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History of Neuroradiology

Evens RG. **Röntgen retrospective: one hundred years of a revolutionary technology.** *JAMA* 1995;274:912–916

We are flattered. In honor of the 100th anniversary of Wilhelm Conrad Röntgen's modest discovery, *JAMA* has devoted many pages to our little area of expertise. Rontgenology's (sic) own Dr Ronald Evens writes that, in the beginning, there was actually tension between those who believed anyone could read the new images since the images "spoke for themselves," and "fledgling" radiologists in favor of special training and skills. Can you imagine such a conflict? Me neither.□J.L.W.

Neck and Nasopharynx

Silverman PM, Zeiberg AS, Sessions RB, Troost TR, Zeman RK. **Three-dimensional imaging of the hypopharynx and larynx by means of helical (spiral) computed tomography: comparison of radiological and otolaryngological evaluation.** *Ann Otol Rhinol Laryngol* 1995;104:425–431

This article was designed to introduce the otolaryngologist to this new technology. Multiple axial CT images and reconstructed "laryngograms" are available. The images are of high quality.□J.D.S.

Imaging Techniques and Artifacts

Kaps M, Schaffer P, Beller K-D, Seidel G, Bliesath H, Wurst W. **Phase I: transcranial echo contrast studies in healthy volunteers.** *Stroke* 1995;26:2048–2052

Eight healthy volunteers received a suspension containing a phospholipid as the active ingredient, acting as an ultrasound contrast agent. The agent was tolerated without complications, and administration of the contrast medium produced an increase in the transcranial Doppler signal (>30 dB) in the intracranial basal cerebral arteries. Signal enhancement appears to last long enough for the transcranial color-coded sonography to display all the basal cerebral arteries. Two color figures.□J.S.R.

Leclerc X, Godefroy O, Pruvo JP, Leys D. **Computed tomographic angiography for the evaluation of carotid artery stenosis.** *Stroke* 1995;26:1577–1581

The authors evaluated helical CT and conventional angiography in 20 patients with atherosclerotic stenosis of the internal carotid. Both shaded surface displays and individual sections in maximum intensity projections were evaluated. There was good correlation between the CT and conventional angiography. Carotid calcification is a limiting factor when using the shaded display of the maximum intensity projection. Seven figures.□J.S.R.

Puce A, Constable RT, Luby ML, et al. **Functional magnetic resonance imaging of sensory and motor cortex: comparison with electrophysiological localization.** *J Neurosurg* 1995;83:262–270

Four patients were studied with a BOLD technique, with the added feature that all the MR studies were correlated with intraoperative cortical grid electrophysiology. □A.D.E.

Golfinos JG, Fitzpatrick BC, Smith LR, Spetzler RF. **Clinical use of a frameless stereotactic arm: results of 325 cases.** *J Neurosurg* 1995;83:191–196

The use and problems associated with this new method are discussed.□A.D.E.

Cerebrospinal Fluid

Jacobs A. **Amino acid uptake in ischemically compromised brain tissue.** *Stroke* 1995;26:1859–1866

Multitracer positron emission tomography (PET) was used on 14 patients with acute hemispheric stroke to investigate amino acid accumulation. Oxygen labeled with oxygen 15 was used for cerebral metabolic rate of oxygen and for cerebral blood flow, carbon $C^{15}O$ for determination of blood volume, and ^{11}C methylmethionine for amino acid accumulation. Increases of ^{11}C methylmethionine uptake were mild, and may reflect widespread transient ischemia with alteration of blood brain barrier with reperfusion, or an activated carrier mediated transport of ^{11}C methylmethionine.□J.S.R.

Kuwabara Y, Ichiya Y, Sasaki M, Yoshida T, Masuda K. **Time dependency of the acetazolamide effect on cerebral hemodynamics in patients with chronic occlusive cerebral arteries.** *Stroke* 1995;26:1825–1829

The authors question the presence of an early steal phenomenon in patients receiving acetazolamide, because of the occasional transient deterioration of ischemic systems after administration. Evaluation of 13 patients with severe stenosis with acetazolamide with PET scanning showed an early steal phenomenon at 5 minutes in five of the 13 patients. Two PET images.□J.S.R.

