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N Altman, R S Boyer, J A Brunberg, A D Elster, A E George, D B Hackney, V M Haughton, R B Lufkin, J S Ross, J D Swartz, J L Weissman and S M Wolpert

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Nolan Altman, Richard S. Boyer, James A. Brunberg, Allen D. Elster, Ajax E. George, David B. Hackney, Victor M. Haughton, Robert B. Lufkin, Jeffrey S. Ross, Joel D. Swartz, Jane L. Weissman, and Samuel M. Wolpert

Anatomy

Kasai K, Salamon-Murayama N, Levrier O, et al. **Theoretical situation of brain white matter tracts evaluated by three-dimensional MRI.** *Surg Radiol Anat* 1996;18:295–302

The location and course of the white matter tracts in the cerebrum are described and shown by means of diagrams in Talarach space. If you want to understand the location and course of the major and the obscure white matter tracts (such as the superior and inferior longitudinal fasciculi), this is worth reviewing. □V.M.H.

Morandi X, Brassier G, Damault P, Mercier P, Scarabin JM, Duval JM. **Microsurgical anatomy of the anterior choroidal artery.** *Surg Radiol Anat* 1996;18:275–280

Beautiful photographs of the vascular anatomy of the proximal intracranial internal carotid artery and its branches and everything you ever wanted to know about the anterior choroidal artery. □V.M.H.

Govsa F, Aktan ZA, Aristoy Y, Varol T, Ozgur T. **Origin of the anterior spinal artery.** *Surg Radiol Anat* 1996;18:189–193

Photographs illustrating the origin of the anterior spinal artery from one (less commonly) or both vertebrae and a discussion of possible clinical significance. □V.M.H.

Dumas J-L, Salama J, Dreyfus P, Thoreux P, Goldlust D, Chevrel, J-P. **Magnetic resonance angiographic analysis of atlanto-axial rotation: anatomic bases of compression of the vertebral arteries.** *Surg Radiol Anat* 1996;18:303–313

In healthy subjects, head turning does not produce a change in the vertebral arterial flow that is detectable with MR angiography. In a patient with fusion of C-2 and C-3 and intermittent torticollis producing transient weakness of the lower extremities and blurring of vision, MR angiography showed disruption of blood flow in one vertebral artery secondary to head rotation. CT of the cervicocranial junction showed abnormal separation of the transverse processes of C-1 and C-2 when the head was turned, suggesting the probable cause for the interruption of flow. □V.M.H.

Braun M, Bracard S, Huot J-C, Roland J, Picard L. **Pontine veins: MRI cross sectional anatomy.** *Surg Radiol Anat* 1996;18:315–321

Braun M, Bracard S, Anxionnat R, Roland J, Picard L. **The veins of the medulla oblongata: MRI cross sectional anatomy.** *Surg Radiol Anat* 1996;18:201–207

The vein of the lateral recess, so dear to many senior neuroradiologists, makes its triumphal reappearance in the literature after debuting in the work of Pen Huang, Wolf, and others in 1968. Many other cherished posterior vascular structures are also featured. □V.M.H.

Nose, Paranasal Sinuses, Face, and Oral Cavity

Brunner E, Jacobs JB, Lebowitz RA, Shpizner BA, Holliday RA. **Role of the agger nasi cell in chronic frontal sinusitis.** *Ann Otol Rhinol Laryngol* 1996;105:694–700

The agger nasi is a small crest of bone located in the lateral nasal wall just anterior and superior to the anterior attachment of the middle turbinate. When pneumatized, this is referred to as an *agger nasi cell* and can result in narrowing or obstruction of the nasofrontal duct. It has been implicated in the pathogenesis of persistent frontoethmoid sinus pain and chronic frontal sinusitis. Three coronal CT scans and two sagittally reformatted images are included. Excellent discussion. □J.D.S.

Kass ES, Salman S, Rubin PAD, Weber AL, Montgomery WW. **Chronic maxillary atelectasis.** *Ann Otol Rhinol Laryngol* 1997;106:109–116

Chronic maxillary atelectasis is a persistent decrease in sinus volume of the maxilla from inward bowing of the antral walls. Multiple CT scans confirm this congenital deformity. The criteria include sinus opacification and lateral displacement of the medial infundibular wall (MIW). The authors believe that the MIW plays a role in the pathogenesis of chronic maxillary atelectasis. Recommended reading for those who see a lot of chronic sinus disease. □J.D.S.

