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ABSTRACTS

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Scientific posters and papers

C008 P010 THE HYPOTHALAMUS—WHAT IS THERE UNDER THE BED? ASSESSMENT OF THE NORMAL ANATOMY AND PATHOLOGICAL CONDITIONS

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Objectives

1. To present the complex anatomy and function of the hypothalamus and identify its main nuclei and tracts, illustrated with drawings and MR images.
2. To review a number of clinical issues and diagnostic imaging findings of hypothalamic lesions on the basis of their aetiological classification.

Materials and Methods

The Hypothalamus (from the Greek "under the bed") can be affected by a large number of pathological conditions. Integrating both the clinical data at the onset and the diagnostic imaging findings may be useful to establish a differential diagnosis.

Results

We present the revision of 20 cases that were diagnosed at our institution and which include developmental abnormalities, tumours, inflammatory/granulomatous diseases, as well as vascular/ischemic and systemic conditions.

Discussion

When radiologically assessing the hypothalamus, a full knowledge of the normal anatomy will make the detection and specific localization of these lesions easier, together with the clinical and imaging features that will lead to a presumptive diagnosis. Many such lesions can be treated and are potentially curable. That is why early diagnosis is essential.

C009 CO19 THE USEFULNESS OF TOPICAL LOW-DOSE CT-DACRYOCYSTOGRAPHY WHEN ASSESSING PATIENTS UNDERGOING TRANSCANALICULAR DACRYOCYSTORHINOSTOMY WITH DIODE LASER DUE TO CHRONIC EPIPHORA

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Objectives

To assess by means of low dose topical CT-dacryocystography (CT-TDCG) the patency of the lachrymal passage in patients having undergone diode laser transcanalicular dacryocystorhinostomy under intranasal control due to chronic epiphora.

Materials and Methods

TDCGs performed at our hospital between May 2007 and May 2008 are reviewed.

Twenty-two procedures were carried out on nineteen eyes in seventeen patients. One patient underwent the procedure on both lachrymal passages and three lachrymal passages were operated on twice.

CT-TDCG was performed on all operated lachrymal passages to assess their patency after surgery.

The patients' clinical records were revised to assess their symptoms after surgery and an in-office examination using the irrigation test was carried out.

Results

Two lachrymal passages were asymptomatic, their patency being observed via CT-TDCG.

Regarding the twenty clinically unsuccessful operations, the causes for failure were diagnosed by means of CT-TDCG

and were as follows: in ten cases, thickening of the mucosal scar; four passages with synechiae in neighbouring structures; in five, failure was due to the wrong site for the DCR windows with partial drainage to ethmoidal cells; in four, stenosis due to fibrosis of the lachrymal sac; and in one, it was due to bone re-growth.

Discussion

CT-TDCG allows for a fast imaging diagnosis without the complications of the causes of failed DDCR and helps the ophthalmologist in drawing up a new treatment strategy.

C011 P011 NEUROIMAGING FINDINGS OF PLAQUE MENINGIOMA

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Objectives

Despite the fact that intra-cranial meningiomas account for 20% cerebral neoplasms, plaque meningioma (PM) is a rare tumour usually related to hyperostosis of the neighbouring bone which is disproportionately large compared to the relatively small size of the tumour. Such hyperostosis gives rise to confusion with other conditions that may also cause hyperostosis, such as fibrous dysplasia, Paget's disease and even bone metastases.

Materials and Methods

We present six cases of PM that were detected at our unit, between November 1998 and April 2009, and analyze the existence of characteristic PM clinical findings by means of CT and MR.

Results

The radiological study, by means of CT and MR, of PM-suggestive lesions should include the localization of the bone area involved, the features it shows (hyperostosis or osteolysis) and its spread, both in depth and superficially. It should also state whether, or not, there are radiological signs that could direct our diagnosis towards PM: the presence of soft tissue involvement, its IV contrast-enhancement pattern, the presence of oedema around the lesion and the related mass effect, as well as the observation of the sub-dural ossification line and/or the so-called dural tails, very typical in meningiomas.

Discussion

Though infrequent, PM should be included in the differential diagnosis of abnormal bony lesions which show soft tissue involvement. CT, and above all MR, provide the relevant radiological information for the diagnosis and the study of the spread of PM.

C012 CO02 THE USEFULNESS OF MR IN THE DIFFERENTIAL DIAGNOSIS OF CHRONIC OTITIS MEDIA

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Objectives

To illustrate the different MR features of several pathological conditions which may be related to middle ear inflammatory diseases, to make a differential diagnosis, and assess under which circumstances MR is an adjunct to and/or better than CT studies.

Materials and Methods

Retrospective analysis of patients with a clinical record of recurrent otitis media where an MR examination was prescribed due to clinical/otoscopic or CT findings, including echo-planar sequences (EPI-DWI) and T1–weighted images with IV contrast enhancement in both the axial and the coronal plane. Patients with a surgical background of the temporal bone (cholesteatoma surgery), with a pathological CT control, and where a post-operative MR study had also been carried out were also included.

Results

Usually, CT studies are the first radiological examinations to be performed when suspecting complications of otitis media in a patient having undergone surgery. But in those patients with a non-conclusive CT and/or because otoscopic findings justify it, an MR examination is very useful. The use of conventional sequences suffices for the diagnosis of cholesterol granuloma and encephalocele, whilst diffusion and T1–weighted with IV contrast enhancement are especially useful for the differential diagnosis between granulation tissue and cholesteatoma, both in unoperated and operated patients.

Discussion

MR provides very useful information for the differential diagnosis of potential complications of chronic otitis media, especially with regard to cholesteatoma, cholesterol granuloma and encephalocele, as well as in determining the potential recurrence of cholesteatoma in post-operative patients.

C013 P012 DESCRIPTIVE STUDY OF MICROBLEEDING IN PATIENTS WITH SPONTANEOUS INTRACEREBRAL HAEMORRHAGE

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Objectives
To describe the rate and distribution of microbleeding in patients with spontaneous intracerebral haemorrhage (ICH) and its relationship with its location and its different aetiologies.
Materials and Methods
Prospective study of 35 patients admitted to the neurology unit with less than 24 hours of spontaneous ICH and on whom a cranial MR was subsequently performed, including echo-gradient sequences. Microbleeding was defined as a rounded hypo-intense lesion in the echo-gradient sequence ≤10 mm diameter, after ruling out other causes of hypo-signal. The number, size and site of microbleeding were analyzed. ICH sites were classified as deep or lobar. ICH aetiology was classified as hypertensive, amyloid, anti-platelet agents, miscellaneous or unknown.
Results
Mean age was 71±12.1 years, with 61% men. Microbleeding was detected in 19 patients (54.3%), 95% were multiple and their size was ≤5 mm. The distribution of microbleeding was as follows: lobar 37%, deep 16% and both 47%. Microbleeding was found in 20% patients of unknown ICH aetiology, 47.6% hypertensive ones, 100% amyloid ones and 75% of those due to anticoagulant agents. Microbleeding was found in 54.4% deep ICH and in 44.4% lobar ICH.
Discussion
Cerebral microbleeding can be detected in over 50% of the patients with ICH. Most of them are multiple and small sized. A larger trend is found in amyloid and anticoagulant-related aetiologies.

C014 P013 NEUROIMAGING IN FXTAS (FRAGILE X TREMOR ATAXIA SYNDROME) AND IN PREMUTATION CARRIERS

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Objectives
To present the FXTAS syndrome, and describe the conventional, structural and spectroscopic MR findings in the CNS of FMR1 gen-premutation carriers.
Materials and Methods
The study comprised 34 age- and gender-matched patients who were FMR1 gen (fragile X) premutation carriers—21 premutated carriers and 13 controls. The FLAIR sequence was assessed as well as the 3D-IR-SPGR, single voxel 1H-ERM (mid–D cerebellar stalk) and Voxel Based Morphometry (VBM). Metabolite concentrations were found at the pre-frontal and dorso-lateral cortex using the LC model.
MR findings were subsequently assessed on the basis of the neurological and neuro-psychological evaluation (executive tasks, memory, attention span, overall intelligence and behavioural symptoms).
The statistical analysis included comparisons between Student's t test and ANOVA groups, in addition to a regression analysis (Spearman's rho).
Results
Premutation carriers showed signal changes in mid-cerebellar stalks and the brain stem, cerebellar and brain stem atrophy, white matter hyper-intensities, fronto-parietal and medial-temporal cerebral atrophy.
Spectroscopy showed glutamate levels that were statistically lower than those found in controls.
Discussion
Considering the wide clinical spectrum of patients who are FMR1 gen premutation carriers, an MR study helps direct the diagnosis of FXTAS in cases of uncharacterized late ataxia cases. On the other hand, the MR potential to predict those asymptomatic cases that may develop the disease is still under discussion.

C015 CO09 CT-GUIDED BIOPSY OF AGGRESSIVE PRIMARY SACRAL TUMOURS

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Objectives
We present a series of eight very rare sacral tumours that show a wide spectrum of aggressive pathology on this bone. We will discuss the pros, cons and indications of CT-guided biopsy.
Materials and Methods
Eight sacral tumours were studied between 2006 and 2008. Prior to performing a biopsy, previous CT and MR images were analyzed in order to properly guide the biopsy. A CT was carried out on the lesion with 3 mm slices in order to find the target area and the needle tract. An 11G coaxial vertebroplasty needle was used in all cases. All the patients received antibiotic prophylaxis during the procedure.
Results
Eight sacral lesions underwent a biopsy and in four of them the diagnosis was made with a CT-guided biopsy. In three cases a single session sufficed and the diagnoses were: chordoma, plasmocytoma and melanoma metastasis, while in the other case, three sessions were required to finally reach the diagnosis of Ewing's sarcoma. In the other four cases, a surgical biopsy was required for several reasons and the final diagnoses were chondrosarcoma, eosinophilic granuloma and lymphoma in two other patients.

Discussion
CT-guided biopsy is an extremely helpful technique for characterizing aggressive sacral tumours. A final diagnosis is not reached in all cases and in some instances a surgical biopsy may be required.

C016 CO04 TREATMENT OF CAROTID ARTERY STENOSIS WITH ANGIOPLASTY AND CAROTID STENT (ACS): 125 CONSECUTIVE CASES TREATED AT A REFERRAL INSTITUTION

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Objectives
To assess the complications related to the last ACSs performed in our institution. To compare the results with those from previous studies (EVA-3S, SPACE, and ICSS).
Materials and Methods
Early (first month) and late complications were recorded in patients undergoing ACS between January 2006 and May 2009.
All patients followed a strict pre-medication protocol (double anti-platelet treatment) as well as pre- and post-treatment follow-up (admission and neurological evaluation on the day before, discharge at 48 hours, clinical and angio-CT follow-up in the outpatient clinic every 3 months). ACSs procedures were carried out by an interventional radiologist with technical expertise, one interventional radiologist in-training and a nurse, always in the presence of an anaesthesiologist.
Results
The morbidity and mortality rate was 3.2%. Four re-perfusion syndromes were recorded (two intracranial haemorrhages were fatal and two cases of cerebral oedema were solved without sequelae), all of them during the first 72 hours after ACS. No early thromboembolic complications were recorded during the follow-up.
Discussion
In our experience ACS morbidity and mortality rates are lower than those found in recent studies and they are within the range suggested for this technique.
Performing this technique under specific "minimal" requirements regarding 1) the interventional radiologists expertise and anaesthetic conditions, 2) patient management in the ward, and 3) clinical and radiological follow-up, is essential in order to achieve good results and which means the results of previous studies are difficult to interpret. The circumstances of each individual hospital must be taken into account when deciding whether to perform a carotid re-vascularisation technique.

C017 CO21 IMPLEMENTING PERFUSION CT AS A ROUTINE TECHNIQUE IN THE ASSESSMENT OF PATIENTS WITH ACUTE STROKE

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Objectives
To analyze the implementation of multi-slice CT with perfusion CT+angio CT in a hospital that did not have the system available and the way to include it within the scope of neurological emergencies in our environment.
Materials and Methods
We analyze the methods that were required to reach the starting point in the management of acute stroke in emergency radiology (plain CT), to an endpoint with a multi-slice CT protocol (plain CT+perfusion CT+angio CT).
Results
The key points in the road map for the implementation of this new technology can be grouped together in actions carried out in the following departments:

A. —Radiological diagnosis: 1.- training of assistants and residents; 2.- training of technicians and nurses; 3.- setting up the action protocol and clinical pathway for the technician-radiologist-neurologist; 4.- standardization of the technique, having it become a "routine" technique.
B. —Neurology: 1.- training of assistants and residents in basic CT techniques; 2.- including the perfusion CT-stroke protocol as a "Routine"; 3.- using the information coming from the perfusion CT in the decision-making process for patients with stroke.
C. —Joint activities: Organizing: 1.- Weekly joint training and case discussion sessions; 2.- Sessions aimed at standardizing Rx-NRL criteria as well as adapting the clinical-Rx-NRL pathway according to requirements.

Discussion
Implementing a new technology routine like the plain CT study+perfusion CT+angio CT in patients with stroke 24/365 is a complex task that requires the cooperation and common efforts of radiological diagnosis and neurology departments, assistants and residents, technicians and nurses. We submit a useful road map that can be implemented, with any relevant changes, in order to reach this kind of teamwork.

