41st ANNUAL DIAGNOSTIC SLIDE SESSION, 2000
REFERENCES AND DIAGNOSES

MODERATOR: E. Tessa Hedley-Whyte, M.D.

MODERATOR, 2000 SESSION: Richard L. Davis, M.D.

EDITOR: Leroy R. Sharer, M.D.

Case 2000-1

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

Diagnosis: Ependymomatosis, involving the spinal subarachnoid space, with multifocal intracranial involvement

Comment: The cells were positive on immunocytochemistry (ICC) for glial fibrillary acidic protein (GFAP), and they were also positive for transthyretin (pre-albumin). Rare nuclei were positive for the MIB-1 clone of the proliferative marker Ki-67. It was felt by everyone that there was no relationship of this lesion to cystic fibrosis, which the patient also had.

References:

Duffner PK, Krischer JP, Sandford RA, Horowitz ME, Burger PC, Cohen ME, Friedman HS, Kun LE, and the Pediatric Oncology Group. Prognostic factors in infants and very young chi9ldren with intracranial ependymomas. Ped Neurosurg 1998; 28:215-222.

Ketoh S, Ikata T, Inoue A. Takahashi M. Intradural extramedullary ependymoma. Spine 1995: 20:2036-2038.

Wagle WA, Jaufman B, Mincy JE. Intradural extramedullary ependymoma: MR-pathologic correlation. J Com Assist Tomography 1998; 12:705-707.

Case 2000-2

Submitted by: Michael A Stier, M.D., Humaira Khanam, M.D., Scott R. VandenBerg, M.D., M. Beatriz Lopes, M.D., University of Virginia, Charlottesville, VA; and Sérgio Rosemberg, M.D., and Paulo H. Aguiar, M.D., University of São Paulo School of Medicine, São Paulo, BRAZIL

Diagnosis: Solitary fibrous tumor

Comment: Several alternative diagnoses were suggested, including mesenchymal perineurioma of the choroid plexus and hemangiopericytoma. The lesion was positive on ICC for CD34, CD99, vimentin, and Bcl-2.

References:

Brunoir A, Cerasoli S, Donati R et al. Solitary fibrous tumor of the meninges: two new cases and review of the literature. Surgical Neurology 1999; 51:636-40.

Nielsen GP, O'Connell JX, Dickersin R et al. Solitary fibrous tumor of soft tissue: A report of 15 cases, including 5 malignant examples with light microscopic, immunohistochemical, and ultrastructural data. Modern Pathology 1997; 10:1028-1037.

Nikas DC, DeGirolami U, Folkerth RD et al. Parasagittal solitary fibrous tumor of the meninges. Case report and review of the literature. Acta Neurochirurgica 1999; 141:307-313.

Somerhausen N de SA, Rubin BP, Fletcher CDM. Myxoid solitary fibrous tumor: a study of seven cases with emphasis on differential diagnosis. Modern Pathology 1999; 12:463-471.

Case 2000-3

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

Diagnosis: Myxoid spindle cell neoplasm of low to intermediate malignant potential

Comment: Again, there was a great range of diagnoses, including metaplastic meningioma (myxoid variant), neurofibroma, myxoid malignant fibrous histiocytoma (MFH), and low grade sarcoma. The tumor cells were positive for PAS and Alcian blue, and on ICC for vimentin, but they were negative for everything else, including epithelial membrane antigen (EMA).

References:

Graham JF, Loo SYT, Matoma A. Primary brain myxoma, an unusual tumor of meningeal origin: case report. Neurosurgery 1999; 45:166-169.

Harrison JD, Rose PE. Myxoid meningioma: histochemistry and electron microscopy. Acta Neuropathol 1985; 68:80-82.

Kimura Y et al. Paucicellular deposition of basement membrane material in myxoid meningioma: immunohistochemical evidence for unbalanced production of type IV collagen and laminin. Pathol Int 1998; 48:53-57.

Nagatani M et al. Primary myxoma in the posterior fossa: case report. Neurosurgery 1987; 20:329-331. (Letter to editor [Branch CL, Neurosurgery 1987; 21:130] criticizes the clinical evaluation of the heart in this case and suggests that cardiac angiography is needed in addition to echocardiography to rule out cardiac myxoma.)

