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ABSTRACTS

XLIII ANNUAL MEETING OF SPANISH SOCIETY OF NEURORADIOGY

23- 25 October 2014, Sevilla, Spain

Spanish Society of Neuroradiology (SENR)

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2014 Activities of the Spanish Society of Neuroradiology

Several scientific events were held in 2014.
• The X National Course of Neuroradiology, which was held in Toledo in February, was devoted to neurodegenerative and demyelinating disorders and had an attendance of more than 200 participants.
• The SENR held its XLIII Annual Meeting in Sevilla on 23-25 October 2014 under the presidency of Pilar Piñeiro González de la Peña. This Annual Meeting included an advanced course in Skull Base. In addition to several excellent Spanish neuroradiologists, several very well known international neuroradiologists, such as Michael Söderman, Alexandra Borges and Marion Smits, were among the invited speakers.
Besides, the new Spanish Society of Neuroradiology Executive Committee was approved and Dra. Ana Ramos has become the President of the Spanish Society, replacing Dr. Alex Rovira.

2014 Honorary Members of the Spanish Society of Neuroradiology

Dr. Antonio Pérez Higueras

Antonio Pérez Higueras was born in Huelva and obtained his Medical Degree in 1971 from the Universidad Complutense in Madrid.
He worked as Neuroradiologist at the Hospital Universitario de La Paz from 1975 to 1992, where he published the book on cerebral ultrasound: "Neuroultrasonografía clínica" Ed. Norma 1990. He obtained his MD degree in 1984 from the University of Oviedo. Since 1992 until now, he has been Chairman of Neuroradiology at the Fundación Jiménez Díaz in Madrid, participating in teaching undergraduate and postgraduate

students as Associated Professor of the Universidad Autónoma in Madrid from 2003. He also has promoted research in endovascular procedures in the animal laboratory there, and trained interventional radiologists internationally with new interventional devices.

Antonio has dedicated to Interventional Neuroradiology for over 4 decades with a vast experience in treating AVMs and aneurysms and innovating novel transoseous venous approaches to AVMs and dural lesions. Dr Pérez Higueras has pioneered the procedure of Vertebroplasty in Spain, contributing to its expansion in our country and beyond through multiple "hands-on courses" and a book "Percutaneous Vertebroplasty" in 1993.

He is author or co-author of over 90 papers in international and national Journals and has participated in several Thesis.

Dr. Pérez Higueras is member of multiple Neuroradiologic Societies, has been the President of the Spanish Neuroradiological Society since 1996 to 2001, a founding member of the Spanish Neurointerventional Group (GENI) in 1996, and a reference in interventional neuroradiology in Spain.

2015 Future Activities of the Spanish Society of Neuroradiology

- The next XI National Course of Neuroradiology about Brain tumor pathology will take place on 19 and 20 February in Barcelona. The classical aspects of neuroradiology of brain tumors and the most currents techniques in neuroradiological diagnosis and nuclear medicine will be reviewed. This is to allow for better characterization of brain tumors and optimize the analysis of their response to different therapies, either in clinical practice or research studies.
- The next XLIV Annual Meeting will take in Pamplona on 22 to 24 October. It will include a pre-congress course about emergencies in neuroradiology. Topics such as stroke, subarachnoid hemorrhage, trauma or spinal cord injuries will be discussed from a diagnostic and therapeutic point of view, providing the latest developments and trying to provide a practical approach.

ABSTRACTS

XLIII ANNUAL MEETING OF SPANISH SOCIETY OF NEURORADIOGY

23- 25 October 2014, Sevilla, Spain

C0023 TRAUMATIC BRAIN INJURY: ASSESSMENT OF DIFFUSE AXONAL INJURY BY DIFFUSION TENSOR IMAGING

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Introduction/Objectives
The clinical pathology underlying traumatic brain injury (TBI)-related impairment is diffuse axonal injury (DAI). DTI provides information abput the directional coherence of water diffusion within tissue through the measurement of fractional anisotropy (FA), and complements the assessment of DAI obtained by conventional MRI.
Our objective is to correlate FA values measured at white matter (WM) tracts with neurological outcome in patients with moderate and severe TBI.
Materials and Methods
Eighty patients with TBI (GCS
We calculated Pearson correlation coefficient between FA values and patient outcome at hospital discharge (Glasgow Outcome Score GOS) and after 6-months after trauma (extended GOS-GOSE).
We also evaluated which portion of the corpus callosum best discriminate patient putcome by means of the area under the ROC curve.
Results
We included 30 moderate and 50 severe head injuries (21 females and 59 males; mean age 35 years).
Low FA values showed a significant correlation with poor outcome in all portions of the corpus callosum, right sCR, left SLF, left ALIC, both PLIC, both EC and CP.
Pearson correlation coefficient showed a range of FA values between 0.283 abd 0.514.
The genu of the corpus callosum was the WM tract that best discriminate patient outcome.
Conclusions
Low FA values were associated in moderate and severe TBI with poor outcome at hospital discharge and 6 months post-injury.
The genu of the corpus callosum showed the highest correlation with outcome.

C0028 NONTRAUMATIC OCULAR AND ORBITAL DISEASE

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Introduction/Objectives
Imaging tests provide essential information in the study of orbital disease, complementing the information from physical examination and the examination of the fundus of the eye, both in patients with ophthalmologic symptoms and in those in whom orbital disease was discovered incidentally in tests done for other reasons.
Materials and Methods
Brief review of the anatomy of the orbit and orbital structures.
Description of the most common orbital lesions, their radiologic characteristics, and the findings that allow them to be diagnosed.
We use CT and MR images from cases at our center to illustrate the those findings.
Conclusions
To optimize management and avoid unnecessary additional tests, radiologists need to be familiar with the findings for inflammatory, neoplastic, vascular, and congenital diseases that affect the orbit as well as those for anatomic variants and postsurgical changes.

C0029 IMAGING OF THE VENTRICULAR SHUNTS: NORMAL POSTSURGICAL FINDINGS AND COMPLICATIONS

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Introduction/Objectives
To review the normal imaging findings and intra-extracranial complications after hydrocephalus treatment by ventricular shunt.
To determine complication rates according to urgent or programmed surgeries.
Materials and Methods
We retrospectively reviewed the ventricular shunt surgical procedures performed at our center from January 2012 to January 2014, including first-time surgical placements and surgical explorations or replacements. Depending on the suspected complication, postoperative control was carried out either with computed tomography, magnetic resonance imaging, conventional radiography, abdominal ultrasound and/or transfontanelar ultrasound. The number and type of imaging studies were different depending on the complexity and evolution of the case. One imaging study was performed in 96% of surgical procedures and two in the remaining 4%.
We evaluated both postprocedural normal imaging findings and complications.
Results
Out of an overall 410 ventricular shunt placements (ventriculoperitoneal, ventriculoatrial and external ventricular drains), postoperative complications were observed in 143 (34,9%). 131 (91,6%) of them were intracranial and 12 (8,4%) extracraneal.
The intracraneal complications were 38 (26,6%) infections, 32 (22,4%) shunt obstructions, 23 (16,1%) pericatheter or intraventricular bleedings, 21 (14,7%) overshuntings (with extra-axial fluid or blood collections, or resulting in small ("slit") ventricles), 8 (5,6%) misplacements into brain parenchyma, 2 (1,4%) loose catheter fragments, and 2 (1,4%) ventricular loculations. There were isolated cases of corpus callosum edema, cerebral venous thrombosis, hemorrhagic infarct, paradoxical herniation and tension pneumacephalus.
The extracraneal complications were 4 (2,8%) abdominal pseudocysts, 2 distal catheter misplacement, 2 peritoneal fibrosis, 1 broken shunt, 1 atrial thrombosis, 1 abdominal wall abscess and 1 bowel perforation.
286 were urgent surgeries of which 107/286 (37,4%) presented postoperative complications; 124 were programmed surgeries and complications were presented in 36/124 (29%).
Conclusions
Because the use of ventricular shunting is the most widely accepted treatment of hydrocephalus, knowledge of the normal imaging findings and common complications of this surgical technique is essential for radiologists.

C0030 ADEQUACY OF CT AND MR NEURORADILOGICAL REFERRALS, EXAMINATIONS AND REPORTS. INTERNAL AUDIT (IA)

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Introduction/Objectives
A Clinical Audit is a qualitative study that has become an important tool for use in our Integral Quality Plan in our Radiology-Neuroradiology Departments.
The Internal Audit (IA) provides evidence, gives direction about which changes are needed and in addition detects the necessary resources for these changes to be applied.
Our IA analyze if the neuroradiological examinations we perform and report, accurately follow what is stated on the referrals.
Materials and Methods
A representative sample of 105 studies were randomly taken and distributed among 7 expert neuroradiologists in our hospitals. The subspecialists did not audit cases from their own departments.
For each case, three aspects were assessed:
- If the referral clearly reflected the clinical situation,
- If the CT/MR study was extended with sequences, protocols or additional anatomical segments with no justification,
- While extended, if the report included information about it.
Each subject was graded and results were taken, as well as appropriate comments and evidences. The results and comments then became the starting point for improvement that will be dealt with by new working groups.
Results
As a short summary of the most interesting figures:
- With regard to adequacy of referrals: 12% did not properly detail the kind of study and did not provide enough clinical information.
- With regard to adequacy of studies, only 4% did not reflect why the agreed protocol was changed.
- With regard to adequacy of reports: 9% informed about changes done; 4% did not state the changes and did not extend information
Conclusions
IA is a useful tool for Quality and Clinical Governance.
It helps to detect repeated errors and to establish improving actions. In addition it involves the staff in working teams and aids professional development. Furthermore, it is used to define protocols and standards in order to improve patient care.

C0032 MORPHOLOGICAL EVALUATION OF LIMBIC SYSTEM CONNECTIONS WITH MAGNETIC RESONANCE BY APPLYING DIFFUSION TENSOR

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Introduction/Objectives
The Limbic System comprises structures which receive inputs from several areas of the neural axis and it is involved in complex and interrelated behaviors as memory, learning and social interactions. Two levels of structural and functional organization are included. The first level encloses would the most medial cortical structures of the boundary (limbus) of the hemisphere, which together form the limbic lobe. The second level includes the structures of the limbic lobe and a group of subcortical nuclei and tracts that together form the Limbic System.
The objective of our study is to describe the afferent and efferent tracts of white matter that connect the different structures of the Limbic System by applying magnetic resonance diffusion tensor imaging (DTI) in order to obtain tractography images.
Materials and Methods
15 healthy patients between 20 and 40 years were selected for the study. The mentioned patients were taken through a study of tractography on a 1.5 Tesla Phillips MRI which later on was used for image processing and three-dimensional reconstructions at an Extend Phillips MR Workspace R 2.6.3.3 workstation.
Results
We carried out a detailed and exhaustive tractographic study of afferent and efferent fibers which form the limbic system, obtaining a map of the white matter tracts that connect its different components.
Conclusions
The implementation of the image using DTI is a breakthrough in the field of functional imaging of the central and peripheral nervous system, allowing qualitative and quantitative evaluations of different structures and neural pathways, performing an indirect estimate of their integrity and their relationships with neoplastic lesions, ischemic, demyelinating or any other kind of injuries. Hence the different white matter that form the Limbic System can be properly assessed by this new technique, been the only one that allows their evaluation in vivo.

C0033 HERPES VIRUS: WHAT CAN THEY DO UPSTAIRS?

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Introduction/Objectives
Central nervous system infection by herpes virus is a serious situation that requires an early diagnosis, and MRI can play an important role, so the purpose of this comunication is to review the pathophysiology of herpetic encephalitis, the imaging findings in each subtype of herpes virus encephalitis and to describe other uncommon findings like cerebral vasculitis and herpetic retinitis.
Materials and Methods
We have reviewed our herpetic encephalilits cases in the past five years, looking for the typical findings on MRI and describing the key findings that can guide us towards each subtype of herpes virus (HSV 1, HSV 2 and VZV).
Results
Herpetic encephalitis has characteristic findings on MRI: involvement of the medial temporal lobes, insular cortex and inferolateral frontal lobes.
MRI shows general edema in affected regions, restricted diffusion and can demostrate haemorrhage, especially in VZV encephalitis.
MRI can also provide evidence of other entities, like VZV vasculitis, as irregularity of the vessels and enhancement of the arterial wall.
Conclusions
MRI has an important role in both the diagnosis and monitoring of patients with herpetic encephalitis, can guide us towards a specific virus and it is also useful in the diagnosis of complications like herpetic vasculitis or retinitis.

