSION

CASE 2000-02

Submitted by:

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Case Reference Number: UVA C7216

Clinical History:

The patient is a 33-year-old female with a history of an acute onset of vertigo, severe headaches and blurred vision that have been occurring frequently for the past two months. She had transiently lost consciousness on a number of occasions. A CT scan revealed a large mass located in the medial wall of the left ventricular atrium with enhancement of the lateral posterior choroidal arteries and choroid plexus. Preoperative nonenhancing and enhancing MRI scans demonstrated a hypodense intraventricular mass that enhanced after contrast administration, suggestive of a meningioma.

The tumor was completed resected using microsurgical technique via a parieto-occipital craniotomy with interparietal sulcal approach. A postoperative MRI scan confirmed a total gross resection of the tumor. The patient had no postoperative motor deficits and remains disease-free. However, she has not been able to return to work due to postoperative agraphia.

Material submitted: 1. T2-weighted MRI of the brain (35 mm).
2. H&E section of the tumor.

Points for discussion: 1. Diagnosis
2. Pathogenesis

CASE 2000 - 03

Submitted By: Philip J. Boyer, M.D., Ph.D.*, Peter J. Christ, M.D.#, Robert R. Eckert, D.O.#, David W. Allen, M.D. and Javed Towfighi, M.D.*
*Department of Pathology, Penn State University - Hershey Medical Center, Hershey, PA and #St. Joseph Medical Center, Reading, PA.

Case Reference Number: SH-99-25826

Clinical History:

The patient is a 21 year old student at a local university who sprained her ankle approximately 9 weeks prior to surgery; she did not immediately seek medical consultation. She was experiencing "light headedness" at that time. In addition, she stated that, when she walked, she veered off to the right; when standing still, she had a tendency to fall backward. She reported left sided headache during the 2.5 weeks prior to surgery. Her ankle continued to be painful and, approximately a week before surgery, she sought consultation with an orthopedic surgeon. While leaving the surgeon's office, she fell and was subsequently noted to have "jerking" movements of her right arm and leg. An outpatient CT scan was performed which identified a lesion and she was admitted for evaluation.

There was no known significant past medical history. Review of systems was unremarkable. Past social history was positive for occasional alcohol use and negative for tobacco and illicit drug use. General physical examination was unremarkable except for tenderness of the right ankle. However, neurologic examination revealed spasticity and dystonic movement of the right upper extremity, with slightly diminished strength of the right arm flexors and extensors. Mild spasticity was noted in the right lower extremity. Reflexes were brisk in the right upper and lower extremities. Cranial nerve examination was normal.

Magnetic resonance imaging identified two lesions:
(1) High left parietal convexity lesion, 2 cm, enhancing, interpreted as intra-axial by imaging, with extensive white matter edema with effacement of overlying sulci and slight lateral ventricle deformity; no corpus callosum encroachment was identified.
(2) Right posterior parietal lobe lesion, adjacent to atrium of the lateral ventricle, with radiographic features consistent with vascular malformation ("venous angioma").

Surgery was carried out. Neurosurgical intraoperative observation found the lesion to be extra-axial and falx / dura-based. It was excised, in fragments, aggregate dimensions approximately 2.6 X 2 X 1 cm.

Materials Submitted:
1. H&E stained section
2. Unstained section

Points of Discussion:
1. Differential diagnosis
2. Optimal stain / immunoperoxidase evaluation panel

Case 2000-4

Submitted by: Sandra L. Cottingham, MD, PhD (Neuropathologist);
Stephen D. Cohle, MD (Forensic Pathologist).
Susan Millett (Michigan State University Medical Student)

Spectrum Health East Campus
Department of Laboratory Medicine
1840 Wealthy SE
Grand Rapids, MI 49506

Case Reference Number: A-99-323

Clinical history:
This 15 year old white male was found face down in bed by his mother on a summer morning; resuscitation efforts were unsuccessful. He had no history of a seizure disorder, or any medical problems. He had been involved in a water skiing accident several weeks prior to death and sustained a small occipital scalp laceration that did not require sutures. There was no loss of consciousness at the time of the accident.