C019 CO16 INCIDENCE OF NEW LESIONS IN DIFFUSION SEQUENCES AFTER INTRAVASCULAR TREATMENT OF CAROTID STENOSIS WITHOUT A DISTAL PROTECTION SYSTEM

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Objectives
To assess the incidence of brain lesions by means of magnetic resonance studies with diffusion sequences after stent placement for the treatment of symptomatic internal cervical carotid artery stenosis without distal protection systems.
Materials and Methods
Prospective study covering the period January 2007 to June 2009 during which diffusion-weighted images of magnetic resonance were performed on all patients a few hours before and during the 24-hour period following the intravascular procedure. The standard procedure consists of placing the stent prior to angioplasty balloon dilatation. Patients in whom MR was contraindicated, or those who did not sign the informed consent form or where the MR examination could not be performed within the time frame required were excluded from the study.
Results
Fifty-seven procedures were carried out. In one case crossing the stenosis was impossible. Of the 56 cases that were treated, 34 underwent an MR study (60.71%). Mean age was 68,52 (49–80) and 4 were women. A Carotid Wall Stent was used in 29 cases. Lesions were found in diffusion in 5 patients (14.70%). All of them showed over 90% stenosis and in 2 cases angioplasty was performed before stent placement.
Discussion
The intravascular treatment without a distal protection system shows a very low incidence of complications and lesions in post-procedure diffusion images. It is very likely that placing a stent prior to angioplasty may reduce the number of cerebral embolisms.

C020 P014 TRAUMATIC PATHOLOGY OF THE CRANIO-CERVICAL JUNCTION—CHAPTER I

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Objectives
To present a tool that makes it possible to understand and simplify the radiological evaluation of the cranio-cervical junction (CCJ) under traumatic circumstances.
Materials and Methods
Starting with a brief anatomical revision and following on with the clinical exclusion or confirmation of cranio-cervical lesions (Nexium and Canadian C Spine Rule), we will review the different radiological methods to be used and the new craniometrical approaches which will direct us in each case.
Results
The cranio-cervical junction spans from the occipital to the second inter-vertebral disc. It is the area in the cervical spine which is most difficult to assess radiologically due to its complex anatomy and the variants in normalcy. Knowing the clinical exclusion or confirmation criteria will help us set the indications for the different radiological diagnostic tools. Plain X-rays are still being used despite their shortcomings. The Nordeter 2005 states under which circumstances a multi-slice CT technique should be performed as a first examination, while magnetic resonance is kept for those cases in which potential spinal and ligament injuries are suspected. Craniometry is an indicative tool, its basic values varying, depending on the radiological methods used and with age.
Discussion
Traumatic CCJ injuries are a significant diagnostic challenge and optimizing the different radiological evaluation tools is essential, hence the importance of knowing their indications, shortcomings as well as the results of craniometry. And now… on to Chapter II.

C021 P015 TRAUMATIC PATHOLOGY OF THE CRANIO-CERVICAL JUNCTION—CHAPTER II

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Objectives
Once we have seen the way to carry out a systematic radiological evaluation of the cranio-cervical junction under trauma circumstances, we will review the main trauma injuries in this area on the basis of their site, causes, without forgetting their age-related rate.
Materials and Methods
Mostly multi-slice CT images from different clinical cases as well as drawings depicting the causes leading to those injuries.

Results
Occipital condylar injuries occur due to an axial load with rotation or lateralization. Atlas injuries (types I to V) are due to several lesional mechanisms. Axis injuries are related to cranio-encephalic lesions in 40% of the cases and may be located at the odontoid process, they may also be due to ligament avulsion or fractures of both pedicles. Atlanto-occipital joint injuries are frequently fatal due to their related neurological injuries. Atlanto-axial injuries are classified on the basis of their cause: partial dislocation, fixation and dissociation. Among elderly patients, CCJ traumatic injuries are mostly due to degenerative changes which transfer the centre of cervical mobility to the 4th–7th vertebra in this anatomical area, and in children where the skull has a larger relative volume and there is muscle and ligament immaturity. (One should not forget the variants in normalcy that may look like fractures.)
Discussion
To reach an effective diagnosis of CCJ traumatic injuries, it is essential to get to know them well and understand the related lesional mechanisms.

C022 P016 CRANIAL CT, PERFUSION CT AND TSA ANGIO CT IMAGING IN PATIENTS WITH STROKE

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Objectives
We submit our experience in a group of patients with STROKE, within the first 3 hours of clinical signs and symptoms, with imaging findings from cranial CT, perfusion CT and TSA angio CT, and their relationship with the clinical decisions that were made for their management.
Materials and Methods
STROKE diagnostic protocol during the first 3 hours: cranial CT, perfusion CT and TSA angio CT in a group of approximately 400 patients. We randomly selected the last 32 patients and we present their imaging diagnostic findings.
Results
Non-contrast-enhanced cranial CT was reported as normal in 23 out of the 32 patients. Angio CT was able to identify the vessel obstruction in 26 out of the 32 patients. In 7 out of the 32 patients the subjective evaluation of perfusion CT images was normal. In 18 out of 32 patients the perfusion showed an alteration of MTT and normal flow volume; that is, an ischemic lesion without an established infarction. In those 7 patients where a core lesion was identified by means of perfusion, in 5/7 the lesion that had been identified as core was subsequently shown to be an established infarction in follow-up studies.
Discussion
Although some reports in the literature argue that perfusion CT does not allow for a precise quantification of the core and penumbra in patients with STROKE, in our experience (and short of a more readily available method), the subjective evaluation of those images provides very useful information to both the clinician and the interventional neuroradiologist in those clinical decisions that are made in the acute period of the disease. It is worth underscoring the outstanding diagnostic reliability of TSA angio CT which makes it possible to diagnose the site and type of vessel occlusion which are the basis for the decision on thrombolytic treatment.

C023 P001 ANGIOGRAPHIC EVALUATION OF CEREBRAL VENOUS PATHOLOGY

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Objectives
We present our experience in the angiographic diagnosis and intravascular treatment of cerebral venous pathology. We present the significance of the proper anatomical and haemodynamic evaluation of the pathology as well as their implications in the clinical management and in an eventual intravascular treatment.
Materials and Methods
In our data base we collected examples of cerebral venous pathology that had been diagnosed by angiography. We selected illustrations of pathology on the basis of their anatomical site and the visualized haemodynamic changes. We analyzed the treatment that was carried out and we present those cases treated with an intravascular technique.
Results
The following cases are presented:

1. As an illustration of extra-cranial, orbital and facial venous pathology: sinus pericranii, carotid-cavernous tracts and a.v. orbital tracts.
2. As an illustration of dural sinus pathology: cavernous sinus pathology, superior longitudinal and transverse sinus thrombosis, dural fistulae at the transverse sinus and the superior longitudinal sinus.
3. As an illustration of superficial venous pathology: dural fistula and intravascular treatment, AVMs with superficial drainage.
4. As an illustration of deep vein pathology: AVMs with deep drainage.
5. As an illustration of posterior fossa pathology: dural fistulae at the tentorium, fistula at the superior perusal sinus, and AVMs at the posterior fossa.

Discussion
Cerebral arteriography is an irreplaceable diagnostic tool in the assessment of cerebral vascular pathology. It allows a haemodynamic and basic anatomical evaluation, which is essential for a neuro-surgical and intravascular approach of cerebral venous pathology.

C024 P002 INTRAVASCULAR TREATMENT OF STROKE: REVIEW OF 4 CASES UNDERGOING SEVERAL RE-VASCULARIZATION TECHNIQUES

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Objectives
We present four cases of patients with a clinical and neuro-imaging diagnosis of cerebral STROKE who underwent intravascular treatment with four different re-vascularisation methods, selected from our series.
Materials and Methods
At our institution, the assessment of patients with cerebral STROKE is carried out as follows: as the first neuro-imaging test, a cranial CT plus angio CT and perfusion CT are performed. In our action protocol intra-arterial re-vascularisation techniques are kept for those patients within the first three hours of clinical signs and symptoms and with obstruction of a large vessel (internal carotid artery, internal carotid and basilar artery bifurcation) with a required NIHSS of 8, and subsequently spread to M1 in up to 6 hours.
We selected the clinical cases of a patient with an obstruction at M1 that was treated with a thrombus retriever (Solitaire Stent), an extra-cranial carotid artery obstruction that was treated with stents (Wingspam) and abciximab, a basilar artery thrombosis that was treated with intra-arterial fibrinolytic agents plus a stent (Wingspam) and an obstruction at M1 that was treated with angioplasty plus intra-arterial fibrinolytic agents.
Results
All patients underwent a cranial CT without contrast enhancement that ruled out the presence of cerebral haemorrhage, an angio CT that diagnosed the vessel obstruction and a perfusion CT that confirmed the presence of a penumbra volume. Re-vascularisation was possible in all the cases with a good angiographic result and an excellent clinical course.
Discussion
Intra-arterial fibrinolysis is an option for the treatment of acute cerebral ischemia and it is found to be a safe and effective technique undergoing continued development and research that will no doubt help it become the treatment of choice in selected patients. A multidisciplinary approach and patient selection on the basis of the analysis of advanced neuro-imaging techniques will make it possible to optimize the management of these patients. These techniques should nonetheless be performed by experts in order to minimize the intra-cranial complication rate.

C025 P017 CERVICAL ARTERIAL DISSECTION: IMAGING DIAGNOSIS AND INTRAVASCULAR TREATMENT STRATEGIES

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Objectives
Cervical arterial dissection is one of the main causes of stroke in young adults, and may account for up to 20% of the total number of strokes among people under 45 years of age.
Recent developments in non-invasive neuro-vascular diagnostic techniques have led to an increase in the number of cases diagnosed in the past few years. Despite this fact, there is not, at present, any controlled clinical trial setting the basis for the management of this condition, and this is why treatments are implemented in each individual patient on the basis of the best scientific evidence available.
Materials and Methods
We present the most illustrative cases of carotid and vertebral artery dissection that were diagnosed and treated at our institution over the past year.
Results
Dissection cases are shown of both the carotid and the vertebral artery where the typical CT and MR findings for this pathology were clearly identified (increased arterial diameter with eccentrical, narrow and irregular lumen; intramural half-moon shaped haematoma; string sign; intimal flap; dissecting pseudo-aneurysm; brain repercussions due to embolic and haemodynamic events).
The treatments used are duly presented (anti-coagulation: stent placement, embolization of pseudo-aneurysm with coils and stent), including images of neuro-interventional procedures and the relevant morphological results.
Discussion
Getting to know the spectrum of radiological findings in cervical artery dissection will not only make it possible to reach an early and precise diagnosis of this condition but will also help choose the best therapy, thereby minimizing the risk of stroke or its sequelae.

C026 P018 USEFULNESS OF MSCT IN THE STUDY OF EC PATHOLOGY: BEYOND OTOSCOPY

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Objectives
Due to the fact that the ear canal (EC) is more readily accessible to inspection and otoscopic examination than the temporal bone as a whole, the role played by imaging diagnostic techniques in the study of its pathology is not as outstanding as it is in the middle or the internal ear. Nonetheless, an imaging diagnosis is essential whenever the presence of dysplasia, masses or inflammatory tissue makes it difficult to conduct the proper EC evaluation which is crucial both for diagnostic purposes and for determining the spread of specific conditions.
Materials and Method
We reviewed temporal bone MSCT scans performed at our institution between June 2008 and June 2009, and subsequently selected those illustrative images related to the study of EC pathology.
Results
Detailed remarks are made about the radiological findings of both the normal anatomy and a wide spectrum of EC pathology, specifying in each individual case which are the data that should be included in the report because of their special interest for the ENT specialist.
Among the selected cases we include congenital conditions (EC atresia), inflammatory-infectious pathology (necrotizing external otitis), tumours (benign and malignant, primary and secondary), post-traumatic and post-surgical changes.
Discussion
MSCT allows a precise assessment of EC anatomy and pathology, which makes it an essential tool in those cases where otoscopy is difficult or incomplete and whenever it becomes necessary to define very precisely the spread of the condition under study.

C027 CO15 INTRAVASCULAR TREATMENT OF CAROTID ARTERY STENOSIS WITHOUT DISTAL PROTECTION SYSTEMS

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Objectives
To share our experience in the treatment of symptomatic carotid artery stenosis without a distal protection system as well as showing the peri-procedural complication rate.
Materials and Methods
All cases of carotid artery stenosis treated with intravascular therapy at our institution from January 2002 till June 2009 were collected. Epidemiological variables were recorded as well as the grade of stenosis, stent type, timing of angioplasty and complications (neurological or technique related) during the procedure itself and 24 hours later.
Results
160 procedures were performed. Nine (6.62%) cases were excluded because it was impossible to go through the stenosis. 151 procedures were therefore performed on 149 patients; 26 (17.44%) were women with a mean age of 66.73 (41–84) years. All patients were symptomatic with >70% stenosis; except for five cases, three asymptomatic with occlusion of the contra-lateral carotid artery and two with <70% stenosis that showed symptoms despite their medical treatment. The mortality rate was zero and only two patients showed permanent neurological complications (1.3%): 1 basal ganglia haematoma and one MCA stroke secondary to a pre-stent angioplasty.
Discussion
In our experience, the intravascular treatment of significant and symptomatic carotid artery stenosis without distal protection systems shows a low complication rate. We believe that performing an angioplasty after stent placement may have a protective effect against embolus-forming phenomena.