C0034 OUR PAROTID LESIONS IMAGING EXPERIENCE; WE ARE ON THE ROAD

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Introduction/Objectives
Parotid lesions are relatively uncommon. Overall approximately 80% of all parotid masses are benign, and the majority of these are pleomorphic adenomas.

We have done a restrospective evaluation of our parotid lesions imaging in the past two years in order to know our diagnostic accuracy in this context and the correlation with pathology reports.

Materials and Methods

Restrospective evaluation of our cross-sectional parotid lesions imaging in the past two years.

Patients were studied with CT, MRI of both of them.

Results

We had recordered CT scans and MRI of patients with parotid lesions and we have correlated our reports with pathology ones. CT and MRI diagnosis correlate with the pathology only in some patients, however, in most cases, MRI and CT were able to classify lesions in probably benign or probably malignant.

Conclusions

According to the literature, our parotid cross-sectional imaging showed that imaging constitutes a valuable tool to predict aggressiveness of parotid lesions; nevertheless in most cases they cannot give us a certain diagnosis of parotid masses.

C0035 UNPROTECTED CAROTID ARTERY STENTING IN SYMPTOMATIC ELDERLY PATIENTS

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Introduction/Objectives

Surgery is known to have fewer adverse events in patients aged >75 years with carotid stenosis, but some are not candidates due to comorbidity. Stenting using protection devices is the most accepted endovascular technique. Our aim is to show the safety and efficacy of carotid stenting without any protection device in these patients.

Materials and Methods

All patients older than 75 years with carotid stenosis treated in our center between January 2002 and December 2012 were included in this prospective study. All were treated by carotid stenting without protection devices. Angiographic results, neurologic complications and Doppler ultrasound were collected during the procedure and within 30 days.

Results

49 patients were included (mean age 78.2 years, range 75–86). The average degree of stenosis was 88.2%. During the procedure there were two cases of transient ischemic attack and one intraparenchymal hemorrhage. At 30 days there was a non-disabling stroke. The combined rate of disabling stroke plus myocardial infarction plus death was 6% at 30 days and the rate of any stroke was 4% during the procedure and 2% at 30 days.

Conclusions

Endovascular treatment of carotid stenosis without protection devices in symptomatic patients aged >75 years is an alternative to endovascular treatment with protection devices. Complications and mortality rates are similar to studies that used protection devices in lower risk patients.

C0040 VASCULAR APHASIAS IN CHILDREN

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Introduction/Objectives

- We present the most common causes of vascular aphasias in children who were diagnosed in our hospital.

Materials and Methods

- We describe the uses of the different diagnostic techniques in the diagnosis of these pathologies: CT, angio-CT, MRI with different sequences and angio-MRI, transcranial Doppler echocardiography and Doppler echocardiography of the supra aortic trunks, and digital angiography.
- Importance of language mapping before neurosurgical or endovascular treatments with embolization for arteriovenous malformations.

Results

1. Venous sinus thrombosis. The venous pathology is relatively typical in children after an inflammatory-infectious otorhinolaryngological process. 10-year-old boy who is admitted with sudden cephalalgia, instability and dysarthria, with catarrhal symptoms the previous days: diagnosis of thrombosis of the sigmoid sinus and the left jugular vein.
2. Iatrogenic. Postoperative complication after a tonsillectomy in a 10-year-old boy with focal neurological involvement with hemiparesis and aphasia caused by the clipping and obstruction of the left carotid artery with acute ischemia.
3. Arteriovenous malformations. 13-year-old boy with right hemiparesis and autistic disorder, speech alterations and refractory epilepsy. AngioMR and AGF (Superselective test with sodium amytal).
4. Moyamoya disease. 7-year-old patient who is admitted with motor aphasia and a decreased level of consciousness. Decorticate posture. Acute ischemic strokes in the area of the left MCA secondary to multiple intracranial arterial stenosis, in the context of a primary or acquired occlusive arterial condition (Moyamoya disease or phenomenon).
5. Wyburn-Masson syndrome. 14-year-old girl who is admitted with campimetric alterations of two months of evolution and transient motor aphasia. Malformation in the right basal ganglia, scalp and right ophthalmic region. Grade V in the Spetzler-Martin scale with deep venous drainage and surface ectatic drainage, with stenosis of the straight sinus.
6. Ischemic stroke. 10 years old girl with sudden aphasia and facial nerve disorders.

Conclusions

Vascular aphasias in children are not infrequent in clinical practice.

C0044 FUNCTIONAL MRI AND TRACTOGRAPHY OF THE COMPLEX LANGUAGE SYSTEM AND ITS PATHOLOGY: APHASIAS. A BRIEF PICTORIAL REVIEW FOR CLINICIANS

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Introduction/Objectives

Advances in neuroimaging using functional magnetic resonance (fMR) and tractography (TDI) have made highly-detailed visualization of language brain structures possible, allowing normal findings to be routinely assessed and language pathology (aphasias) to be detected.

Materials and Methods

We present an integrated perspective of the normal anatomy of the language system established by radiologists and neurosurgeons in order to provide a practical imaging review, which combine

MR images with intraoperative findings (cortico subcortical electrical stimulation, the gold standard in language mapping). The information about cortico subcortical language system includes anatomy, function and a brief listing of the most common pathologies affecting them.

Results

-Cortical and subcortical language representation in the human brain. Functional MRI shows activations based on neurovascular coupling and Diffusion tensor imaging shows the anatomy of the white matter bundles.
-Vascular aphasias (The most common cause): Ischemic, haemorrage and AVM.
-Tumor aphasias. Primary tumors and metastases.
-Degenerative diseases: Alzheimer and frontotemporal dementia. Progressive primary aphasias.
-Inflammatory and infectious diseases. Multiple esclerosis, brain abscess, toxoplasma, TBC…

Conclusions

This study shows the anatomic and functional language system and the correlation with funtional MR and tractography as very useful tools for teaching and learning this complex system, providing a highly realistic visualization of language areas and their connections in 2D and 3D view. Moreover, the most common causes of aphasias are briefly discussed.

C0047 RELATIONSHIP AMONG FACET JOINT FLUID AT MRI, AGE, AND DISK DEGENERATION IN PATIENTS AFFECTED WITH LOW BACK PAIN

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Introduction/Objectives

Lumbar spine (LS) instability is commonly related to degeneration/laxity of restraining structures such as disks, facet joints(FJ), muscles and ligaments. Degeneration of FJ is characterized by osteoarthritis, chondropathy and synovial inflammation with fluid accumulation. When a patient with suspected anterior subluxation lays supine (e.g., during an Magnetic Resonance Imaging (MRI) examination), the unstable LS segment is unloaded, producing a gap within the degenerated FJ; synovial fluid accumulates and can be detected on T2-weighted-MRI sequences. Our aim was to estimate the relationship between facet joint fluid (FJF), age, and disk degeneration (DD) in patients undergoing MRI for low back pain (LBP).

Materials and Methods

Ninety-six patients (M/F 48/48; aged 49 ± 15 years) affected with LBP underwent MRI of LS using sagittal T1- and T2-weighted fast spin-echo and axial T2*-weighted gradient-echo sequences. For each level from L3 to S1, DD was graded using the Pfirrmann grading system (1-5), while the FJF was graded as 0 (absent), 1 (monolateral), or 2 (bilateral): per-patient DD and FJF were calculated summing the scores of the 3 spine levels.Spearman correlation coefficient, multivariate regression analysis, Friedman McNemar tests were used. Data were reported as median and interquartile interval (II).

Results

The degeneration of L3/L4 (median 3; II 2-3) was lower than that of both L4/L5 (median 3; II 2-3; $p = 0.017$) and L5/S1 (median 3; II 3-4; $p = 0.002$).The FJF of L5/S1 (median 0; II 0-1) was lower than that of both L3/L4 (median 1; II 0-2; $p = 0.002$) and L4/L5 (median 1; II 0-2; $p = 0.019$). At bivariate per patient analysis, age was correlated negatively with FJF ($r = -0.199$; $p = 0.052$) and positively with DD ($r = 0.582$; p0.142).

Conclusions

This preliminary study suggests that young patients undergoing MRI for LBP show higher FJF than older patients, regardless the DD. Further studies should investigate the role of FJF on LBP.

C0049 MR ANGIOGRAPHY AND 64-SLICE CT CEREBRAL ANGIOGRAPHY IN THE DIAGNOSIS OF ACUTE SUBARAC HNOID HAEMORRHAGE

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Introduction/Objectives

To evaluate the efficacy of MR angiography and 64-Slice CT Angigraphy in the detection of aneurysms or intracranial malformations in patients with acute subarachnoid haemorrhage (SAH). Digital substraction andiography (DSA) is use for patients treatment and in cases on insufficient information in CTA or MRA.

Materials and Methods

From January 2003 to Febrero 2014, 115 patients with acute SAH were studied with MRA angiography or CT-Angiography for the detection of the cause of the haemorrhage. 66 women (52,17%), 49 men (47,83%); mean age 56,93 years (range 22-90). MRA (including gadolinium-enhanced MR angiography in practically all cases) or CT-Angiograhy (with iodated contrast) was performed in the first 24 hours after the acute episodie. The choice of the diagnostic method depended of the experience of the radiologist, disponibility of CT or magnetic resonance and the existence of allergies or renal failure (MR angiography without gadolinium).

Results

CTA was performed in 55 patients (47,8%). In 40 patiensts CTA detected vascular aneurysm, 39 were confirmed with DSA (previous to endovascular treatment) and only in one case DSA not confirmed vascular malformation. In the group of patients with normal CTA, 6 presented DSA normal, 8 MRSA normal and 2 DSA and MRA without aneurysm. MRA was performed in 60 patients (52,25). In 44 patiensts MRA detected vascular aneurysm, all were confirmed with DSA (previous to endovascular treatment). In the group of patients with normal MRA (16), 9 presented DSA normal and 7 normal CTA. Anterior communicating artery was the most frecuent localization of the aneurysms. In 8 patients MRA or CTA detected 2 aneurysms and in 2 patients there were 3 aneurysms in each one.

Conclusions

MRA or CTA are an excellent method for the detection of aneurysms or intracranial malformations in patients with acute SAH. One of them must be the initial imaging modality when intracranial haemorrhage is diagnosed on CT, especially in the out-of-hours setting.

C0050 BASIC KNOWLEDGE TO AVOID MISTAKES IN NEURORADIOLOGY

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Introduction/Objectives

To review and illustrate the normal variants visualized in neuroimaging and deficiencies in the radiological technique, that can be frequent causes of error.

To describe what to look for in neuroradiology imaging, in order to help residents and non-specialized radiologists to lose their fear to the neuroradiological interpretation.

Materials and Methods

We have reviewed emergency neuroradiological studies between January 2013 to December 2013, obtained in our hospital.

We have obtained the patients studies using a Siemens 2 slice CT scan, Philips 64 slice CT scan, and a General Electric 1.5T MRI. We used our institution protocols for brain and skull.
The errors were further classified as errors of observation that included omissions, or errors of interpretation, that included understating or overstating the significance of an abnormality. We divided also the errors depending on the affected structured in the brain or skull.
Results
In total we have obtained 2327 studies, in which we found 108 interpretation errors and 37 observation errors. The most common mistakes are the standard configuration changes in skull, followed by variations of the duramater, brain, LCR spaces, vascular and skull pneumatization.
The most common errors were calcifications, cysts, arachnoid granulations, pseudofractures, partial volume effect, virchow-robin spaces, exostosis, asymmetries or contrast encephalopathy.
Conclusions
It is important to know the normal variations of the skull, brain and cerebrospinal fluid spaces that can occasionally produce confusing findings in CT and MRI. Residents and non-specialized radiologists should be familiarized with these images in order to defend themselves in the emergency studies and avoid mistakes that lead to overdiagnosis.
Controllable influencing factors also include film quality and the experience of physicians.