From Miami (Fla) Children's Hospital (N.A.), 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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Soricelli A, Postiglione A, Cuocolo A, et al. **Effect of adenosine on cerebral blood flow as evaluated by single-photon emission computed tomography in normal subjects and in patients with occlusive carotid disease.** *Stroke* 1995;26:1572–1576

Adenosine is a vasodilatory compound with short biological half life, similar in function to acetazolamide. The authors of this paper measured regional cerebral blood flow relative to that of the cerebellum with single-photon emission CT. Regional blood flow values were higher after adenosine than after acetazolamide. Four of 6 patients with cerebrovascular disease showed increased side-to-side asymmetry with adenosine as compared with acetazolamide. The advantage of adenosine over acetazolamide is a possibility of interrupting the test with reversal of symptoms because of the short biological half-life.□J.S.R.

Efficacy and Use Studies

Eliasziw M, Rankin RN, Fox AJ, et al. **Accuracy and prognostic consequences of ultrasonography in identifying severe carotid artery stenosis.** *Stroke* 1995;26:1747–1752

This report from the North American Symptomatic Carotid Endarterectomy Trial (NASCET) group looks at the accuracy of routine ultrasonography in detecting stenoses, compared with angiography. They found moderate accuracy of ultrasonography, and conclude that it should be used as a screening tool to exclude patients with no disease from further testing. They recommend conventional angiography as an essential investigation for deciding appropriate treatment.□J.S.R.

Patel MR, Kuntz KM, Klufas RA, et al. **Preoperative assessment of the carotid bifurcation: can magnetic resonance angiography and duplex ultrasonography replace contrast arteriography?** *Stroke* 1995;26:1753–1758

Authors performed a blinded comparison of three-dimensional time of flight, 2-D time of flight, and ultrasound in 176 arteries. Conventional angiography was used as the standard. Combining data from the 3-D time of flight and ultrasound yielded a sensitivity of 100%, specificity of 91%, and accuracy of 94% among concordant noninvasive tests. Three-dimensional time of flight appears the most accurate of these noninvasive tests.□J.S.R.

Hans SS, Zeskind HJ. **Routine use of limited abdominal aortography with digital subtraction carotid and cerebral angiography.** *Stroke* 1995;26:1221–1224

Out of a group of 401 consecutive carotid intraarterial digital subtraction angiograms, the authors detected renal artery stenosis in 6%, abdominal aortic aneurysm in close to 6%, one renal cell carcinoma, and a renal artery aneurysm. The additional charge for the abdominal aortography was $95 more than the cost of ultrasound of the abdominal aorta at that institution. The authors conclude that the diagnosis of unsuspected aneurysm with digital subtraction angiography can help to reduce morbidity and mortality from ruptured aneurysms.□J.S.R.

Interventional Neuroradiology

Yang X, Saari T, Kansanen M, Puranen M, Soimakallio S. **Epistaxis from nontraumatic intracavernous carotid aneurysm: endovascular treatment with detachable coils and electrothrombosis.** *Am J Otolaryngol* 1995;16:255–259

A large cavernous aneurysm was found to be the cause of recurrent severe epistaxis. The authors report their endovascular approach via detachable platinum coils and electrothrombosis. A successful result was achieved. CT and angiography (before and after) images are included.□J.D.S.

Clark WM, Barnwell SL, Nesbit G, O'Neill OR, Wynn ML, Coull BM. **Safety and efficacy of percutaneous transluminal angioplasty for intracranial atherosclerotic stenosis.** *Stroke* 1995;26:1200–1204

Percutaneous transluminal angioplasty was performed in 22 vessels in 17 patients who had recurrent neurologic symptoms despite medical therapy. It was successful in 82% of the vessels, and there were 2 strokes during angioplasty. They did not find evidence of early restenosis. The authors suggest a NASCET-type protocol needed to determine whether percutaneous transluminal angioplasty is superior to the best medical management alone.□J.S.R.