Paulus W et al. Intracranial neurothekeoma (nerve-sheath myxoma): case report. J Neurosurg 1993; 79:280-282.

Case 2000-4

Submitted by: Sandra L. Cottingham, M.D., Ph.D., Stephen D. Cohle, M.D., and Susan Millet, Spectrum Health East Campus, Grand Rapids, MI

Diagnosis: **Meningioangiomatosis**

Comment: The lesion, which involved the cortex and the subarachnoid space, also focally involved the white matter. There were also neurofibrillary degeneration and granulovacuolar degeneration in neurons. This lesion, which can be associated with NF2, can also be an incidental finding at autopsy, and some questioned whether it was related to the patient's death. It was mentioned that this lesion also occurs in cats.

References:

Halper J, Scheithauer BW, Okazaki H, Laws ER. Meningio-angiomatosis: a report of six cases with special reference to the occurrence of neurofibrillary tangles. J Neuropathol Exp Neurol 1986; 45:426-446.

Stemmer-Rachamimov AO et al. Meningioangiomatosis is associated with neurofibromatosis 2 but not with somatic alterations of the NF2 gene. J Neuropathol Exp Neurol 1997; 56:485-489.

Wiebe S, Munoz DG, Smith S, Lee DH. Meningioangiomatosis: a comprehensive analysis of clinical and laboratory features. Brain 1999; 122:709-726.

Case 2000-5

Submitted by: Arnulf H. Koeppen, M.D., and Jiang Qian, M.D., Ph.D., Albany Medical College, Albany, NY

Diagnosis: Gliomatosis cerebri

Comment: The lesion was quite widespread, involving the molecular layer and white matter of the cerebellum and also the CA1 region of the hippocampus. Many of the cells have elongated, rod-like nuclei. These cells are positive on ICC for CD45 and also with the lectin RCA-1, but they are negative for HAM-56, raising a question as to whether they

are microglial cells or not. In this case, GFAP and CD45 staining did not coincide, on confocal microscopy, and GFAP staining in general was disappointing.

References:

Couch JR, Weiss SA. Gliomatosis cerebri: report of four cases and review of the literature. Neurology 1974; 24:504-511.

Cummings TJ, Hulette CM, Longee DC, Bottom KS, McLendon RE, Chu CT. Gliomatosis cerebri: cytologic and autopsy findings in a case involving the entire neuraxis. Clin Neuropathol 1999; 18:190-197.

Jennings MT, Frenchman M, Shehab T, Johnson MD, Creasy J, LaPorte K, Dettbarn WD. Gliomatosis cerebri presenting as intractable epilepsy during early childhood. J Child Neurol 1995; 10:37-45.

Case 2000-6

Submitted by: Dennis Dickson, M.D., Mayo Clinic Jacksonville, Jacksonville, FL

Diagnosis: Non-paraneoplastic (idiopathic) limbic encephalitis

Comment: No occult neoplasm was discovered at autopsy. Several observers stated that chronic herpes simplex encephalitis needed to be ruled out, and this might require the use of PCR.

References:

Langston JW, Dorfman LJ, Forno LS. "Encephalomyeloneuritis" in the absence of cancer. Neurology 1975: 25:633-637.

Horoupian DS, Kim Y. Encephalomyeloneuropathy with ganglionitis of the myenteric plexus in the absence of cancer. Ann Neurol 1982; 11:628-632.

Case 2000-7

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

Diagnosis: Lymphoplasmacytic meningoencephalitis secondary to trematode (*Nasitrema* sp.) parasite migration

Comment: Histologic findings (from the presenter): "Within the meninges are numerous refractile brown-yellow triangular parasite eggs, which range from 50 to 70 microns in diameter. Most of the parasite eggs are not viable, but a few are embryonated. Multi-nucleate giant cells surround many of the ova. Extending into the brain parenchyma are

multiple necrotic tracts with associated edema, mild gliosis, and intralesional parasite eggs. There is a mild to moderate multifocal perivascular lymphoplasmacytosis."