C0054 THE POSTOPERATIVE CRANIUM: EXPECTED AND NOT-SO-EXPECTED FINDINGS

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Introduction/Objectives
- To **describe and illustrate** normal imaging findings and postoperative complications in neurosurgical procedures.
- To emphasize the relevance of **clinical and radiological correlation** to get to an acute diagnosis.
- To calculate the **rate of postoperative complications** in our hospital, attending to the surgical indication and the type of surgery (urgent or programmed).
Materials and Methods
We retrospectively reviewed all the neurosurgical cranial procedures performed at our center from January 2012 to April 2013, including **burr holes, craniotomy, craniectomy and cranioplasty.**
Postoperative control was carried out with computed tomography (CT), magnetic resonance imaging (MRI) and/or cerebrovascular angiography, evaluating both postprocedural expected imaging findings and complications.
Postsurgical complications were classified as hemorrhages (extradural, subdural, intraparenquimatous hematoma or others), infarctions, infections (soft tissue, bone flap, empyemas or abscesses), tension neumocephalus, extracraneal herniations, hygromas and others.
Results
Out of overall 412 neurosurgical procedures, 79(19%) presented **one or more** postoperative complications: 36/79(46%) complicated surgerys because of hemorrhage, 19/79(24%) of ***infarction*** and 17/79(21%) of ***infection***.
Only 3/79(4%) surgerys were complicated because of a ***tension neumocephalus***, with clinical deterioration accompaning characteristic imaging findings.
Too many patients presented ***extracraneal herniation*** after a craniectomy surgery, but only 3 of them represented a real complication (3/79(4%)).
Up to 14/412(3%) postoperative controls presented ***hygromas*** of significant size, but only 2/14(14%) causing ***brain tamponade*** (2/79(3%)).
There were also isolated cases of ***pseudomeningocele*** (2), ***pseudoaneurysm*** (2), ***venous thrombosis*** (2) and ***remote cerebellar hemorrhage*** (1).
The rate of complications was 37/203(18%) in the context of **tumor**, 11/57(19%) in **trauma**, 15/84(18%) in **vascular disease** and 16/68(23%) in others.
133 interventions were **urgent** and 28/133(21%) presented postoperative complications while 279 were **programmed** and 51/279(18%) presented complications.
Conclusions
Neurosurgical cranial procedures are relatively frequent in the daily practice and radiologists must know how to **differentiate normal findings from postoperative complications** to prevent and treat them.
Clinical, surgical and imaging **correlation is essentia**l.

C0058 ASSESSMENT OF PRE-TREATMENT MR PERFUSION PARAMETERS FROM THE PERITUMORAL REGION AS PROGNOSTIC FACTORS OF SURVIVAL IN PATIENTS WITH GLIOBLASTOMA

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Introduction/Objectives
The histological grade is the best indicator of survival in patients with astrocytomas, but it often varies within the same grade. It has been demonstrated that the MR perfusion parameters obtained from the tumor region have a prognostic value, but the use of the peritumoral area has not been well studied for this purpose yet.
The aim of this work is to investigate the relationship between the perfusion parameters from the peritumoral region and the survival time of these patients.
Materials and Methods
Twenty patients with histologically demonstrated glioblastoma were included (60 ± 7 years). They underwent pre-treatment MRI with a standard brain tumor protocol, including a T2*-weighted perfusion sequence (1.5T, EPI-GRE, TR ~ 1s, TE ~ 20ms, angle ~ 30°, 2s/dynamic, contrast dose 0.2ml/kg@4ml/s).
For each patient, the arterial input function (middle cerebral artery) and the peritumoral volume (signal alteration area in FLAIR-T2, excluding large vessels and T1-weighted late enhancing areas) were manually selected.
Uptake curves were extracted voxel-by-voxel and the following parameters were obtained: blood volume (CBV), blood flow (CBF), mean transit time (MTT), signal recovery, extravasated volume, transfer constant (K^{trans}), washout constant (k_{ep}), interstitial volume (v_e), vascular volume (v_p) and area under curve at 60 seconds ($IAUC_{60}$).
Mean values were obtained for each case and a non-supervised clustering method was applied to separate populations based on the parameters. Finally, survival analyses were performed on these clusters.
Results
The cluster classification obtained from CBV showed two separate groups (9 and 11 cases) with values of 0.52 ± 0.11 and 0.32 ± 0.04 ml/100ml, respectively (p
Conclusions
CBV at the peritumoral region has prognostic value to determine survival time in patients with glioblastoma.
Acknowledgments, conflicts of interest
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C0063 CLINICALLY ISOLATED SYNDROMES: ANALYSIS OF 1000 CASES

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Introduction/Objectives
To determine the effect of baseline demographic, clinical, MRI and biological factors on conversion to clinically definite multiple sclerosis (CDMS) and development of disability in a prospective cohort of patients with clinically isolated syndromes (CIS).
Materials and Methods
From 1995 to 2012, 1058 CIS patients underwent clinical and MRI follow-up. We studied the influence of age, gender, topography, number and location of lesions at baseline and IgG oligoclonal bands (OB) on the risk of CDMS and development of disability using Cox univariate and multivariate regression analysis.
Results
We included 1015 patients followed for a mean of 81 (SD 57) months with positive OB in 453/798 (57.2%) and normal MRI in 299/951 (31%). Gender was not associated with the development of CDMS or disability progression. Younger age at onset showed a higher risk of CDMS (HR 1.9 [1.1 – 3.1]) but no effect on disability progression. Patients with optic neuritis had a lower risk of conversion (HR 0.6 [0.5 - 0.8] and disability progression (HR 0.5 [0.3 – 0.8]), however this protective effect disappeared when adjusting for MRI and DMT. Presence of OB increased the risk of CDMS (HR 1.5 [1.1 – 2]) and EDSS 3.0 (HR 2.3 [1.3 – 4.0]) independently of other factors. In the adjusted model, the number of lesions on MRI increased the risk of CDMS (HR 6.6 [4.6 – 9.5]), and disability progression (HR 2.4 [1.3 – 4.2]). Treating patients before the second attack resulted in a reduced risk of CDMS (HR 0.6 [0.4 - 0.8]) and disability progression(HR 0.5 [0.2 - 0.9]) irrespective of MRI and other factors.
Conclusions
MRI baseline characteristics have a high impact in the long term. OB and topography/demographic characteristics are of medium and low impact, respectively. Early DMT decreases the risk of CDMS and accumulation of disability.

C0064 VISUAL CONSPICUITY OF MULTIPLE SCLEROSIS LESIONS WITH CONTRAST-ENHANCED T1-WEIGHTED GRADIENT ECHO AND SPIN ECHO SEQUENCES AT 3.0T

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Introduction/Objectives
To compare the ability of gradient-echo (GE) and spin-echo (SE) two sequences to detect active multiple sclerosis (MS) lesions at 3T MRI
Materials and Methods
100 relapsing MS patients underwent 3.0 T brain MRI including enhanced GE and SE T1 sequences acquired 15 minutes after injection of a double dose (0.2 mmol/kg) of gadolinium. An experienced neuroradiologist identified and marked contrast-enhanced MS lesions in these sequences. Differentiation of MS lesions in GE and SE images was evaluated using a 5-point qualitative scale. Each of the two sets of contrast-enhanced T1W scans was then evaluated in a random fashion by three experienced neuroradiologists. The results were compared with the gold standard reference to obtain the number of true-positive (TP), false-negative (FN), and false positive (FP) evaluations. Quantitative assessment of lesion conspicuity and the effect of spatial location were based on image contrast and the contrast-to-noise ratio between lesions and their 3-pixel-width surroundings, and division of the intracranial region into four quadrants in each slice.
Results
We found 607 MS lesions. The qualitative approach showed slightly better lesion differentiation with SE images. However, analysis of agreement between readers and gold standard segmentations showed better sensitivity to detect lesions with GE images (0.828) than with SE (0.767), and a similar mean number of FPs (GE, 16.33; SE, 16.67). SE images showed a higher image contrast ratio (TP, 0.37; FN, 0.20; FP, 0.25) than GE images (TP, 0.23; FN, 0.11; FP, 0.16), whereas the contrast-to-noise ratio was higher for GE (TP, 37.76; FN, 17.02; FP, 20.71) than for SE (TP, 27.26; FN, 13.69; FP, 14.85). Both comparisons presented significant statistical differences (p
Conclusions
The results obtained suggest that visual conspicuity of contrast-enhancing MS lesions in images acquired at 3.0T is better in GE than in SE sequences.

C0073 CEMENTOPLASTY FOR ARTHRODESIS SCREW LOOSENING: A TECHNIQUE TO PROLONG THE USEFUL LIFE OF AN IMPLANT

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Introduction/Objectives
Vertebroplasty is a recognized technique that is efficacious for pain relief and stabilization of osteoporotic fractures. Likewise, using hollow transpedicular screws with cement is an efficacious technique for increasing the hold of arthrodeses in osteoporotic vertebrae.
The problem arises when one end of an arthrodesis loosens due to unrecognized osteoporosis or other reasons. What to do in these cases?
Materials and Methods
In March 2013, to prolong the life of arthrodeses and to avoid having to replace or lengthening them, we started to cement screws that had become loosened. We have treated 7 patients (2 men and 5 women) with clinical and radiologic signs of arthrodesis loosening by percutaneous cementation of the loosened screws, most (5) on S1. We describe the technique and the follow-up.
Results
All patients report significant relief of pain due to the mechanical instability of the arthrodesis, and all arthrodeses continue to hold without signs of greater loosening or need for extension. No significant complications have occurred. Cement leaks (3 patients) have mostly affected the posterior soft tissues.
Conclusions
Although not simple, vertebroplasty to cement loose screws is efficacious and useful to prevent or at least delay prosthesis replacement or arthrodesis extension.

C0078 EVALUATION OF STRUCTURAL BRAIN PATHOLOGY CAUSING SEIZURES IN PEDIATRIC PATIENTS ATTENDED IN OUR HOSPITAL

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Introduction/Objectives
To describe the different brain pathology diagnosed in our hospital that can correlate to a structural etiology regarding seizures in children and teenagers.

Materials and Methods
A retrospective descriptive study evaluating patients with a range of age between 0-18 years old, diagnosed with seizures and epilepsy from January 2008 to January 2014. We also reviewed Neuroimaging studies and determine the different structural etiologies that can cause seizures (head trauma, brain tumors, stroke, intracranial infections, cerebral degeneration, congenital malformations, inborn errors of metabolism and no neuroradiological findings). Statistical analysis was made using SPSS Mac v.21 to determine measures of central tendency and P value.
Results
171 patients were studied with a mean age of 7.37 ± 5.79 and a range 0-18 years. 49.1 % were male and 50.9 % were female (P > 0.334). Neuroimaging findings were evaluated (Brain MRI 69%, CT 20.5 % and US 10.5%) and structural brain injury were present 22.2 % (head trauma related injuries 1.8%, brain tumors 1.2%, stroke related injuries 0.6%, intracranial infections 5.3%, cerebral degeneration 2.9%, congenital malformations 9.4%, inborn errors of metabolism 1.2% and no neuroradiological findings 77.8%).
Conclusions
No statistical differences were obtained between males and females. The most prevalent brain pathology in our hospital was the congenital malformations (colpocephaly, agenesis or hypoplasia of the corpus callosum, and neuronal migration disorder [lissencephaly, pachygyria, microgyria and nodular heterotopia]. Our hospital is a non-pediatric specialized care center, but sometimes it is frequent to encounter with pediatric pathology were the radiologist is not used to diagnosing.

C0079 LUMBAR INTERSPINOUS SPACERS: RADIOLOGICAL STUDY AND PRESENTATION OF OUR EXPERIENCE

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Introduction/Objectives
To review and illustrate the variety of lumbar interspinous devices.
To describe the important role of radiology in the follow up of patients with lumbar interspinous devices
Materials and Methods
A retrospective descriptive study evaluating patients with a range of age between 19-75 years old in which an interspinous spacer was implanted between January 2011 to October 2013, in our hospital.
Indications were symptomatic lumbar spinal stenosis, degenerative disk disease, facet syndrome, herniated disks and foraminal stenosis. All patients were diagnosed by conventional radiography and CT and/or MRI. Lumbar dynamic study was performed prior to treatment.
Results
112 interspinous spacers were implanted in 92 patients: 41 DIAM (30 patients), 52 InSwing (48 patients) and 19 In-Space (14 patients); 41 females (44,6%) and 51 males (55,4%). Their ages ranged from 19-75 years (mean 47,8 years). 1 device was implanted at L2-L3 (0.9%), 16 at L3-L4 level (14.3%), 70 at L4-L5 (62.5%) and 25 at L5-S1 (22.3%). All patients showed good tolerance to the device, with no significant complications. In not a single case the removal of the material had been required.
Follow up was performed with dynamic lumbar spine radiographs and CT or MRI.
Conclusions
Radiographically, there is limitation in the extension of the vertebral segment and the decreased of the discectomizated space is smaller with the installation of the devices that without them.
Clinically, there is improvement in back pain.