Tenjin H, Fushiki S, Nakahara Y, et al. **Effect of Guglielmi detachable coils on experimental carotid artery aneurysms in primates.** *Stroke* 1995;26:2075–2080

Twenty-three aneurysms were induced in the carotid arteries of 16 monkeys. Nineteen aneurysms were occluded with Guglielmi detachable coils. Findings were then assessed with microscopy, angiography, and scanning electron microscopy. Guglielmi detachable coils initiate cellular response within several hours of occlusion, and by two weeks endothelialization was proceeding. At 3 months, remodeling had progressed, producing a media-like structure in the former aneurysm. Five figures, including gross histopathology, scanning electron microscopy, and light microscopy.□J.S.R.

Nose, Paranasal Sinuses, Face, and Oral Cavity

Dublin AB, Dedo HH, Bridger WH. **Intranasal schwannoma: magnetic resonance and computed tomography appearance.** *Am J Otolaryngol* 1995;16:251–254

High-quality CT and MR images demonstrate a destructive (CT), intensely enhancing, heterogenous (MR) lesion in the superior portion of the nasal cavity. The differential diagnosis included lymphoma, esthesioneuroblastoma, squamous carcinoma, and inverting papilloma. Report includes a good discussion of the pathologic differences between schwannomas and neurofibromas.□J.D.S.

Strong EB, Woodward PJ, Johnson LP. **Intraoral ultrasound evaluation of peritonsillar abscess.** *Laryngoscope* 1995;105:779–782

Sixteen patients suspected of having peritonsillar abscess were studied with intraoral ultrasound. Correct diagnoses were made in 9 (90%) of 10 abscesses and 5 (83%) of 6 cases of cellulitis.□R.B.L.

Kennedy DW, ed. **International conference on sinus disease: terminology, staging, therapy.** *Ann Otol Rhinol Laryngol* 1995;104(supplement 167):3–31

The editor and numerous participants have provided three authoritative discussions: anatomic terminology and nomenclature, quantification for staging sinusitis, and medical management of sinusitis. This trilogy is an extremely useful reference for all of us who regularly perform routine screening sinus CT. In particular, the article on anatomic terminology and nomenclature is encyclopedic in nature and uses high-quality drawings (no images). □J.D.S.

Ophthalmologic Radiology

Newman NJ, Slamovits TL, Friedland S, Wilson WB. **Neuroophthalmic manifestations of meningocerebral inflammation from the limited forms of Wegener's granulomatosis.** *Am J Ophthalmol* 1995;120:613–621

Intense leptomeningeal thickening and pathologic contrast enhancement was demonstrated with MR in 4 patients (3 illustrated). Underlying parenchymal abnormalities of varying degrees were identified in each. All patients presented with ocular motor dysfunction. Biopsy demonstrated necrotizing granulomatous inflammation consistent with Wegener granulomatosis ("limited" Wegener). In these patients the respiratory tract and kidneys were spared. Good-quality images with convincing findings. □J.D.S.

Greenberg PB, Haik BG, Martin PC. **A pigmented adenoma of the ciliary epithelium examined by magnetic resonance imaging.** *Am J Ophthalmol* 1995;120:679–681

The authors report a 16-year-old boy with a remote trauma history on whom an iris lesion was detected in the left eye during a school screening examination. Findings were confirmed via slit lamp. T1-weighted MR images (illustrated) demonstrated a hyperintense lesion in the vicinity of the ciliary body on the left immediately adjacent to the lens, which revealed faint enhancement with gadolinium. At surgery, a tumor consisting of a nonencapsulated mass of columnar cells was removed. Ciliary body adenoma was diagnosed. The authors indicate that these are rare lesions difficult to differentiate clinically from melanoma.□J.D.S.

