Surgical Decision Making for Carotid Endarterectomy and Contemporary Magnetic Resonance Angiography

Background. Benefit from carotid endarterectomy (CEA) centers on patient selection and percent stenosis as determined by cerebral angiography. However, angiography remains expensive and poses risks. Validated carotid duplex ultrasonography has proven to be an accurate tool for selecting patients for CEA. However, the role of another noninvasive test — magnetic resonance angiography (MRA) — remains uncertain. Because of recent advances in MRA hardware and software, we hypothesized that clinically appropriate patients could be accurately selected for CEA based on MRA alone.

Methods. Fifty-four carotid arteries in 29 patients (with and without symptoms) underwent both three-dimensional time-of-flight MRA (1.5 Tesla) with multiple overlapping thin slab acquisition and biplanar intra-arterial digital subtraction angiography. All patients undergoing both tests over a 24-month period were included. The majority of these patients did not undergo carotid duplex ultrasonography owing to the clinical practice of the hospital’s neurosurgery service. Staff radiologists interpreted each study. The accuracy of patient selection based on MRA was calculated using angiography as the standard (NASCET method). Since operative thresholds vary depending on clinical history, we considered four commonly used ranges of percent stenosis for CEA.

Results. Patient selection accuracy of MRA alone was low, but increased as percent stenosis increased. Out of 10 occluded arteries by angiography, 5 were interpreted as patent with stenosis (70% to 99%) by MRA. One patent artery was misread as occluded on MRA. Five patients (with and without symptoms) underwent both tests over a 24-month period were included. The majority of these patients did not undergo carotid duplex ultrasonography owing to the clinical practice of the hospital’s neurosurgery service. Staff radiologists interpreted each study. The accuracy of patient selection based on MRA was calculated using angiography as the standard (NASCET method). Since operative thresholds vary depending on clinical history, we considered four commonly used ranges of percent stenosis for CEA.

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The extent of AP shunting was well correlated to that of non-MTC imaging due to complex signal attenuation behavior of either the background liver tissue or the tumor itself. Conclusions. The complex pathological change of the cirrhotic liver tissue may account for the wide variation of the MT effect and the compromised lesion contrast in cirrhotic patients. Caution should be taken when cirrhotic tissue has an unusually weak MT effect. Then, the possibility of a mixed disease process such as fatty metamorphosis or diffuse hepatic fibrosis should be highly suspected. Our experience shows that MTC imaging plays a potential role in the evaluation of the multi-facets of cirrhotic tissue change.

Dynamic Helical Biphasic CT Emerges as a Potential Tool for the Diagnosis of Proximal Arterioportal Shunting

J-H Chen, C-L Huang, J-I Hwang
Department of Radiology, China Medical College Hospital No. 2, Yuh-Der Road Taichung Taiwan.

Hepato-Gastroenterology 1999; 46: 1791-7

Background/Aims. This article reports our preliminary observations regarding the diagnostic ability of dynamic helical biphasic computed tomography (CT) for proximal arteriportal shunting in hepatoma patients as compared with that of conventional angiography.

Methodology. Three hundred and sixty patients with clinically-suspected liver lesions received both dynamic helical biphasic CT scan and conventional angiography of the liver. The criteria for diagnosis of proximal arterial (AP) shunting in dynamic helical biphasic CT included early and strong enhancement of main portal vein or its major branches in the arterial phase. Periportal subsegmental small AP shunting was excluded from our study. The existence and extent of AP shunting were compared in these two imaging modalities.

Results. Dynamic helical biphasic CT scan demonstrated proximal AP shunting in 23 patients. All of these patients harbored hepatoma. Conventional angiography showed proximal AP shunting in 20 patients, which was more positive on dynamic helical CT scan. Dynamic helical biphasic CT demonstrated the presence of proximal AP shunting in 3 more patients than conventional angiography did. The extent of AP shunting was well correlated between these two imaging modalities in 17 patients.

Conclusions. From our preliminary experience, the diagnostic accuracy of dynamic helical biphasic CT for proximal AP shunting in patients with hepatoma seemed to be comparable to, or even surpassed that of conventional angiography. It seems that faint AP shunting in patients with large hepatoma might be missed by conventional angiography.

Staging Laparoscopy and Laparoscopic Ultrasonography in More Than 400 Patients with Upper Gastrointestinal Tumor

EJ Nieveen van Dijkum, LTh de Wit, OM van Delden
Department of Surgery, Reinder de Graaf Gasthuis, Postbus 5011, 2600 GA Delft, The Netherlands.


Background. Resection offers the only chance of cure to patients with esophageal, gastroesophageal junction, and hepatopancreatobiliary tumors. Staging is essential to select patients who will benefit from operation because palliation can also be performed nonoperatively. Several studies, including limited numbers of patients, have shown that laparoscopic staging prevents unnecessary laparotomies, but it is doubtful whether general application of this staging method can be advised. The aim of this study was to assess the benefit of diagnostic laparoscopy for staging patients with esophageal, gastroesophageal junction, and hepatopancreatobiliary tumors.

Study Design. Between June 1992 and December 1996, 420 patients with a resectable tumor after conventional staging underwent diagnostic laparoscopy combined with laparoscopic ultrasonography. Histologic proof of metastases or ingrowth was used to cancel laparotomy.

Results. Laparoscopic staging avoided laparotomy in 20% of patients (sensitivity 0.70); 5% with an esophageal tumor, 15% with a periampullary tumor, 40% with a proximal bile duct tumor, 35% with a liver tumor, and 40% with a pancreatic body or tail tumor. Complications and port-site metastases were seen in 4% and 2% of patients, respectively.

Conclusions. Laparoscopic staging is a safe procedure with low morbidity and without mortality in this series. It has shown no benefit in esophageal cancer, but seems beneficial for staging tumors located at the gastroesophageal junction, proximal bile duct tumors, liver tumors, and pancreatic body and tail tumors. The value of laparoscopic staging for patients with periampullary tumors is not as great as stated in previous studies and is still the subject of investigation.

Intraoperative Ultrasonography versus Helical Computed Tomography and Computed Tomography with Arteriography in Diagnosing Colorectal Liver Metastases: Lesion-by-Lesion Analysis

Johannes Schmidt, Markus Strotzer, Stephan Fraunhofer
Department of Surgery, University Witten-Herdecke, Heusner-Strass 40, D-42883 Wuppertal, Germany.

World J. Survey 2000; 24

Abstract. Helical computed tomography with arteriography (CTAP) and intraoperative sonography (IOUS) are both recognized to be extremely sensitive in the detection of liver metastases measuring < 2cm in diameter. As sensitivity and specificity values for both techniques differ significantly in the literature and in default of sufficient published data regarding this subject, a lesion-by-lesion analysis was considered necessary. Accuracy of IOUS was compared with helical computed tomography (CT) and portal-phase contrast enhancement (CTAP) in the preoperative detection of liver metastases from colorectal carcinoma projected as a prospective blinded study. Cost efficiency should be determined. Liver CTAP and IOUS were evaluated in 33 patients with colorectal carcinoma. Metastases were resected in 10 cases, and the remaining 23 patients were observed for follow-up with CT investigations every 3 months for a period of 1 year. CTAP and IOUS detected all 13 lesions measuring 5-10mm (13/13). One metastasis measuring > 10mm was missed by IOUS. CTAP presented an ideal sensitivity of 100%, but specificity was as low as 68%, IOUS sensitivity was 98% and specificity was 95%, IOUS and CTAP are of comparable value regarding the detection of liver metastases < 10mm. Both techniques may be used if resections of synchronous or metachronous metastases are planned in order not to miss small lesions and to prevent superficial liver surgery. Helical CT scan with dynamic intravenous contrast enhancement is considered the most cost-effective preoperative staging method, although local staging may not be achieved because of insufficient intraabdominal survey.

GYNÉCOLOGIE-OBSTÉTRIQUE

Endometrial cancer: preoperative evaluation of myometrial infiltration magnetic resonance imaging versus transvaginal ultrasonography

G Zarbo, G Caruso, S Caruso, U Mangano, R Zarbo
2nd Obstetrics and Gynaecology Clinic, Catania University, Catania (Italy).