C0080 RELATIONSHIP BETWEEN PRESURGICAL DTI MOTOR TRACT MAPS AND INTRAOPERATIVE EVOKED POTENTIALS IN PATIENTS WITH CNS TUMORS

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Introduction/Objectives
To study the accuracy of DTI in the presurgical identification of the motor tract and its correlation with evoked potentials obtained during brain tumor surgery.
Materials and Methods
54 pyramidal tractographies based on DTI images were performed before and after surgery in patients with glioma tumours histologically confirmed (17 diffuse anaplastic gliomas, 8 oligoastrocytomas and 29 multiform glioblastoma) which were immediately adjacent or in direct contact to the pyramidal tract.
During surgery, central sulcus was identified and confirmed by evoked potentials. For evoked potential a direct phase technique for cortical stimulation with high frequency (250Hz) monopolar electrodes was used. For cortical stimulation an 8 contacts electrode was used whereas a current waveform with eight electromyograms was used for evoked potentials continuous monitoring.
When resection approaches the pyramidal tract, subcortical stimulators were used and the electromyographic response was observed after subcortical stimulation.
The minimum distance ratio between the resection cavity and subcortical stimulation intensity, in relation to the pyramidal tract, was studied using regression and ANOVA correlation analysis. The p-value was considered as $p < 0.05$.
Results
The distance between the resection cavity and the motor tract in tractographic sequences postoperatively were 2.5 to 23.7 mm. The results were correlated with data obtained from cortical evoked potentials monitored during surgery. There was a significant linear correlation of 1.08 by applying a regression test between distance and stimulus intensity ($R2 = 0.8202$, $P < 0.001$).
Conclusions
Correlation was demonstrated between the electrophysiological and DTI in the analysis of the pyramidal tract by imaging based on the use of direct subcortical stimulation. The DTI should be systematically included in the standard imaging protocol for the study of brain tumours both for etiologic diagnosis to treatment planning in order to preserve the maximum motor tract as possible.

C0081 ROLE OF THE DTI AND FIBER TRACTOGRAPHY IN THE DIFFERENTIAL DIAGNOSIS OF SOLITARY INTRA CRANEAL MASSES

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Introduction/Objectives
To establish the differences between metastases and primary high grade glial tumors using diffusion-tensor sequences
Materials and Methods
51 patients with solitary intracranial mass were analyzed: 24 metastasis and 27 GBM.Fractional anisotropy (FA), medium diffusion (MD), pure anisotropic diffusion (q*) and total magnitude of the diffusion (L) were studied, both in the contrast enhanced tumor area and the affected adjacent white matter region. These measures were reproduced in the contrataleral unaffected side of the brain by obtaining mirror images.
Results
DTI sequences and mainly q* (P
Conclusions
DTI and fiber tractography add valuable information for the differential diagnosis between glioblastoma multiforme (GBM) and metastases in patients with a solitary cerebral expansive lesion.

C0082 3T VS 1.5T MRI IN PATIENTES WITH RETINOBLASTOMA. A REVIEW OF IMAGING CRITERIA FOR EXTRAOCULAR TUMOR EXTENTION

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Introduction/Objectives
To know the extraocular extension of the retinoblastoma to choroid, sclera, optic nerve and orbit is crucial in tumor staging and to decide the appropriate treatment. Nowadays, the actual accuracy of Magnetic Resonance Imaging (MRI) evaluating extraocular extension in this condition remains controversial.
The aims of this exhibit are:
- To review MRI criteria for extraocular extension and progression
- To evaluate the usefulness of MRI, comparing 3T vs 1.5T MRI, in the final decision of eye enucleation when dissemination or progression is uncertain
Materials and Methods
13 patients with retinoblastoma (24 eyes: 11 bilateral, 2 in patients with a single eye) under chemotherapy were evaluated with 1.5 and 3T MRI within 1 month.
Orbital extension, bothintraocular (choroidal or scleral spread, vitreous seed, and involvement of the anterior segment) and extraocular (postlaminar optic nerve involvement and extrascleral invasion) was evaluated.
11 eyes were enucleated and 2 patients were followed-up. Correspondence between MRI-based indication for enucleation and histology was also studied.
Results
3T MR showed better sensibility for detection of extraocular extension and to delimitate morphology and size tumor, but it also showed more false positive results in optic nerve and choroid involvement.
Conclusions
3TMR allows more reliable information before enucleation in patients with retinoblastoma concerning choroid and optic nerve invasion, anterior chamber infiltration and specially evaluating the morphology and size of the tumor, but it also shows more false positive results. Despite the small number of the series, we infer that indirect criteria, specially in optical nerve and choroid-scleral extend, should be review when we use 3T Magnetic Resonance

C0083 NEURORADIOLOGIST EMERGENCY EVALUATION OF PATIENTS WITH SUDDEN VISUAL LOSS AND NORMAL EYE FUNDUS

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Introduction/Objectives
The aims of this study were to evaluate the spectrum of non ocular causes of sudden visual loss in the Emergency Department, with or without radiological findings, and to discuss the role of CT and /or MRI in the diagnosis of uni or bilateral sudden visual loss in order to achieve a short differential diagnosis and a correct final diagnosis.
Materials and Methods
For a two and a half years period (January 2011- June 2014), all patients admitted to our Emergency Department with sudden visual loss and ophthalmologic negative study were retrospectively reviewed.
Results
The authors identified 62 patients suffering from sudden visual loss with normal eye fundus. CT and/ or MRI were performed in order to exclude brain lesions. Ischemic pathology (acute posterior circulation infarction), demyelinating (multiple sclerosis or optic neuromyelitis), visual pathway extrinsic compression (primary tumors, metastases, pituitary or tumor apoplexy, fibrous dysplasia of the skull base or compressive aneurisms), inflammatory conditions (tuberculosis or sarcoidosis), posterior reversible encephalopathy syndrome or iatrogenic causes such as acute optic neuropathy due to radiotherapy were identified as causes of this entity, but negative radiological report loss were listed in more than half of the patients.
Conclusions
Diagnosis and management of acute visual loss at the Emergency is a challenging issue, especially when, in the eyes examination, the ocular etiology, such as retinal detachment or vascular occlusion, is ruled out. Although neuro-ophthalmologic approach with fundus eye examination is the first step in acute unexplained visual loss, neuroimaging should be immediately after performed in order to achieve an accurate diagnosis that allow a prompt and specific treatment, if possible as more than half of the patients lack radiological findings explaining their symptoms.

C0087 AGREEMENT BETWEEN 18-F-FLUOROCHOLINE-POSITRON EMISSION TOMOGRAPHY/COMPUTED TOMOGRAPHY AND MULTIPARAMETRIC ADVANCED MAGNETIC RESONANCE IN FOLLOW-UP OF LOW GRADE GLIOMA

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Introduction/Objectives
In the follow up of low grade glioma (LGG) are not unusual inconclusive findings to make a certain diagnosis. The aim of this work is to evaluate the possible relation between 18-F-Fluorocholine PET/CT (PET) and multiparametric advanced magnetic resonance imaging (aMRI) in patients with treated LGG under suspicious of relapse.
Materials and Methods
Prospective study including 18 patients treated of LGG with clinical/radiological suspicion of progression. PET and aMRI were performed to all patients, evaluating: in PET study the maximal Standard Uptake Value (SUV) in the area of highest fluorcholine uptake. In aMRI was obtained parametric maps of apparent diffusion coefficient (ADC) and regional cerebral blood volume (rCBV). In the same localization of the ROIs positives for tumour progression, were performed the perfusion, diffusion and single voxel spectroscopy, subsequently calculating the values of ADC, rCBV and peak metabolites ratios: Cho/NAA, Cho/Cr and NAA/Cr. Several cases showed different topographic areas analyzed in PET and aMRI, then a new ROI was selected, re-processing the aMRI and re-calculating the rCBV and ADC in the same localization of the ROI with higher uptake on PET.
Results
In 10 patients there was agreement between MRI and PET results, with coincidence of the area with highest SUV and the area where spectroscopy was performed. In 8 patients there was disagreement; 1 was diagnosed by aMRI of progression and had a negative PET, being the final result a false positive aMRI and 7 cases with inconclusive MRI and PET showing tumour progression. Also, the rCBV and ADC showed lower values in the original ROI compared to the PET ROI of maximum uptake.
Conclusions
According this results, in LGG patients with suspicious of tumour progression and inconclusive MRI, the 18-F-Fluorocholine PET/CT seems useful as a complementary diagnostic test.

C0088 ASPECTS ON NON CONTRAST CT VS ASPECTS ON CT PERFUSION: SIMILAR, OPPOSITE OR COMPLEMENTARY MEASURES?

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Introduction/Objectives
Brain imaging has revolutionized the treatment of patients with acute ischemic stroke. CT is currently one of the most used imaging modality for evaluation of patients with acute stroke. It is used as a screening tool to exclude intracranial hemorrhage before taking therapeutic decisions.
Initial early ischemic changes (EIC) definition is based on edema and mass effect. On cerebral non contrast CT (NCCT) are initially defined as parenchymal hypoattenuation and focal swelling or mass effect.
The assessment of EIC using ASPECTS allows clinicians to identify patients candidates for thrombolysis or endovascular therapy. Traditionally, this score is measured at NCCT, however the use of CT perfusion techniques (CTP) expands the role of this score by providing physiologic insights into cerebral hemodynamics making this measure in so many cases more reliably.
The objectives were:
To review EIC on NCCT and CTP using ASPECTS
To illustrate differences and similarities of features between these two techniques and their clinical implications
To determinate the value of CTP ASPECTS in therapeutic decisions
Materials and Methods
Patients with isquemic acute stroke diagnosed and treated in our institution with endovascular treatment was retrospectively reviewed from June 2011 to June 2014, a total of 83 patients was included. ASPECTS was evaluated on NCCT and cerebral blood volume of CTP. Using the data obtained, we classified the findings and illustrate differences and similarities between these two techniques and illustrate their clinical implications.
Results
NCCT ASPECTS and CTP ASPECTS has similar radiologic values and best predicted infarct size in the absence of major neurologic improvement. Patients with NCCT ASPECTS ≥ 7 and CTP ASPECT ≥ 8 have good clinical outcome. CTP ASPECTS predicted major neurologic improvement.
Conclusions
NCCT ASPECTS and CTP ASPECTS are equivalent predicting radiologic outcome but CTP ASPECT may have an additional benefit predicting patients with major neurologic improvement.

C0089 NEUROIMAGING FINDINGS OF HEMATOLOGIC NEOPLASM AFFECTING THE CENTRAL NERVOUS SYSTEM

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Introduction/Objectives
Hematologic neoplasms that affects central nervous system (CNS) includes a broad spectrum of radiological appearances. Lymphoma, myeloma and leukemia can mimic many other pathologies of brain and spine and should be included in the differential diagnosis for almost any lesion in these structures. Knowledge of traditional and advanced imaging techniques and their findings is key to making the diagnosis and follow treatment response.
The objectives were:
To review typical and atypical presentations of CNS hematologic neoplasms at traditional computer tomography (CT) and magnetic resonance imaging (MR)
To show characteristic findings with advanced imaging techniques
To illustrate differences between CNS hematologic neoplasms and their principal differential diagnosis
Materials and Methods
Cases of lymphoma, multiple myeloma and leukemia in the CNS diagnosed and treated at our institution, was retrospectively reviewed. We evaluated radiological features on CT, traditional MR, perfusion imaging, diffusion-weighted images and MR spectroscopy studies.
Results
Using the data obtained, we classify findings by pathology, create algorithms for differential diagnosis and illustrate practical cases.
Conclusions
CNS hematologic malignances may be difficult to distinguish, with variable imaging appearances they can mimic other pathologies. Knowledge of different imaging findings and accurate radiological description of these lesions is essential in reaching the correct diagnosis to ensure timely an appropriate targeted therapy planning.

C0090 NEUROIMAGING APPEARANCES OF GLIOMATOSIS CEREBRI

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Introduction/Objectives

Gliomatosis cerebri (GC) is a rare diffusely infiltrating usually bilateral glial tumor involving at least 3 lobes. Its etiology is controversial and is classified as neoplasm of unknown histogenesis.

The prognosis is generally poor, survival ranges from weeks to years.

The imaging appearances of GC may be similar to more common diseases like arteriolosclerosis or herpes encephalitis, but the clinical presentations differ.

The Objectives were:

1. To review general GC issues
2. To show characteristic imaging findings at computed tomography (CT) and magnetic resonance (MR) and its correlation with microscopic pathology features
3. To explain the utility of MR advanced techniques in the diagnosis and monitoring
4. To illustrate differences between GC and its principal differential diagnosis using sample cases and diagnostic algorithms

Materials and Methods

We performed a literature review of the gliomatosis cerebri as well a review of cases diagnosed and treated in our institution during the period from January 2011 to January 2014. With the data obtained we made a review of epidemiology, natural history and clinical presentation of GC, imaging findings and the main differential diagnoses.