Acierno MD, Trobe JD, Cornblath WT, Gebarski SS. **Painful oculomotor palsy caused by posterior-draining dural carotid cavernous fistulas.** *Arch Ophthalmol* 1995;113:1045–1049

The majority of patients with dural or direct carotid cavernous fistulas present with conjunctival hyperemia and chemosis, eyelid edema, and proptosis caused by increased orbital venous pressure from drainage via the superior and inferior ophthalmic veins. The authors describe two "white-eyed" carotid-cavernous fistulas caused by posterior-directed drainage via the inferior and superior petrosal sinuses. In both of these cases the diagnosis was delayed because of the absence of eye findings. The authors are unfortunately unable to elucidate the pathogenesis of the oculomotor nerve palsy in their patients. □J.D.S.

Goodall KL, Jackson A, Leatherbarrow B, Whitehouse RW. **Enlargement of the tensor intermuscularis muscle in Graves' ophthalmopathy.** *Arch Ophthalmol* 1995;113:1286–1289

The tensor intermuscularis muscle (TIM) consists of muscle fibers within the superolateral portion of the intermuscular orbital septum. The septum itself is normally well appreciated on high resolution coronal MR and CT images obtained posterior to the globe. A normal-sized TIM cannot be appreciated as distinct from the septum. The authors exquisitely demonstrate pathologic enlargement of the TIM in patients with Graves disease as a curvilinear thickening of this portion of the septum.□J.D.S.

Cohen JA, Char DH, Norman D. **Bilateral orbital varices associated with habitual bending.** *Arch Ophthalmol* 1995;113:1360–1362

T1- and T2-weighted axial MR images and precontrast and postcontrast axial CT images demonstrated a thrombosed varix on the left and an additional varix on the right, which became apparent only after a Valsalva maneuver in a 62-year-old female yoga instructor. The authors postulate that habitual long-term bending of the head below the level of the heart caused chronic pooling and resulting varix formation. The authors cite a report in the ophthalmology literature of another yoga instructor in whom bilateral conjunctival varices developed. Satisfactory-quality images.□J.D.S.

Radiation Effects

Boice JD, Mandel JS, Doody MM. **Breast cancer among radiologic technologists.** *JAMA* 1995;274:394–401

Just what is the effect of radiation on the (shielded) body? The authors evaluated more than 143 000 certified radiology technologists registered for at least 2 years between 1926 and 1982. The study found no increased risk of breast cancer in these women. Even jobs that included fluoroscopy and exposure to radioisotopes did not demonstrate a statistically significant increased risk. This retrospective study has some important limitations: the number of years the women worked was known, but their radiation exposure was not; breast cancer has a long induction period, possibly longer than this study period. Nonetheless, the results are interesting (and vaguely reassuring).□J.L.W.

Temporal Bone

Wiet RJ, Zappia JJ, Hecht CS, O'Connor CA. **Conservative management of patients with small acoustic tumors.** *Laryngoscope* 1995;105:795–800

Fifty-three patients with acoustic neuroma were managed with follow up and no initial intervention. Twenty-one patients demonstrated tumor growth within 1.9 years and were treated. The remaining 32 (60%) had no demonstrable growth with a mean follow up of 2.13 years.□R.B.L.

Saunders JE, Derebery MJ, Lo WWM. **Magnetic resonance imaging of cochlear otosclerosis.** *Ann Otol Rhinol Laryngol* 1995;104:826–829

High-quality axial T1-weighted images demonstrate pathologic signal within the cochlear capsule and minimal gadolinium enhancement. Cochlear otosclerosis was confirmed with CT (included). The authors indicate that the reader should be aware of these imaging manifestations because, on occasion, patients with otosclerosis present primarily with retrocochlear symptoms rather than conductive hearing deficit; therefore an MR may be ordered initially instead of CT.□J.D.S.