Autopsy findings:
At autopsy, a 3 cm firm, intra-axial white lesion was identified at the tip of the left frontal lobe. Toxicologic analysis was negative. No other significant autopsy findings were noted; in particular, no findings suggestive of a phakomatosis were identified.

Material submitted:
Kodachrome of left frontal lobe lesion
H&E-stained section of left frontal lobe lesion

Points for Discussion:
1. Diagnosis
2. Pathogenesis (Hamartoma v. Malformation v. Neoplasm)

41ST ANNUAL DIAGNOSTIC SLIDE SESSION

CASE 2000-05

Submitted by
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[3]Albany Medical College, Albany, N.Y. 12208

Case reference number: N99-38

Clinical history

In 1995, this 82-year-old man first noticed gait disability, and several falls occurred. During a routine examination at another hospital, he was found to have atrial fibrillation. Cardioversion was applied but he continued to have cardiac arrhythmia. His past medical history also included *in situ* carcinoma of the bladder and aortic valvular disease. His abnormal gait was attributed to Parkinsonism but a treatment trial with carbidopa/L-dopa was not successful. A magnetic resonance imaging study (MRI) of his head was interpreted as showing a "pontine glioma", and radiation therapy followed. The imaging studies were re-interpreted elsewhere, and a general consensus was reached that the findings did not represent a tumor of the brain stem.

In 1997, he was evaluated in Albany, N.Y., and his findings were thought compatible with progressive supranuclear palsy. In 1998, an extensive new examination by a consulting neurologist revealed the following: defective memory for recent events, slow and jerky eye movements, defective saccades, and absent optokinetic nystagmus on vertical movement of the tape. His speech lacked clarity. His power was good everywhere but he had neck and extremity rigidity. Reflexes were not remarkable. He required a wheelchair and walked by holding on to it. He took lurching ataxic steps and did not pivot well. He had lateropulsion and readily lost his balance. The interpretation was that of multiple system atrophy. Low-dose pergolide was begun. Additional MRI were obtained. They were interpreted as normal. He made three follow-up visits before he died. They all indicated further deterioration of his Parkinsonism but also produced evidence of some dysautonomia, including incontinence.

His neurological disability required admission to a nursing home. Urinary retention and herpes zoster prompted hospital admission, and the diagnosis of carcinoma of the prostate was made. His prostate-specific antigen rose to 92, and a bone scan showed innumerable metastases. Comfort measures were taken, and he died 4 years after the onset of his neurological disability.

The general autopsy revealed adenocarcinoma of the prostate with metastatic spread, cardiomegaly and atherosclerosis. The brain weighed 1,130 g and showed massive hydrocephalus.

Material submitted: one slide of the brain stem stained with hematoxylin and eosin; one unstained slide.

Points for discussion: Diagnosis

CASE 2000-6

Submitted by: **Dennis Dickson, MD**
Mayo Clinic Jacksonville, Jacksonville, FL 32224

NA99-215

Clinical History:

This 69-year-old man was in his usual state of health until May 1999 when he presented with complaints of fatigue, periodic somnolence and loss of short-term memory. He had no other cognitive difficulties. Orientation, speaking, reading and writing were normal. He had no fever, headache or meningismus. He had no history of insect or animal bites. He had no risk factors for stroke and no history of previous stroke. The review of systems was noncontributory, except for nonprogressive chronic peripheral neuropathy. His neuropathy had been evaluated extensively in the past and not found to be due to paraneoplastic or rheumatologic etiologies. EMG showed sensory-motor neuronopathy. His past medical history was remarkable for hypertension, enterovesical fistula that was surgically repaired in 1997, diverticulosis, right ankle fracture with ORIF in 1997 and appendectomy in 1942. His family history was negative for neurological disorders. He did not use drugs or alcohol. He had a 40 pack-year history of smoking, but had stopped in 1987. He had no known allergies. On examination his MMSE was 35/38, with points lost for poor drawing of a cube and poor recall. The general medical and neurologic exams were normal except for loss of pinprick, light touch and temperature sense in a stocking and glove distribution.