C030 CO05 USEFULNESS OF MAGNETIC SUSCEPTIBILITY SEQUENCING (MSS) IN THE DETECTION OF VENOUS DRAINAGE ABNORMALITIES (VDAs)

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Objectives
MSS sensitivity and precision are analyzed in the detection and characterization of venous drainage abnormalities (VDAs), comparing the method versus conventional (T2- and post-contrast T1–weighted) MR sequences.
Materials and Methods
A prospective study was conducted for 15 months in 101 patients where for several reasons MR brain studies were performed in a 1.5 T equipment and where MSS sequences were included in order to detect intracranial haemorrhagic lesions (vessel malformations, tumours, head injury, cerebrovascular disease). In 23 patients of this group VDAs were detected and their main features were analyzed (number, site, vessel architecture). These characteristics were also analyzed in conventional T2–weighted sequences (turbo spin eco, FLAIR), as well as T2*- and post-contrast T1–weighted.
Results
Twenty-eight VDAs were identified in 23 patients of which 57% were lobular, 14% were located at the basal ganglia, 7% at the brain stem and 23% at the cerebellum. The MSS

sequence showed a higher sensitivity ($p<0.005$) than the other T2–weighted sequences in detecting the number of VDAs, and a higher precision in the evaluation of vessel architecture. Conversely, no statistically significant differences were found between the MSS and the post-contrast T1–weighted sequences.

Discussion

The MSS sequence shows a higher sensitivity for detection purposes and makes it possible to better characterize VDAs versus T2- and T2*–weighted sequences, while contrast-enhanced T1 sequences are about equal. MSS sequences should be considered as an option in the diagnosis of VDAs.

C031 CO22 PRELIMINARY STUDY OF PERFUSION BY MEANS OF ARTERIAL SPIN LABELLING IN 3 TESLA MR FOR CEREBROVASCULAR PATHOLOGY

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Objectives

Arterial spin labelling (ASL) is an MR perfusion modality that magnetizes arterial water, thereby allowing the measurement of cerebral blood flow without exogenous contrast agents. This study presents the findings in perfusion through ASL in a group of selected patients with acute or chronic cerebro-vascular pathology.

Materials and Methods

A prospective study was carried out with a 2-month run-in period in patients with ischemic stroke, vessel malformation, carotid artery stenosis and other vascular diseases. The study protocol included the ASL sequence, a study of the brain with T1-, T2- and diffusion-weighted sequences, as well as angiographic sequences with or without contrast enhancement (angio MR and TOF). An analysis was made of flow qualitative maps in ASL and the findings from the other sequences.

Results

Thirteen patients were included in the study (8 men, 5 women) with a mean age of 58 (range 28–79). The most frequently found pathologies were: carotid artery stenosis (8/13), infarction (6/13), haemorrhage (3/13), AV malformations (2/13), cavernomas (2/13) and dissection of the internal carotid artery 1/13). The analysis of cerebral blood flow maps obtained with ASL found hypo-perfusion in 62% of the cases (identified in infarctions and arterial stenosis) and hyper-perfusion in 15% (arterio-venous malformations and luxury perfusion areas). In the remaining 23%, the study was normal (both in terms of arterial stenosis and vascular diseases).

Discussion

ASL perfusion is a new technique that makes it possible to assess the cerebral blood flow. This preliminary study shows its usefulness in cerebro-vascular pathology as an alternative to contrast-enhancement perfusion.

C032 P019 THE ROLE OF ANGIO-MR IN THE DIAGNOSIS OF SPINAL DURAL FISTULAE

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Objectives

Spinal vascular malformations account for 4% of all intra-spinal conditions.

Dural arterio-venous fistulae (DAVF) account for 80% of the total and they consist of a direct communication between the radicular-meningeal artery and an intra-dural spinal vein, thereby creating a back-flow in the peri-spinal plexus.

Materials and Methods

A clinical case is presented of a 33-year-old male who was admitted to the Emergency Room with right-side lumbo-sciatic pain, saddle hypoesthesia and sphincteric dysfunction, compatible with a cauda equina syndrome lasting for two weeks. Lumbo-sacral MR was performed as well as angio MR.

Results

The above-mentioned tests showed the existence of a dural fistula at D12 with a related myelopathy.

Discussion

Despite being infrequent, DAVFs are clinically very relevant because they give rise to very severe neurological symptoms or even death unless properly diagnosed and treated.

Although the level of the fistula can be inferred through the setup of the venous drainage, only the visualization of the sinus tract can provide the required diagnostic certainty and, nowadays, the available contrast enhanced angio MR techniques can help us find non-invasively the precise site of dural fistulae.

C033 P020 THE ROLE OF ANGIO CT IN THE ASSESSMENT OF INTRACRANIAL VASCULAR PATHOLOGY

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Objectives

To review the intracranial vascular pathology that lends itself to an angio CT study.

Materials and Methods

We conducted a retrospective review of all angio CT intracranial examinations carried out at our institution during the 18-month period from January 2008 till June 2009, (n=268).

Results
The most frequent indications for the examination were intracranial aneurysms (n=78), stroke codes (n=61), intracranial haematomas (with or without intraventricular haemorrhage) (n=25), the clinical suspicion of intracranial atheromatosis (n=29) and sub-arachnoid haemorrhages (n=23). This technique was also used in the assessment of arteriovenous malformations (n=12) and tracts (n=15). Less frequently an angio CT was requested due to a clinical suspicion of venous thrombosis (n=11), paresis of the third cranial pair (n=5), mycotic aneurysms (n=4), vasculitis (n=3) and sentinel headaches (n=2).
In this presentation we will show some of the most illustrative cases of each individual pathology, reviewing the most outstanding points in the clinical management of our patients.
Discussion
Angio CT is presented as a non-invasive tool that is readily available, and in many cases decisive, for the management of patients with cerebral vascular pathology.

C034 P021 RADIOLOGICAL FINDINGS IN MOYAMOYA SYNDROME

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Objectives

1. To define Moyamoya syndrome as an independent condition and different from conventional Moyamoya disease.
2. To present the main radiological findings of both conditions.

Materials and Methods
Review of cases diagnosed by means of angio CT and angio MR at our institution from January 2008 till June 2009.
Results
Moyamoya Syndrome is a compensatory development of a fine network of collaterals at the base of the brain as a result of a chronic and progressive stenosis of the intracranial internal carotid artery. Only when the obstruction is idiopathic is it called Moyamoya Disease.
Our study shows that the main diagnostic tools in either case are conventional angiograms, angio CT and angio MR, that show a stenotic involvement predominantly at the MCA and ACA, mostly bilateral and with a normal posterior territory. The "smoke puff" sign, which is secondary to a strong and characteristic collateral circulation through the perforating branches and looks very much like cigarette smoke, is common to both conditions.
Through our review we were able to show how, with a combined analysis of the clinical record and imaging techniques, it becomes possible to diagnose Moyamoya Syndrome even though its angiographic appearance is similar to that of Moyamoya Disease.
Discussion
Being aware of the characteristic "cigarette smoke puff" sign in the angiogram will enable radiologists to carry out a diagnostic approach vis-à-vis the Moyamoya spectrum; although for a precise diagnosis of the syndrome it is essential to go through the patient's record in detail.

C035 P003 INTRACRANIAL HYPOTENSION AND CSF FISTULAE. TREATMENT APPROACH

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Objectives
Presentation of a case of cerebrospinal fluid (CSF) spontaneous fistula related to intracranial hypotension. Assessment of diagnostic criteria in the treatment and follow-up decision-making process.
Materials and Methods
49-year-old male with headache not responding to a two-month period of conventional treatment. On the admission CT scan there is a suspicion of intracranial hypertension, which is confirmed through MRI as intracranial hypotension with herniation of cerebellar amygdala and diffuse dural thickening with sub-dural collection. An MR myelogram shows a CSF fistula with epidural collection and bilateral pleural effusion. A CT myelogram shows the fistula at T7-8. Under scopic control 5 cc of the patient's blood are injected in the epidural space with full remission of symptoms 12 hours later. Control studies show the persistence of the CSF fistula, though smaller, and intracranial hypotension disappears.
Results
Clinical improvement and a picture of intracranial hypotension with persistence of a CSF fistula, after epidural injection in an area nearby.
Discussion
Consider CSF fistulae as a potential cause of headaches even without an obvious traumatic cause. Suspect a CSF fistula in cases of intracranial hypotension. The usefulness of MR myelogram for diagnostic purposes and confirmation through contrast-enhanced CT myelogram. A treatment possibility is the injection of the patient's own blood close to the fistula. Clinical improvement can be achieved thanks to a decreased extravasation although the fistula may still persist.

C036 P022 THE USEFULNESS OF NEUROIMAGING TECHNIQUES IN THE DIAGNOSIS OF THE POSTERIOR REVERSIBLE ENCEPHALOPATHY SYNDROME (PRES)

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Objectives
To show the very complex pathophysiology, manifestations and usefulness of MR findings in the diagnosis of PRES.
Materials and Methods
Review of cases collected at our hospital and clinically confirmed, together with an up-to-date review of the literature on PRES.
Results
PRES is an acute or sub-acute condition with a wide and varied range of symptoms. Its most frequent manifestations are: headache, visual alterations, vomit, mental status changes, confusion and seizures.
Its aetiopathogenicity remains a controversial issue and the syndrome has classically been related to arterial hypertension levels that surpass self-regulatory limits, giving rise to hyperperfusion and vasogenetic oedema. Nonetheless, in many cases, the blood pressure levels found are normal or mildly elevated.
In patients with PRES-related risk factors (pre-eclampsia/eclampsia, transplantations, auto-immune diseases, chemotherapy agents, infections and sepsis…) and with a suggestive clinical picture, MR findings can be very helpful in making the diagnosis. It typically occurs in the form of focal, symmetrical, hemispheric areas of vasogenic oedema with an occipito-parietal distribution, although there may be other less typical forms of presentation.
Neuroradiology also provides other techniques such as angio MR and perfusion MR which may help elucidate the pathogenesis of the disease (hypoperfusion data shown in perfusion MR studies from some patients).
Discussion
MR and related techniques are a very effective method in the diagnosis of PRES and they help clarify some points of its pathophysiology.

C037 CO12 INTRAVASCULAR ULTRASOUND WITH VIRTUAL HISTOLOGY IN THE CAROTID ARTERY PLAQUE. PRELIMINARY RESULTS

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Objectives
Intravascular ultrasound with virtual histology (IVUS) is a technique that makes it possible to characterize the atherosclerotic plaque according to 4 main components (fibrous, fibro-lipidic, necrotic core, calcium). Our objective is to report on the procedure and present the preliminary results of the study of the carotid artery atheroma plaque.
Material and Methods
IVUS was performed on 25 patients with severe atherosclerotic stenosis (>70%), mean age 66.92 years (range: 49–81), 76% men and 80% symptomatic. The intravascular catheter has a diameter of 3.5 Fr (1.17 mm). Ultrasound was performed after placing a protective system against emboli and before carrying out PTCA. Plaques were classified following the CAPITAL Study (Carotid Artery Plaque Virtual Histology Evaluation Study).
Results
The procedure morbidity and mortality rates were the same as for TIAs. Calcium levels at the arteriogram were 64%, while they were 96% in IVUS.
The type of plaque that was found was 48% type 1 (pathological intimal thickening), 8% type 2 (fibrous atheroma), 12% type 3 (calcified fibrous atheroma), 4% type 4 (fibrous atheroma with a thin layer of contact with the lumen), 28% type 5 (calcified fibrous atheroma with a thin layer of contact with the lumen) and none of type 6 (fibrocalcidic).
Discussion
IVUS makes it possible to characterize the atherosclerotic plaque and identify vulnerable plaques (types 4 and 5). The most frequent types of plaque are 1 and 5. The sensitivity for measuring calcium levels is higher than that of angiography.

C038 CO13 INTRAVASCULAR TREATMENT OF SEVERE CAROTID ARTERY STENOSIS WITH CONTRALATERAL OCCLUSION: MORE THAN AN OPTION

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Objectives
Although endarterectomy is considered as the treatment of choice for carotid artery stenosis, it entails a high morbidity and mortality in patients with severe carotid artery stenosis and contralateral occlusion (13.6% according to the NASCET study).
The objective of our study is to present the results of intravascular treatment in this group of patients.

Materials and Methods
Between 1991 and March 2009, 969 patients with severe atherosclerotic stenosis (>70%) underwent stent angioplasty (SA) or angioplasty without a stent (non-SA). In this group of patients, 153 presented with severe carotid artery stenosis and contralateral occlusion (15.8%). The inclusion criteria for the treatment of asymptomatic patients were the following: disease progression (>85%), exhausted or steal vessel reactivity, detection of micro-emboli in the trans-cranial Doppler and/or asymptomatic lesions in the CT/MR sequences.
Results
Mean age 64.9 years (range: 40–86), 137 (89.5%) were men and 93 (60.8%) showed symptoms. SA was performed in 26 patients (17%) and non-SA in 127 (83%). Distal protection was used in 93 patients (60.8%). The transient haemodynamic effects during the procedure were: hypotension (47.1%), bradicardia (51.6%), asystolia (30.7%) and syncope (28.1%). The morbidity and mortality rate was 4%: one patient with TIA (0.7%), 2 with a minor stroke (1.3%) and 3 with a major stroke (2%).
Discussion
Stent angioplasty is a safe and effective treatment in patients with severe carotid artery stenosis and contralateral occlusion, but randomized trials are essential for these results to be confirmed.