Results

1- Epidemiology, natural history and clinical presentation of GC
2- Review of imaging findings: CT features, Traditional MR features, Functional imaging findings (Diffusion, perfusion and spectroscopic imaging)
3- Radiopathologic correlation
4- Differential Diagnosis
5- Sample cases and diagnostic algorithms

Conclusions

Gliomatosis cerebri have characteristic features on conventional imaging which are well described however differentiating a lesion as GC on this imaging basis alone is often difficult. The increasing role of supportive imaging is important and may eventually preclude the need for histological diagnosis. Therefore it is important the knowledge of the imaging modalities and findings that are key to making the diagnosis.

C0091 TEXTURE ANALYSIS FOR DISCRIMINATING BETWEEN BRAIN METASTASES AND RADIONECROSIS IN ROUTINE MRI

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Introduction/Objectives

Brain metastases are usually treated with radiotherapy/radiosurgery, which may lead to radionecrosis. Both lesions have similar symptoms and appearance on MRI, but the associated treatment is different. To date, a precise diagnosis is only attainable pathologically after surgical resection. The purpose of the present work was to extract texture features from brain contrast-enhanced T1-MRI to discriminate between metastases and radionecrosis lesions by training a support vector machine classifier.

Materials and Methods

Our data included 115 brain lesions, 32 of them previously diagnosed as radionecrosis and 83 as metastases. Texture analysis was performed on the lesions, extracting 179 texture features. Prior to classification, a feature selection process was applied to determine the most relevant texture features and to avoid the curse of dimensionality. A feature selection process was carried out to reduce the number of texture features. Data were split into training (70%) and test (30%) subsets. A support vector machine classifier was developed with the reduced subset of features on training data.

Results

Sixteen features were selected, being most of them related to structural heterogeneity such as entropy and variance (derived from co-occurrence matrix), and high spatial frequency (derived from wavelet transform and run-length matrix). Receiver operating characteristic curves provided area-under-the-curve (0.93), accuracy (87.5%), sensitivity (91.3%) and specificity (77.7%) on test data.

Conclusions

The application of texture analysis and a support vector machine classifier was useful to discriminate brain metastases from radionecrosis in routine MRI.

Acknowledgments, conflicts of interest

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C0092 COMPUTER-AIDED DETECTION OF BRAIN METAST ASES IN CONTRAST-ENHANCED T1 WEIGHTED-IMAGES

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Introduction/Objectives

Approximately 25% of adult cancer patients suffer from brain metastases and the consequent cognitive and motor deficits. Our purpose was to detect a high percentage of brain metastases in brain magnetic resonance imaging (MRI) by means of a computer-aided method, emphasizing the reduction of false positives

Materials and Methods

Nineteen patients (11 men, 8 women, aged 65 ± 23 year-old) harboring 62 brain metastases from 2.5 to 44.1 mm in diameter were scanned using a 1.5 T MRI scanner after contrast administration. One third of the metastases became part of the training group and the rest belonged to the validation group. The images were acquired using a 3DT1 spoiled gradient-recalled echo (SPGR) sequence and a 1′1′1.3 mm^3 acquisition protocol. For brain metastases detection, three-dimensional tumor appearance templates were cross-correlated with the brain volume. Subsequently, for false positives reduction, two methods were applied in order to set a threshold and remove elongated objects such as blood vessels. Firstly, each detection was segmented in the three orthogonal views and an approximated three-dimensional degree of anisotropy was calculated. Secondly, each structure was segmented in all its extension and the three-dimensional degree of

anisotropy was obtained after applying the ellipsoid of inertia method.

Results

For the training group, a sensitivity of 85% and a false positive rate per slice of 0.045 and per case of 5.63 were obtained. The validation group showed a sensitivity of 88.1% and on average, 0.048 false positives per slice and 5.91 per case

Conclusions

Segmentation is a demanding task that has allowed to calculate the degree of anisotropy, leading to a reduction of false positives per slice by a factor of fourteen. This computer-aided method is a support to the clinical diagnosis. The methodology for false positives removal could be a complement to the existing methods.

C0093 ROLE OF NEUROIMAGING SCORES IN ACUTE STROKE TRIAGE

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Introduction/Objectives

Neuroimaging has revolutionized acute ischemic and hemorrhagic stroke diagnosis and management. Imaging techniques have been used to tailor therapy appropriate to a patient. CT was used as a screening tool to exclude intracranial hemorrhage before therapeutic decisions. This review summarizes current knowledge on the Alberta Stroke Program Early CT Score (ASPECTS) and other neuroimaging scores that help a clinician determine prognosis and decide on appropriate therapy in patients presenting with acute strokes.

Our objectives were:

• To review neuroimaging scores used in acute stroke triage
• To illustrate differences and similarities between these scores and their clinical implications
• To discuss the additional roles of ns on prediction of outcome in acute stroke patients
• To understand their correlation with clinical scores

Materials and Methods

We performed a literature review of the neuroimaging scores using in acute ischemic and haemorrhagic stroke triage, then we summarizes and explain these scores and illustrate them with imaging of patients diagnosed and treated in our institution.

Results

Ischemic Stroke:

Anterior Circulation Neuroimaging Scores:
ASPECTS
The One-Third Rule
The Clot Burden Store
The Boston Acute Stroke Imaging Scale (BASIS)
Leptomeningeal Collaterals Score on CTA
Posterior Circulation Neuroimaging Scores
pc-ASPECTS
Pons-Midbrain Index

Hemorrhagic Stroke

Primary Intracerebral Hemorrhage
The Total Volume of Extravasated Intracranial Blood
CT Angiography Spot Sign
Secondary Intracerebral Hemorrhage
Secondary Intracerebral Hemorrhage Score (SICH)
CT Angiography Spot Sign

Conclusions

Neuroimaging scores help in conveying pathophysiological information in acute ischemic and hemorrhagic strokes derived from imaging techniques in a simple, easy to use form that helps clinicians in making appropriate treatment decisions and in determining prognosis with reasonable accuracy.

C0095 MENINGIOMAS: RADIOLOGICAL FINDINGS IN A TWO YEARS EXPERIENCE STUDY

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Introduction/Objectives

To report our institution experience about meningiomas brain tumors. To review and illustrate signs, symptoms and principal imaging characteristics of meningiomas.

Materials and Methods

Meningiomas are the most common primary brain tumors, representing one-third of all such tumor. We retrospectively review the medical records of patients diagnosed with meningiomas brain tumors that have had surgically resection between January 2012 and December 2013 in our institution. We described imaging appearances, histological subtype, symptoms, and complications among other features.

Results

We have reviewed 23 patients in which 24 meningiomas have been surgically resected by neurosurgeons. 7 patients were males and 16 females; their ages ranged between 33-81 years (mean 64 years). The most common location was the convexity of the brain (39.1%), followed by parasagittal (falcine) (17.5%), posterior fossa (13.1%), olfatory groove (8.7%), supraorbital (8.7%), sphenoid ridge (4.3%), suprasellar (4.3%) and multiple (4.3%). The most frequent subtype was transitional (37.5%), followed by meningotheliomatous (20.9%), fibrous (20.9%), atypical (12.5%) psammomatous (4.1%) and secretor (4.1%). Symptoms, medical history, days of hospitalization, ASA classification system and post-surgical complications data were also collected. Tumor size ranged between 17-70 mm, mean size 47.6 mm. Imaging appearances included edema (35% of patients), calcifications (9%), homogeneous contrast enhancement (87% patients), or bone changes. 6 patients (26%) need surgery and radiation therapy.

Conclusions

Meningiomas are the most common extraaxial neoplasm found in adults being more common in women age 50 or older. In our institution, the most common location was the convexity of the brain, and the most common subtype was transitional. Radiologically, they have typical imaging characteristics being the homogeneous contrast enhancement the most frequent finding. Post-surgical complications were found in 10 patients (43%).

C0099 MR IMAGING OF LATE EFFECTS OF RADION THERAPY: VASCULAR MALFORMATIONS AND SECOND MALIGNANCIES

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Introduction/Objectives

Cerebrovascular effects and second malignancies are late effects of radiation therapy (RT), and important complications in patients with a longer life expectancy. Late reactions occur more than 90 days after the start of cranial radiation and are generally less reversible than acute or early-delayed reactions.

The purpose of this comunication is to review and to provide a better knowledge of this late radiation-induced injury by using some real cases.

Materials and Methods
We retrospectively reviewed several cases of intracerebral cavernous malformations and second malignancies of central nervous system (CNS) in patients who were treated with cranial RT during childhood or youth.
MRI findings were collected and literature reviewed.
Results
Cerebrovascular effects include vascular occlusive disease (stroke and other ischemic events) as well as cavernous malformations. Cavernous malformations occur with a latency of 3-6 to 20 years after radiation, with an overall cumulative incidence of 43% at 10 years and the detection increases when gradient-echo sequences are included. The risk of bleeding is higher than in patients non-irradiated and in those with radiological progression. The typical MRI finding is the "popcorn" image. May contain blood in different stages, hemosiderin ring and spontaneous bleeding. Usually appear in the radiated field.
The risk of secondary malignancies of CNS is both dose and age dependent. Among these tumors 70% are meningiomas, 20% gliomas and 10% sarcomas. Secondary meningiomas appear at the edge of RT area and are generally more aggressive, have a higher male-female ratio and patients are younger.
Conclusions
Control with MRI of the cerebrovascular effects and second malignancies of CNS tumors in long-term cancer survivors who received cranial RT may extend up 15 years, according to several authors because of the long interval between cranial RT and diagnosis. Recognize the features as well as the differential diagnosis should improve its follow up.

C0105 NEUROCUTANEOUS SYNDROMES: ROLE OF NEUROIMAGING

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Introduction/Objectives
Neurocutaneous syndromes (also called phakomatoses) form a rare and heterogeneous group of diseases, most of them hereditary with multisystem involvement including the presence of skin lesions and central and peripheral nervous system tumors.
The most common syndromes include neurofibromatosis (NF) (type 1 or Von Reckinghausen disease and type 2), tuberous sclerosis (TS), Sturge Weber syndrome (SWS) and von Hippel-Lindau syndrome (VHLS).
The aim of this communication is to review and improve the knowledge of the neuroimaging features of these neurocutaneous syndromes.
Materials and Methods
We reviewed retrospectively several cases of neurocutaneous syndromes and selected the relevant findings of each entity.
MRI findings were collected and literature reviewed.
Results
NF type 1 is the most common of all neurocutaneous syndromes. Plexiform neurofibromas are extracranial tumors found in NF-1 and pathognomonic but not always present. MRI findings are neurofibroma, optic glioma, cerebelar, brainstem and brain astrocitomas, hyperintense areas in T2WI, spinal dural ectasia, lateral thoracic meningocele, pachygyria, microgyria and other heterotopia.
NF type 2 also has a pathognomonic finding: bilateral vestibular schwannoma. Other findings are schwannomas of the cranial and spinal nerves which are common tumors, meningiomas (which are frequently multiple) and sublenticular cataract in a young patient.
ET also called Bourneville disease has subependimal nodules and cortical tubers in most of patients.
SWS shows cerebral atrophy with secondary bone and sinus hypertrophy, leptomeningeal thickening, and choroid plexus enlargement.
VHLS is characterized by hemangioblastomas. Nearly all hemangioblastomas occur in the posterior fossa or spinal cord. Ocular angioma is also a common finding.
Conclusions
Since neurocutaneous syndromes are life-long conditions neuroimaging plays an important role in diagnosis, follow up and screening of first-degree relatives of patients.

C0107 SPONTANEOUS INTRACRANIAL HYPOTENSION: ETIOLOGY AND DIAGNOSTIC IMAGING

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Introduction/Objectives
Spontaneous intracranial hypotension (SIH) is caused by spontaneous spinal cerebrospinal fluid (CSF) leaks and is characterized by orthostatic headache, low CSF pressure (less than 7 cm H2O) and diffuse pachymeningeal enhancement of brain MR imaging. Nevertheless other headache patterns occur as well and some patients have normal CSF pressure and normal brain MR imaging.
We review the role that neuroimaging techniques play in the diagnosis of SIH. We describe brain and spinal TC, MR and mielotomography imaging findings in our series of patients.
Materials and Methods
Brain and spinal imaging findings of our patients with SIH and literature were retrospectively reviewed.
Results
SIH is more often in women and CSF leak is usually located in cervical and thoracic spine due to alterations in the equilibrium between the volumes of intracranial blood, CSF and brain tissue.
Advances in neuroimaging have improved the ability to diagnose this syndrome and have allowed treating those patients misdiagnosed.
TC imaging findings are sub-dural collection, cerebellar tonsillar herniation into the foramen magnum and dural venous sinus distension.
MR imaging findings are diffuse pachymeningeal enhancement, subdural effusions and fluid collections, prominent venous structures, pituitary hyperemia and descent of the cerebellar tonsil.
Myelography could identify the location of CSF leak by introducing myelographic contrast into the thecal space.
Conclusions
Spontaneous intracranial hypotension remains underdiagnosed in patients with novel orthostatic headache. Diagnosis is based on clinical findings, cranial and spinal (specially cervical and thoracic) magnetic resonance imaging, and myelography (where available). Recognize these findings could help for a better diagnosis and treatment.