Hanson W, Parnes LS. **Vestibular nerve compression in Camurati-Engelmann disease.** *Ann Otol Rhinol Laryngol* 1995;104:823–825

Camurati-Engelmann disease (progressive diaphyseal dysplasia) is characterized by progressive sclerosis of the skull and diaphysis of long bones. In addition to limb pain and muscle weakness, presenting symptoms may include sensorineural hearing loss as well as facial palsy, trigeminal neuropathy, and visual impairment. Axial and coronal CT images in this case (illustrated) reveal a clearly definable bony narrowing at the level of the meatus of the left internal auditory canal in comparison with the right. The patient had complete resolution of her vestibular symptoms after decompression via the suboccipital approach. To the authors' knowledge, this is the first reported case of vestibular nerve decompression in this disorder. MR was apparently not performed and probably would have been fascinating.□J.D.S.

Naito Y, Honjo I, Takahashi H, et al. **Surface-coil magnetic resonance imaging of the internal auditory canal and the inner ear.** *Ann Otol Rhinol Laryngol* 1995;104:776–782

Three-millimeter sagittal T2-weighted fast spin-echo imaging with a 512 × 384 matrix was performed on 22 normal ears in 14 subjects. Several images are quite impressive; however, expect to see crisper images in the literature soon.□J.D.S.

Trauma

Alvarez-Sabin J, Turon A, Lozano-Sánchez M, Vázquez J, Codina A. **Delayed posttraumatic hemorrhage: "Spät-Apoplexie."** *Stroke* 1995;26:1531–1535

The authors retrospectively reviewed ten cases of CT-proved delayed posttraumatic hemorrhage. Most of the hemorrhages were located deep in the hemispheres and were of small or medium size. Prognosis in the short and long term was good. Patients also presented with a clear symptom-free interval and sudden onset. CT images from 9 patients.□J.S.R.

Sakas DE, Bullock MR, Patterson J, et al. **Focal cerebral hyperemia after focal head injury in humans: a benign phenomenon?** *J Neurosurg* 1995;83:277–284

Single-photon emission CT was performed in 53 patients within 3 weeks of a focal brain injury. Focal zones of hyperemia were present in 38% of patients in the adjacent rim of structurally "normal" brain tissue seen on CT or MR. Such areas of posttraumatic hyperemia may be associated with a more favorable outcome.□A.D.E.

Stroke

Seidel G, Kaps M, Gerriets T. **Potential and limitations of transcranial color-coded sonography in stroke patients.** *Stroke* 1995;26:2061–2066

Eighty-four consecutive patients with symptoms suggesting acute stroke were evaluated within 48 hours of onset. Positive and negative predictive values of pathologic flow in patients with middle cerebral artery infarcts or transient ischemic attacks were .92 and .48. Positive and negative predictive values for intracerebral hematoma were .88 and .96. Dropout rate caused by insufficient acoustic window was 20%. This may help to expedite and select patients for specific therapeutic procedures and may provide information on patients not suitable for angiography.□J.S.R.

Welch KMA, Windham J, Knight RA, et al. **A model to predict the histopathology of human stroke using diffusion and T2-weighted magnetic resonance imaging.** *Stroke* 1995;26:1983–1989

The authors developed an MR tissue signature model using apparent diffusion coefficient (ADC) of water and T2. They derived five MR signatures based on whether the ADC was normal, low, or high, the T2 being either normal or high. Two of these may predict either cell recovery or progression during necrosis. One appears to mark the transition to necrosis and two may be markers of established cell necrosis.□J.S.R.

Siebler M, Nachtmann A, Sitzer M, et al. **Cerebral microembolism and the risk of ischemia in asymptomatic high-grade internal carotid artery stenosis.** *Stroke* 1995;26:2184–2186

Sixty-four asymptomatic patients with high-rate internal carotid artery stenoses were evaluated with transcranial Doppler sonography. A microembolic rate of at least 2 per hour in the ipsilateral middle cerebral was associated with increased risk of ischemia developing within that carotid territory.