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Annotated Bibliography

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

Spine

Milhorat TH, Johnson RW, Milhorat RH, Capocelli AL Jr, Pevsner PH. **Clinicopathological correlations in syringomyelia using axial magnetic resonance imaging.** *Neurosurgery* 1995;37:206-213

In 115 patients with syringomyelia, axial magnetic resonance (MR) images were used to classify syrinx formation into three varieties. Symmetrically enlarged central cavities were generally asymptomatic or produced non-specific symptoms, and they tended to be associated with hindbrain anomalies (especially Chiari I), which altered cerebrospinal fluid flow. Central cavities that extended paracentrally in one or more areas also related to hindbrain anomalies, but clinical signs were segmental and related to the level and quadrant of involvement. Eccentric cavities tended to occur in watershed zones and in association with trauma, infection, and ischemia. They were associated with segmental and with nonspecific clinical findings of greater severity. □J.A.B.

Boden SD. **Current concepts review: the use of radiographic imaging studies in the evaluation of patients who have degenerative disorders of the lumbar spine.** *J Bone Joint Surg [Am]* 1996;78:114-124

A good, succinct review of current indications for imaging, divided into the evaluation of low back pain, lower-limb pain, and postoperative spine. One MR image. □J.S.R.

Battie MC, Haynor DR, Fisher LD, et al. **Similarities in degenerative findings on magnetic resonance images of the lumbar spines of identical twins.** *J Bone Joint Surg [Am]* 1995;77:1662-1670

Evaluation of MR images of 40 male identical twins for degeneration, bulging or herniated disks, and loss of disk space height showed that 26% to 72% of the variability was explained by the addition of the variable representing the twin status. Six MR figures. □J.S.R.

Boden SD, Riew KD, Yamaguchi K, Branch TP, Schellinger D, Wiesel S. **Orientation of the lumbar facet joints: association with degenerative disc disease.** *J Bone Joint Surg [Am]* 1996;78:403-411

The authors evaluated the orientation of the lumbar facet joints on MR images of 140 subjects, looking for association between facet tropism and disk disease in spondylolisthesis. There did not appear to be an association between facet tropism and disk degeneration in general. However, patients with spondylolisthesis showed more sagittally oriented facets at the L4-5 and L5-S1 level (greater than 45°). □J.S.R.

Winter RB, Lonstein JE, Boachie-Adjei O. **Congenital spinal deformity.** *J Bone Joint Surg [Am]* 1996;78:300-311

Another in a series of instructional course lectures from the American Academy of Orthopedic Surgeons, this is a nice primer on scoliosis, with emphasis on clinical and plain-film evaluation. □J.S.R.

Dickman CA, Greene KA, Sonntag VKH. **Injuries involving the transverse atlantal ligament: classification and treatment guidelines based upon experience with 39 injuries.** *Neurosurgery* 1996;38:44-50

Transverse atlantal ligament injuries were classified with computed tomography (CT) and MR images as type I if the ligament was disrupted at the midportion or at its periosteal insertion; and as type II if there was avulsion of the tubercle for insertion of the transverse ligaments, either associated with a comminuted fracture of the lateral mass or with an intact lateral mass. There was a 74% success rate for treatment of type II fractures with a rigid cervical orthosis, while all type I injuries required surgical fixation. In type II injuries, surgery was done only when there was persistent instability after 3 to 4 months of immobilization. The use of CT and MR for characterization of these injuries is discussed and illustrated. The need for early internal fixation for type I injuries is emphasized. □J.A.B.

Ross JS, Robertson JT, Frederickson RC, et al. **Association between peridural scar and recurrent radicular pain after lumbar discectomy: magnetic resonance evaluation.** *Neurosurgery* 1996;38:855-863

MR imaging 6 months after lumbar discectomy in 197 patients showed a correlation between recurrent radicular pain and volume of scar tissue. Patients having extensive epidural scar were 3.2 times more likely to have recurrent radicular symptoms than were those with less extensive scarring. MR findings helped distinguish scar from recurrent disk. Mechanisms of recurrent radicular pain in the presence of regional scar tissue are reviewed. □J.A.B.

Dailey AT, Tsuruda JS, Goodkin R, et al. **Magnetic resonance neurography for cervical radiculopathy: a preliminary report.** *Neurosurgery* 1996;38:488-492

The term *magnetic resonance neurography* has been applied to MR techniques that improve the contrast-to-noise ratio of peripheral nerve structures. Pulse sequences used for this purpose are described. Images are presented for three patients with cervical radiculopathy and for one control subject. Increased signal intensity is shown in nerve trunks at the level of clinical radiculopathy on T2-weighted fast spin-echo multiplanar short-tau inversion recovery images. □J.A.B.