C0108 COMPARISON OF THE DIAGNOSTIC ACCURACY OF DIFFERENT ADVANCED MAGNETIC RESONANCE IMAGING PARAMETERS IN FOLLOW-UP OF LOW GRADE GLIOMA PATIENTS

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Introduction/Objectives
In the follow up of low grade glioma (LGG) it is a challenge to correctly diagnose tumour relapse. When conventional MRI is inconclusive, advanced magnetic resonance imaging (MRIa) could be considered as complementary, evaluating several parameters. The aim of this work is to compare the diagnostic accuracy of different parameters of MRIa by ROC analysis in LGG patients and to determine which one is the best for the correct diagnosis of tumor progression.
Materials and Methods
Prospective study including 18 patients treated of LGG under follow up and clinical/radiological suspicion of tumour progression. MRIa was performed to all patients according to international protocols obtaining parametric maps of apparent diffusion coefficient (ADC) and regional cerebral blood volume (rCBV). In the same localization of the regions suggestive of tumour progression, were performed the perfusion, diffusion and single voxel spectroscopy, subsequently calculating the values of ADC, rCBV and peak metabolites ratios: Cho/NAA, Cho/Cr, NAA/Cr, myo-inositol/NAA and myo-inositol/Cr. Diagnostic accuracy was compared between each of the parameters, using ROC analysis. Final diagnosis was obtained by histology of surgical specimen (n = 5) and by consensus report according clinical and imaging evolution (n = 13).
Results
Three patients were considered negative for tumour, in 5 tumors activity was surgically corroborated and in 13 was assumed by consensus. The highest area under ROC curve was found in the rCBV (area = 0.933), followed by metabolites ratios of Cho/NAA and Cho/Cr (both with area = 0.758). The parameter showing the smallest area under ROC curve was the rADC (area = 0.533).
Conclusions
According to our results, the best diagnostic accuracy of the MRIa parameters is achieved by the rCBV in patients with LGG under suspicion of relapse.

C0109 CYTOMEGALOVIRUS-RELATED FETAL BRAIN LESIONS: COMPARISON BETWEEN PRENATAL MAGNETIC RESONANCE IMAGING AND NEUROULTRASOUND

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Introduction/Objectives
Congenital cytomegalovirus (CMV) infection can cause auditory, cognitive and neurological impairment. Magnetic Resonance (MRI) has been reported to show abnormalities in the fetal brain after CMV infection even when ultrasound (US) results are normal. The aim of our study was to evaluate the potential of prenatal MRI to predict symptomatic neonatal infection and to compare it to dedicated neuro-US.
Materials and Methods
We studied 9 cases of congenital CMV infection, reviewed abnormal findings in their prenatal brain MRI and US, and compared them with findings on postnatal brain US and clinical follow-up at 18 months. Diagnosis of infection was established by positive polymerase chain reaction in amniotic fluid. The gestational age at imaging was 28 ± 4 weeks. Fetal brain MRI examinations were aquired in a General Electric, 1,5 Tesla, Signa MRI suite. US examinations were obtained with a General Electric Voluson system equiped with 3D software.
Results
Abnormalities were shown by US in 3 (33%) cases: cerebellar hypoplasia (1), ventriculomegaly (2), microcephaly (2), periventricular calcifications (2), enlarged cisterna magna (1) and ventricular sinechiae (1). MRI showed abnormal findings in 5 (55%) fetuses: cerebellar hypoplasia (2), ventriculomegaly (2), altered neuronal migration (2), enlarged cisterna magna (2), microcephaly (1), periventricular calcifications (2), cortical anomalies (2), white matter anomalies (2), temporal lobe lesions (2) and ventricular sinechiae (1). The 4 fetuses with negative MRI were asymptomatic at birth and at 18 months follow up. Of the 5 fetuses with findings in fetal MRI, 1 died in the neonatal period, 1 had severe neurological symptoms, 2 had mild neurological symptoms and 1 was asymptomatic.
Conclusions
Fetal brain MRI detects more abnormalities than neuro-US, especially cortical mantle, temporal lobe and cerebellar anomalies. Our study suggests that the positive predictive value of US for symptomatic neonatal infection is increased with the addition of prenatal MRI.

C0110 ENDOVASCULAR TREATMENT OF INTRACRANIAL ANEURYSMS: A TEN YEARS SINGLE-CENTRE EXPERIENCE

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Introduction/Objectives
To present our experience in endovascular treatment of intracranial aneurysms showing epidemiological data, clinical findings, and size and location of the aneurysms.
Materials and Methods
We prospectively collected all consecutive patients who underwent endovascular treatment of intracranial aneurysms at our institution in the last ten years (from January 2004 to December 2013). Patients under 14 years old and patients with dissecting and/or fusiform aneurysms were excluded. Epidemiological data, clinical presentation (Hunt and Hess scale), diagnostic imaging findings (Fisher scale) and therapeutic data were collected from Neuroradiology Unit of our Hospital.
Results
A total of 238 aneurysms in 188 patients (127 women and 61 men) were treated. Mean age was 55 year (range 15-86). Clinically, 151 patients presented with subarachnoid hemorrhage; in 30 patients, the aneurysm was incidentally found; and 7 patients presented with other symptoms (1 hydrocephalus, 2 diplopia, 1 headache, 1 cranial nerves compression, 1 cerebellar syndrome and 1 vision loss). According to location, 94.54% of the aneurysms were located on the anterior circulation and 5.46% on the posterior circulation. Mean size of treated aneurysms was 5.57 mm (range 2-40 mm). According to endovascular therapy, 152 aneurysms were occluded with coils; 81 aneurysms required balloon and / or stent assistance for coil embolization; and 5 aneurysms were treated with stents. Seventeen patients died within 30 days after therapy. Treated patients were followed up by MR-angiography. No rebleeding events were reported.
Conclusions
In the last ten years, a total of 238 intracranial aneurysms were endovasculary treated at our institution with low periprocedural morbidity and mortality rates. No rebleeding events were reported.

C0111 MR ANGIOGRAPHY FOLLOW-UP OF RUPTURED INTRACRANIAL ANEURYSMS ENDOVASCULARY TREATED

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Introduction/Objectives
To show MR angiography follow-up of ruptured intracranial aneurysms endovascular treated at our institution.

Materials and Methods
We prospectively collected all consecutive patients who underwent endovascular treatment of ruptured intracranial aneurysms at our institution in the last ten years (from January 2004 to December 2013). We established a surveillance protocol based on MRI for these patients. The protocol included a cerebral MRI and gadolinium-enhanced MR angiography at 6, 12, 24, and 60 months after the procedure. MR studies were reviewed by both diagnostic and interventional neuroradiologists and findings were classified into three categories: complete occlusion, residual neck and residual aneurysm. Data were collected from Neuroradiology Unit of our Hospital.
Results
A total of 152 aneurysms in 151 patients (100 women and 51 men) were treated. Mean age was 56.23 year (range19-86). According to location, 95.4% of the aneurysms were on the anterior circulation. Mean size of treated aneurysms was 4.41 mm (range 2-30 mm). One hundred twenty-three patients (80.92%) were endovascular treated within 48 hours after the aneurysmal rupture. Balloon and / or stent assistance for coil embolization was required in 26.31% of cases. According to follow-up, 15 patients died within 30 days after treatment; 43 patients were lost to follow-up, and 53 patients were followed-up during 24 months. Among all patients, 15% were re-treated. There were no rebleeding events after treatment.
Conclusions
Early endovascular treatment of ruptured intracranial aneurysms is a feasible and safe procedure with a very low mortality rate. This therapy can prevent rebleeding events. MR angiography is a non-invasive technique useful for long-term aneurysms follow-up.

C0112 OCCUPATIONAL EXPOSURE TO RADIATION IN THE CRYSTALLINE DURING NEUROANGIOGRAPHIES

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Introduction/Objectives
In Interventional Neuroradiology few operators routinely use radiation protection glasses. Moreover, radiation dose data in most Centers only accounts for whole body dose without specific information on crystalline dose. In 2011, the International Commission on Radiological Protection advised that the threshold limit value to the crystalline should be 20mSv/year instead of the previous 150mSv limit. The purpose of this study was to measure the radiation dose in the operator´s crystalline in Diagnostic and Interventional Neuroangiographies in order to calculate the number of procedures that may be performed per year within the suggested limit of exposure.
Materials and Methods
Using the EDD30 dosimeter, accumulated radiation dose in the crystalline was measured in 13 neuroangiographies: 7 diagnostic and 6 interventional. Operators with and without radiation protection glasses were included and the sensor was placed near their left eye, closest to the radiation beam.
Results
Without glasses, the mean dose of radiation in the crystalline was 6,38μSv for diagnostic procedures and 248,67μSv for interventional procedures. Using glasses, these values were reduced to 2,10μSv and 17,45μSv, respectively.
Conclusions
Considering 20mSv as the suggested annual limit of equivalent dose in the crystalline, neuroradiologists may perform up to 3134 diagnostic procedures/year without protecting glasses, number that increases to 9524 when glasses are consistently used. Regarding intervention, a maximum of 80 procedures/year is advised if glasses are not used and up to 1146 procedures/year may be performed using this protection. Therefore, neuroradiologists should always wear radiation protection glasses, mainly in interventional angiographies.

C0114 COMPUTED TOMOGRAPHY PERFUSION (CTP) VS NON ENHANCED CT (NCT) IN THE MANAGEMENT AND TREATMENT OF ACUTE BRAIN STROKE

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Introduction/Objectives
To determine whether the use of computed tomography perfusion (CTP) has any statistical significance vs. Non-enhanced computed tomography (NCT) in the treatment, management and outcome of an acute brain stroke.
Materials and Methods
Descriptive - retrospective study of 46 patients attended at our hospital from January 2012 to May 2014, with an acute brain stroke, affecting the middle cerebral artery (MCA) territory, and treated with intravenous thrombolytic therapy (r-TPA). The stroke protocol in our hospital, National Institutes of Health Stroke Scale, or NIH Stroke Scale (NIHSS) to determine the neurological impairment at the emergency room, time of onset of symptoms, NCT (to discard hemorrhagic stroke), CTP (to evaluate presence of penumbra), finally treatment intravenously with r-TPA with less than 6 hours of total time of onset of symptoms. The patients were divided into 2 groups, group 1: patients study only with NCT and group 2: patient study with NCT + CTP. Statistical analysis was performed using SPSS Mac v.21, with the help of parametric and non-parametric tests, to compare each group and find out if statistical difference exists.
Results
Group 1: 25 patients were obtained with a mean age of 73.92 years Â ± 10.03, with a range of 56-89 years. Group 2: 21 patients were obtained with a mean age of 68.80 years Â ± 17.47 with a range of 28-85 years. No statistical differences were obtained between the two groups (CTP vs. NCT) with the following variables (age, initial NIHSS, and the initial systolic and diastolic blood pressure). Statistical differences were obtained regarding total time (from onset of symptoms to thrombolytic therapy time). NCT group with mean of 02:45 hrs (02:27-03:03 hrs, 95% confidence interval) vs. CTP group mean 03:30 hrs (02:56-04:04 hrs, 95% confidence interval). (P = 0.022 t-test). No significant difference existed between the following variables: 24 hrs NIHSS, discharge NIHSS, hemorrhagic complication secondary of thrombolytic therapy, and the average length of stay in days.
Conclusions
Brain perfusion helps neurologist and radiologist on call, to determine if patients with an acute ischemic stroke will benefit with an intravenous thrombolytic therapy and to provide longer time window especially in patients with wake-up stroke and undetermined onset of time.

C0117 MYOTONIC DYSTROPHY TIPE 1: WHITE MATTER DISEASE EVALUATION BY MAGNETIC RESONANCE IMAGING AND ITS CORRELATION WITH NEUROPSYCHOLOGIC DYSFUNCTION

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Introduction/Objectives
To analyze severity and localization of white matter disease with brain magnetic resonance imaging (MRI) in patients with myotonic dystrophy

1 (DM1) or Steinert's disease. To assess the relationship between white matter lesions and specific cognitive impairment.