An MRI showed bilateral, symmetrical temporal lobe hyperintensities. He was treated empirically for Herpes encephalitis, but was subsequently shown to be serologically negative for HSV. PCR was performed on CSF, and it too was negative for HSV 1 and 2. Other negative results included serologic tests for Eastern and Western equine encephalitis, St Louis encephalitis, TBc, mumps, measles, Rocky Mountain spotted fever, Ehrlichia Q fever, Mycoplasma pneumonia, brucella, toxoplasma, Bartonella, CMV, HIV, EBV and Lyme disease. PCR of CSF was negative for Whipple disease. Serologic tests for anti-neuronal antibodies were negative. CT with contrast of chest and abdomen did not reveal any evidence of tumors. Routine laboratory studies showed no hematologic abnormalities.

He had steady progression of his neurological disorder. A brain biopsy was performed in July 1999. Afterwards, high dose steroids and Cytoxan were administered, but he showed no signs of improvement. A repeat MRI in August showed worsening of the temporal lobe lesions and extension of the process into both orbital frontal lobes. He was placed in hospice care in October and died in December with wasting, decubitus ulcers and pneumonia. A complete autopsy was performed.

Material submitted: H&E stained section of hippocampus

Points for discussion: Differential diagnosis; etiology

CASE 2000-7

Submitted by: Alexandra I. Brower, D.V.M. and Barbara Crain, M.D., Ph.D., Johns Hopkins University School of Medicine, Baltimore, MD

Case reference number: JHU Vet Path Accession 41926

Clinical History:

This adult female Atlantic Bottlenose dolphin (*Tursiops truncatus*) was found stranded on Assateaque Island on September 6, 1999. Physical exam revealed numerous healing skin lacerations located on the flukes, dorsum, and lateral body wall, suggestive of a shark attack in recent days to weeks. A focally extensive ulcerative dermatitis was located over the rostrum and peduncles. The animal was transported to the National Aquarium in Baltimore where she was treated for approximately five weeks. Her clinical course included a moderate to severe regenerative anemia, a non-healing ulcerative dermatitis, and a lymphopenia with rising eosinophilia. In spite of an excellent appetite and weight gain, the dolphin was seen suddenly struggling to breath on the evening of October 15,1999. Following this brief episode of apnea, she rolled over and sank to the bottom of the tank.

Necropsy Findings:

Significant lesions found in the general necropsy included moderate focally extensive myocardial necrosis, lymphadenopathy, and granulomas in the lungs, stomach, spleen, lymph nodes and pancreas. Grossly, the brain showed an area of adherent, thickened meninges located along the ventral surface of the brainstem at the level of the left vestibulocochlear cranial nerve.

Material Submitted:

One H&E stained section of ventral brainstem

Points for Discussion:

1. Diagnosis
2. Causes of dolphin strandings

Case 2000-08

Submitted by: Robert E. Mrak, M.D., Ph.D.
Department of Pathology
DVAMC and University of Arkansas for Medical Sciences
Little Rock, Arkansas

Reference #: UAMS 99-AU-61

Clinical summary:

The patient was a healthy, 19 year-old construction worker without significant past medical history, who presented to a local emergency room with weakness in his right arm and leg.

Four or five days prior to admission a large door fell on his back and neck at a construction site, knocking him down. However, he did not lose consciousness and was able to work the rest of the day with a mild headache. One day prior to admission he noted vague "tingling" in his right arm. On the day of admission he was driving home from work with friends, and incidentally passing a local hospital, when he suddenly developed weakness in his right arm and leg. By the time they had pulled into the parking lot, this had progressed to right leg paralysis, now accompanied by weakness in his left arm and severe back pain with radiation to his chest and right arm. He was evaluated and transferred to UAMS for neurosurgical evaluation.

On arrival at UAMS, he had full deltoid strength and 4+ biceps strength bilaterally, 0-1/5 right and 3/5 left intrinsic hand muscle strength, and no leg strength on either side. Difficulty voiding necessitated placement of a Foley catheter. Myotatic stretch reflexes were present only in the biceps muscles, there was a C6 sensory level, and there was decreased rectal tone. Subsequently, priapism was noted, together with loss of cremasteric and abdominal reflexes.