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.), 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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Interventional Neuroradiology

Graves VB, Strother CM, Duff TA, Perl J II. **Early treatment of ruptured aneurysms with Guglielmi detachable coils: effect on subsequent bleeding.** *Neurosurgery* 1995;37:640-648

Of 13 aneurysm patients treated with Guglielmi detachable coils within 72 hours of subarachnoid hemorrhage, none had a rebleed over the subsequent 36 months (versus 30% rebleed in untreated patients, $P < .01$). Complete occlusion of the aneurysm was achieved on initial treatment in 69%, and in all subjects there was over 90% aneurysm luminal occlusion. Early use of the detachable coil allowed more aggressive management of vasospasm than could be accomplished in patients with untreated aneurysmal hemorrhage. □J.A.B.

Wallace RC, Flom RA, Khayata MH, et al. **The safety and effectiveness of brain arteriovenous malformation embolization using acrylic and particles: the experiences of a single institution.** *Neurosurgery* 1995;37:606-618

Experience with the safety and effectiveness of embolization of arteriovenous malformations in 49 patients, with polyvinyl alcohol particles in 26 and *N*-butyl cyanoacrylate in 23, is documented. Technical aspects of the embolization techniques, each done by a separate team, are discussed. Although the authors overall prefer cyanoacrylate, advantages and disadvantages of each technique are presented. Comments by three interventional neuroradiology groups add a larger perspective to the data and concepts. □J.A.B.

Beebe HG, Archie JP, Baker WH, et al. **Concern about safety of carotid angioplasty.** *Stroke* 1996;27:197-198

A call for safety, as well as for sanity. □J.S.R.

Nagasaka S, Fukushima T, Gogo K, Ohjimi H, Iwabuchi S, Maehara F. **Treatment of scalp arteriovenous malformation.** *Neurosurgery* 1996;38:671-677

Angiographic findings and management of arteriovenous malformations of the scalp are presented for seven patients, with excellent angiographic and clinical illustrations. Differing anatomic and embryologic nidi within these malformations necessitated differing combinations of embolization, surgical resection, and scalp reconstruction. □J.A.B.

Anatomy

Marinkovic SV, Gibo H. **The blood supply of the trigeminal nerve root, with special reference to the trigeminocerebellar artery.** *Neurosurgery* 1995;37:309-317

In 19 autopsy samples, the blood supply of the trigeminal nerve roots was identified after India ink injection and microdissection. Illustrated by photography are the origins of two to six trigeminal arteries from the superolateral pontine branch of the basilar artery, and/or from the peduncular cerebellar branch of the anterior inferior cerebellar artery. Patterns of supply to specific sensory and motor branches are discussed. □J.A.B.

Marinkovic S, Gibo H, Zelic O, Nikodijevic I. **The neurovascular relationships and the blood supply of the trochlear nerve: surgical anatomy of its cisternal segment.** *Neurosurgery* 1996;38:161-169

The gross and microscopic anatomic relationships of the nuclear and cisternal segments of the trochlear nerve are described and beautifully illustrated in this article based on the study of perfused autopsy specimens. Vascular, inflammatory, and mass lesions responsible for trochlear nerve dysfunction are discussed. □J.A.B.

Iatrogenic Disorders

Zeidman SM, Thompson K, Ducker TB. **Complications of cervical discography: analysis of 4400 diagnostic disc injuries.** *Neurosurgery* 1995;37:414-417

The extensive experience of a single radiologist in complications after cervical diskography is documented in this brief, well-written article. Disk space infection as the most common (0.5% of patients) complication is discussed in relation to technique and clinical symptoms. Contraindications to the performance of the cervical diskography, and the possible accentuation of cord compression after it, are discussed. □J.A.B.

Trauma

Berryhill P, Lilly MA, Levin HS, et al. **Frontal lobe changes after severe diffuse closed head injury in children: a volumetric study of magnetic resonance imaging.** *Neurosurgery* 1995;37:392-400

Segmented MR images showed that in 14 children with severe closed head injury (Glasgow Coma Scale ≤ 8), frontal lobe gray matter volumes were decreased and subarachnoid fluid spaces increased compared with similar measurements made in children with mild head injury (Glasgow Coma Scale 13 to 15). Both groups were evaluated 3 months or more after closed head injury, and patients were selected so that none had focal parenchymal imaging alterations. Two thirds of the severely injured group had persisting disability; 12 of 14 with mild injury made good recovery. Although segmentation method in this study, based on a single T2-weighted sequence, was less than optimal, the findings suggest that posttraumatic clinical sequelae may relate to quantifiable gray matter volume loss in the absence of other imaging alterations. □J.A.B.