Stroke

Pantoni L, Garcia JH. **Pathogenesis of leukoaraiosis: a review.** *Stroke* 1997;28:652–659

Analysis of over 100 publications dealing with anatomy and physiology of arterial circulation and white matter. The most consistent histologic substrate of leukoaraiosis is diffuse pallor of the white matter attributed to rarefaction of the myelin. □J.S.R.

From Miami (Fla) Children's Hospital (N.A.), Primary Children's Medical Center, Salt Lake City, Utah (R.S.B.), University Hospital, Ann Arbor, Mich (J.A.B.), Bowman Gray School of Medicine, Winston-Salem, NC (A.D.E.), New York (NY) University Medical Center (A.E.G.), Hospital of the University of Pennsylvania, Philadelphia (D.B.H.), Medical College of Wisconsin, Milwaukee (V.M.H.), University of California at Los Angeles School of Medicine (R.B.L.), the Cleveland (Ohio) Clinic Foundation (J.S.R.), the Germantown Hospital and Medical Center, Philadelphia, Pa (J.D.S.), the University of Pittsburgh (Pa) School of Medicine (J.L.W.), and New England Medical Center Hospital, Boston, Mass (S.M.W.).

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Uluğ AM, Beauchamp N Jr, Bryan RN, van Zijl PCM. **Absolute quantitation of diffusion constants in human stroke.** *Stroke* 1997;28:483-490

Measurement of apparent diffusion constants in individual directions leads to erroneous interpretation of stroke data with respect to stroke evolution. Measurement of the average apparent diffusion constant value is reproducible in healthy volunteers and in normal-appearing regions in stroke patients. Hemispheric ratios appear independent of the diffusion time; they recommend using these ratios to evaluate diffusional changes in stroke. Three figures. □J.S.R.

Patel MR, Edelman RR, Warach S. **Detection of hyperacute primary intraparenchymal hemorrhage by magnetic resonance imaging.** *Stroke* 1996;27:2321-2324

Six cases of parenchymal hemorrhage studied by MR within 6 hours. Hemorrhages were most evident as foci of T2* hypointensity. These were unambiguous on the echo planar gradient-echo images. They suggest that MR at 1.5 T might be more sensitive to hyperacute hemorrhage than had previously been thought. Subarachnoid hemorrhage is not covered. □J.S.R.

Del Bigio MR, Yan H-J, Buist R, Peeling J. **Experimental intracerebral hemorrhage in rats: magnetic resonance imaging and histopathological correlates.** *Stroke* 1996;27:2312-2320

A model is presented for parenchymal hemorrhage in a rat. A combination of heparin and bacterial collagenase give rise to a rapidly forming hematoma of uniform shape and reproducible size. Possible confounding effects due to tissue compression and "infusion edema" are minimized. □J.S.R.

Liao D, Cooper L, Cai J, et al. **Presence and severity of cerebral white matter lesions and hypertension, its treatment, and its control: the ARIC study.** *Stroke* 1996;27:2262-2270

This is the first population-based study designed to investigate the association of white matter lesions with hypertension (its duration, treatment, and control status). They found that white matter lesions were associated with hypertension, and the associations were attributable to the levels of blood pressure, especially the systolic blood pressure. □J.S.R.

Young B, Moore WS, Robertson JT, et al. **An analysis of perioperative surgical mortality and morbidity in the asymptomatic carotid atherosclerosis study.** *Stroke* 1996;27:2216-2224

The authors recommend that the acceptable rate for perioperative stroke and mortality related to carotid endarterectomy be 3% or less. Of the population studied, 1.5% died or had strokes from carotid endarterectomy with 1.2% suffering transient ischemic attack from arteriography. □J.S.R.

Mull M, Schwarz M, Thron A. **Cerebral hemispheric low-flow infarcts in arterial occlusive disease: lesion patterns and angiomorphological conditions.** *Stroke* 1997;28:118-123

CT and MR were evaluated in 30 patients with presumed supratentorial low-flow state infarcts. They showed a typical, but not pathognomonic, pattern (watershed type). Common to these lesions was a noncompetent circle of Willis. □J.S.R.