Eur. J. Gynaec. Oncol. 2000; 21

From January 1996 to December 1998, 33 patients with endometrial carcinoma were preoperatively examined in our department: 30 were women undergoing laparoscopic staging and arteriography (TVUS) and magnetic resonance imaging (MRI), and 3 only TVUS. Diagnosis was obtained by histopathological examination of the tissue removed by hysteroscopically controlled biopsy or by curettage of the uterine cavity. TVUS and MRI were performed a few days before surgery. After surgery the uterus was histopathologically examined by a pathologist in order to evaluate the depth of myometrial invasion. The results were compared with TVUS and MRI data to determine sensitivity and specificity, positive predictive value (PPV) and negative predictive value (NPV) of the two methods. According to the results of the present study we conclude that:
TVUS is a low cost, easily performed and reliable method in a high percentage of cases if carried out by a skilled echographist. MRI, is more expensive and has a lower specificity and sensitivity index; it is a valid method if the cervical canal is involved and/or myometrial invasion is > 50% (M2) and if lymphatic invasion has to be investigated.

Ovarian cancer identified through screening with serum markers but not by pelvic imaging

RP Woolas, DH Oram, AR Jeyarajah, RC Bast Jr, UJ Jacobs

Department of Gynaecological Oncology, St Mary’s Hospital, Portsmouth, PO3 6AD UK.

Int J Gynecol Cancer 1999; 9: 497-501

This study evaluated the possible role of 3 additional tumor markers to CA 125 among postmenopausal volunteers participating in a sequential multimodal ovarian cancer screening study. In 82 asymptomatic women the finding of a serum CA 125 level of > 30U/ml precipitated pelvic ultrasound examination. Levels of CA15-3, CA72-4 and CA19-9 were subsequently determined from sera stored from the time of the CA 125 assay. Following ultrasound 29 women underwent surgery for benign conditions. The remaining 53 women underwent 2 years of surveillance. In 5 of these women a diagnosis of ovarian cancer was established between 6 and 10 months after their initial investigation. Elevated levels of at least one of the 3 additional tumor markers were present in the serum, prior to ultrasound abnormalities being detected, in 4 (80%) of the women who developed cancer. At least one of this 3-marker panel was elevated in 29% of the 48 women who had not developed cancer and 14% of the 29 women undergoing surgery for benign conditions. Information collected on demographics to pelvic ultrasound examination for the pre-clinical detection of ovarian cancer could be obtained through multiple marker assay. Coordinated elevated serum levels of tumor markers could increase the sensitivity of this sequential screening protocol.

Magnetic resonance imaging of male and female genitalia during coitus and female sexual arousal

W Weijmar Schultz, P van Andel, I Sabelis, E Mooyaart

Department of Gynaecology, University Hospital Groningen, PO Box 30 001, 9700 RB Groningen, Netherlands.

BJM 1999; 319: 1596-600

Objective. To find out whether taking images of the male and female genitalia during coitus is feasible and to find out whether former and current ideas about the anatomy during sexual intercourse and during female sexual arousal are based on assumptions or on facts.

Design. Observational study.


Methods. Magnetic resonance imaging was used to study the female sexual response and the male and female genitalia during coitus. Thirteen experiments were performed with eight couples and three single women.

Results. The images obtained showed that during intercourse in the "missionary position" the penis has the shape of a boomerang and 1/3 of its length consists of the root of the penis. During female sexual arousal without intercourse the uterus was raised and the anterior vaginal wall lengthened. The size of the uterus did not increase during sexual arousal.

Conclusion. Taking magnetic resonance images of the male and female genitilia during coitus is feasible and contributes to understanding of anatomy.

INTERVENTIONNEL

Angiographic Embolization for Arrest of Bleeding after Penetrating Trauma to the Abdomen

GC Velmathos, D Demetriadis, S Chawhan

Medical Center, 1200 N. State Street, Room 9900, Los Angeles, California 90033-4525.


Background. Angiographic embolization is an effective technique to control bleeding after blunt trauma to the liver or pelvis. Its role in penetrating trauma to the abdomen has not been studied.

Methods. From January 1992 to May 1998, 40 patients underwent angiography for bleeding resulting from intra-abdominal penetrating injuries (33 gunshot wounds, 7 stab wounds). Angiographic embolization of intra-peritoneal or retroperitoneal vessels was performed by standard angiographic techniques with gelatin sponge and/or coils. Data were extracted from medical records, radiology data bank, trauma registry, and morbidity/mortality records, and compared by Student’s t-test and chi-square test. The main outcome measures were failure of angiographic embolization to control bleeding and complications of angiographic embolization.

Results. Angiography was performed during 4 days of nonoperative management in 6 patients (group A), because of failure to control bleeding surgically in 23 (group B), and because of late vascular complications after an initially successful operation in 11 more (group C). In 32 patients, angiography revealed active bleeding; 29 (91%) underwnt successful angiographic embolization. Of the remaining 3 patients, 2 were successfully managed surgically (1 each from groups A and B) and 1 died despite multiple surgical maneuvers (group B). One patient who developed postoperatively a large, bleeding superior mesenteric artery pseudoaneurysm, suffered extensive bowel necrosis after angiographic embolization. No other significant complication was related to angiographic embolization.

Conclusions. Angiographic embolization after penetrating injuries to the abdomen is safe and effective for a small number of selected patients. It is a valuable tool for bleeding control when surgery has failed. It may be ideal for control of late vascular complications when reoperation is not desirable. It may prove to be a useful adjunct in the nonoperative treatment of selected injuries.

Value of ultrasound-guided fine-needle aspiration biopsy of thyroid nodules in an endemic goitre area.

P Mikosch, HJ Gallwitsch, E Kresnik

Department of Nuclear Medicine and Special Endocrinology, Landeskrankenhaus, Klagenfurt St. Veiterstr. 47. A-9020 Klagenfurt. Austria.


The aim of this study was to determine the value, advantages and limitations of ultrasound-guided fine-needle aspiration biopsy (US-FNAB) in an endemic goitre area. US-FNAB was performed on all outpatients who presented with hypoechoic and/or hypofunctional and/or growing nodules. A total of 4518 US-FNABs were performed and 718 patients from this series underwent surgery. Cytological results of the primarily performed with the histological results. US-FNAB results were grouped as non-malignant (n = 303), non-malignant follicular proliferation (n = 177), malignancy cannot be ruled out (n = 133) malignancy (n = 61) inadequate (n = 34), and sampling error biopsy of a non-malignant nodule (n = 10). Nodules as small as 5mm in diameter could be biopsied, gaining representative material. US-FNAB found a malignant or suspicious cytology in 65 out of 87 cases with malignant histology (74.7%). Diagnosis of early tumour stages was often possible: 12 of 18 thyroid carcinomas biopsied and smaller than 10mm in diameter had malignant or suspicious cytoLOGY (groups 3 and 4). US-FNAB was performed incorrectly within non-malignant nodules in ten patients (1.3%) with multinodular goitre (ten papillary carcinomas, nine smaller than 10mm). Regarding the cytology of groups 1 and 2 as benign and those of groups 3 and 4 as malignant. US-FNAB performance was as follows: sensitivity 87.84%, specificity 78.50%, negative predictive values 98.13%, positive predictive values 33.51% and accuracy 79.53%. Biopsies with inadequate material were obtained in 4.73% of all biopsies. No major adverse effects occurred. Re-biopsies in 61 cases did not alter the cytological outcome in those cases where adequate material was obtained. US-FNAB is a valuable method in the pre-operative assessment of thyroid nodules in order to select patients for surgery, as malignancy can often be detected even in early tumour stages. However, even with ultrasonographic guidance, the minimal tumour size detectable by US-FNAB is around 5mm. The cytological interpretation in cases with regression and microcystic proliferation also sets limits on the method. However, patients with non-malignant cytologies can be followed up safely by sonography due to the high NPV of US-FNAB as long as thyroid nodules do not become larger. Re-biopsies can be justified if limited value as long as adequate material was obtained by US-FNAB.