Magnetic resonance imaging of the head and entire spine were normal. The patient was started on decadron, and subsequently treated with acyclovir. Cerebrospinal fluid analysis showed glucose 65 mg/dl, protein 74 mg/dl, 1 WBC/cc, and 2 RBC/cc. A repeat analysis on the 7th hospital day showed glucose 65, protein 74, 1 WBC, and 0 RBCs.

High dose solumedrol was added to the acyclovir, without improvement. On the 8th hospital day the patient died suddenly.

Postmortem findings:

At autopsy, a large pulmonary saddle embolus was found. The cervical spinal cord was extremely friable. Additional findings were cardiomegaly (495 g) without significant coronary atherosclerosis; hepatic congestion, and Hashimoto's thyroiditis.

Slide provided: Cervical spinal cord (hematoxylin and eosin)

Points for discussion:

1. Diagnosis
2. Pathogenesis

CASE 2000-9

Submitted by: Leroy R. Sharer, M.D., Department of Pathology, and Ivan Dressner, M.D., Department of Neurosciences, New Jersey Medical School, 185 South Orange Avenue, Newark, NJ 07103

Case Reference Number: NP99-177

Clinical History: The patient was a 65-year-old man who complained of gait difficulty. He first noted problems some ten years ago, following coronary bypass surgery, when he began to fall while running. He reported that he needed to hold onto railings while walking up and down stairs. As this progressed, he stated that when he officiated at funerals and had to walk behind a casket while reading from a book, he had to hold onto the casket itself, to prevent himself from falling. His general physical examination was normal, with blood pressure 90/60 mm Hg. Neurological examination revealed a "weaving" gait, with difficulty with tandem walking. He was unable to hop on both feet, and he had some heel-to-shin ataxia in the left leg only, with no finger-to-nose dysmetria. Ankle reflexes were absent, with preservation of other reflexes and no long tract signs. Muscle strength was normal. He had diminished vibration sensation in the upper and lower extremities, much worse in the legs, with normal position, touch, pin and temperature sensation. Mentation was normal, as were the cranial nerves, except for slightly decreased hearing on the right.

A serum ELISA for Lyme disease was positive, as was ELISA in the CSF, but serum Western blot was negative. The serum was negative for Hu and anti-MAG antibodies. CSF protein was 37, glucose 64, with no cells, and no oligoclonal bands. MRI scans disclosed multiple white matter hyperintensities, in the cerebral hemispheres only. EMG and nerve conduction showed slowed conduction velocities, with results suggesting axonal and demyelinating polyneuropathy.

Material Submitted: One 1μ section, stained with toluidine blue, from a sural nerve biopsy.

Points for Discussion:

1. Diagnosis
2. Pathogenesis
3. Prognosis

CASE 2000 - 10

SUBMITTED BY: Dr. J.M. Bilbao
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30 Bond Street, Toronto, Ontario, M5B 1W8, Canada

CASE REFERENCE NUMBERS: B3933 & 99-S-10990

CLINICAL HISTORY:

The patient is 34 years of age and the mother of a normal 9 month old boy. She has a history of familial neuromuscular disorder affecting her mother (now bed-ridden), her sister and a niece; two nephews are unaffected.

As a todler she walked on her toes, had an Achilles tendon release at the age of 9, at the age of 12 had eye surgery for strabismus and she never walked or run well. Beginning in her teens she developed slowly progressive muscle weakness involving lower extremities, eventually she complained of weakness in the shoulder girdle.

CPK determination is 460 and the sedimentation rate is slightly elevated.

The patient had a muscle biopsy at the age of 11 which was inconclusive.

Muscle biopsy from the left deltoid was performed in October, 1999.

MATERIAL SUBMITTED: Any one of:

a) cryosection stained with H&E
b) cryosection stained with Gomori-trichrome
c) semithin sections

POINT FOR DISCUSSION: Diagnosis