C040 CO07 ASSESSMENT OF THE MORPHOLOGICAL AND CLINICAL RESULTS OF INTRA-ARTERIAL TREATMENT IN PATIENTS WITH ACUTE STROKE

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Objectives
Analysis of the morphological and clinical results achieved at our hospital in patients undergoing intra-arterial treatment, either alone or in combination with intra-venous fibrinolysis in patients with acute carotid or vertebro-basilar stroke.
Materials and Methods
We analyzed patients treated intra-arterially one year after the implementation of a specific protocol; and a 24/7 on-call interventional neuroradiology unit in our hospital.
Results
So far we have recruited 25 patients (approximately 3–4 per month). Our protocol includes, in the absence of any contra-indication, the start of intravenous fibrinolytic therapy as well as salvage intra-arterial treatment prior to an angiographic study and perfusion CT or MR confirming the presence of an occluded vessel and ischemic penumbra in those cases lasting for over 4.5 hours. We also included patients undergoing direct intra-arterial treatment because of contra-indications or because they had gone beyond the drug treatment window. RTPA intra-arterial treatment was used; and for mechanical retrieval purposes, the Retriever Merci System was used. Patients with a primary stent were also included.
Discussion
The initial results of arteriography show a vessel re-opening rate of >80% with a morbidity and a mortality rate <10%. The re-opening rate is even higher in the vertebro-basilar territory. Clinically, a comprehensive patient re-evaluation remains to be carried out after a six-month stroke course, but preliminary results show improved values in NIHSS in the early post-treatment stage and Rankin in the subsequent clinical evaluation.

C041 P023 STUDY OF THE "PRES SYNDROME" WITH IMAGING DIAGNOSTIC TECHNIQUES

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Objectives
Posterior reversible encephalopathy syndrome (PRES) is a clinical and radiological condition that presents either acutely or sub-acutely and which may be triggered by several causes, including an acute rise in blood-pressure levels. Radiologically it is characterized by the appearance of posteriorly distributed confluent areas of vasogenic oedema.
It is essential to identify PRES-related changes because they may be reversible. Thus, an early diagnosis will allow the patient to be treated and prevent the progression of the syndrome towards irreversible lesions such as infarction or encephalomalacia.
Materials and Methods
Review of cases with this syndrome that were diagnosed at our institution with CT and/or MR in the past two years.
Results
Several cases are presented that show the diverse aetiology of the process (hypertensive crisis, chemotherapy, eclampsia, etc.) as well as typical CT and MR imaging findings. Other less frequent forms of presentation and course are also shown, such as involvement of the anterior blood flow, haemorrhagic transformation and development of cytotoxic oedema.
Discussion
Given the fact that clinical findings of this condition are not specific enough to make a diagnosis, and that urgent treatment is required to prevent permanent neurological damage, we would like to underscore the significance of neuroimaging studies in the management of this pathology.

C042 P024 COMPARISON BETWEEN TRANSOESOPHAGEAL ECHOCARDIOGRAM AND ANGIO CT IN THE STUDY OF THE AORTIC ARCH IN PATIENTS WITH ACUTE STROKE

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Objectives
To assess the ability of angio CT to detect atheroma plaques ≥4 mm
Materials and Methods
Retrospective study of angio CT scans performed between January 2007 and April 2008 on patients with stroke who were also studied with TEE. Angio CT scans were examined by a radiologist who was blinded to the clinical data and TEE results. Plaques of ≥4 mm and their location were included (ascending aorta, aortic arch, descending aorta) in the study.
Results
Thirty patients underwent both examinations during the acute phase of the stroke and in 25 patients it was possible to assess the aortic arch in its entirety. Mean age 62 years (SD=14). In 52% of the patients the cause of the stroke could not be found.
Angio CT was able to detect ≥4 mm plaques in 18/25 patients (72%), versus 5/25 patients (20%) (Kappa index 0.2). When different aortic segments were examined by means of angio CT or TEE, ≥4 mm plaques were detected in the ascending aorta in 4% and 4%, aortic arch in 52% and 8%, and in the descending aorta in 36% y 12%, respectively.
Discussion
We did not find a good correlation in ≥4 mm-plaque detection between angio CT and TEE in our series. Angio CT is more sensitive in the detection of atheroma plaques but it might overestimate their size compared to TEE results.

C044 P025 ISOLATED CORTICAL VEIN THROMBOSIS: DIAGNOSTIC IMAGING FINDINGS

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Objectives
Isolated cortical vein thrombosis is difficult to diagnose both clinically and radiologically because it occurs less frequently than dural sinus thrombosis. We present three cases so as to illustrate the diagnostic imaging findings of this pathology that is frequently underdiagnosed.
Materials and Methods
Three patients were diagnosed with isolated cortical vein thrombosis at our hospital in recent years. They were all taken to the Emergency Room due to seizures; and subsequently hospitalized due to the suspicion of a tumour in two patients and a haematoma in the third one, on the basis of the findings of the CT that was carried out in the ER. The correct diagnosis as well as the proper treatment were delayed till an MR was performed or till the interpretation of the MR findings or the CT scan performed at the ER by neuroradiologists became available.
Results
We present the clinical manifestation and findings of the diagnostic imaging techniques (CT, MR and arteriogram) of the three cases. The three patients started with partial seizures with two of them evolving towards hemi-paresis and moderate hemi-hypoesthesia.
In the three cases, MR provided direct (thrombus visualization) or indirect (signs of infarction, with or without haemorrhagic transformation and hematoma) diagnostic signs. In the last case, a digital angiogram confirmed venous thrombosis.
Discussion
Isolated cortical vein thrombosis is a picture which is difficult to diagnose both clinically or with imaging techniques unless a careful interpretation of the latter is carried out.

C045 P026 ANATOMY OF THE NORMAL LACHRYMAL DUCT BY MEANS OF LOW-DOSE TOPICAL CT DACRIOCYSTOGRAPHY (LD CT TDCG)

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Objectives
To assess the anatomy and patency of the normal lachrymal drainage system by means of LD CT TDCG.
Materials and Methods
Between May 2007 and May 2008 40 LD CT TDCG scans of normal lachrymal ducts from patients undergoing orbital CT scans due to symptoms that were not related to the lachrymal drainage were collected as well as from patients with chronic epiphora in the contralateral eye.
The discomfort due to the conjunctival iodinated topical contrast agent was recorded according to the following four grades: none, mild, moderate and severe.
The visualization of the contrast agent in each segment of the lachrymal duct was given a score from 0 to 4: non visible (0), very difficult to see (1), visible but with poor

details (2), visible with moderate details (3) and visible, dense with excellent details.

Results

87.5% of the patients did not show any discomfort and the remaining 12.5% showed mild discomfort.

The superior canaliculus was visible in 92.5%, the inferior one in 95% and the common one in 97.5%. The fundus of the lachrymal sac was visible in 100%, and the body in 95%. The bony nasolachrymal duct was visible in 83.5% and the membranous duct in 87.5%.

Only in three ducts were we unable to see patency in the nasolachrymal duct.

Discussion

LD CT TDCG is able to assess very easily and with little discomfort to the patient the anatomy and patency of the normal lachrymal duct in close to 100% of the cases, which makes it an excellent diagnostic technique for the study of lachrymal pathology.

C047 P027 THE ROLE OF MAGNETIC RESONANCE IN EPILEPSY

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Objectives

To conduct a review and update of the diagnosis of epilepsy through Magnetic Resonance Imaging.

Materials and Methods

A literature review was carried out to assess the proper protocol to conduct studies on epilepsy by means of Magnetic Resonance Imaging as well as the many other parameters that bear an influence on the sensitivity and specificity of this diagnostic technique.

We share our experience with a recently acquired 3 Tesla magnetic resonance equipment and assess future trends for Magnetic Resonance.

Results

We cannot confine ourselves to standard cranial examinations for the diagnosis of patients with epilepsy, and the implementation of specific sequences becomes essential, as is performing such studies at a high or very high field. We present our experience and show how it is possible to implement an epilepsy protocol based on the literature recommendations and within a reasonable examination time (19 minutes).

Discussion

With Epilepsy Units becoming more common, and with the growing use of very high field magnetic resonance sequences (3 Tesla), the diagnosis of epilepsy has made significant steps forward.

C048 P028 GRAPHIC DESCRIPTION OF THE ANATOMICAL AND CLINICAL CORRELATION IN WALLENBERG'S SYNDROME

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Objectives

To describe graphically the site of the different nuclei and bulbar ducts affected by retro-bulbar trigonal lesions. To relate the lesion and the clinical symptoms.

Materials and Methods

Review of an MR representative study from a patient with Wallenberg's syndrome of ischemic aetiology.

Results

We illustrate the normal anatomy of structures in the area behind the olive which are involved in Wallenberg's syndrome. We present in a simple and summarized way the lesion in such structures with its signs and symptoms. Dysphonia, dysphagia and dysarthria are due to a compromised ambiguous nucleus (IX and X cranial pairs). The occurrence of hypoalgesia/ipsilateral facial pain as well as the lack of a corneal reflex is related to a lesion at the spinal nucleus (V pair). The involvement of the spinothalamic tract gives rise to hypoalgesia and thermo-anaesthesia of the trunk and the contralateral limbs. The compromise of the first order neurone of the occulo-sympathetic tract, as it crosses the bulb, gives rise to Horner's ipsilateral syndrome. Other less frequent clinical manifestations such as diplopia or facial paresis, ataxia or vertigo take place due to the spread of the lesion towards the protuberance, vestibular nuclei or inferior cerebellar stalk respectively.

Discussion

The anatomy of the dorsolateral region of the bulb is presented as well as the clinical relationship between the symptoms and the anatomical site of the lesion. The usefulness of magnetic resonance is shown for the proper topographic and aetiological assessment as well as the clinical correlation between imaging findings and the neurological examination.

C049 P029 GIANT PERIVASCULAR MIDBRAIN SPACES AS A CAUSE OF OBSTRUCTIVE HYDROCEPHALUS

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Hospital Universitario Doctor Peset. Valencia

Objectives

Description of a case of obstructive hydrocephalus secondary to a cavernous dilatation in Virchow-Robin

brain stem spaces. Review of the typical MR findings in this condition.

Materials and Methods

Description of a case of obstructive hydrocephalus secondary to a cavernous dilatation in Virchow-Robin brain stem spaces.

Results

Signal intensity similar to that of CSF in all MR sequences. No changes were found in the neighbouring parenchyma or abnormal contrast agent uptake. The woman patient underwent a ventriculoperitoneal shunt with improvement of her clinical symptoms and her ventricular system dilatation. Clinical and radiological examinations were stable.

Discussion

Giant perivascular spaces are an extremely rare condition worth bearing in mind in the differential diagnosis of brain cystic changes. Imaging diagnostic findings, their characteristic location, the absence of neurological dysfunction and their stability over time are key to its diagnosis, thereby avoiding unnecessary surgical procedures and further imaging examinations.

C050 P030 EXAMINATION OF THE PAROTID GLAND THROUGH ULTRASOUND: ADVANTAGES AND SHORTCOMINGS OF THE TECHNIQUE

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Objectives

1. To show that ultrasound is the technique of choice for the initial study of the parotid gland.
2. In acute pathology to determine obstructive or non-obstructive aetiology; in chronic pathology to suggest specific conditions, and in palpable lesions to localize and state their benign or malignant characteristics.
3. To study its shortcomings.

Materials and Methods

Systematic review and analysis of different ultrasound findings within the clinical setting of acute inflammatory conditions, chronic inflammatory or degenerative conditions or focal lesions, obtained from the Radiology Department, at the Reina Sofia University Hospital in Cordoba, Spain.

Results

When reviewing the ultrasound findings from parotid gland studies at our institution, we realized the usefulness of ultrasound for discerning between cystic and solid lesions, finding the cause of obstruction in acute pathology and localizing focal lesions. Nonetheless, more nonspecific results were found in degenerative or chronic inflammatory conditions or in determining the benign or malignant features of palpable focal lesions. This is due to the fact that there are malignant lesions that show benign ultrasound features and in cases like lymphoma or lymphoepithelial lesions there may be several forms of presentation. In such cases, and in order to reach a definitive diagnosis, fine-needle or thick-needle aspiration biopsy can be performed in the involved area. And this is precisely another advantage of this technique.

Discussion

In the initial study of parotid gland pathology, ultrasound is an excellent diagnostic technique. When the lesion characterization is not possible with this method, it is a reliable guide as to the most relevant area on which to carry out a biopsy.

C051 P031 IMAGING PROTOCOL IN ACUTE STROKE

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Objectives

To describe the imaging protocol used in the assessment of patients with acute stroke.

To assess CT and MR findings.