The parasite normally resides in the cranial air sinuses, but it can migrate around the eighth cranial (vestibular) nerve, which is present on the submitted section. This results in vestibular dysfunction, causing "stranding." Some noted an occlusive vasculitis, with infarcts in the brainstem. A curious layer of cells in the subpial zone is apparently a normal finding in the brainstem in this species.

References:

Lewis, RJ, Berry K. Brain lesions in a Pacific white-sided dolphin (*Lagenorhynchus obliquidens*). J Wildl Dis 1988; 24:577-581.

Morimitsu T et al. Mass stranding of Odontoceti caused by parasitogenic eighth cranial neuropathy. J Wildl Dis 1987; 23:586-590.

O'Shea TJ et al. *Nasitrema* sp.-associated encephalitis in a striped dolphin (*Stenella coeruleoalba*) stranded in the Gulf of Mexico. J Wildl Dis 1991; 27:706-709.

Case 2000-8

Submitted by: Robert E. Mrak, M.D., Ph.D., University of Arkansas, Little Rock, AR

Diagnosis: Spinal cord infarction resulting from fibrocartilaginous embolization

Comment: The emboli are present in vessels in the leptomeninges, and they were present on all slides submitted. This condition was probably related to trauma in this patient, and it has been associated with many predisposing physical conditions. This phenomenon also occurs spontaneously in dogs. The entire cord was necrotic in the most severely involved segments, while the section submitted was from the margin of the infarct.

References:

Bots GT, Wattendorff AR, Buruma OJ, Roos RA, Endtz LJ. Acute myelopathy caused by fibrocartilaginous emboli. Neurology 1981; 31:1250-1256.

Ho KL, Gorell JM, Hayden MT. Fatal spinal cord infarction caused by fibrocartilaginous embolization of the anterior spinal artery. Hum Pathol 1980; 11:471-475.

Toro G, Roman GC, Navarro-Roman L, Cantillo J, Serrano B, Vergara I: Natural history of spinal cord infarction caused by nucleus pulposus embolism. Spine 1994; 19:360-366.

Case 2000-9

Submitted by: Leroy R. Sharer, M.D., and Ivan Dressner, M.D., New Jersey Medical School, Newark, NJ

Diagnosis: Adult polyglucosan body disease involving peripheral nerve, in association with the $Tyr^{329}Ser$ mutation in the glycogen-branching enzyme gene

Comment: The patient was of Ashkenazi Jewish descent, and this mutation has been described in this ethnic group. The patient was homozygous for the mutation. The polyglucosan bodies were PAS and Alcian blue positive, and they were filamentous on ultrastructural examination. Most of the reported cases have dementia, which was not clinically apparent in this patient.

References:

Gray F, Gherardi R, Marshall A, Janota I, Poirier J. Adult polyglucosan body disease (APBD). J Neuropathol Exp Neurol 1988; 47:459-474.

Lossos A, Meiner A, Barash V, Soffer D, Schlesinger I, Abramsky O, Argov Z, Shpitzen S, Meiner V. Adult polyglucosan body disease in Ashkenazi Jewish patients carrying the $Tyr^{329}Ser$ mutation in the glycogen-branching enzyme gene. Ann Neurol 1998; 44:867-872.

Ziemssen F, Sindern E, Schröder JM, Shin YS, Zange J, Kilimann MW, Malin J-P, Vorgerd M. Novel missense mutations in the glycogen-branching enzyme gene in adult polyglucosan body disease. Ann Neurol 2000; 47:536-540.

Case 2000-10

Submitted by: Juan M. Bilbao, M.D., St. Michael's Hospital, Toronto, Ontario, CANADA

Diagnosis: Myopathy with tubular aggregates

Comment: Several alternative diagnoses were entertained, including oculopharyngeal dystrophy, inclusion body myopathy, and nemaline myopathy. There is predominantly perinuclear, granular, basophilic material in type 1 and type 2 fibers. Tubular aggregates were seen on electron microscopy. The biopsy also had type 1 fiber predominance, a change that was also seen in the biopsy done at age 11 years, as well as fiber necrosis and phagocytosis.

Reference:

Fardeau M, Tomé FMS. Chapter 57, Congenital myopathies. In: Engel AG, Franzini-Armstrong C, eds., Myology, Second Edition, McGraw-Hill, 1994, pp. 1516-1519.