Nakagawara J, Sperling B, Lassen NA. **Incomplete brain infarction of reperfused cortex may be quantitated with iomazenil.** *Stroke* 1997;28:124-132

Iomazenil is a radioligand for central benzodiazepine receptor of the brain. The authors performed single-photon emission CT (SPECT) imaging in 14 patients having an embolic occlusion of an intracranial artery with reperfusion within 24 hours by thrombolysis. They found a reduction of the benzodiazepine receptor in the reperfused cortex, which was structurally intact. Thrombolytic therapy appears to result in partial salvage of brain tissue; that amount of salvaged cortex may be quantified by SPECT with the use of iomazenil. □J.S.R.

Hatsukami TS, Ferguson MS, Beach KW, et al. **Carotid plaque morphology and clinical events.** *Stroke* 1997;28:95-100

Are specific plaque composition characteristics associated with clinical outcome? The authors found that intraplaque hemorrhage, lipid core, and necrotic calcification are found in highly stenotic plaques, and that they are similar in asymptomatic and symptomatic individuals. They do not feel identification of plaque features will help to categorize patients at higher risk for stroke. □J.S.R.

Cerebral Blood Flow

Smielewski P, Czosnyka M, Kirkpatrick P, McEroy H, Rutkowska H, Pickard JD. **Assessment of cerebral autoregulation using carotid artery compression.** *Stroke* 1996;27:2197-2203

This technique assesses autoregulation by inducing a transient fall in cerebral perfusion pressure and monitoring the cerebral blood flow response using transcranial Doppler flowmetry. This result appears independent of the compression duration of the carotid, providing that it lasts for at least 5 seconds. It appears simple in application and suitable for regular examinations. Theoretical concerns regarding its use in the presence of atheromatous plaque are discussed. □J.S.R.

Mandible and Maxilla

Keyser JS, Postma GN. **Brown tumor of the mandible.** *Am J Otolaryngol* 1996;17:407-410

A single good CT scan shows a lytic mass of the left paramedian aspect of the mandible, eroding the buccal cortex, and associated with a large soft-tissue mass. Brown tumors are focal lesions occurring as a result of abnormal bone metabolism in either primary or secondary hyperparathyroidism. The mandible is a common head and neck site. The authors emphasize that these tumors have a strong histologic resemblance to giant cell tumors and recommend that all patients with a true Brown tumor be screened for both hypercalcemia and hyperparathyroidism. □J.D.S.

Neck and Nasopharynx

Batsakis JG, El-Naggar AK, Luna MA. **Pathology consultation: thyroid gland ectopias.** *Ann Otol Rhinol Laryngol* 1996;105:996-1000

The thyroid gland is an endodermal diverticulum arising from the midline of the ventral pharynx between the first and second pharyngeal pouches. The thyroid gland completes its inferior migration along the thyroglossal duct by the seventh week of gestation. The authors extensively review lingual thyroid, a collection of thyroid tissue in the midline, at the base of the tongue, between the circumvallate papillae and the epiglottis. They also review thyroglossal duct cysts, a cystic expansion of remnants of the thyroglossal tract. Lateral thyroid ectopias are also included. This is an excellent, thorough, and useful review, recommended for all head and neck imaging specialists. □J.D.S.

Zbären P, Becker M. **Imaging case study of the month: schwannoma of the brachial plexus.** *Ann Otol Rhinol Laryngol* 1996;105:748-750

A 41-year-old woman with a left neck mass developing several years after thyroidectomy was initially suspected of harboring a metastasis. Instead, an intensely enhancing paraspinal mass at the C-6 level was identified. The authors distinguish schwannoma, an encapsulated lesion extrinsic to its parent fascicles, from neurofibroma, a non-encapsulated lesion intertwining itself within its fascicles of origin. They state that there have been several cases of schwannomas reported in association with thyroid tumors but do not elaborate. They emphasize that this lesion had a center area of necrosis or cyst formation which was responsible for a target appearance on the coronal, contrast-enhanced T1-weighted image. They suggest that this is an important imaging characteristic from the standpoint of differential diagnosis. □J.D.S.