Power Doppler Ultrasonographic Assistance in Percutaneous Ethanol Injection of Autonomously Functioning Thyroid Nodules

S Spiezia, G Cerbone, A Pio Assanti

J Radiol 2000; 81

The purpose of this study was to explore the potential role of power Doppler sonography in guiding percutaneous ethanol injection of autonomously functioning thyroid nodules. Thirty-two patients with non-toxic adenomas and 15 with toxic adenoma underwent percutaneous ethanol injection under power Doppler sonographic guidance. All patients with pretoxic adenoma and 13 of 15 patients with toxic adenoma were treated successfully (i.e., ablation of thyroid hormone release) and 10 had complete recovery of extranodular tracer uptake at scintigraphy. Power Doppler sonography showed the progressive reduction of the intranodular blood flow until its extinction after 6 to 12 months. Nodular shrinkage was obtained in all patients (from 10.85 ± 1.04 to 2.9 ± 0.3 ml in pretoxic adenoma and from 15.4 ± 1.8 to 4.2 ± 0.7 ml in toxic adenoma. Power Doppler sonographic guidance seems to improve the outcome of percutaneous ethanol injection, allowing detection of blood flow even in very small vessels, permitting the ethanol to be guided toward the mainafferent vessels of the nodules, and making it possible to monitor the diffusion and the effects of ethanol on nodular vascularization.

Ultrasound-guided needle biopsy of primary bone tumours

A Saifuddin, R Mitchell, SJD Burnett, A Sandison, JAS Pringle

The Royal National Orthopaedic Hospital Trust, Brockley Hill, Stanmore, Middlesex HA7 4LP, UK.

J Bone Joint Surg 2000; 82-B: 50-4

Needle biopsy is an established technique for the histological diagnosis of bone tumours, usually guided by fluoroscopy or CT. Surface lesions and aggressive tumours which have extended through the cortex are also amenable to imaging with ultrasound (US). We have assessed the diagnostic accuracy of US-guided Trucut needle biopsy in a consecutive series of patients referred to a Bone Tumour Unit with suspected primary bone tumours. Of 144 patients (83 men, 61 women; mean age 43.7 years) referred over a period of two years, 63 were considered suitable for US-guided biopsy. This was based on the presence of a relatively large extracortical component, seen typically in osteosarcoma and malignant round-cell tumours. The results of needle biopsy were compared with those of surgical biopsy. The diagnostic accuracy was 98.4%, with only a single failed biopsy.

Thus, in a selected group of patients, US is a very reliable technique of guidance for percutaneous needle biopsy of bone tumours.

OSTÉO-ARTICULAIRE

Magnetic resonance imaging as a screening procedure to avoid arthroscopy for meniscal tears

J Elvenes, CP Jerome, O Reikeras, O Johansen

Department of Orthopaedics, University Hospital of Tromsø, N-9038 Tromsø, Norway.

Arch Orthop Traumatology 2000; 120:14-16.

The objective of this study was to evaluate the role of magnetic resonance imaging (MRI) as a screening procedure before arthroscopy of meniscal tears. Forty-one knees in 40 patients underwent MRI and arthroscopy. Compared with arthroscopy, the sensitivity, specificity, positive predictive value and negative predictive value for MRI for the medial meniscus were 87%, 100%, 72% and 97%, respectively, while the values for the lateral meniscus were 40%, 89%, 33% and 91%, respectively. The over-all accuracy for MRI of the medial and lateral menisci combined was 84%. On the basis of the high predictive value of negative MRI, we conclude that MRI is useful to exclude patients from unnecessary arthroscopy.

Conclusion. Protocols defining the nonfluoroscopic radiographic procedures for the semiflexed view provide the most accurate radionanatomic joint positioning, and the most reproducible joint repositioning and JSW measurement. Using this method significantly fewer knees would be required to detect significant JSW changes in a structure modifying drug trial compared to the schuss and the extended knee positions.

Ultrasonic measurement of the thickness of human articular cartilage in situ

JQ Yao, BB Seedhom

Biomechanics Laboratory, Rheumatology and Rehabilitation Research Unit, University of Leeds, 36 Clarendon Road, Leeds LS2 9NZ, UK.

Rheumatology 1999;38:1269-71

Objective. The objective of the present study was to explore the possibility of using the ultrasound pulse-echo technique for the non-invasive measurement of cartilage thickness in situ by using a joint arthroscopic examination. The accuracy of the ultrasonic measurement was assessed in vitro against that of an established needling technique which is destructive.

Methods. The velocity of sound in articular cartilage was measured in an in vitro study of one set of ipsilateral human ankle and hip joints at 69 test sites. Its variability was determined.

Results. The velocity of sound in human articular cartilage measured in situ varied widely (1419-2428m/s; mean: 1892m/s: S.D. 183m/s) and therefore the error in the thickness of cartilage obtained from ultrasonic measurement based upon a constant velocity of sound could be as large as 33.6% (mean 7.38%; S.D. 6.25%).

Conclusions. The ultrasonic pulse-echo technique is not accurate for the measurement of the thickness of cartilage in situ. An alternative (albeit minimally invasive) technique would be the needling technique. This requires the development of a specialized probe.

Type II Autosomal Dominant Osteopetrosis (Albers-Schönberg Disease): Clinical and Radiological Manifestations in 42 Patients

OD Bénic-tou, JD Laredo, MC Vermejoul

INSERM U 349, Centre Viggo Petersen, Hôpital Lariboisière, 2, rue Ambroise Paré, 75010 Paris, France.

Bone 2000; 26: 87-93
Type II autosomal dominant osteopetrosis (ADO II, Albers-Schönberg disease) is a genetic condition characterized by generalized osteosclerosis predominating in some skeletal sites such as the spine and pelvis. ADO II is rare, and most available clinical descriptions are based on small numbers of patients. We report the clinical and radiological manifestations in 42 ADO II patients. To our knowledge, this is the largest series reported so far. Our inclusion criterion was presence on radiographs of the spine of vertebral endplate thickening, producing the classic sandwich vertebra appearance. We found various patterns of sandwich vertebra, of which we provide a description to assist physicians in diagnosing ADO II. The classic bone-within-bone appearance was present in most but not all skeletal sites. The radiological penetrance of the disease was high (90%) and increased after 20 years of age. As many as 81% of our patients experienced clinical manifestations. Fractures were common (78% of patients) and healed slowly. Hip osteoarthrosis was the most common complication (51%). Severe, the name “benign osteopetrosis” is probably a misnomer.

We always use MRI to diagnose osteomyelitis. For long-term follow-up of patients with mandibular osteomyelitis, we recommend MRI and bone scintigraphy. We report the clinical and radiological manifestations in 42 ADO II patients. To our knowledge, this is the largest series reported so far. Our inclusion criterion was presence on radiographs of the spine of vertebral endplate thickening, producing the classic sandwich vertebra appearance. We found various patterns of sandwich vertebra, of which we provide a description to assist physicians in diagnosing ADO II. The classic bone-within-bone appearance was present in most but not all skeletal sites. The radiological penetrance of the disease was high (90%) and increased after 20 years of age. As many as 81% of our patients experienced clinical manifestations. Fractures were common (78% of patients) and healed slowly. Hip osteoarthrosis was the most common complication (51%). Severe, the name “benign osteopetrosis” is probably a misnomer.

We always use MRI to diagnose osteomyelitis. For long-term follow-up of patients with mandibular osteomyelitis, we recommend MRI and bone scintigraphy.

**Chondroid Tumors of the Larynx: Computed Tomography Findings**

SJ Wang, A Borges, RB Lukfin
Division of Head and Neck Surgery, UCLA Medical Center, CHS 62-132, 10833 Le Conte Ave, Los Angeles, CA 90095-1624.


**Purpose.** Chondromas and chondrosarcomas of the larynx are rare cartilaginous tumors making up less than 1% of all laryngeal tumors. Patients typically present with symptoms of hoarseness, dysphagia, or dyspnea. The most common location in the larynx for these tumors is the cricoid cartilage. Radiographically, these lesions are typically hypodense, well-circumscribed masses containing mottled calcifications with smooth walls centered within the cartilage.

**Materials and Methods.** We present 6 cases of chondroid tumors of the larynx.

**Results.** One patient had a chondroma, 4 patients had low-grade chondrosarcomas, and 1 patient had an intermediate-grade chondrosarcoma. Two partial laryngeal resections and 4 total laryngectomies were performed.

**Conclusions.** In most cases of chondroma or chondrosarcoma of the larynx, conservative surgical therapy should be attempted, but total laryngectomy may be required for large or recurrent lesions.