Materials and Methods

Twenty-one patients with genetically confirmed DM1 diagnosis and 14 healthy controls of equivalent range of age were studied. A structural cranial MRI was performed (T1/T2/FLAIR/diffusion-weighted sequences) and a neuropsychological evaluation including memory, attention and visuospatial assessment. White matter lesions extent was assessed according to the ARWMC (age-related white matter changes) scale, and correlation of disease severity with neuropsychological impairrment was examined.

Results

Subjects with DM1 showed a higher degree of white matter disease as compared to controls and a high degree of impairment in neuropsychological evaluation

Conclusions

White matter disease, specifically in anterior temporal region, is frequent in DM1 and may suggest demyelination and/or axonal destruction as the etiopathogenic mechanism underlying neuropsychological impairment in DM1 patients

C0121 VOLUMETRIC AND VISUAL ASSESSMENT OF BRAIN ATROPHY IN COGNITIVE DECLINE

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Introduction/Objectives

It has been documented that several stages of brain atrophy may appear in cognitive decline. However, the diagnostic value of visual inspection and volumetry of different regions of the brain on MRI in daily practice is insufficiently known. The present study aims to correlate volumetric data from different brain regions and neuroimaging scales in a cohort of elderly subjects without known brain disease.

Materials and Methods

150 subjects followed in Primary Care, with age > 50 years and no known brain disease, were examined by a structural 3T brain MR study. Visual assessment scales such as GCA (Global Cortical Atrophy), MTA (Medial Temporal lobe Atrophy) and Koedam (posterior parietal atrophy scale) were rated by two different neuroradiologists and inter-rater reliability was compared. Whole brain volumetric analysis and segmentation were also performed according to both Destrieux and Desikan atlases (using FreeSurfer software package). Statistical data correlations were calculated.

Results

Inter-rater agreement for neuroimaging scales was variable among different scales (kappa ranged between 0,5 for Koedam and 0,75 for MTA) and significant correlations were found between those visual assessment scales and some volumetric results. We point out statistically significant correlations between GCA and the supratentorial intracranial volume, between MTA and hypoccampal and amygdala volumes (in both hemispheres) and, though weaker, between Koedam and both left superior parietal lobule and left angular gyrus.

Conclusions

Since visual rating scales of both global and segmental atrophy correlate with volumetry and are quicker to perform with a good inter-rater reliability, we propose that they can and should be used in a clinical setting when evaluating patients with cognitive decline. Regarding the recent Koedam scale, its weaker correlation is in agreement with its lower inter-rater reliability suggesting it still needs more validation before it is implemented routinely in clinical practice.

C0123 THE PERSISTENT OCCLUSION OF THE CENTRAL SULCUS ARTERY IS RELATED WITH POOR FUNCTIONAL PROGNOSIS IN THE ENDOVASCULAR TREATMENT OF M2 OCCLUSIONS

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Introduction/Objectives

The arterial recanalization in patients with acute ischemic stroke is a strong factor to improve their prognosis. The endovascular treatment is a proved technique that reaches this goal. However, in patients with M2 middle cerebral artery occlusion this treatment is not often considered. The aim of this study was to evaluate safety and efficacy of endovascular treatment in these patients and its impact in their functional prognosis.

Materials and Methods

This retrospective single-centre study includes 33 consecutive patients with acute ischemic stroke due to occlusion of the M2 artery treated with endovascular thrombectomy within 8 hours symptom onset. Successful recanalization rates (Thrombolysis In Cerebral Infarction 2b–3), post-procedure persistent occluded territory, periprocedural complications, symptomatic hemorrhage, modified Rankin Scale (mRS) and mortality rate at 90 days were assessed.

Results

The mean age of patients was 74 ± 8 years; ten patients (30.3%) were male. Successful revascularization was obtained in twenty-five patients (75.75%) with 5 (15.15%) periprocedural complications. Symptomatic intracranial hemorrhage was detected in three patients (9.1%). Good functional outcome (0-2 mRS) at 3 months was observed in 60.6% of the patients (20/33) and the mortality rate was 15.15% (5/33).

Persistent occlusion of the central sulcus artery was seen in five patients. These cases are more likely to present poor functional prognosis (3-6 mRS) in comparison to patients where this artery is permeable after the procedure (80%vs.32.1% $p = 0.04$).

Conclusions

Endovascular therapy achieved high recanalization rates in M2 occlusions; therefore, this treatment may improve the clinical outcome. However, the complication rate is higher than expected, so the risk-benefit should be carefully evaluated in every case.

The persistent occlusion of the central sulcus artery is related with poor functional prognosis, thus its recanalization should be mandatory.

C0127 SALIVARY GLANDS PATHOLOGY: DIAGNOSTIC ALGORITHM, INCIDENCE AND REVISION OF LITERATURE

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Introduction/Objectives

To determine the incidence of salivary gland pathology in our centre and its radiology features by different imaging modalities. Revision of literature.

Materials and Methods

Retrospective study of salivary gland lesions analyzed in our centre with histological confirmation between January 2013 and June 2014. We

observed its behaviour by US and MR/CT and compared it with those published in the literature.

Results

We obtained 103 salivary gland lesions: 64 were parotid lesions (86% tumoral but only 15% of them were malignant), 9 lesions came from submaxilar gland (33% were tumours and there were no malignancies) and finally we had 30 minor salivary gland lesions with 18% of malignancies of the total of tumours.

Conclusions

There are plenty of histologic types of tumors in salivary glands being the tissue with the most heterogeneous group of tumours. Most of them are localized in the biggest gland, which is parotid gland, although the percentage of malignant lesions is higher in those localized in minor glands.

Acknowledgments, conflicts of interest

Hospital Universitario de Canarias Anatomic Pathology Service

C0133 EMBOLIZATION OF HEAD AND NECK PARAG ANGLIOMA. REVIEW OF A 5-YEAR EXPERIENCE

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Introduction/Objectives

Paragangliomas are rare tumors of neural crest origin which commonly arise from the carotid body, the jugular bulb or the vagal nerve. The definitive treatment for these tumors is surgical resection, often augmented with pre-operative embolization due their highly vascular nature. The aim of this poster is to review CT, MRI and angiography findings of paragangliomas and to present our experience examining the efficacy and safety of endovascular embolization of these tumors.

Materials and Methods

A review of patient's diagnosed with paragangliomas who underwent pre-operative embolization over a 5-year period (2008–2013) was performed. Fiveteen patiens were included. The tumor subtype, efficacy of embolization, method of embolization, and rate of complication were noted.

Results

All patients were subjected to digital subtraction angiography to define the vascular supply of the tumor. The most common artery embolized was the ascending pharyngeal branch of the external carotid artery.

Conclusions

Combined therapeutic approach with preoperative selective embolization followed by surgical resection is a safe and effective method for complete excision of the tumors with a reduced morbidity rate.

C0138 COMPLICATIONS OF THE UNPROTECTED CAROTID ARTERY STENTING

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Introduction/Objectives

An observational, prospective study was performed to evaluate the safety of unprotected carotid artery stenting.

Materials and Methods

266 patients were included with 278 carotid stenosis. Inclusion criteria were the following:

- Symptomatic patients with a ≥ 70% stenosis.
- Symptomatic patients with a 50%-70% stenosis despite antiplatelet therapy.
- Symptomatic patients with progressive ≥ 70% stenosis.
- Significant stenosis with contralateral carotid occlusion.

Periprocedural, within 30 days and a year after the procedure complications were evaluated

Results

The procedure wasn´t successfully completed in 8 patients. There were complications produced by compression of the carotid sinus in 50 patients (18%), all of then recuperated without severe damage. 2 inguinal hematoma after femoral puncture. There were 3 TIAs, 1 disabling stroke, 1 nondisabling stroke and 1 intracranial bleeding. The combined rate disabling stroke, death or myocardial infarction was 0.37% (n = 1).

In 258 patients treatment was completed. During the initial 30 day follow-up there were 1 TIA, 2 disabling stroke, 3 nondisabling stroke, 2 intracranial bleeding and 6 deaths (3 stroke, 1 myocardial infarction and 2 nonrelated). The combined rate disabling stroke, myocardial infarction and death was 2.7%.

243 patients treated completed a year follow-up, 9 patients were lost to follow-up. There were TIAs (n = 4), disabling stroke (n = 2), nondisabling stroke (n = 3), myocardial infarction (n = 3) and 5 deaths (1 stroke, 1 myocardial infarction y 3 others). The combined rate disabling stroke, myocardial infarction and death was 4% (n = 10).

Conclusions

In our experience unprotected carotid artery stenting is safety and effective procedure; complications rate are similar between carotid artery stenting without protection and patients treated with cerebral protection.

C0144 HYPERTROPHIC OLIVARY DEGENERATION: REVIEW OF THE LITERATURE AND REPORT OF 5 CASES

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Introduction/Objectives

The Hypertrophic olivary degeneration is an atypical process due to lesions to the dentato-rubro-olivary pathway. Initially described by Guillain and Mollaret and with a characteristic clinical symptoms. From an anatomopathological point of view there is a vacuolar degeneration with astrocytes proliferation.

Our presentation objective is to perform a preview of the anatomical and functional pathways involved and the physiopathology of the hypertrophic olivary degeneration.

Materials and Methods

We present 5 cases from our institutional records, with different etiologies, although all of them with lesions in the dentato-rubro-olivary pathway and anatomical imaging of hypertrophic olivary degeneration.

Initially described as a hemorrhagic lesion of the dentate nucleus, we present cases secondary to different etiologies such as cavernomas, lacunar infarcts, perimesencephalic hemorrhage and postsurgery.

Results

The imaging findings in conventional sequences are described ands its correlation to diffusion and perfusion studies, the latency, evolution and progression since the cause happened.

Conclusions

The Hypertrophic olivary degeneration is a low frequency pathology that has many causes and an exhaustive knowledge of the

involved neural network of the posterior fossa is needed to do a correct diagnosis.

C0145 RESOLVE VERSUS TYPICAL EPI DIFFUSION IMAGING AT 3T IN HEAD AND NECK TUMORS

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Introduction/Objectives
The head and neck region is particularly difficult for performing DW imaging.
A readout segmented diffusion technique (RESOLVE) permits the use of extremely short echo spacing independent of the spatial resolution, reducing the image distortions.
The purpose of this study was to compare lesion conspicuity on RESOLVE versus typical EPI diffusion imaging at 3T in patients diagnosed with head and neck tumors.
Materials and Methods
We performed 3TMR imaging in 26 patients with different head and neck tumors using two different DWI-sequences (conventional and RESOLVE), in the period from July2013 and February2014. We recorded in each sequence the presence or absence of artifacts and its severity. In addition a quantitative analysis of the ADC values of the primary tumor was performed
Results
The lesions were found 19(73.0%) at the oral cavity, 5(19.9%) at the oropharynx, and 2(7.6%) at other locations.
23 patients were diagnosed of squamous cell carcinoma: 7 patients(26.9%) were staged T1, 3 patients(11.5%) staged T2, 2 patients(7.6%) staged T3, and 11 patient (42.3%) staged T4. The remaining 3 patients had lymphoma(1) and benign tumors(2).
Of the 7 patients staged T1, in 3 patients (42.8%) the lesion was identified with the DWI RESOLVE sequence and none with the conventional DWI sequence. The other stages of the desease were seen with both sequences.
Mild artifacts were identified on the DWI RESOLVE images in 2 cases (7.6%), while all conventional DWI images cases had different degrees of artifacts classified as mild in 4(15.3%) cases, moderate in 17(65.3%) cases and severe in 5(19.2%) cases.
ADC values of the primary lesions assessed with the two sequences showed minimal, although non-significant differences.
Conclusions
DWI RESOLVE sequences minimize the susceptibility artifacts that are constantly identified with conventional DWI sequences. These preliminary results suggest better lesion conspicuity under RESOLVE when compared to standard DWI sequence, supporting the use of this technique at 3T for assessing head and neck tumors.