Seizure Disorders

Clarke DB, Olivier A, Andermann F, Fish D. **Surgical treatment of epilepsy: the problem of lesion/focus incongruence.** *Surg Neurol* 1996;46:579-586

When the electroencephalographic (EEG) abnormalities and a lesion seen by imaging congruently coexist, the EEG focus can be accepted with a high degree of confidence. When the imaging study and the EEG are incongruent in location, it must be recognized that the EEG has a much greater variability than the imaging lesion. More emphasis needs to be given to the imaging study. □J.S.R.

Patil A-A, Andrews RV, Torkelson R. **Surgical treatment of intractable seizures with multilobar or bihemispheric seizure foci (MLBHSF).** *Surg Neurol* 1996;47:72-78

The authors describe their experience with poor surgical candidates because of drug-resistant epilepsy and epilepsy distributed over several lobes of the same hemisphere or both hemispheres. They applied various combinations of surgical procedures, including multiple subpial transections, limited topectomy, and amygdalohippocampectomy. MR, positron emission tomography, SPECT, and continuous video monitoring were also used. Of this difficult group, 47% were free of seizures or only had rare seizures after treatment. □J.S.R.

Ophthalmologic Radiology

Hansen HC, Helmke K. **The subarachnoid space surrounding the optic nerves: an ultrasound study of the optic nerve sheath.** *Surg Radiol Anat* 1996;18:323-328

Explains the generally poor echo from fluid in the subarachnoid space surrounding the optic nerve. □V.M.H.

Pediatric Neuroradiology and Congenital Malformations

Woolley AL, Clary RA, Lusk RP. **Antrochoanal polyps in children.** *Am J Otolaryngol* 1996;17:368-373

Seven children with antrochoanal polyps were studied. Two CT scans and one MR image are included. The prevalence of these lesions is higher in the pediatric population. Patients with antrochoanal polyps typically present with nasal obstruction and a unilateral polypoid mass. In this population, differential diagnosis included juvenile angiofibroma, nasal glioma, encephalocele, and nasopharyngeal malignancies. □J.D.S.

Steinlin MJ, Nadal D, Eich GF, Martin E, Boltshauser EJ. **Late intrauterine cytomegalovirus infection: clinical and neuroimaging findings.** *Pediatr Neurol* 1996;15:249-253

The CT (six patients) and MR imaging (seven patients) findings of children with fetal cytomegalovirus infection during the third trimester of pregnancy. Clinical findings included microcephaly, hearing loss, and developmental delay. CT showed calcification in four of six patients. MR imaging showed white matter abnormalities in all seven patients, which ranged from small nodular to large confluent areas of bright signal on T2-weighted scans. The authors suggest that these represent foci of dysmyelination. Good CT and MR images. □R.S.B.

Glenn OA, Barkovich AJ. **Intracranial germ cell tumors: a comprehensive review of proposed embryologic derivation.** *Pediatr Neurosurg* 1996;24:242-251

This thoughtful paper reviews the proposed mechanisms of development of intracranial germ cell tumors, particularly in light of their midline location in structures of diencephalic origin, and their predilection for boys. Several theories related to embryogenesis of intracranial germ cell tumors are discussed, including laboratory support for them. Heavy but interesting reading! □R.S.B.

Shevell MI, Majnemer A. **Clinical features of developmental disability associated with cerebellar hypoplasia.** *Pediatr Neurol* 1996;15:224-229

From a database of 2500 patients, 11 children with nonsyndromic cerebellar hypoplasia were identified on neuroimaging studies (CT and/or MR imaging). Eight of the 11 patients were microcephalic. All exhibited developmental disability, usually mild to moderate in degree. Motor disability, particularly fine motor skills, were most affected. Authors conclude that cerebellar hypoplasia is a developmental anomaly that appears to be either etiologically related to, or a marker for, developmental disability. The data suggest that cerebellar hypoplasia should be considered in the young child presenting with developmental delay and motor impairment, particularly with cerebellar signs and/or microcephaly. □R.S.B.