Duhaime AC, Eppley M, Margulies S, Heher KL, Bartlett SP. **Crush injuries to the head in children.** *Neurosurgery* 1995;37:401-407

Clinical and imaging findings relating to crush injury to the head in children are described. Crush injuries having a force duration of more than 200 milliseconds are contrasted with the more common dynamic head injuries, in which force is applied over a duration of less than 200 milliseconds. Crush injuries were associated with multiple cranial base fractures and facial injuries, but were shown to have relative preservation of brain parenchyma. Survivors had a good long-term prognosis. The biomechanics of static and dynamic loading injury to the head in children is briefly discussed. □J.A.B.

Pediatric Neuroradiology and Congenital Malformations

Arjmand EM, Lusk RP. **Management of recurrent and chronic sinusitis in children.** *Am J Otolaryngol* 1995;16:367-382

This detailed and thorough clinical article reflects on all aspects of the care of sinusitis in children. Appropriate emphasis is placed on the role of the CT scan and correlations with endoscopic sinus surgery. Recommended reading when a "view from the other side" is required. □J.D.S.

Badie B, Mendoza D, Batzdorf U. **Posterior fossa volume and response to suboccipital decompression in patients with Chiari I malformation.** *Neurosurgery* 1995;37:214-218

Among 20 patients with Chiari I malformations, posterior fossa volume determined from MR images was found to be decreased relative to supratentorial volume compared with 20 healthy control subjects ($P < .01$). The authors conclude that a smaller posterior fossa may be the cause of Chiari I malformation. Patients with Chiari I malformations and smaller posterior volumes were found to show symptoms earlier and to respond better to suboccipital decompression than did those with normal volumes. □J.A.B.

Henrich DE, Smith TL, Mukherji S, Drake AF. **Pediatric craniocervical necrotizing fasciitis.** *Ann Otol Rhinol Laryngol* 1996;105:72-74

Three axial CT images exquisitely demonstrate air dissecting along the fascial planes of the neck from the oropharynx to the thoracic inlet. The upper mediastinum is also diffusely involved. This entity is reported occasionally in adults who have had dental infections or trauma; this patient is a 4-year-old boy. This disease primarily involves the superficial musculoaponeurotic system and superficial fascial planes of the neck. It is life threatening, and early recognition combined with aggressive surgical debridement is critical. □J.D.S.

Ersahin Y, Mutluer S, Çagli S, Duman Y. **Cerebellar mutism: report of seven cases and review of the literature.** *Neurosurgery* 1996;38:60-66

Cerebellar mutism characterized by transient severe dysarthria after posterior fossa surgery is reviewed and seven new cases reported. The relation of these symptoms to surgical resection of posterior fossa midline mass lesions is emphasized. Functional bilateral disruption of the dentatorubrothalamic tract from the dentate nuclei to the brain stem is postulated as the mechanism. Predominant involvement of pediatric patients is thought to relate to the more frequent occurrence of midline posterior fossa masses in patients of this age. □J.A.B.

Van Bogaert P, Donner C, David P, Rodesch F, Avni EF, Szliwowski HB. **Congenital bilateral perisylvian syndrome in a monozygotic twin with intra-uterine death of the co-twin.** *Dev Med Child Neurol* 1996;38:166-171

The perisylvian syndrome, consisting of four-layered polymicrogyria involving perisylvian cortex, ventriculomegaly, gray matter heterotopias, and associated clinical correlates of pseudobulbar palsy and occasional fasciopharyngo-glosso-masticatory diplegia, is reviewed. A single case is described. Sonographic and MR images are presented. □J.A.B.

Cioni G, Fazzi B, Ipata AE, Canapicchi R, van Hof-van Duin J. **Correlation between cerebral visual impairment and magnetic resonance imaging in children with neonatal encephalopathy.** *Dev Med Child Neurol* 1996;38:120-132

In 80 infants and young children with perinatal hypoxic-ischemic or hemorrhagic insults, MR findings in the optic radiation and occipital cortex were compared with clinical visual assessment. Among 48 subjects found to have cerebral visual impairment, 42 had MR evidence of lesions involving the optic radiation and 19 had lesions of the visual cortex. Damage to the optic radiations was a better predictor of visual acuity than was damage to the visual cortex. MR alterations in these regions are illustrated. □J.A.B.