To analyze the different kinds of thrombolytic treatments performed and their results.

Materials and Methods

From October 2008 till March 2009 we treated 109 patients with a clinical suspicion of acute cerebral infarction. Patients were cared for within the time limits of the protocol, four and a half hours from the beginning of symptoms. CT or MR studies were carried out including perfusion and angiogram in all patients. Fifty patients were treated with intravenous thrombolysis, 10 with intravenous and salvage intra-arterial treatment, three cases with intra-arterial treatment and in 4 cases mechanical thrombolysis was performed. Forty-two cases received no treatment at all.

Results

48% of the cases improved clinically after treatment with an improvement of more than 4 points in the NIH scale, in 52% of the cases the recovery was incomplete with an improvement of less than 4 points and the mortality rate was 11%.

Discussion

It is important to have diagnostic imaging methods available to be able to properly select those patients who may benefit from thrombolytic therapy and rule out other conditions that may be causing symptoms. Imaging studies will enable us to rule out a haemorrhage that would be a contraindication for treatment, and the perfusion study will show whether there is still viable tissue, while angio-CT will assess arterial obstructions.

In order to reach early diagnosis and treatment of these patients, it is essential to have a multidisciplinary team available that cooperates in the treatment decision-making process.

C055 P032 CRIME SCENE INVESTIGATION PORTIMÃO PRESENTS: CASES OF BULLETS SEEN IN MULTISLICE COMPUTERIZED TOMOGRAPHY

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Objectives
To review the data provided by brain and spine MSCT in cases of bullet wounds.
Materials and Methods
Using the clinical cases of bullets through the skull and spine, we will describe the related lesional mechanisms and the resulting lesions that can be detected by MSCT in the initial assessment of these patients.
Results
A bullet is a force vector and its purpose is to transfer its energy to the body. The injury that ensues is closely related to its kinetic energy. This also depends on what the bullet finds on its way. Soft tissues absorb fewer shock waves than bone which can fracture and cause new lesions.
If the bullet goes right through the body leaving an exit wound, it causes less damage than a bullet that stays in the body. As a general rule, the exit wound has a larger diameter than the entry one. MSCT is still the best radiological method as a first approach to a patient who received a gunshot. It will show the location of the bullet or its fragments, its trajectory—this being essential for proper neuro-surgical planning—as well as any related lesions.
The dorsal spine is the most frequently involved area of the spine in case of bullet wounds. Injuries in the cervical spine may involve the airways.
The potential role of MR remains to be defined because of the potential migration of fragments and the possibility of causing more damage.
Discussion
MSCT is the examination of choice in the initial approach of a patient with bullet wounds.

C056 P033 PLEOMORPHIC XANTHOASTROCYTOMA

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Objectives
To present findings from neuro-imaging techniques in the diagnosis, the medical and surgical treatment, as well as the evolutionary control of a case of pleomorphic xanthoastrocytoma in a 9-year-old girl.
Materials and Methods
We retrospectively assessed CT and MRI imaging findings, with both conventional techniques and pre-surgical functional, perfusion and spectrum studies conducted over 5 years on a xanthoastrocytoma.
Results
We present the case of a 5-year-old girl with occipital focal epilepsy who received a diagnosis of occipital cordial dysplasia made through high field MR. After a poor clinical course during the four subsequent years, with a poor control of her seizures and many changes of treatment, an occipital tumour was detected that, after an anatomo-pathological study, was diagnosed as pleomorphic xanthoastrocytoma. Two surgical resections were carried out in less than a year because of persisting tumour remnants. During the last MR checkups tumour remnants with high perfusion were found that led to the suspicion of malignancy. A new surgical procedure was then planned after conducting motor functional studies. Full resection was achieved and the patient's clinical course was good. We will discuss the theories around neoplastic transformation in cortical dysplasia and the malignant turn towards pleomorphic xanthoastrocytoma.
Discussion
This condition should be suspected in patients with focal seizures. Advanced sequence MR is essential for the diagnosis, pre-surgical evaluation and evolutionary control of the process, given the high recurrence rate and the non negligible rate of malignant transformation.

C058 P034 DIFFERENTIAL DIAGNOSIS OF INFILTRATIVE LESIONS OF THE ORBIT

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Objectives
To analyze the imaging findings and the semiological clues that make it possible to reach a differential diagnosis in infiltrative conditions of the orbit.
Materials and Methods
Cases of orbital diffuse infiltrative pathology were reviewed from our files, excluding those lesions with a well-defined origin at the optic nerve, the ocular extrinsic muscles, the lachrymal gland and the eyeball.
Results
Infiltrative lesions of the orbit are difficult to diagnose both for the clinician and the radiologist and they include many

different conditions. In many instances they are the first manifestation of an underlying systemic process that requires other analytical tests or additional imaging techniques. We present the findings of the most representative cases in each individual aetiological group as follows: 1) inflammatory (such as sarcoidosis or orbital pseudotumour), 2) infectious (orbital mycosis, bacterial cellulites), 3) auto-immune vasculitis (such as Wegener's, Good-Pasture's syndrome), 4) infiltrative, and 5) malignant tumours (lymphoma, metastasis). The combination of post-Gadolinium and fat suppression sequences was essential for precise topographic diagnosis and staging.

Discussion

It is essential to be aware of the behaviour patterns of different pathological processes that can infiltrate orbital structures in order to guide one's thinking towards the final diagnosis. Joint evaluation with the clinical record will enable us to get close to the diagnosis but in most cases it will be essential to conduct an anatomo-pathological study.

C059 P035 CLINICAL AND RADIOLOGICAL FINDINGS IN ACUTE CEREBELLITIS

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Objectives

To show the clinical and neuro-radiological findings of acute cerebellitis.

Materials and Methods

The clinical and radiological findings of three cases diagnosed with acute cerebellitis and studied by MR in our hospital in the past two years were assessed.

Results

We present three cases of acute cerebellitis, a rare condition that usually affects children of school age and which presents clinically as an acute ataxia, headache and fever, often weeks after a viral infection. In images they usually show as expansive lesions with a related lepto-meningeal enhancement that may involve one or both hemispheres. Late cerebellar atrophy has been reported in some patients though it does not give rise to motor sequelae and the prognosis is favourable in most cases.

It is worthwhile pointing out that in some instances image findings pose a differential diagnosis with other tumour processes such as Lhermitte-Duclos disease, and even ischemic lesions in the vertebro-basilar region, in which case it is essential to have the clinical record in order to differentiate.

We analyzed the diagnostic imaging tests and subsequent evolutionary checkups. In addition, we carried out a literature review of reported cases.

Discussion

Cerebellitis is a rare condition that should be included in the differential diagnosis of ataxia in childhood.

MR is the gold standard since it is the best imaging method to assess the posterior fossa, making it possible to reach a diagnosis in most cases.

C060 CO01 QUALITY CONTROL OF RADIOLOGICAL REPORTS IN AN EMERGENCY ROOM TELE-RADIOLOGY DEPARTMENT

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Objectives

At the Tele-radiology Department in the Emergency Room of CRC Corporació Sanitaria, a team of 30 radiologists report via tele-radiology on urgent CT scans from 14 hospitals. In May 2009 a control system was set up to evaluate the quality of the reports, detect potential errors and prevent them from occurring.

We present our quality control protocol and the initial results on cranial CT scans in May and June 2009.

Materials and Methods

The morning after a night on duty a team of radiologists reviews a previously set number of cases (approximately 30% of the emergencies). At the beginning, the cases to be reviewed are chosen randomly but subsequently, additional criteria are used on the basis of errors detected in previous reviews.

Reviews receive a value, from 0 to 3, depending on the level of agreement between the reviewer and the radiologist on duty. If the disagreement could have clinical repercussions, an addendum is prepared and sent to the relevant hospital.

Results

In May and June 2009, 1006 reports were issued on cranial CT scans at our institution (STU). Of those, 292 reports were reviewed with the following results: 231 G0 (79.1%), 41 G1 (14.1%), 20 G2 (6.8%) and 0 G3 (0%). In 7 cases an addendum was issued.

Discussion

Information obtained through quality control helps improve the quality of reports gradually and, in addition, it allows any errors made during the previous period of duty to be corrected. Most addenda issued were not related to findings requiring immediate action.

C062 P036 PITFALLS IN ODONTOID FRACTURES: THE USEFULNESS OF MULTISLICE CT

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Objectives
To describe those multi-slice CT signs that may help discern an odontoid fracture from the main false positive results reported in the literature.
Materials and Methods
We present a series that was retrospectively collected of two cases of odontoid fracture (types I and III) and 13 cases of pitfalls for the same situation. We provide multi-planar and volumetric reconstructions for a better characterization. Thirteen cases were scanned with a 16-slice CT and two cases with a 4–slice spiral CT. The main reasons for the study were: cervical trauma (4), pain (2), cancer revision (2), rheumatoid arthritis (2) and the study of tumour lesions (2). The age range was 5 to 80 years and the gender distribution 8:7.
Results
Considering our findings, we believe that the differential diagnosis of an odontoid fracture should include: the odontoid bone, the ossiculum terminale, the physiological synchondrosis, calcifications of the alar and transverse ligaments, as well as rheumatoid arthritis. Knowing these variants and the anatomical ligament situations, as well as the tomographic signs related to the lesion outline and soft tissue oedema related to the fracture made it possible to reach the diagnosis of pitfalls.
Discussion
In a confusing clinical setting, the anatomical knowledge of the cranio-vertebral junction and the radiological signs provided by multi-slice CT in the assessment of an odontoid fracture help towards making the proper diagnosis. That is the reason why we think that multi-slice CT is the technique of choice for this assessment in an ER setting.

C063 CO17 INTRA-ARTERIAL REVASCULARIZATION IN ACUTE STROKE

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Objectives
To assess the efficacy and safety of intravascular treatment in acute stroke.
Materials and Methods
We reviewed all patients with acute stroke who were treated at our institution by means of intra-arterial revascularization techniques from December 2006 till June 2009. All patients included showed an evolution time of 3–6 h and NIHSS >10 points in acute stroke in the anterior region and up to 30 h in the posterior region.
Results
We performed 31 arteriograms on 31 patients (87% men and 13% women) with a mean age of 56.58 years (14–78 years). In 58% of the cases the occlusion was found in the posterior region and in 42% in the anterior region. The ICA was occluded at its origin in two cases. Six patients were not treated due to the following reasons: non-occlusion of the vessel to be treated (2), isolated territory (2), tandem occlusion (1) and Leriche's syndrome (1). Re-vascularisation was achieved (T1C1 2–3) in 24 out of 25 patients (96%) by means of several intravascular techniques including UK thrombolysis, suction systems, angioplasty and stent. Two complications arose during the procedure (SAH) and four haemorrhagic transformations (16%) during the first 24 h (1 SAH, 2 hematomas and 1 petechial haemorrhage). At 30 days the functional result was good (mRS$\leq$2) in 10 patients (40%) with a 23% mortality rate in patients with stroke in the anterior region and 68.75 % in those with stroke in the posterior region.
Discussion
The proper patient selection makes it possible to achieve arterial re-vascularisation combining several intravascular techniques in most patients with acute stroke. The use of UK gives rise to very few haemorrhagic complications.

C064 CO18 INTRAVASCULAR TREATMENT OF CAROTID ARTERY DISSECTION

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Objectives
Although carotid artery dissection is a rare cause of stroke, it is relatively frequent in young people. Despite the fact that the accepted treatment consists of 3–6 month anti-coagulation, series have been reported where the clinical evolution was poor in 1 out of every 4 patients since in some cases there is an overt haemodynamic compromise, which is related to occlusions or significant stenosis of main arteries either intra- or extra-cranial. In such cases, intravascular treatment could be indicated and this is precisely what we present in a series of 6 patients with carotid artery dissection and stroke who did not respond to medical treatment.
Materials and Methods
Retrospective analysis of a consecutive series of six patients with carotid artery dissection and stroke. Three patients

presented with the sub-acute form, with repeated TIAs. The other three patients with acute stroke, in two cases with isolated proximal occlusion and in one case with a tandem lesion at the ipsilateral MCA.

Results

In all cases the lesion was repaired with stents achieving long term patency in all of them (mean follow-up 22 months). In one case fibrinolytic treatment was added in the MCA. After treatment all patients became clinically stable. The 90-day clinical result was good (mRS<2) in all of them. In one acutely treated case there was an asymptomatic cerebral haemorrhage.

Discussion

The intravascular treatment of carotid artery dissection in patients with a haemodynamic compromise shows promising results in terms of safety and efficacy. In this group of patients re-vascularisation is related to clinical stabilization.

C065 CO08 MR SELECTIVE CORTICAL THICKNESS DECREASE IN PATIENTS WITH COGNITIVE IMPAIRMENT AND PARKINSON'S DISEASE

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Objectives

83% of the patients with PD develop dementia after some years of evolution. MR allows the quantification of PD selective decrease in cortical thickness, an issue that as not been widely studied.

Objectives: To quantify cortical thickness in 3 T MR images and study differences among patients with PD without dementia (NDPD), those with mild cognitive impairment (PDMCI), and those with dementia (PDD).