**The role of computed tomography in the preoperative assessment and follow-up of oromandibular reconstruction with microvascular osteomyo-cutaneous free flaps**

L. Preda, R Dore, M Benazzo, A Occhini
Istituto di Radiologia, Università di Pavia. IRCCS Policlinico S. Matteo, p. le C. Golgi, 2. 27100 Pavia, Italy.

*Dentomaxillofacial Radiology* 1999; 28, 338-43

**Objective.** To investigate the capacity of helical CT in the pre- and post-operative management of oromandibular reconstruction of patients with oropharyngeal carcinoma using microvascular composite free flaps.

**Materials/methods.** Thirty-four patients with oropharyngeal cancer were examined by helical CT and nine (six men and three women) submitted to oromandibular reconstruction were taken from the iliac crest in six cases and from the fibula in three cases. All patients were examined by CT 1-4 days postoperatively and then at 6 months interval. Double helical scans were performed in all cases, with slices of 2-3mm for primary lesion studies and 5mm for lymph node staging, pitch 2 = 1 and R = 1. Multplanar (MPR) an 3D reconstructions were obtained from pre- and postoperative CT examinations.

**Results.** Preoperative CT showed massive bone infiltration in six of the nine surgical patients and marginal infiltration in three. These findings were confirmed histologically. There were no false negatives. The immediate postoperative examination showed correct flap positioning in eight of nine cases. The flap underwent ischemic necrosis in two cases; CT showed very early signs of bone ischemia in both. CT detected two cases of recurrence after about 1 year.

**Conclusions.** Axial CT permitted adequate assessment of the extent of mandibular infiltration and detected early ischemic complications and distant recurrences. Integration with MPR and 3D reconstructions simplified the choice of flap type and size and enabled the postoperative assessment of correct flap positioning. This helped the surgeon plan subsequent rehabilitation with osseo-integrated implants.

**Clinical and radiological evaluation in children with microtia**

F Calzolari, G Garani, A Sensi, A Martini
Servizio di Neuroradiologia, Arcispedale S Anna, Corso Gioveca 203, 44100 Ferrara, Italy.

*British Journal of Audiology* 1999; 33: 303-312

The management of a child with congenital ear malformation, in particular if the external ear is severely involved, is difficult because of the complexity of the therapeutic problem, and that of parental anxiety. It is very important to plan a complete therapeutic/habilitative programme as soon as possible, even if surgical procedures are delayed. Diagnostic imaging plays an important role in the global assessment of a child with microtia, in order to diagnose possible associated external auditory canal, middle and inner ear malformations. For these reasons our diagnostic protocol for children with microtia includes otological and audiological evaluation, clinical genetics and radiological imaging, from the neonatal period. Here, data are reported on 27 children with microtia who completed the diagnostic protocol. In eight of 27 cases microtia was bilateral; in unilateral cases the right side was affected more frequently. Other congenital malformations were diagnosed in 41% of cases. A high correlation between the degree of microtia and the frequency of external and middle ear dysplasias was found, in accordance with larger studies of the literature. Inner ear malformations were found less frequently, but without apparent correlation with the degree of microtia. The fact that children with microtia may also have severe inner ear malformations is emphasized.

**PÉDIATRIE**

**The use of ultrasound in determining the initiation of treatment in instability of the hip in neonates**

KJ Holen, A Tegnander, SH Eik-Nes, T Terjesen
The National Hospital, Centre of Orthopaedics, Trondheimsv. 132, N-0570 Oslo, Norway.


We have evaluated the effect of the use of ultrasound in determining the initiation of treatment in neonatal instability of the hip. A total...
of 99 newborn infants (1.5% of all live births) with neonatal hip instability did not have treatment from birth, but were re-examined at eight to 15 days. In the 31 who had persistent clinical instability and ultrasound abnormality, treatment was provided by starting a Frejka pillow. The hips in the remaining 68 infants showed spontaneous clinical stabilisation and improvement of the ultrasound findings. Treatment was therefore withheld. There was a marked trend towards normal development in mildly unstable hips, whereas no hips with severe instability did so spontaneously.

Further follow-up showed normal development in all the hips which had been treated, and in five of the 68 untreated infants. These five infants showed persistent hip dysplasia on both ultrasound and radiological examination at four to five months of age. Treatment with an abduction splint was then started and their hips developed normally.

Ultrasound is very useful in deciding on treatment if the examiners have adequate experience. Its use substantially reduces the rate of treatment. Spontaneous resolution occurred in more than half of the unstable hips. Since five of the untreated infants developed hip dysplasia a strict follow-up is essential to identify and treat these cases.

Central Nervous System Abnormalities Assessed With Prenatal Magnetic Resonance Imaging

D Levine, PD Barnes, JR Madsen

Departments of Radiology and Obstetrics and Gynecology, Beth Israel Deaconess Medical Center, Boston; and the Departments of Radiology and Neurosurgery, Children’s Hospital, Boston, Massachusetts.


Objective. To determine the frequency at which magnetic resonance imaging (MRI) provides additional information in fetuses with suspected central nervous system (CNS) abnormalities on ultrasound.

Methods. Between May 1, 1996, and March 26, 1999, 83 women with 90 etuses (including seven sets of five twins) had 91 ultrasonographic and MRI examinations of the fetal CNS. Eight women were studied twice, one for two different indications. If referrals came from outside our institution, a confirmatory sono-gram was obtained. Indications for examination were ventriculomegaly (n = 25), suspected neural tube defect (n = 16), arachnoid cyst (n = 12), large cisterna magna (n = 11), and miscellaneous indications (n = 20).

Results. Magnetic resonance imaging findings led to changed diagnoses in 26 (40%) of 66 fetuses with abnormal confirmatory sonograms. Magnetic resonance imaging findings not found by ultrasound included partial or complete agenesis of the corpus callosum (n = 11), porencephaly (n = 6), hemorrhage (n = 5), tethered cord (n = 3), cortical gyral abnormality (n = 2), cortical cleft (n = 2), microdysgenesis (n = 2), and partial or complete agenesis of the septi pellucidi (n = 3), as well as holoprosencephaly, cerebellar hypoplasia, subependymal and cortical tubers, vascular malformation, and vermian cysts (one case each). Abnormalities better delineated by MRI than ultrasound included three cephaloceles, a dural arteriovenous malformation, one distal sacral neural tube defect, and the mass effect of three arachnoid cysts. That information was used to alter patient counseling and at times management.

Conclusion. When a CNS anomaly is detected by sonography or suspected on ultrasound, MRI findings might lead to altered diagnosis and patient counseling.

Neurophysiology and MRI in Late-Infantile Metachromatic Leukodystrophy

D Zaefiriou, EE Kontopoulos, HM Michelakakis

Child Neurologist; Eigenni St. 106; Thessaloniki 54622, Greece.

Pediatr Neurol 1999; 21: 843-6

We present serial clinical, radiologic, and neurophysiologic findings of a patient with late-infantile metachromatic leukodystrophy who was first admitted at 30 months of age because of progressive muscle weakness. The neurologic findings were consistent with mild spastic diplegia (occasionally with toe walking). Magnetic resonance imaging disclosed diffuse high intensity in the cerebral white matter on T2-weighted images. Evoked potential studies and evoked-potential studies were markedly abnormal. Assay of arylsulfatase A activity in leukocyte culture disclosed a marked deficiency of the enzyme, confirming the diagnosis of late-infantile metachromatic leukodystrophy. Serial neurophysiologic studies demonstrated a marked decrease of nerve conduction velocities, both motor and sensory, as well as prolongation or disappearance of brainstem auditory-, visual-, and somatosensory-evoked potential latencies. Magnetic resonance imaging studies revealed initially diffuse increased signal intensity of periventricular and subcortical white matter, progressing to cortical atrophy with involvement of the arcuate fibers and the cerebellar white matter, correlating with the clinical deterioration (severe spastic tetraplegia with optic atrophy and epilepsy).

Predictive Value of Neonatal MRI as Compared to Ultrasound in Premature Infants with Mild Periventricular White Matter Changes

G van Wezel-Meijer, MS van der Knaap, J Oosting

Department of Paediatrics, Subdivision of Neuroradiology, Free University Hospital, Amsterdam, The Netherlands.