Trevisan CP, Martinello F, Ferruzza E, Fanin M, Chevallay M, Tomé FMS. **Brain alterations in the classical form of congenital muscular dystrophy: clinical and neuroimaging follow-up of 12 cases and correlation with the expression of merosin in muscle.** *Childs Nerv Syst* 1996;12:604-610

Brain imaging findings of 12 children with a classical form of congenital muscular dystrophy who were examined longitudinally for a mean period of 8 years. Nine patients had at least minor brain alterations, six of whom had evidence of leukoencephalopathy. On follow-up, the white matter abnormality was unchanged in three patients, improved in two, and worse in one (a patient with merosin deficiency demonstrated by muscle biopsy). The brain abnormalities of these children are much more mild than those seen in other forms of brain and muscle disease, such as Walker-Warburg syndrome or Fukuyama dystrophy. Two cases illustrated with MR images. □R.S.B.

Mallucci CL, Parkes SE, Barber P, et al. **Paediatric meningeal tumours.** *Childs Nerv Syst* 1996;12:582-589

Twenty-one cases of pediatric meningeal tumors accumulated at the same neurosurgical center over a period of 37 years. Sixteen patients had tumors that were meningiomas (three of whom had neurofibromatosis) and had a good prognosis if the meningioma was completely surgically resected. Five patients had tumors that were poorly differentiated and highly malignant with an average survival of 5 months. Nineteen of 21 tumors were supratentorial, five of which were intraventricular. There was no female predilection. Three tumors are shown with CT images. □R.S.B.

Albright AL. **Diffuse brainstem tumors: when is a biopsy necessary?** *Pediatr Neurosurg* 1996;24:252-255

This paper is from the New York University symposium on brain stem tumors of childhood (December 1995). The author proposes that biopsy is not necessary in children with typical symptoms and MR appearance of a diffuse, infiltrating brain stem tumor with its center in the pons. Not only are biopsies associated with sampling error and risks, they do not alter treatment. Biopsy is indicated only for children whose clinical or radiologic features are not characteristic of diffuse infiltrating brain stem tumor. □R.S.B.

Shiminski-Maher T. **Brainstem tumors in childhood: preparing patients and families for long- and short-term care.** *Pediatr Neurosurg* 1996;24:267-271

This sobering paper from the New York University symposium deals with the social and family issues surrounding children with this disease, most of whom die within 2 years after diagnosis. The author suggests a multidisciplinary approach to short- and long-term care of these children. Such care is complex and benefits by use of a coordinator to organize services for the physical, medical, and emotional needs of these children and their families. □R.S.B.

Hoffman HJ. **Dorsally exophytic brain stem tumors and midbrain tumors.** *Pediatr Neurosurg* 1996;24:256-262

This paper from the New York University symposium reports a subgroup of children with exophytic tumors of the brain stem or focal midbrain tumors. These patients represent approximately 10% of the total group of children with brain stem tumors. They have a significantly better prognosis than the larger group and most do not require adjunctive therapy, though surgical debulking of the exophytic tumors is indicated. Several examples are illustrated with good MR images. □R.S.B.

Hsiang JNK, Goh KYC, Zhu X-L, Poon WS. **Features of pediatric head injury in Hong Kong.** *Childs Nerv Syst* 1996;12:611-614

A 5-year review of 2785 children admitted to a neurosurgical service for head injury. Falling from a height was the most common cause of injury in infants and preschool-age children. In older children, traffic or bicycle accidents were the most common cause. Overall mortality was 0.6%, with traffic accidents accounting for 67% of the fatalities. Preventive measures, particularly the use of bicycle helmets, are discussed. □R.S.B.

Fedrizzi E, Inverno M, Bruzzone MG, Botteon G, Saletti V, Farinotti M. **MRI features of cerebral lesions and cognitive functions in preterm spastic diplegic children.** *Pediatr Neurol* 1996;15:207-212

A study of 30 children with periventricular leukomalacia (PVL). The MR imaging findings of PVL (including severity of ventricular dilatation, extent of white matter reduction, optic radiation involvement, and thinning of the posterior corpus callosum) were correlated with the results of Full Scale, Verbal, and Performance IQ tests. While there was significant correlation between the MR imaging findings of PVL and Full Scale and Performance IQ, no correlation was observed with Verbal IQ. The authors suggest that an MR imaging examination between the ages of 1 and 2 years may be helpful in predicting a specific neuropsychological pattern of dysfunction. □R.S.B.