Materials and Methods

44 patients with PD, 25 men and 19 women, age(mean age = 74 years), education- and gender-matched, were allocated to three different groups (15 PDND,15 PDMCI and14 PDD) on the basis of their degree of cognitive impairment (Clinical Dementia Rating scale, CDR and DSM-IV-TR clinical criteria for dementia). A 3 T MR (3D-FFE) was performed as well as cortical division into parts and quantification of the cortical thickness with Freesurfer in GRID. Differences between groups were recorded (Student's T test).

Results

A decrease in cortical thickness was found at the entorhinal/parahippocampal cortex of both hemispheres in patients with PDD versus NDPD and PDMCI. In addition, a decreased cortical thickness was found at the posterior cingulate gyrus of the left cerebral hemisphere and in temporal, parietal and frontal areas of the right hemisphere (table 1). Comparisons survive correction for multiple comparisons (False Discovery Rate, $p<0.001$), and covariance with age and PD course in years.

	PDD vs nonDPD	PDD vs PDMCI
Left hemisphere		
Entorhinal/ Parahippocampal	0.0005	0.002
Posterior cingulate gyrus	0.003	0.01
Mid frontal	0.001	
Superior parietal		0.0008
Inferior parietal		0.0004
Right hemisphere		
Parahippocampal	0.001	0.0006
Mid temporal/inferior	0.0002	0.00001
Posterior cingulate gyrus	0.008	
Pre-cuneate	0.005	
Pre-central/post-central	0.0006	

Discussion

A selective cortical thickness decrease is found in patients with cognitive impairment and PD. These findings are in agreement with the evidence of cortical cognitive and memory dysfunction in such patients.

C066 P037 MOYAMOYA DISEASE: REVIEW OF RADIOLOGICAL FINDINGS WITH ARTERIOGRAPHY, ANGIO CT AND MR

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Objectives

To review the radiological findings of Moyamoya disease, a condition that predisposes to stroke, and their relationship with the progressive stenosis of intra-cranial carotid arteries and their proximal branching.

Materials and Methods

We reviewed five patients diagnosed with Moyamoya disease who were studied in our institution from 2005–2009; three men and two women, with ages ranging between 24 and 57 years.

Results

Four patients presented with cerebral ischemia symptoms (TIAs, seizures) or cerebral ischemia compensatory mechanisms, such as dilatation of collaterals (headache). The fifth patient presented with sudden headache secondary to an intra-parenchymal haemorrhage and ASN.

Three patients underwent CT and two MR.
Three patients underwent arteriograms, which showed a gradual thinning of both internal carotid arteries, with or without occlusion, as well as involvement of the proximal segments of the mid and anterior cerebral arteries, together with new vessel formation and the development of small anastomotic vessels, all of which are pathognomonic findings of Moyamoya disease, and their severity was established following Suzuki's classification. One patient was treated with an external-internal by-pass with a subsequent control arteriogram.
Discussion
Moyamoya disease is a progressive idiopathic vessel disease which is rare in our environment but nonetheless it should be taken into account in the differential diagnosis of stroke in children and adults. Radiological findings make it possible to reach the diagnosis and decide on the treatment approach.

C068 P038 SPINAL VESSEL MALFORMATIONS

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Objectives
The detection, characterization and classification of spinal vessel malformations.
Spinal vessel malformations are rare conditions and they remain underdiagnosed. Their clinical course is marked by a progressive and ascending, motor and sensitive neurological deficiency, which is frequently related to urine incontinence.
If untreated (embolization and/or surgery) they may give rise to severe and sometimes irreversible spinal injuries secondary to venous congestion, steal phenomena, compression, ischemia or haemorrhage.
Materials and Methods
We describe the cases that have been diagnosed at our hospital since 2000. Most patients underwent MR studies with conventional sequences and angio MR as well as arteriography. Detected malformations were classified on the basis of their site (dural, intra-dural, peri-spinal or intra-spinal). MR controls were carried out after embolization or surgery.
Results
The clinical manifestations and imaging findings (MT and arteriograms) are presented. In most cases the clinical onset was insidious, torpid, and could be confused with other types of myelopathy or with degenerative pathology of the disc or OA (canal stenosis, etc.)
We report direct MR findings (visualization of abnormal vessel structures) as well as indirect ones (secondary myelopathy), and their confirmation through arteriography. A comparison is also presented of diagnostic MR findings versus those of control MR performed once treatment was completed.
Discussion
Spinal vessel malformations are rare conditions with a difficult clinical diagnosis, especially those that present with symptoms secondary to venous hypertension, due to their torpid course. Their early detection can prevent an irreversible spinal injury.

C069 P039 CRANIOFACIAL TRAUMATIC PATHOLOGY: RADIOLOGICAL MANAGEMENT IN THE ER

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Objectives
To carry out a review of the most prevalent craniofacial traumatic pathology, emphasizing its radiological signs and the role computerized tomography (CT) can play in its assessment.
Materials and Methods
Our review is based on 976 studies of cranial CT, facial CT and angio CT, performed in cases of suspicion of arterial dissection, that were carried out in our institution during the period from June 2008 up to June 2009 in trauma patients in the acute phase.
Results
In 43.9% of the cases the CT study revealed trauma injuries. The most prevalent were, from most to least: brain parenchymal haemorrhagic bruising and other intracranial haemorrhages including subdural hematoma, epidural less frequently, and post-traumatic subarachnoid haemorrhage. Bone fractures were also detected as well as other trauma injuries like arterial dissection in fewer cases.
Discussion
CT is the method of choice in the early management of a patient with craniofacial trauma. It makes it possible to diagnose unsuspected trauma injuries early and is relevant for the subsequent management of the patient.

C070 INTERNAL AUDIT PROCEDURES IN THE QUALITY CONTROL OF NEURO-RADIOLOGICAL REPORTS

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Objectives
Quality control systems are essential in a Radiological Diagnosis Department. Among them, Internal Audits (IA) that have become integrated in our department together with the other protocols (report-writing guidelines, double

reading, prior evaluation of the radiologists' level of knowledge, issuing addenda, protocolized dialogue with clinicians).

The objective is, therefore, to present our IA protocol, which aims at assessing the quality of reports and at undertaking eventual corrective action in order to improve it.

Materials and Methods

IAs are carried out every two weeks. The cases, that are randomly chosen, are distributed according to sub-specialty, modality and hospital of origin.

The head of the Department supervises and distributes requests, reports and images to a group of knowledgeable sub-specialists.

For each report a review is done on: a) diagnostic repercussions, b) clinical repercussions, and c) use of language and text style.

Each individual parameter receives a score depending on whether it is: 4: perfect; 3: reasonable; 2; could be improved; 1: incorrect; 0: wrong.

Radiologists receive information about the results and, if necessary, they will issue the relevant addenda. Clinicians will be contacted and delivered the right kind of information.

As an illustration we present de IAs conducted at the Neuroradiology Department during the first semester of 2009.

Results

2% of 23,150 reports were audited. The mean percentual values for the three parameters were: 82.72% perfect; 14.18% reasonable; 2.30% could be improved; 0.36% incorrect, and 0.43% wrong.

Discussion

As are an objective method to assess the quality of radiological reports and they are probably an additional tool to improve quality control in a Radiology Department.

C071 P040 DISEASES THAT AFFECT THE BRAIN WHITE MATTER IN CHILDREN

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Objectives

- To emphasize the role of radiology in the diagnosis of leukodystrophy in children.
- To underline the fact that radiologists should work on the basis of their knowledge of the patient's clinical record, in addition to the images, placing a special focus on the metabolic analysis and certain clinical findings.

Materials and Methods

We conducted a retrospective study of the radiological findings from patients with a diagnosis of neurogenic or neurometabolic diseases involving the brain white matter by means of CT and MR at the Department of Child Radiology at Hospital Universitario Reina Sofía. We assessed the early radiological signs, the evolutionary controls as well as the disease final status.

Results

In our hospital a wide variety of diseases affecting the white matter were diagnosed, such as: Leigh's Disease, Canavan's Disease, Van der Knapp's Disease, Menkes' Disease, vanishing white matter disease, glutaric aciduria, MELAS, peroxysomal disorder, non-ketone hyperglycemia, methylmalonic acidemia, mucopolysaccharidosis, as well as undetermined Leukodystrophy.

Discussion

MR is a useful tool for the diagnosis and classification of different leukodystrophies. Although findings are frequently non-specific, the systematic study of minor details will make it possible to narrow the differential diagnosis and will help clinicians to reach the right diagnosis together with the patient's clinical record, physical examination and metabolic analysis. MR is also useful to find out the course of the disease and monitor the response to treatment.

C072 P041 NEURORADIOLOGICAL DIAGNOSIS OF TYPE 1 NEUROFIBROMATOSIS IN CHILDHOOD

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Objectives

To review findings at the CNS in children with a diagnosis of Type 1 Neurofibromatosis (NF1).

To assess the usefulness of magnetic resonance (MR) as an imaging technique in the early diagnosis and follow-up of NF1.

Materials and Methods

We analyzed those NF1 cases that were followed in the Department of Paediatric Radiology at Hospital Universitario Reina Sofía de Córdoba, during the past 10 years. Thirty children required a CNS diagnostic imaging technique (MR and CT) in order to assess their status. Sixteen were boys and fourteen girls with ages ranging from 4 to 17 years.

Results

The most frequent manifestations of CNS involvement in children with NF include hyper-intense lesions in T2/STIR-weighted sequences (myelin vacuolization) in the dentate nucleus, the cerebellum, the globus pallidus, the thalamus

and the hippocampus, that are present in over half the patients in our series. The second finding in order of frequency was a glyoma of the optic canal (n=6). We also found other radiological manifestations which are less frequent and well known. Some of them are part of the diagnostic criteria for NF1 (dural ectasis of the optic nerve, plexiform neurofibroma), as well as other unrelated findings (choroid fissure cyst, hydrocephalus, cavum sel septum pellucidum, mega-cisterna magna).

Discussion

Magnetic Resonance is the most sensitive diagnostic imaging technique for the diagnosis and follow-up of children with Type 1 neurofibromatosis.

C073 P004 TRANS-VENOUS APPROACH: A TREATMENT OPTION FOR AV FISTULAE WITH PERI-SPINAL DRAINAGE (COGNARD TYPE V)

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Objectives

1. To describe the technicalities of the trans-venous approach in the treatment of Cognard V intracranial dural AV fistula.
2. To describe the pathophysiology of intracranial dural AV fistulae.
3. To describe the intravascular treatment options and present the trans-venous approach as a potential option for dural fistulae with peri-spinal drainage (Cognard V) where the trans-arterial approach was not successful.

Materials and Methods

With regard to a case of Cognard V intracranial DAVG, we reviewed the pathophysiology, clinical findings, angiographic findings and the conventional treatment options.
And concerning the same case, we would like to emphasize the trans-venous approach with an intention to treat because this is a rarely reported issue in the literature.

Discussion

The trans-venous approach in Cognard V intracranial DAVGs is a good management option to achieve the proper treatment.

C074 P042 TRAUMATIC ENTRAPMENT OF THE BASILAR ARTERY DUE TO A LONGITUDINAL FRACTURE OF THE CLIVUS

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Objectives

Clivus fractures are extremely rare. Longitudinal ones show a high mortality rate (67–80%) due to the occlusion of the basilar artery and/or direct trauma to the brain stem. So far, only 12 cases have been reported (7 at autopsy).

Materials and Methods

The clinical history was reviewed, as well as the diagnostic imaging results (CT, angio CT, MR and angio MR) and the clinical course of two patients, 37 and 66 years old respectively, who were taken to the ER due to head injury with impact in the frontal area.

Results

The first patient was admitted with left hemiparesis and bilateral internuclear ophtalmoplegia Glasgow 15, while the second one was admitted in coma and required intubation. Both cases showed multiple craniofacial fractures, among which a clivus longitudinal one was found together with entrapment of the basilar artery, brain stem infarctions as well as several haemorrhagic lesions.
In the first patient, the infarction involved the right half of the protuberance and after medical treatment with anticoagulants he was discharged with residual left-side hemiparesis.
In the second patient, the infarction involved both sides of the protuberance as well as the right side of the midbrain. He clinically evolved towards a captivity syndrome and subsequent death.

Discussion

In cases of cranial trauma with skull base fractures, one should suspect the possibility of a vascular lesion.
The diagnosis of basilar entrapment due to a longitudinal fracture of the clivus is difficult to reach and its prognosis is usually very poor. We suggest that in patients with this type of fracture and neurological deficiency, an angio CT or angio MR be performed in order to be able to rule out the entrapment of the basilar artery.

C075 P005 VERTEBROPLASTY VIA A TRANSORAL APPROACH IN VERTEBRAL FRACTURES DUE TO METASTASIS AT THE SUPERIOR CERVICAL SPINE

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Objectives

1. To review the indications, technical issues and complications of the use of the transoral approach in vertebroplasty.
2. To share our experience concerning two patients with metastatic fractures in C2.

Materials and Methods

1. The anatomy of the superior cervical spine and vascular distribution at the oropharynx.
2. Indications for transoral vertebroplasty.
3. Description of technical points including the materials, anaesthesia, patient's position so as to achieve a safe approach.
4. Description of the technique of approach and cement administration.
5. Description of two cases of vertebroplasty with the transoral approach.
6. Potential complications.