Neuropediatrics 1999; 30: 231-8

A follow-up study was performed in 42 premature infants in whom serial neonatal ultrasound and a single neonatal MRI of the brain was normal, or showed mild periventricular white matter changes. The aim of the study was to evaluate the clinical significance of periventricular signal intensity changes on MRI and to compare the predictive value of neonatal MRI with that of ultrasound. The infants underwent repeated standardised motor assessments and developmental tests. MRI was repeated at the corrected age of 12 months. Pronounced periventricular signal intensity changes on neonatal MRI and periventricular echodensities (flaring) on ultrasound were associated with a high incidence of transient motor problems during infancy. The degree of echogenicity carried the highest predictive value, as compared to duration of flaring on ultrasound and degree of periventricular signal intensity change on MRI. It is concluded that signal intensity changes on neonatal MRI represent the same ischaemic change of the periventricular white matter as flaring on ultrasound and that routine neonatal MRI screening is not warranted in premature infants without clinical evidence of neurological problems and with normal or mildly abnormal ultrasound scans. Recording of the degree of echogenicity should become a routine procedure in neonatal cerebral ultrasonography.

RACHIS

Prevalence of Radiological Changes in the Cervical Spine — A Cross Sectional Study After 20 Years from Presentation of Rheumatoid Arthritis

MH Neva, K Kaarela, M Kauppi

Department of Rheumatology, Rheumatism Foundation Hospital, FIN-18120 Heinola, Finland.

J Rheumatol 2000; 27: 90-3

Objective. To evaluate the prevalence of cervical spine changes in patients with rheumatoid factor (RF) positive rheumatoid arthritis (RA) followed prospectively for 20 years.

Methods. An inception cohort of 103 patients with RF positive RA have been followed at the Rheumatism Foundation Hospital, Heinola. A total of 68 patients attended for the 20 year followup. An additional 28 patients died and 7 were not able to attend due to severe disease or old age. The plain cervical spine radiographs of 69 patients (68 and one received from another hospital) taken after 20 years of RA were evaluated.

Results. Anterior atlantoaxial subluxation was found in 16 cases (23%), while 18 patients (26%) had atlantoaxial impaction as judged by the Sakaguchi-Kauppi method. Subaxial subluxations and lateral atlantoaxial subluxations were found in 13 cases (19%) and 3/52 cases (6%), respectively, while 45 patients (65%) had subaxial disc space narrowing.

Conclusion. Cervical spine changes are common in patients with long lasting RA. They should be diagnosed and treated early to avoid complications. In our patient group no cervical spine surgery was performed, but at least 7 patients (10%) required further evaluation for possible surgery.

Quantitative Assessment with SPECT Imaging of Stress Injuries of the Pars Intertailarulis and Response to Bra- cling

K Anderson, JF Sarwark, JG Conway

Division of Pediatric Orthopaedic Surgery, Children’s Memorial Hospital, 2300 Children’s Plaza #69, Chicago, IL 60614-3394, U.S.A.

Journal of Pediatric Orthopaedics 2000; 20: 28-33

The evaluation and management of acute spondylolysis remains unclear in part be...
cause of outcome data that are primarily subjective. The aim of this study was to evaluate and monitor these patients objectively using quantitative single-photon emission computed tomography (SPECT). Thirty-four patients were observed clinically between 1987 and 1996 and were studied with an initial and at least one follow-up SPECT scintigram. Initial radiographs and planar bone scans failed to demonstrate the pars lesion in 53% and 19% of the patients, respectively. The average SPECT ratio before brace treatment was 1.45. After treatment, this ratio significantly decreased to 1.27 (p = 0.03). A subset of patients remained symptomatic at follow-up. Their reduction in SPECT ratio averaged only 2.8% as compared with 13% for the remainder of the patients (p = 0.01). Patients diagnosed and braced in the early, more active stage of the condition with greater intensity on SPECT had more predictable symptom relief. An initial SPECT ratio of > 1.5 was associated with complete symptom resolution after brace treatment. Patients treated with activity restriction only (>3 months) before bracing were more likely to have persistent symptoms and more modest improvements.

Brucellar Spondylitis: Review of 35 Cases and Literature Survey

J Solera, E Lozano, E Martinez-Alfaro
Clinical Infectious Diseases 1999; 29: 1440-9

Thirty-five patients aged 14-74 years (average, 54 years) who had brucellar spondylitis were treated between January 1991 and December 1997. The time from onset of symptoms to diagnosis of spondylitis ranged from 1 week to 8 months (median, 9 weeks). Back or neck pain (100% of patients), fever from 1 week to 8 months (median, 9 weeks). Persistence of symptoms was most common symptoms. Cultures of blood specimens from 26 patients (74%) were positive for Brucella melitensis. The duration of antimicrobial therapy (median, 120 days; range, 45-535 days) varied according to clinical response and the presence of epidural and paravertebral masses. One of the 35 patients underwent surgical treatment of a spinal epidural abscess. Therapy failed for 9 patients (26%), 95% confidence interval [CI] 12%-43%, and 5 (14%; 95% CI, 5%-30%) had a relapse. There were no deaths or severe sequelae in this study. Brucellar spondylitis causes considerable suffering and absenteeism from work, but long-term clinical responses are favorable.

Comparison of CSF Cytology and Spinal Magnetic Resonance Imaging in the Detection of Leptomeningeal Disease in Pediatric Medulloblastoma or Primitive Neuroectodermal Tumor

M Fouladi, A Gajjar, JM Boyett
Department of Hematology-Oncology, St Jude Children's Research Hospital, 332 N Lauderdale, Memphis, TN 38105.

J Clin Oncol 1999; 17: 3234-7

Purpose. Leptomeningeal disease (LMD) significantly affects the prognosis and treatment of pediatric patients with medulloblastoma or primitive neuroectodermal tumor (PNET). Examination of CSF for malignant cells, detection of LMD on spinal magnetic resonance imaging (MRI), or both are the methods routinely used to diagnose LMD. A recent study suggested 100% correlation between CSF and MRI findings in children with medulloblastoma. To determine the validity of this hypothesis, we compared the rate of detection of LMD between concurrent lumbar CSF cytology and spinal MRI performed at diagnosis in patients with medulloblastoma or PNET.

Patients and Methods. As a part of diagnostic staging, 106 consecutive patients newly diagnosed with medulloblastoma or PNET were evaluated with concurrent lumbar CSF cytology and spinal MRI. CSF cytology was examined for the presence of malignant cells and spinal MRI was reviewed independently for the presence of LMD.

Results. Thirty-four patients (32%) were diagnosed with LMD based on CSF cytology, spinal MRI, or both. There were 21 discordant results. Nine patients (8.5%) with positive MRI had negative CSF cytology. Twelve patients (11.3%) with positive CSF cytology had negative MRIs. The exact 95% upper bound on the proportion of patients with LMD whose disease would have gone undetected using either CSF cytology or MRI as the only diagnostic modality was calculated at 14.4% and 17.7%, respectively.

Conclusion. With the use of either CSF cytology or spinal MRI alone, LMD would be missed in 14% and 18% of patients with medulloblastoma or PNET. Thus, both CSF cytology and spinal MRI should routinely be used to diagnose LMD in patients with medulloblastoma or PNET.

Harris or Axis Ring: An Aid in Diagnosing Low (Type 3) Odontoid Fractures

LJM Mortelmans, EAM Geusens, MB Sabbe, HH Delooz
1. Departments of Emergency Medicine and 2. Radiology, University Hospital Gasthuisberg, Leuven, Belgium.

Eur J Surg 1999; 165: 1138-41

Objective. To present our experience of diagnosing fractures of the odontoid process on lateral radiographs of the cervical spine that show the Harris (axis) ring.

Design. Retrospective study.

Setting. Teaching hospital, Belgium.

Subjects. 12 patients with multiple injuries, including cervical spine, 8 of them unconscious or uncooperative. Interventions: Cross table lateral view of the cervical spine.

Main outcome measure. Identification of otherwise hidden type 3 axial fractures.

Results. Diagnosis of low odontoid fractures in all cases.

Conclusion. The Harris ring is disrupted in low odontoid fractures and intact in fractures of the odontoid process. Awareness of this sign will allow diagnosis of otherwise hidden axial fractures.

Magnetic resonance imaging and neurorecovery in acute spinal cord injury: observations from the National Acute Spinal Cord Injury Study 3

MJ Shepard, MB Bracken
Department of Epidemiology and Public Health, Yale University School of Medicine, Box: 206934, 332 College Street, New Haven, CT 06520-8304, USA.