Nicolaides P, Appleton RE. **Stroke in children.** *Dev Med Child Neurol* 1996;38:172-180

In a concise review, unadorned by CT or MR images, the patterns and causes of stroke in children are tabulated and briefly discussed. Extensive references point the way to more definitive discussions of several of the more uncommon causes of cerebral hemorrhage and infarction in this age group. □J.A.B.

Pollack IF, Kinnunen D, Albright AL. **The effect of early craniocervical decompression on functional outcome in neonates and young infants with myelodysplasia and symptomatic Chiari II malformations: results from a prospective series.** *Neurosurgery* 1996;38:703-710

In newborn infants with Chiari II malformations, symptoms of brain stem compression are shown to respond favorably to early craniocervical decompression. Symptoms of stridor caused by vocal cord paralysis, apneic spells, and neurogenic dysphagia manifest as nasal regurgitation, aspiration pneumonitis, and choking or cyanosis during feedings, were all found to be almost uniformly responsive to urgent decompression. MR correlates of effacement of cerebrospinal fluid surrounding cervicomedullary structures at the foramen magnum and upper cervical levels are briefly discussed. □J.A.B.

Bonnier C, Nassogne M-C, Evrard P. **Outcome and prognosis of whiplash shaken infant syndrome: late consequences after a symptom-free interval.** *Dev Med Child Neurol* 1995;37:943-956

The idea that victims of shaken infant syndrome who appear normal 2 months after diagnosis will have a good prognosis is refuted by this study of 12 infants. Six had persisting symptoms and six appeared to have recovered fully 2 months after the incident. Five of the latter six had findings of decelerated brain growth, seizures, cognitive impairment, and behavioral disorders over subsequent periods of 4 months to 6 years. MR findings of late cortical and subcortical regions of increased signal intensity on T2 images are briefly discussed. □J.A.B.

Neck and Nasopharynx

Duffey DC, Billings KR, Eichel BS, Sercarz JA. **Internal jugular vein thrombosis.** *Ann Otol Rhinol Laryngol* 1995;104:899-903

A well-documented case of left internal jugular vein thrombosis is shown clearly with good-quality CT and MR angiography. The authors provide a detailed review of the pathogenesis of this disease as well as a solid review of imaging issues. The patient had a history of numerous contributing factors but did not present in a fulminant manner. □J.D.S.

Rucci L, Gammarota L, Cirri MBB. **Carcinoma of the anterior commissure of the larynx, I: embryological and anatomic considerations.** *Ann Otol Rhinol Laryngol* 1996;105:303-308

Laborious discussion of this neoplasm emphasizes the embryology of the region. Those of use with an exceptionally strong interest in the larynx might be interested. No images. □J.D.S.

Baker LL, Bower CM, Glasier CM. **Atlanto-axial subluxation and cervical osteomyelitis: two unusual complications of adenoidectomy.** *Ann Otol Rhinol Laryngol* 1996;105:295-299

Two patients had persistent neck pain after uncomplicated adenoidectomy. The first had Grisel syndrome, a spontaneous atlantoaxial subluxation. The mechanism is generally believed to be hyperemia after infection or surgical trauma, which leads to decalcification of the anterior arch of the atlas and laxity of the transverse ligament. This case is illustrated with lateral flexion and extension views of the cervical spine, three-dimensional CT reconstruction, and sagittal contrast-enhanced T1-weighted MR imaging. The second patient had osteomyelitis at the anterior tubercle of C1, demonstrated with one axial CT scan. □J.D.S.

Mayer M, Haddad J Jr. **Human immunodeficiency virus infection presenting with lymphoepithelial cysts in a six-year-old child.** *Ann Otol Rhinol Laryngol* 1996;105:242-244

Satisfactory-quality axial CT images show large lymphoepithelial cysts in both parotid glands in a 6-year-old girl with the human immunodeficiency virus. A large cyst involved the deep lobe on the left. A short but satisfactory discussion is included; it cites the current opinion that these lesions are caused by cystic enlargement of intraparotid lymph nodes. □J.D.S.

Borba LA, Al-Mefty O. **Intravagal paragangliomas: report of four cases.** *Neurosurgery* 1996;38:569-575

Four cases of glomus vagale tumors, with angiographic and MR correlation. Clinical and imaging findings as they relate to the diagnosis, surgical management, and histology of these uncommon tumors are briefly reviewed. □J.A.B.

Stroke

Bowler JV, Wade JPH, Jones BE, Nijran K, Steiner TJ. **Single-photon emission computed tomography using hexamethylpropyleneamine oxime in the prognosis of acute cerebral infarction.** *Stroke* 1996;27:82-86

Central nervous system scores measured at 1 week had correlation coefficients of .76, which was better than those obtained using single-photon emission CT or CT infarct volume data. Hexamethylpropyleneamine oxime single-photon emission CT is not recommended as a routine prognostic tool in cerebral infarction. □J.S.R.