Discussion

The transoral approach is an effective and safe way of performing vertebroplasty in the superior cervical spine.

C076 P006 INTRAVASCULAR TREATMENT OF CAROTID-CAVERNOUS FISTULAE

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Objectives

1. To describe the clinical features, natural history, radiological findings and treatment strategies for carotid-cavernous fistulae.
2. To review treatment techniques using transvenous and transarterial approaches.
3. To explain the different materials that can be used in the treatment of carotid-cavernous fistulae.

Materials and Methods

1. Description of the normal anatomy of the cavernous sinus.
2. Anatomical considerations in the classification and treatment of carotid-cavernous fistulae.
3. Present strategies in the intravascular treatment of carotid-cavernous fistulae.

Discussion

The goal of this poster is to present the intravascular treatment options in carotid-cavernous fistulae on the basis of anatomical features, clinical symptoms and radiological findings.

C077 P043 MR QUANTIFICATION OF BIOMARKERS OF BRAIN COMPLIANCE IN HEALTHY INDIVIDUALS

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Objectives

The fact that the skull is hard implies the intracranial volume must be constant. Pressure changes related to volume variations are an indirect sign of the degree of brain compliance. The objective of this study is to analyze the intracranial and spinal fluid dynamics (CSF and blood) in order to find biomarkers that describe intracranial compliance quantitatively.

Materials and Methods

Fifteen healthy individuals (27±4 years) were studied with the same 3 T MR equipment and within the same time range. For each individual study four phase-contrast examinations were performed: two sequences to estimate the CSF (midbrain aqueduct and C2C3 perispinal space) and two sequences to estimate the blood flow (internal carotid and vertebral arteries, superior sagittal sinus and rectus sinus). Arterio-cerebral and arterio-spinal compliance rates were estimated during a cardiac cycle.

Results

Compliance rates were obtained for the brain (35±10) and spinal (1.10±0.45) compartments in a normal population. The inflow of arterial blood, the venous blood flow (at 22% and 38% of the cardiac cycle at the rectus sinus and the superior sagittal sinus respectively) and that of CSF (at 12% and 25% of the cardiac cycle at the C2C3 perispinal space and the midbrain aqueduct respectively) describe pulsatility under normal circumstances.

Discussion

Thanks to flow-velocity maps obtained via MR, it becomes possible to quantitatively describe the dynamics of the brain and infer the compliant behaviour of both the brain and the spine. These rates may be helpful in assessing more precisely some diseases of the CNS.

C078 P044 SPINAL EPIDURAL LESIONS WITH SIMILAR BEHAVIOUR IN MAGNETIC RESONANCE. DIFFERENTIAL DIAGNOSIS

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Objectives

To include in the differential diagnosis of epidural spinal lesions those lesions which are difficult to discern in MR from the most frequent ones and which can provide interesting data for treatment purposes.

Materials and Methods

On the basis of several cases, the differential diagnosis of spinal epidural lesions that show similar behaviour in MR (hypointensity in T1-weighted images, hyperintensity in T2-weighted images and contrast uptake) is proposed. Among the most frequent lesions meeting the above

requirements we find tumours of the nerve sheath and meningiomas. But one should not exclude other lesions such as those of vascular origin (haemangioma and AV malformations) as well as neoplastic lesions.

Results

When making the differential diagnosis of spinal lesions with MR, it is important to bear in mind their location vis-à-vis the spinal cord and the dura, as well as their behaviour in different MR sequences. Nonetheless, in some of them it is difficult to tell the difference with imaging techniques and the final diagnosis can only be reached through pathological anatomy.

Discussion

There are spinal lesions like haemangioma which, though less frequent, cannot be easily distinguished from other lesions such as meningioma or schwanoma with MR.

They should be included in the differential diagnosis of the above-mentioned lesions since they may provide very important data about a potential surgical procedure; for instance, a higher risk of bleeding when it is a lesion originating at the vessels.

C080 P045 BRAIN PERFUSION STUDIES WITH MAGNETIC RESONANCE IN GLIOMA

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Objectives

Brain perfusion studies with magnetic resonance in glioma: correlation between cerebral blood flow and histological grade.

Materials and Methods

A prospective study where we collected data on all patients with cerebral glioma that had been diagnosed in our institution and had undergone an MR brain perfusion study between March 2007 and June 2009. The data included epidemiological variables and conventional MR sequence findings, as well as cerebral blood flow volume (CBFV) maps determined on the basis of the first pass of the bolus of contrast agent. We subsequently estimated the relative cerebral blood flow volume (rCBFV) between the tumour and normal white matter (maximum CBFV of tumour / CBFV of contralateral white matter), comparing this value in high grade and low grade glioma.

Results

Twenty-seven patients were studied with a mean age of 50 years. Fifteen were men and twelve women. Fifteen cases were diagnosed as high grade. The mean CBFV was 1.23±0.95 for low grade glioma and 3.89±1.44 for high grade ones ($p<0.01$; Mann-Whitney's U test).

The CBFV cut-off value that made it possible to discriminate between high grade (MBG and anaplastic astrocytoma) and low grade was 1.44, with 100% sensitivity and 75% specificity.

Discussion

The quantification of the rCBFV is a useful and reliable technique to estimate the histological grade of glial tumours.

C081 CO06 INTRAVASCULAR TREATMENT OF INTRACRANIAL ANEURYSMS WITH ARTERIES ORIGINATING FROM THE ANEURYSMAL SAC

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Objectives

The presence of an artery originating at the aneurysmal sac has usually led to considering surgical treatment as the option of choice. Another possibility is the intravascular treatment with the use of 3D coils, a remodelling technique or a stent-assisted technique. The goal of this study is to find out the efficacy of intravascular treatment in this kind of aneurysm.

Materials and Methods

Intravascular treatment was performed on 32 intracranial aneurysms in 31 patients. The treatment of 22 aneurysms was associated to SAH. Six aneurysms were treated without an assisted technique. In 3 aneurysms the stent-assisted technique was used and in 21 aneurysms a balloon catheter was used (double balloon in 2 aneurysms).

Results

Unruptured aneurysms could not be treated because it was impossible to place the balloon catheter at the intra-aneurysmal origin of the artery.

The occlusion grades were: 4 aneurysms with partial occlusion, 9 aneurysms with subtotal occlusion and 19 aneurysms with complete occlusion.

Thirteen aneurysms had an angiographic control one year later; in 11 aneurysms the grade of occlusion remains stable and in 2 aneurysms the grade of occlusion went from subtotal to partial.

Rupture of 1 aneurysm due perforation by 1 coil, and 2 thrombotic complications at the neck of the aneurysm that were treated with reopro, without clinical repercussions nor ischemic lesions in the magnetic resonance study that was performed post-embolization.

There was no re-bleeding.

Three patients died as a result of the complications related to subarachnoid haemorrhage.

Discussion

Intracranial aneurysms with arteries originating at the aneurysmal sac can be treated with an intravascular approach.

C083 CO11 REVIEW OF FLUOROSCOPY AND CT-GUIDED TECHNIQUES FOR THE PERCUTANEOUS TREATMENT OF CHRONIC PAIN

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Objectives
To carry out a systematic review of different percutaneous techniques requiring radiological guidance and which are performed at our institution for the treatment of chronic pain. To assess its indications, benefits as well as potential risks and complications.
Materials and Methods
Our review includes those patients who underwent any of the CT-guided or fluoroscopic techniques at our institution from June 2007 to June 2009. It is a group of 584 patients, most of them with degenerative and chronic vertebral bone and joint pathology, and who underwent mainly root-blocking procedures, of interapophyseal joints, caudal infiltrations and radiofrequency.
Results
Fluoroscopy is in most cases a suitable guiding method. CT provides better spatial resolution at the price of a higher amount of irradiation and its use would only be justified in some highly selected cases.
The use of these techniques makes it possible to decrease the dose of analgesics in a significant percentage of cases and in some patients it may even avoid or postpone surgical procedures.
Discussion
A radiological guide allows implementing the above techniques under the best possible safety conditions for the patient. It is essential to carry out the proper clinical evaluation of our patients as well as to have the proper knowledge of radiological anatomy and the different techniques that we have available for the correct management of pain in these cases.

C084 P046 EVALUATION OF THE APPARENT DIFFUSION COEFFICIENT IN PRION ENCEPHALOPATHIES

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Objectives
Prion encephalopathies encompass a number of low-prevalence conditions that have a fatal prognosis. The one with the highest prevalence is Creutzfeldt-Jakob disease. There is a range of classic criteria for clinical, analytical, EEG and histological diagnoses. Magnetic resonance, however, with advanced imaging techniques such as diffusion, is able to increase both the sensitivity and specificity in a pre-mortem diagnosis.
Materials and Methods
A retrospective case-controlled study was conducted in 7 patients with prion encephalopathy, 6 of them with a diagnosis of Creutzfeldt-Jakob disease and 1 with fatal familial insomnia (FFI). Nine control individuals were recruited. The TSE T2, FLAIR and triple gradient b0, b500 and b1000 sequences were used, as well as ADC maps. Two radiologists did the reading blindly and collected apparent diffusion coefficients at the cortex (superior frontal gyrus, supra-marginal gyrus, and primary motor and sensitive cortex), subcortical grey matter (caudate lobe, putamen, globus pallidus and thalamus), as well as in both semi-oval centres. In addition, ADC ratios of the pre-central-superior frontal gyrus and post-central cortex-supra-marginal gyrus were estimated.
Results
The statistical analysis shows differences in the magnitude of the apparent diffusion coefficients in the different areas that were studied between patients with CJD and control individuals. Only in a few cases were such differences statistically significant. This trend was also found in the assessment of ADC ratios where the statistical analysis showed significant differences in all cases. The inter- and intra-observer correlation was excellent.
Discussion
The use of diffusion sequences in the qualitative and quantitative assessment (ADC) of prion encephalopathy provides a proper diagnosis of this group of conditions with a sensitive, reliable, reproducible approach that can be easily implemented in the daily clinical setting.

C085 P007 INTRAVASCULAR TREATMENT OF DIRECT INTRA AND EXTRACRANIAL ARTERIOVENOUS FISTULAE

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Objectives
To identify the radiological signs of direct arteriovenous fistulae (AVF) located in the head and neck, by means of several imaging techniques, as well as treatment options with interventional neuroradiology.
Discussion
AVFs are characterized by a direct artery-vein communication without the presence of a normal capillary bed. Since

the capillary bed is the resistance surface against the blood flow, its absence makes AVFs show low resistance and high flow. The two most frequent sites are the cavernous sinus and the vertebral artery because in both cases the artery goes alongside a venous plexus and that makes it more prone to having an AVF.

AVFs can be either extracranial or intracranial:

Extracranial: common carotid artery-internal jugular vein, external carotid artery-external jugular vein, vertebro-vertebral, vertebro-jugular, thyrobicervicoscapular trunk-inferior vena cava.

Intracranial: carotid-cavernous, vertebro-vertebral, and pial fistulae.

The most frequent aetiology is trauma/iatrogenic (head injuries, gunshot or stab wounds, iatrogenesis). They can also have a congenital cause (those related to a collagen disease such as Ehlers-Danlos, Marfan, neurofibromatosis). The clinical appearance will vary depending on their location (asymptomatic, tinnitus, steal phenomenon, venous hypertension, and subarachnoid haemorrhage).

The diagnosis is made via angio CT, angio MR and brain angiography. Intravascular treatment is the technique of choice with several options available: platinum coils, deployable balloons, stent grafts or stent plus platinum coils, as well as occlusion above and below the fistula.

C086 CO10 MSCT ASSESSMENT OF OSTEOSYNTHESIS OF THE SPINE

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Objectives

To show the usefulness of MSCT in the assessment of the proper position, integrity and complications of the osteosynthesis material used in spinal surgery.

Materials and Methods

Metal osteosynthesis has been used as a treatment of choice in a significant number of spinal pathologies. MSCT provides the best assessment of the status and progression of bone fusion, of integrity and potential complications of plain x-ray in the post-operative evaluation. It is becoming the method of choice because it provides a high quality image and bone details, as well as the possibility of making multiplanar and 3D reconstructions. In addition, the latest equipment decreases metal-related image artefacts.

Results

An illustration is given of several types of osteosynthesis and immediate and late complications including malposition and instrument breakage, non-fused or resorbed bone grafts, loosening and infection.

Discussion

MSCT is extremely useful in the evaluation of the status, fusion progression and complications of spinal surgery. Radiologists should become familiar with these images and the potential complications because they may give rise to recurrent or persistent symptoms.

C087 P047 DIFFUSION TENSOR LIGAMENT IMAGING OF THE CERVICAL SPINAL CORD IN PATIENTS WITH MULTIPLE SCLEROSIS

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Objectives

To assess the characteristics of diffusion tensor ligament imaging (DTI) at different levels of the cervical spinal cord in patients with multiple sclerosis (MS).

Materials and Methods

Eighteen patients were studied (13 men/5 women), mean age 36.5 years, with MS (16RR, 1 PP, 1 SP) and 11 controls in 1.5 T equipment with a protocol including T2 sagittal, synchronized PD with peripheral pulse, STIR, axial T2* and DTI. The DTI sequence was acquired in the axial plane with diffusion gradients applied in 20 non-colinear directions. The ACD and FA were estimated with regions of interest (ROI) on lateral and posterior cords, as well as the central region of the spinal cord at C2, C4-C5 and C7-T1.