Spinal Cord 1999; 37: 833-7

Study design. Data are from a multicenter, randomized, double blind clinical trial of acute spinal cord injury.

Objectives. To evaluate the prognostic value of magnetic resonance imaging (MRI) for randomized patients in the National Acute Spinal Cord Injury Study 3 (NASCIS). Setting. Sixteen spinal cord injury centers throughout the United States and Canada. Methods. Of 499 patients randomized in NASCIS 3 between December 1991 and September 1995, MRI was electively done on 191 patients within 72 h of injury. Indications of hemorrhage, edema, and contusion were recorded by standard protocol. Neurological impairment as determined by motor function, response to pin prick and light touch was assessed at admission to the participating center and 6 weeks after injury. Change in neurological function was obtained by subtracting the score of each neurological parameter at admission from that measured at 6 weeks. Spinal cord surgery performed within the 3 days after injury was noted. Data were analyzed by: chi square, analysis of variance, multiple logistic regression and linear regression models. Results. Patients with hemorrhage were much more likely to have a complete injury (OR = 2.88, 95% CI 1.32, 6.23); however this association was much reduced when the initial neurological examination was taken into account (AOR = 1.43, 95% CI 0.55, 3.73) and was no longer a significant predictor of injury. MRI evidence of cord edema was the strongest predictor of reduced improvement in motor function (<3.34 points, P = 0.06) and light touch sensation (<3.41 points, P = 0.05) at 6 weeks. Conclusions. Cord hemorrhage, contusion, and edema on MRI were not associated with diagnosis of a complete cord injury after neurological assessment from the initial clinical examination was taken into account. Prediction of a worse 6 week neurological status was weakly associated with the presence of edema diagnosed by MRI. As MRI technology improves, these diagnostic and predictive capabilities need to be re-assessed. Sponsorship. NASCIS 3 was funded by the National Institute of Neurological Disorders and Stroke at the National Institutes of Health, Washington, DC, USA. Pharmacia and Upjohn provided study drugs and placebos; they also monitored data quality, and funded additional tests, in accordance with Food and Drug Administration regulatory requirements. Dr Bracken has served as an occasional paid consultant to Pharmacia and Upjohn.

SÉNOLOGIE

Role of Breast Magnetic Resonance Imaging in Determining Breast as a...
**Source of Unknown Metastatic Lymphadenopathy**

Ronda S, Henry-Tillman, SE Harms, KC Westbrook

Department of Surgery, Division of Surgical Oncology, University of Arkansas for Medical Sciences, Slot 725, Little Rock, Arkansas 72205.


**Background.** Occult primary breast cancer (OPBC) represents less than 1% of breast cancer. In only a third of cases, mammography identifies a primary tumor. We hypothesized that rotating delivery of excitation off-resonance breast magnetic resonance imaging (MRI) would identify or exclude the breast as a primary site in patients with OPBC.

**Methods.** In a retrospective review, 10 patients were identified with OPBC in which MRI was performed. Malignant appearing lesions were correlated with histopathologic findings at biopsy or surgery.

**Results.** MRI identified the primary site in 8 of 10 cases as breast (80%), and excluded it in 2 cases. The extent of disease and location was accurately predicted when compared with histopathologic specimen.

**Conclusions.** As we continue to focus on a cure of early breast cancer, it is imperative that diagnostic images become more sensitive and specific. MRI accurately predicted OPBC in this subset of patients.

**Silicone Breast Implant Rupture: Pitfalls of Magnetic Resonance Imaging and Relative Efficacies of Magnetic Resonance, Mammography, and Ultrasound**

I Debra M, Borofsky Harriet B, Herkens Robert J

Stanford University School of Medicine; Department of Radiology; S-068A, Route 1: Stanford, Calif. 94305-5105.


The objective of this study was to evaluate the relative efficacies of magnetic resonance (MR) imaging, ultrasonography, and mammography in implant rupture detection and to illustrate pitfalls in MR image interpretation. Thirty patients referred by plastic surgeons with suspected breast implant rupture were prospectively evaluated using MR, ultrasonography, and mammography in implant rupture detection and to illustrate pitfalls in MR image interpretation. Thirty patients referred by plastic surgeons with suspected breast implant rupture were prospectively evaluated using MR, ultrasonography, and mammography in implant rupture detection and to illustrate pitfalls in MR image interpretation.

**Background.** Silicone breast implants are commonly placed for breast augmentations and breast reconstructions. Although the complications of ruptured silicone breast implants are well documented, these complications are uniquely challenging to detect on clinical examination and mammography due to subclinical silicone extrusion. As women are living longer, these implants are being replaced at an increased rate, and silicone implant rupture is becoming an increasingly important clinical entity.

**Methods.** MRI, ultrasonography, and mammography were prospectively compared for their relative efficacies in implant rupture detection. Sensitivities, specificities, and positive and negative predictive values were calculated.

**Results.** In 16 patients (53 percent) with 31 implants showed 13 (42 percent) were intact, 5 (16 percent) had severe gel bleed, and 13 (42 percent) were ruptured. MR sensitivity was 100 percent and specificity was 63 percent. Accuracy for ruptures was 81 percent with MR, higher than with ultrasonography and mammography (77 and 59 percent, respectively). We describe a specific pitfall in MRI interpretation, the rat-tail sign, which is composed of medial linear extension of silicone along the chest wall. Seen in eight cases (four intact, three ruptures, one gel bleed), the rat-tail sign may lead to misdiagnosis of implant rupture if seen in isolation. Magnetic resonance imaging is more accurate and sensitive than ultrasonography and mammography in detecting breast implant rupture. We describe a new sign (rat-tail sign) composed of medial compression of the implant simulating silicone extrusion as a potential false-positive MR finding for rupture. This article presents clinical experience with magnetic resonance, mammography, and ultrasonography in the diagnosis of implant rupture and defines and illustrates potential pitfalls of MR interpretation, including the new rat-tail sign.

**SYSTÈME NERVEUX**

**Encephalitis after hepatitis B vaccination**

Recurrent disseminated encephalitis or MS?

A Tourbah, O Gout, R Liblau, O Lyon-Caen

Fédération de Neurologie, Hôpital de la Salpétrière, 47, Boulevard de l’Hôpital, 75651, Paris Cedex 13, France.

**Objective.** To describe clinical and MRI features of patients with a disease suggestive of CNS inflammation after hepatitis B vaccination.

**Methods.** Eight patients with confirmed CNS inflammation occurring less than 10 weeks after hepatitis B vaccination are described. They received follow-up clinically and on MRI for a mean period of 18 months.

**Results.** Clinical and MRI findings were compatible with acute disseminated encephalomyelitis. However, clinical follow-up, repeated MRI, or both showed the persistence of inflammatory activity, which makes this encephalitis more suggestive of MS than of acute disseminated encephalomyelitis.

**Conclusion.** The persistent inflammatory activity observed clinically and on MRI in these patients is comparable with that usually observed in MS. Epidemiologic studies are currently testing the hypothesis of a triggering role of hepatitis B vaccination in CNS demyelination.

**Diffusion-Weighted MRI in Acute Lacunar Syndromes. A Clinical-Radiological Correlation Study.**

WJ Schonewille, S Tuhrim, MB Singer, SW Atlas

Sinai School of Medicine, Department of Neurology, Box 1137, One Gustave L. Levy Place, New York, NY 10029.


**Background and Purpose.** Clinical-radiological correlation studies in lacunar syndromes have been handicapped by the low sensitivity of CT and standard MRI for acute small-vessel infarction and their difficulty in differentiating between acute and chronic lesions.

**Methods.** We prospectively studied 43 patients presenting with a classic lacunar syndrome using diffusion-weighted MRI, a technique with a high sensitivity and specificity for acute small-vessel infarction.

**Results.** All patients were scanned within 6 days of stroke onset. An acute infarction was identified in all patients. Pure motor stroke was associated with lesions in the posterior limb of the internal capsule (PLIC), pons, corona radiata, and medial medulla; ataxic hemiparesis with lesions in the PLIC, corona radiata, pons, and insular cortex; sensorimotor stroke with lesions in the PLIC and lateral medulla; dysarthria-clumsy hand syndrome with lesions in the PLIC and caudate nucleus; and pure sensory stroke with a lesion in the thalamus. Subcortical lesions extended into neighboring anatomic structures in 48% of the patients.