O'Leary DH, Polak JF, Kronmal RA, et al. **Thickening of the carotid wall: a marker for atherosclerosis in the elderly?** *Stroke* 1996;27:224-231

Risk factors for atherosclerosis are compared with intima-media thickness within the common carotid arteries and internal carotid arteries on ultrasound. In the elderly, noninvasive sonographic measurements of carotid artery intima-media thickening can be used in models to predict the existence of clinical coronary heart disease and atherosclerosis. □J.S.R.

Preter M, Tzourio C, Ameri A, Bousser M-G. **Long-term prognosis in cerebral venous thrombosis: follow-up of 77 patients.** *Stroke* 1996;27:243-246

Follow-up was done for a mean of 77.8 months in 77 patients who had had cerebral venous thrombosis. It appears that cerebral venous thrombosis has a good long-term prognosis and the frequency of epilepsy is low. Additional thrombotic episodes occurred in 20% of patients. □J.S.R.

Rothwell PM, Slattery J, Warlow CP. **A systematic comparison of the risks of stroke and death due to carotid endarterectomy for symptomatic and asymptomatic stenosis.** *Stroke* 1996;27:266-269

The risks of stroke and death from carotid endarterectomy for symptomatic and asymptomatic stenosis are reviewed from the published data. Mortality within 30 days of endarterectomy was 1.31% for asymptomatic stenosis and 1.81% for symptomatic stenosis. □J.S.R.

Marinkovic S, Kovacevic M, Gibo H, Milisavljevic M, Bumbasirevic L. **The anatomical basis for the cerebellar infarcts.** *Surg Neurol* 1995;44:450-461

The cerebellums of 26 subjects were injected with india ink, with specific attention to the anatomic features of the posterior and anterior inferior cerebellar and superior cerebellar arteries. MR images of patients with posterior fossa infarcts were compared with gross anatomic findings in 10 patients. Eleven figures, including gross sections, anatomic drawings, and photomicrographs. □J.S.R.

Leclerc X, Godefroy O, Salhi A, Lucas C, Leys D, Pruvo JP. **Helical CT for the diagnosis of extracranial internal carotid artery dissection.** *Stroke* 1996;27:461-466

Sixteen patients with 18 angiographically confirmed internal carotid artery dissections were studied with helical CT. A narrowed eccentric lumen and enlargement of the dissected artery appear to be the best criteria. Helical CT is concluded to be a reliable method for evaluating extracranial dissection of the internal carotid artery. The authors propose that this might be a complementary test to MR in those theoretical cases in which the methemoglobin might not be visible on MR very early. They do note that they have never encountered this situation. □J.S.R.

LaIoux P, Jamart J, Meurisse H, De Coster P, Laterre C. **Persisting perfusion defect in transient ischemic attacks: a new clinically useful subgroup?** *Stroke* 1996;27:425-430

CT and single-photon emission CT (SPECT) findings were evaluated in 76 patients presenting with transient ischemic attack in the carotid artery territory. SPECT is shown to be more sensitive than CT in detecting focal prolonged ischemia. However, it does not provide additional clinically useful information on the vascular risk factors and etiology in this group of consecutive patients. □J.S.R.

Young GR, Humphrey PRD, Nixon TE, Smith ETS. **Variability in measurement of extracranial internal carotid artery stenosis as displayed by both digital subtraction and magnetic resonance angiography: an assessment of three-caliper techniques and visual impression of stenosis.** *Stroke* 1996;27:467-473

An evaluation of the ECST method, the NASCET method, and the common carotid method compared with visual impression of stenoses for intraarterial digital subtraction and MR angiography of the carotid bifurcations. Interestingly, although observer variability can be considerable, no important differences were found among these techniques. □J.S.R.

Nighoghossian N, Berthezene Y, Philippon B, Adeleine P, Froment JC, Trouillas P. **Hemodynamic parameter assessment with dynamic susceptibility contrast magnetic resonance imaging in unilateral symptomatic internal carotid artery occlusion.** *Stroke* 1996;27:474-479

Twelve patients with occlusion of the internal carotid artery were evaluated with dynamic susceptibility contrast MR for regional cerebral blood volume, mean transit time, and regional cerebral blood flow. Significant hemodynamic compromise was seen in patients with unilateral symptomatic carotid occlusion, according to cerebral blood flow and mean transit time values. This occurred despite the single-section technique with its relatively poor temporal resolution. □J.S.R.