Results

FA values in controls ranged between 0.946 and 0.650 at C2, 0.918 and 0.603 at C4-C5, and 0.790 and 0.512 at C7-T1. FA values in patients ranged between 0.943 and 0.513 at C2, 0.856 and 0.455 at C4-C5, and 0.785 and 0.273 at C7-T1.

ADC values in control individuals ranged between 0.560 and 0.91610–3/mm2/sec at C2, 0.718 and 1.28710–3/mm2/sec at C4-C5, and 0.845 and 1.34410–3/mm2/sec at C7-T1. ACD values in patients ranged between 0.632 and 1.24710–3/mm2/sec en C2, 0.702 and 1.41210–3/mm2/ssec at C4-C5, and 0.876 and 1.79510–3/mm2/sec at C7-T1.

Statistically significant differences were found between patients and controls at the right lateral cord at C2 (ADC P0.013), posterior columns (right ADC P0.03 and left ADC P0.05) and lateral columns (ADC P0.02 and left FA P0.014; CDA/ADC P0.04) at C7-T1.

Discussion
DTI provides additional information that could be useful in the clinical management of patients with MS.

C088 P048 PRELIMINARY STUDY OF PATIENTS WITH INTRACRANIAL TUMOURS WITH THE ARTERIAL SPIN-LABELLING (ASL) TECHNIQUE

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Objectives
Perfusion studies based on the susceptibility created by a high concentration gadolinium injection have become a routine technique for the evaluation of a good number of intracranial conditions. The Arterial Spin Labelling (ASL) technique is a new method to assess perfusion by measuring the cerebral blood flow (CBF) using blood spins as tracers.
The goal of this study is to report the findings in a group of patients with intracranial tumours and assess the results of this technique and compare them with images from the gadolinium susceptibility technique.
Materials and Methods
Over a two-month period we carried out nine MR studies adding the ASL technique to the MR protocol study in intracranial tumours. Five men and four women, aged 40–69 years, were included in the study.
The anatomopathological diagnosis was GBM in two cases, grade 1 oligodendroglioma in 2, 1 anaplastic astrocytoma, 1 meningioma, and 1 adenocarcinoma metastasis. In 2 patients MR findings were highly suggestive of GBM; although due to the patients' status, surgery was not performed.
In all cases the rCBV (relative Cerebral Blood Volume) and rCBF (relative Cerebral Blood Flow) parametric maps, estimated by means of the perfusion technique based on gadolinium susceptibility, were obtained. The rCBF map was compared to rCBF images obtained via the ASL technique. Gadolinium-enhanced T1-weighted images were also assessed and correlated with the parametric perfusion maps.
Results
In all the patients hyperperfusion in the tumour area could be seen.
Discussion
We report the findings obtained with this new MR perfusion technique that requires no contrast enhancement, in a group of patients with different intracranial tumours, together with their correlation with the gadolinium perfusion technique.

C089 CO23 CLINICAL AND RADIOLOGICAL FOLLOW-UP OF ASYMPTOMATIC PATIENTS WITH AN MR SUGGESTIVE OF MULTIPLE SCLEROSIS

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Objectives
The wide use of MR gives rise to an increase in the detection of CNS white matter changes. We studied the course of patients without previous neurological symptoms but with MR findings which were highly suggestive of multiple sclerosis (MS).
Materials and Methods
Retrospective descriptive study of nine patients with MR findings compatible with MS. The radiological progression and the conversion towards an Isolated Neurological Syndrome (INS) and Clinically Defined Multiple Sclerosis (CDMS) were followed longitudinally.
Results
Nine patients were identified (6 women and 3 men, mean age: 35.8 years, range: 28–49 years). MR studies were carried out due to: headache (2), prolactinoma (2), cervical pain/lumbar pain (2), head injury (1), syncope (1) and seizures (1). The average number of Barkhof-Tintore criteria at the first MR was 3.2. All patients underwent oligoclonal strip analyses (5 were positive) as well as visual evoked potentials (3 were pathological). The mean follow-up was 3.67 years (range: 1-139 months). The mean time elapsed between the first and the second MR was 40.8 months. Radiological progression was identified in 7 patients (5 with gadolinium-enhanced lesions). Five patients showed a conversion towards INS (two brainstem relapses, two sensitive relapses, one optic nerve neuritis), with a mean time from the initial MR of 4.13 years. Three of them showed conversion to CDMS, two in a recurrent-remitting form, (8.54 years as an average from the initial MR) and another one had a primary progressive form.
Discussion
The identification of incidental lesions which are highly suggestive of MS could help establish a group of individuals at a high risk of developing MS.

C090 CO14 CLINICAL AND RADIOLOGICAL FOLLOW-UP OF PATIENTS WITH AN ISOLATED CLINICAL SYNDROME AND NORMAL BASELINE MR FINDINGS

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Objectives
Several studies have found that patients who presented with an isolated clinical syndrome (ICS) suggestive of an inflammatory-demyelinating origin and who showed demyelinating lesions in baseline MR studies, evolved in 88% toward a clinically defined multiple sclerosis (CDMS) in the subsequent 14 years, while only 19% of the patients with ICS and normal MR findings developed MS (Brex et al. 2002). However, those studies were begun more than twenty years ago and were conducted in low-field MR equipment with poor resolution images, factors that decreased their sensitivity in detecting demyelinating lesions.
Our objective was to longitudinally study a number of patients who presented with an ICS in whom the baseline MR that was carried out under a standardized protocol with high-field equipment (1.5 T) was normal or nearly normal (not meeting any of Barkhof's criteria).
Materials and Methods
In a prospective study (July 2001–April 2009) a number of patients who had had an ICS were included in a prospective study. A subgroup of the patients was selected as long as they met the following inclusion criteria: (1) age between 14 and 50 years; (2) availability of at least two MR studies, one done at the onset of symptoms and the second one 12 months later; and (3) a clinical follow-up of at least 24 months from the onset of the ICS. In the MR examinations, the presence of subclinical lesions was evaluated in T2-weighted images, as well as the number of Barkhof's criteria and the number of new lesions in the follow-up MR.
Results
198 patients were included in the study. Mean age 30.6 years and a men/women ratio of 2.47. At the baseline MR, 47 patients (24%) did not show lesions (group A), in 21 patients (11%) subclinical lesions were identified that did not meet any Barkhof's criteria (group B), and the remaining 130 (66%) met at least one of Barkhof's criteria (group C). 49% of the patients included in group A started with optic neuritis (ON), while the initial clinical signs and symptoms in groups B and C was an ON in 33% and 30% respectively. During the follow-up with cranial MR, new lesions were found in 2 patients in Group A (4%), in 6 patients included in Group B (29%) and in 83 from Group C (71%). After a two-year follow-up, a conversion towards CDMS was found in 3 patients in group A (6%), 1 patient in group B (6%) and 66 patients in group C (50%).
Discussion
Compared to previous studies and probably due to technological developments in MR, our study proved a higher sensitivity in showing demyelinating subclinical lesions in patients with ICS. Nonetheless, a normal cranial MR during an ICS does not rule out the risk of a rapid development of CDMS.

C092 P008 INTRACRANIAL DURAL FISTULAE: ANGIOGRAPHIC ASSESSMENT AND TREATMENT APPROACH. PART II

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Objectives
The objective of this study is to review the angiographic diagnosis and treatment approach to intracranial dural arteriovenous fistulae (DAVF) and to present a management algorithm on the basis of the site, symptoms and drainage pattern as a guide in the choice of a specific treatment approach able to improve the clinical course and prognosis of the disease.
Materials and Methods
A review was conducted of intracranial DAVFs paying special attention to those risk factors predisposing to an aggressive neurological course, and to the treatment approach with its potential complications.
Results
Intracranial DAVFs show a whole range of clinical presentations and prognosis depending on their site, the type of venous drainage and flow characteristics. They may appear as benign lesions or show an aggressive clinical course related to intracranial haemorrhage, neurological deficiency and death. Knowing the angiographic morphological and functional characteristics makes it possible to find those factors that predispose towards an aggressive neurological course, as well as planning the proper treatment strategy for each kind of fistula.
Discussion
DAVF treatment, whether palliative or curative, requires a deep knowledge of vessel architecture, as well as of the risk factors of an aggressive clinical course and the different conservative and intravascular treatment techniques.

C094 P009 INTRACRANIAL DURAL FISTULAE: PATHOPHYSIOLOGY, NATURAL HISTORY AND CLINICAL FORMS OF PRESENTATION. PART I

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Objectives
Intracranial dural arteriovenous fistulae (DAVF) are abnormal arteriovenous communications in the dura or nearby. In adults they are considered acquired lesions and they account for 15% of all intracranial vascular malformations.
Knowing their aetiology, pathophysiology and natural history makes it possible to better understand this pathology, its symptoms and prognosis, as well as the potential changes that may occur during the course of the disease.
Materials and Methods
A review of DAVFs was conducted in adults. Their aetiology, pathophysiology and natural history were studied, the angiographic classifications were reviewed, and their potential locations and clinical manifestations were described.
Discussion
DAVFs are dynamic lesions that show an extremely varied range of symptoms and clinical courses, from asymptomatic to those presenting with a fatal haemorrhage. The proper knowledge of their aetiology, pathophysiology and natural history is essential in order to understand, diagnose and treat this pathology.

C095 CO03 DILATATION OF THE VESTIBULAR AQUEDUCT. A REVIEW OF 34 CASES

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Objectives
This abnormality of the inner ear is the most frequent cause of neurosensitive deafness. A recent review of the classification of cochlear malformations found that there is one type that is related to a dilatation of the vestibular aqueduct and corresponds to Mondini's malformation. Our objective is to clarify the differences between the types of malformation associated with DVA and the accompanying picture.
Materials and Methods
We reviewed the patients' clinical records where we found DVA in CT and/or MR studies carried out due to the existence of neurosensitive or combined hypoacusis. We assessed the time of onset of the clinical symptoms and their course, as well any concurrent circumstances. We analyzed the potential abnormalities related to the other structures of the inner ear.
Results
We found 34 patients with DVA, 23 females and 11 males aged between 2 and 41 years. Two patients were sisters. In five patients the abnormality was unilateral. In four patients it was associated to Pendred's syndrome. In all patients we found modiolus abnormalities as reported by some authors. In almost all patients hypoacusis started before the age of three, except in six cases where it was congenital. In those patients where hypoacusis was not deep, the course was progressive.
Discussion
Cochlear malformations should be carefully analyzed to make the difference between DVA and other anomalies clear. The degree and grade of hypoacusis does not depend on the size of the aqueduct or the abnormality of the cochlea.

C098 CO24 CONTRAST EXTRAVASATION FOUND AT MR IS RELATED TO EARLY NEUROLOGICAL IMPAIRMENT AND HIGHER HOSPITAL MORTALITY IN PRIMARY CEREBRAL HAEMORRHAGE

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Objectives
Using MR to find markers that may be related to a poor prognosis in patients with acute primary cerebral haemorrhage (ICH).
Materials and Methods
34 consecutive patients with ICH were studied with CT and MR within the first 12 hours after the onset of clinical symptoms.
The clinical and radiological variables were collected at admission and 72 hours later.
Clinical variables: patients were assessed with the NIHSS scale at admission and 72 hours later. Early neurological impairment (ENI) was defined as a ≥4 point decrease in the NIHSS between the baseline examination and 72 hours later. Hospital mortality rates were recorded during the hospitalization period.
CT variables: the volume of the haematoma was evaluated, as well as that of the perihaematoma and the presence of

intraventricular haemorrhage (IVH) at the baseline CT scan and 72 hours later.

MR variables: The presence and number of microbleeds (MB) defined as focal areas of signal loss in T2-weighted* images, size <5 mm within the brain parenchyma but far from ICH.

Contrast extravasation (CE) was defined as those high intensity areas within the haematoma in T1-weighted images after contrast administration compared to T1 baseline sequences. CE was classified in 4 patterns: Type A: CE within the haematoma; Type B: high intensity images around the haematoma; Type C: a combination of A and B, and Type D: absence of CE.

Results

The haematoma volume was associated to ENI (37±26.3 ml vs 13.2±10.8 ml, P=0.001) and to a higher hospital mortality rate (36±27.3 ml vs 13.5±10.7 ml, P=0.001).

IVH was found in 11 patients (32.4%); the ENI rate was higher in patients with IVH (14.7% vs 8.8%, P=0.037).

CE was confirmed in 20 patients (58.8%); Type A in 6 patients (17.6%): Type B in 3 (8.8%): and Type C in 12 (35.3%). CE in Types A and C showed a greater ENI (20.6% vs 2.9%, P=0.039) and hospital mortality rate (20.6% vs 2.9%, P=0.039) than those in Types B and D.

In the multivariate analysis, the haematoma volume and CE for Types A and C were independent predictive factors of hospital mortality and ENI.

Discussion

In addition to the initial volume of the haematoma, the presence of CE within the haematoma and proven through MR at admission, is an independent predictive factor of poor neurological prognosis and higher mortality in the acute phase in patients with primary ICH.