**Conclusions.** Lacunar syndromes can be caused by lesions in a variety of locations, and specific locations can cause a variety of lacunar syndromes. Extension of lesions into neighboring structures in patients with lacunar syndromes appears to be more frequent than previously described in studies using CT and standard MRI.

**Neurosurgical implications of Carney complex**

JC Watson, CA Stratakis, PK Bryant-Greenwood

Department of Laboratory Medicine and Pathology, Mayo Clinic and Mayo Foundation, Rochester, Minnesota.


Object. The authors present their neurosurgical experience with Carney complex. Carney complex, characterized by spotty skin pigmentation, cardiac myxomas, primary pigmented nodular adrenocortical disease, pituitary tumors, and nerve sheath tumors (NSTs), is a recently described, autosomal-dominant familial syndrome that is relatively unknown to neurosurgeons. Neurosurgery is required to treat pituitary adenomas and a rare NST, the psammomatous melanotic schwannoma (PMS), in patients with Carney complex. Cushings syndrome, a common component of the complex, is caused by primary pigmented nodular adrenocortical disease and is not secondary to an adrenocorticotropic hormone-secreting pituitary adenoma.

**Methods.** The authors reviewed 14 cases of Carney complex, five from the literature and nine from their own experience. Of the 14 pituitary adenomas recognized in association with Carney complex, 12 developed growth hormone (GH) hypersecretion (producing gigantism in two patients and acromegaly in 10), and results of immunohistochemical studies in one of the other two were positive for GH. The association of PMSs with Carney complex was established in 1990. Of the reported tumors, 28% were associated with spinal nerve sheathomas. The spinal tumors occurred in adults (mean age 32 years, range 18-49 years) who presented with pain and radiculopathy. These NSTs may be malignant (10%) and, as with the cardiac myxomas, are associated with significant rates of morbidity and mortality.

**Conclusions.** Because of the surgical comorbidity associated with cardiac myxoma and/ or Cushings syndrome, recognition of Carney complex has important implications for perisurgical patient management and family screening. Study of the genetics of the Carney complex and of the biological abnormalities associated with the tumors may provide insight into the general pathological abnormalities associated with the tumors and may provide insight into the general pathological features of pituitary adenomas and NSTs.
Postoperative MRI Appearance After Transsphenoidal Pituitary Tumor Resection

V Rajaraman, M Schulder
Division of Neurosurgery, New Jersey Medical School, Newark, New Jersey.

Surg Neurol 1999; 52: 592-9

Background. Knowledge of the magnetic resonance imaging (MRI) appearance of the pituitary fossa following transsphenoidal resection of a pituitary adenoma, in the early and late postoperative period, is important for detecting complications and for assessing extent of tumor excision. Few prospective studies have addressed this issue.

Methods. Fourteen patients with pituitary macroadenomas were prospectively studied with MRI. Maximal tumor resection was accomplished in each patient, and the postoperative histological diagnoses included non-secreting adenoma in 11 patients, prolactinoma in 2 and necrosis in one. Early postoperative scans were obtained within 14 days after surgery, and late studies between 3 and 4 months, in all patients. Four patients also had delayed scans between 8 months and a year. The maximum coronal dimension (MCTD) of the sellar and suprasellar contents was measured on T1-weighted contrast enhanced scans.

Results. All patients had normal or improved visual examinations and normal or improved hormonal function postoperatively. The preoperative MCTD ranged from 11 mm to 59 mm in height (mean 30.3 mm). There was little change in MCTD on the early postoperative MRI scans (range 7-49 mm, mean 23.5 mm). However, in all patients the MCTD decreased in height by 4 months (range 2-35 mm, mean 11.95 mm). In all patients the MCTD ranged from 11 mm to 59 mm in height (range 2-35 mm, mean 23.5 mm). However, in all patients the MCTD decreased in height by 4 months (range 2-35 mm, mean 23.5 mm). Therefore, the MCTD after the transsphenoidal resection was smaller than that before surgery in patients who are clinically stable.

Conclusion. MRI is indeed superior to CCT in the diagnosis of BM according to diagnostic contrast-enhanced computed tomography (CCT), we investigated, what additional information could be gained by contrast-enhanced magnetic resonance imaging (MRI).

Methods/Results Among 55 patients with solitary BM according to CCT, 17 had multiple BM on MRI (31%) and 38 had solitary BM in both. Based on a presumed binomial distribution of our data, we calculated a rate of at least 19% of patients with solitary BM on CCT, in which MRI should show multiple lesions (p = 0.05). The two main characteristics for BM missed by CCT were the smaller diameter, which averages 2.4 mm less than in BM identified with both modalities, and a preferential frontotemporal location.

Conclusion. MRI is indeed superior to CCT in the diagnosis of BM and its essential features besides detecting smaller lesions being a better soft tissue contrast, significantly stronger enhancement with paramagnetic contrast agents, the lack of bone artifacts, fewer partial volume effects, and direct imaging in three different planes. Therefore, MRI is indispensable in the diagnostic workup of patients with BM for choosing the optimum therapeutic approach, especially with regard to the decision whether to operate or to primarily irradiate the patient's metastases.

Carotid Artery Stenting in Patients at Surgical High Risk: Clinical and Ultrasound Findings

B Grewinga, F Brasselec, U von Smekalb, MT Al Ahmarrb, Ch Kesslerb
Cerebrovasc Dis 2000; 10: 44-48

Angioplasty and stenting (A/S) provide an alternative for patients with severe simultaneous severe cardiac and cerebrovascular disease, or with medical illnesses which carry a high perioperative risk. We conducted A/S in 20 high-risk patients (15 males, 5 females, mean age = 64.5 years, range = 46-71 years) with symptomatic (n = 10) and asymptomatic (n = 4) high-grade stenosis (>70%, NASCET criterion) of the internal carotid artery. Patients had neurological examinations before, during and after the procedure. Color-coded duplex sonography was performed before and for every 3 months after the procedure: the 3 months examination also included cerebral angiography. The mean degree of stenosis was reduced from 85.7±3.5% to 53.8±2.4% (p = 0.001). Within 18 months follow-up with color-coded duplex sonography the effects of the A/S could be visualized effectively: 2 with local, transient vasospasms, 1 with asymptomatic occlusions, 2 carotid arteries with remaining stenoses of 50% or asymptomatic minimal hyperplasia within the stent. In conclusion, in patients with a high perioperative risk, A/S is a therapeutic alternative to surgery.

MRA Findings and Clinical Manifestations in Rathke's Cleft Cyst

N Saeki, K Sunami, Y Sugaya, A Yamaura
Department of Neurological Surgery, Chiba University School of Medicine, Inohana, Chuoh-ku, Chiba-shi, Chiba Japan

We retrospectively analysed patients with histologically proven Rathke's cleft cyst (RCC) in relation to the clinical manifestations and MRI findings. In particular, of cyst size and intensity in order to obtain an insight into their growing mechanisms, clinical presentations and their management. Eleven patients with RCC were divided into two groups based on T2 weighted images (WI). The A group consisted of 4 patients with cyst of low intensity in T1 WI. The age averaged 64.5 years. Their initial complaints were visual field defects (VFD). Their complaints were either insidious. The maximum cyst size averaged 27.8 ± 2.4 mm. The B group consisted of 7 patients with cyst of iso- or high-intensity in T1 WI. Two patients in the B group showed mixture of low and high and iso- and high-intensity, suggesting the presence of bleeding at the onset of symptoms or growing mechanism of the cysts. In the B group the age averaged 39.9 years, being lower than that in the A group (P = 0.0140 with Mann-Whitney's U test). The 5 patients out of 7 showed headache of insidious type or acute onset and the 3 showed a fluctuation of the VFD. The average size was 21.7 ± 3.5 mm and smaller than that of the A group (P = 0.0208 with Mann-Whitney's U test). Our study has shown that the cyst with iso- to high intensity on T1 WI may cause clinical symptoms with a smaller size than cysts of the low intensity. In the former cyst pattern the onset and growing mechanism may be related to bleeding. The patients with this pat-
tern are more likely to have acute and/or fluctuation of clinical presentations. Knowing these various clinical manifestations based on MRT pattern will be of help in following and managing patients with RCC.

THORAX

Atteinte pulmonaire au cours de la sclérodermie systémique Partie I, Pneumopathie interstitielle chronique fibrosante

I Marie, H Lévesque, S Dominigue, PY Hatron

Département de médecine interne, centre hospitalier universitaire de Rouen-Boisguillaume, 7631 Rouen cedex

Rev Méd Interne 1990; 20: 1004-16

Introduction. La pneumopathie interstitielle chronique fibrosante constitue la plus fréquente des manifestations respiratoires de la sclérodermie systémique, et sa prévalence est estimée à 80%. Elle demeure une complication grave de la maladie dont elle représente, à l’heure actuelle, la première cause de mortalité, aboutissant au décès par insuffisance respiratoire chronique dans 20 à 60% des cas. Actualités et points forts. Sa date de survenue demeure inconnue, mais elle est exceptionnellement révélatrice de la sclérodermie systémique. Ses signes d’appel cliniques sont tardifs et leur apparition traduit une atteinte respiratoire étendue, affectant plus de 50% de l’ensemble du parenchyme pulmonaire. Les explorations complémentaires de choix pour la détection, précocité, sont la tomodensitométrie haute résolution et les explorations fonctionnelles respiratoires, qui devraient être réalisées lors du bilan initial et de la surveillance annuelle de la maladie. De plus, les données de la tomodensitométrie haute résolution ont un intérêt pronostique, car il existe une corrélation entre la nature et la sévérité des lésions tomodensitométriques et histologiques. Les indications des autres examens, en particulier du lavage broncho-alvéolaire, restent à déterminer. Son traitement spécifique n’est pas clairement établi, l’association de bronchodilatateurs et de corticoïdes est en cours d’évaluation (indications, modalités d’administration, durée), et elle pourrait être la plus efficace.

Projets et perspectives. La pneumopathie interstitielle chronique fibrosante représente un des principaux facteurs de morbidité et de mortalité au cours de la sclérodermie systémique. À l’heure actuelle, l’accent doit être mis sur l’importance de son diagnostic et de sa prise en charge thérapeutique précoce.

Pulmonary Function and High-Resolution CT Findings in Patients With an Inherited Form of Pulmonary Fibrosis, Hermansky-Pudlak Syndrome, Due to Mutations in HPS-1*

MB Brantly, NA Avila, V Sholetersuk

10 Center Dr, MSc 1830. Building 10, Room 955-M. NICHD, NIH, Bethesda, MD 20892-1830.

Chest 2000; 117: 129-136

Objective. To describe and correlate pulmonary function and high-resolution CT (HRCT) scan scores in individuals with a high risk for development of pulmonary fibrosis, ie, Hermansky-Pudlak syndrome (HPS) patients with mutations in the HPS-1 gene. Design: Cross-sectional analysis of consecutive, eligible patients. Patients: Thirty-eight HPS inpatients at the National Institutes of Health Clinical Center with HPS-1 mutations. Results. Thirty-seven patients were Puerto Rican and exhibited the typical 16-base pair (bp) duplication in exon 15 of HPS-1. One non-Puerto Rican was homozygous for a different mutation (intervening sequence 17 -2A→C) previously reported in the HPS-1 gene; he died at age 35 of pulmonary insufficiency. For the 23 patients who had pulmonary symptoms, the mean age of onset was 35 years. For all 38 patients (mean age, 37 ± 2 years), the mean FVC was 71% of predicted; the mean FEV1, 76%; mean total lung capacity (TLC), 72%; mean vital capacity (VC), 68%; and mean diffusing capacity of the lung for carbon monoxide (DLCO), 72%. When patients were grouped according to the extent of their reduction in FVC, the other four pulmonary function parameters followed the FVC. Seventeen patients had abnormal chest radiographs, and 31 (82%) had abnormal HRCT scans of the chest, for which a scoring system was created inversely with FVC and DLCO. Conclusions. Mutations in the HPS-1 gene, whether or not they involve the typical 16-bp duplication seen in Puerto Rican patients, are associated with fatal pulmonary fibrosis. In affected patients, the FVC, FEV1, TLC, VC, and DLCO fall in concert, and this functional deficit correlates with HRCT scan evidence of progression of interstitial lung disease.

Lower Pulmonary Function and Cerebral Subclinical Abnormalities Detected by MRI. The Atherosclerosis Risk in Communities Study

D Liao, M Higgins, NR Bryan

Chest 1999; 116: 150-6

DIVERS

Performance evaluation of a multislice CT system

CH McCollough, FE Zink

Department of Diagnostic Radiology, Mayo Clinic, 200 First Street SW, Rochester, Minnesota 55905

Med. Phys. 1999; 26

Our purpose in this study was to characterize the performance of a recently introduced multislice CT scanner (LightSpeed QX/i, Version 1.0, General Electric Medical Systems) in comparison to a single-slice scanner from the same manufacturer (HiSpeed CT/i, Version 4.0). To facilitate this comparison, a refined definition of pitch is introduced which accommodates multislice CT systems, yet maintains the existing relationships between pitch, patient dose, and image quality. The following performance parameters were assessed: radiation and slice sensitivity profiles, low-contrast and limiting spatial resolution, image uniformity and noise, CT number and geometric accuracy, and dose. The multi-slice system was tested in axial (1, 2, or 4 images per gantry rotation) and HQ (Pitch = 0.75) and HS (Pitch = 1.3) helical modes. Axial and helical acquisition speed and limiting spatial resolution (0.8-s exposure) were improved on the multi-slice system. Slice sensitivity profiles, image noise, CT number accuracy and uniformity, and low-contrast resolution were similar. In some HS helical modes, helical artifacts and geometric distortion were more pronounced with a different appearance. Radiation slice profiles and doses were larger on the multi-slice system at all scan widths. For a typical abdomen and pelvis exam, the central and surface body doses for 5-mm helical scans were higher on the multi-slice system by approximately 50%. The increase in surface CTDI values (with respect to the single-slice system) was 50% for the 4 x 1.25-mm configuration (190% for head, 240% for body) and least for the 4 x 5-mm configuration (53% for head, 76% for body). Preliminary testing of version 1.1 software demonstrated reduced doses on the multi-slice scanner, where the increase in body surface CTDI values (with respect to the single-slice system) was 105% for the 4 x 1.25-mm detector configuration and 10% for the 4 x 5-mm configuration. In summary, the axial and HQ-helical modes of ED Sono and to provide excellent image quality and a substantial reduction in exam time and tube loading, although at varying degrees of increased dose relative to the single-slice scanner.

Patient Satisfaction and Diagnostic Accuracy With Ultrasound by Emergency Physicians

W Durston, ML Carl

Emergency Department, Kaiser Foundation Hospital, 6600 Bruceville Rd, Sacramento, CA 95823.


In recent years, there has been considerable interest and controversy concerning the performance of ultrasound by emergency physicians (ED Sono), but patient satisfaction with ED Sono has not been well studied. The primary purpose of this investigation was to assess the level of patient satisfaction with ED Sono and to compare satisfaction with ED Sono with ultrasound by the Medical Imaging Department (MI Sono). A secondary objective was to assess the accuracy of ED Sono at our facility. During a 5-month period, including the startup phase of a program for ED Sono, emergency physicians prospectively identified patients who were candidates for ultrasound as a part of their workup. Patients were contacted by telephone after their ED visit and asked to rate satisfaction on a 0 to 10 scale for various aspects of their care, including the ultrasound if one was done. The accuracy of ED Sono was determined by comparing ED ultrasound interpretations with surgical pathology, repeat imaging studies, or clinical follow-up. Two hundred forty patients were entered into the study, and 186 (78%) responded to the satisfaction survey. Satisfaction ratings were very high for ED Sono (mean, 8.9: 95% CI, 8.6 to 9.2) and MI Sono (mean, 8.8: 95% CI, 8.2 to 9.4). Eighteen percent of ultrasonograms performed by emergency physicians were indeterminate. Including indeterminate scans and scans for which confirmation was not possible, the accuracy of ED Sono was 99.1% (95% CI, 99.1% to >99.9%). We conclude that during the startup phase of our ED Sono program, patient satisfaction was high, and the error rate was very low.