C0151 3T MAGNETIC RESONANCE IMAGING IN THE DIAGNOSIS OF EPILEPSY, A NEW WINDOW THROUGH WHICH TO LOOK AT THE PRESENT

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Introduction/Objectives
Magnetic resonance imaging is the main structural imaging in epilepsy. Current situation of MRI techniques, propose a basic protocol of epilepsy and mention the indications for structural or morphological MRI.
Any injury affecting cortical gray matter of the cerebral hemispheres may be susceptible of causing epilepsy. The most common causes of focal seizures are medial temporal sclerosis (MTS) and focal cortical dysplasia (FCD).
Materials and Methods
Numerous studies have proven that the use of lower field magnets of 1.5T is absolutely contraindicated and that the use of routine sequences are inadequate. The main objective of a study in patients with epilepsy suspect, is to maximize contrast between white and gray matter.
3T magnetic fields have the advantage of increasing the signal/noise ratio. They also improve the contrast in T2WI, so is possible to increase resolution and contrast, using similar timing to those with conventional protocols.
A basic epilepsy protocol included 3D T1WI sequences, coronal T2WI and FLAIR, and axial FLAIR and T2* images.
Results
We had several patients who were studied with 1.5T magnetic resonance due to a clinical and/or electroencephalographically suspicious focal seizure. After a while and a new 3T MRI, patients who continued with clinical or pathological data were radiologically reassessed. In some of them the results were negative again. But in a considerable number of patients, and with the use of normal MRI sequences, typical changes due to MTS or FCD were observed.
Conclusions
This difference, as described in previous studies, is expected. Therefore, and given the recent availability of such MR, an exhaustive analysis by a specialist radiologist clearly increases diagnostic sensitivity in proving organic causes of a focal seizure.
All of these makes 3T MR in an essential tool in cases of doubt, prior surgery, drug-resistant epilepsy or those whom evolution or prognosis is uncertain.

C0154 INTRAARTERIAL TREATMENT OF STROKE. OUR EXPERIENCE

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Introduction/Objectives
Assessment of intraarterial treatment in patients with ischemic stroke in a hospital with a target population of 800,000.
Materials and Methods
Retrospective assessment of a prospectively collected data during the period January 2010-May 2014. The variables analyzed were: demographic variables, duration of symptoms, NIHSS scale, location of occlusion, prior administration of intravenous thrombolysis (IVT), time to angiography and score on the Rankin Scale (mRS) per month.
Results
150 patients were included consecutively, 100 men (66.6%) and 50 women (33.3%) with a mean age of 67.2 years (range 29-91; SD 11,75).
The average time from onset of symptoms to arrival at the center was 165.1 minutes.
The mean NIHSS score was 16.2 (range 4-30; SD 5.1).
The affected vessel was the MCA in 50.6% (n = 76), the ICA in 38% (n = 57) and posterior circulation in 11.3% (n = 17).
Prior TIV was administered in 46% of patients (n = 69).
Mean time from arrival at the center until the completion of angiography was 51 minutes in cases where only intraarterial treatment was performed and 99.5 minutes when TIV was administered prior.
Intraarterial treatment was performed in 138 patients (92%). The type of treatment was: drug 15.9% (n = 22), guidewire and microcatheter 2.9% (n = 4), balloon angioplasty 0.7% (n = 1), stent 13% (n = 18), Penumbra thromboaspiration catheter 1.4% (n = 2), Stentriever 29% (n = 40) and combined therapies 36,9% (n = 51).
It was achieved recanalization TICI 2b/3 in 72% of cases (n = 99).
In clinical assessment per month, 55.8% of patients had mRS ≤ 2 (n = 77).
Mortality (mRS = 6) was 21% (n = 29).

Conclusions
In our center the data obtained are consistent with the results of published clinical trials.

C0159 APPLICATION OF 3D FAST IMMAGING WITH STEADY STATE ACQUISITION (3D FIESTA) SEQUENCES IN THE EVALUATION OF AQUEDUCTAL STENOSIS.

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Introduction/Objectives
One of the most common causes of hydrocephalus is aqueduct stenosis. Standard protocols frequently include fast spin echo T2-weighted (FSE T2W) sequences in morphological and qualitative assessment. These sequences provide a marked myelographic effect and also are useful for detecting turbulent cerebrospinal fluid flow when flow artifacts are seen. However, these artifacts often prevent a clear image of the aqueduct.
We propose the use of 3D Fast imaging with Steady State Acquisition (FIESTA) for such morphological assessment, these sequences maintain myelographic appearance, but with sensitivity to cerebrospinal flow (CSF) pulsation and magnetic artifacts decrease, with the possibility to make high quality reconstructions in MIP, MPR and volume rendering.
Materials and Methods
We apply 3D FIESTA sequences on the anatomical region comprising all along the aqueduct of Sylvius. This requires extending the range to third and fourth ventricles and centering at that position. We compare the obtained measurements and the advantages of multiplanar reconstruction.
Results
Different segments of the aqueduct of Sylvius are measured in order to obtain high definition images, which allow a better characterization of the stenosis within normal T2WI sequences.
They also provide more detailed information of the rest of the ventricular system and basal cisterns.
Conclusions
3D FIESTA sequences allow optimal morphological characterization of the spaces occupied by CSF, being very useful in the definition of the aqueduct, and solving the problems presented on FSE T2W.
We would therefore recommend the inclusion of 3D FIESTA sequences in an MR imaging protocol of CSF.

C0160 CT ANGIOGRAPHY SOURCE IMAGES PREDICT FUNCTIONAL OUTCOME AND MORTALITY RATE IN PATIENTS WITH BASILAR ARTERY OCCLUSION TREATED WITH MECHANICAL THROMBECTOMY

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Introduction/Objectives
The aim of our study was to evaluate non-enhanced CT (NECT) and CT angiography source images (CTASI) on admission and its relationship with functional outcome and mortality rate at 3 months in patients with basilar artery occlusion (BAO) treated with mechanical thrombectomy with successful recanalization.
Materials and Methods
This retrospective single-center study included 17 patients with BAO treated with mechanical thrombectomy within 24 hours from symptom onset in whom successful recanalization was achieved. The pc-ASPECTS scale and Pons-Midbrain index (PMI) was analyzed in NECT and CTASI images performed on admission by one neuroradiologist and one resident in consensus. The results were dichotomized (pc-ASPECTS ≥ 8 vs. < 8; PMI ≥ 3 vs. < 3) and its associations with functional outcome and mortality at three months were evaluated.
Results
The median age was 61 ± 19 years and 12 patients were male. Median NIHSS score at admission was 20 (IQR 11-30). Twelve had a pc-ASPECTS score ≥8 and nine patients had a PMI score
Conclusions
On CTASI images, PC-ASPECTS score predicts functional outcome, and PC-ASPECTS and PMI score predict mortality rate in patients with BAO treated with mechanical thrombectomy. Prospective studies are needed with larger numbers of patients to confirm these findings.

C0161 RADIOLOGICAL MANIFESTATIONS OF ACCUTE DISSEMINATED ENCEPHALOMYELITIS

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Introduction/Objectives
Acute disseminated encephalomyelitis (ADEM) is an usually subacute phase course and multifocal demyelinating and inflammatory disease, most with a close temporal relationship to an infectious event and / or vaccination. There are also several diseases such as multiple sclerosis, presenting with very similar images. Therefore we present this review, with the aim of recognizing the main clinical and radiological findings of this disease, which can help to make a correct differential diagnosis features.
Materials and Methods
A retrospective study of all cases of ADEM diagnosed in our center in the last fifteen years is performed. A review of the most common clinical presentation is shown as well as the most common findings on CT and MRI. Further clinical follow-up of these patients is performed over this period.
Results
In the review the typical findings on the behavior of this disease is mainly through MR images and the different topographic patterns, some with spinal cord involvement. We also appreciate their evolution in time, key point, given their usual acute or subacute character.
It takes, on the other hand, a clinical follow-up of these cases over the past fifteen years, in order to show what is the prognosis of this disease and the factors that confer a more aggressive this disease characteristics.
Conclusions
The diagnosis of ADEM is held before a, multifocal, monophasic demyelinating and inflammatory characteristics and subacute clinical presentation. MRI of brain and / or spinal cord and the evolution of the lesions over time, are essential to exclude other diagnoses, especially MS.

C0173 MULTIVARIANT ANALYSIS IN MR IMAGING OF SALIVARY PLEOMORPHIC ADENOMAS

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Introduction/Objectives
Pleomorphic Adenomas are the most common salivary gland tumors.
They are benign neoplasms but associated with a malignancy trasformation rate of 5%. For this reason surgical resection is the treatment of choice.

The surgical methods used in the treatment of tumors go from enucleation to complete parotidectomy with sacrifice of the facial nerve. Choosing one or the other depends on whether the tumor is benign or malignant and the tumor type.
The purpose of this study is to establish MRI as the technique of choice in the study of pleomorphic adenomas because lets define the morphological and biological characteristics of image that distinguish them from other tumor histpathologies.
Materials and Methods
We reviewed MRI studies of 54 Pleomorphic Adenomas. 2 of them located in minor salivary glands, 3 located in submandibular gland and 49located in the parotid gland. Morphological characteristics (location, size, morphology and signal pattern) and biological imaging parameters (CDA value and pattern of uptake in perfusion sequences) are analysed
Histological confirmation was performed in all cases.
Results
If the following conditions are met:
MR morphological characteristics:
- A lesion with well defined edges
- Hyperintense signal on T2
- Intense enhancement after gadolinium administration
MR Biological characteristics:
- ADC values greater than 1.6
- Pattern of progressive uptake in MRI perfusion
Then Pleomorphic Adenoma was the diagnosis with a specificity of 100%, a sensitivity of 55%, a PPV of 100% and an NPV of 82.2%
Conclusions
MR not only determines the location and extension of the lesion but also allows the definitive diagnosis of pleomorphic adenoma with high reliability. This can help to define the surgical approach and even avoid performing preoperative FNA.

C0174 MULTIVARIANT ANALYSIS IN THE STUDY OF MRI WARTHIN TUMORS

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Introduction/Objectives
Warthin tumors are the second most common salivary tumors. They are located exclusively in the parotid gland. They are benign epithelial lesions found most frequently in older patients. Malignant transformation is rare. Although the treatment of choice for parotid tumors is surgical resection, the characteristics described above have made that observation may be a treatment option.
The purpose of this study is to establish MRI as the technique of choice for the study of Warthin tumors because it allows to define the morphological and biological characteristics that distinguish them from other tumor histopathologies
Materials and Methods
51 MRI studies of Warthin tumors located in the parotid gland are reviewed. Morphological characteristics (location, size, morphology, and signal pattern) and Parameters biological imaging (ADC value and pattern of uptake in perfusion sequences) are analysed.
Histological confirmation was performed in all cases
Results
If the following conditions are met:
MR morphological characteristics:
- A lesion with well defined edges
- Hypointense or isointense signal on T2
- Mild enhancement after gadolinium administration
MR biological characteristics:
- ADC values less than 1
- Early uptake of contrast with quick washout in MRI perfusion
Then Warthin tumor was the definitive diagnosis with a specificity of 98%, a sensitivity of 47%, a PPV of 92% and an NPV of 79%
Conclusions
MRI and to determine the location and extent of the lesion allows for early diagnosis of Warthin tumor with high reliability. This can help to define the treatment of choice specially when the tumor is located in the deep lobe and occurs in older individuals with associated comorbidities

C0175 UTILITY OF RADIOLOGIC IMAGING IN THE DIAGNOSIS AND FOLLOW UP OF NORMAL PRESSURE HYDROCEPHALUS

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Introduction/Objectives
To evaluate the utility of imaging features in the diagnosis of normal pressure hydrocephalus (NPH) and in predicting the outcome after ventriculoperitoneal shunt (VPS).
To illustrate the radiological changes after surgery.
To investigate whether there is a relationship between clinical outcome and onset time of symptoms.
Materials and Methods
Between January 2007 and February 2013, we examined 50 patients with suspected NPH. 21 patients were not candidates for VPS on the basis of comorbidity or age, 3 were on waiting list for surgery and the remaining 26 were treated with VPS. For the clinical and radiological evaluation in shunted patients, Mini-Mental State Examination (MMSE), lumbar puncture, Katzman test, Evan´s index, size of the Sylvian fissures, presence or absence of focal dilatation of the cerebral sulci, white-matter changes and stroke-volume (SV) were recorded. Onset time on symptoms until VPS and radiological changes after surgery were also recorded.
Results
Twelve patients did not improve after VPS. In this group, the mean time of symptom onset was fourteen months. Statistically, there were not significant differences between the onset time of symptoms in improved and unimproved patients. In eight patients, the clinical deterioration coincided with white-matter hyperintensities in pre-shunt study. In a group of seven radiologically improved patients after surgery, three reported clinical improvement.
Conclusions
The presence of periventricular and deep white-matter hyperintensities associated with ischemic degeneration in patients with NPH and long time elapsed from onset of symptoms to VPS, were predictors of a poor outcome after shunt surgery. The fact that many patients were not candidate for surgery on the basis of comorbidity or age means an important limitation of the study sample.

C0180 WHAT WE CAN BE FOUND IN PATIENTS WITH EPILEPSY OF TEMPORAL LOBE?

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Introduction/Objectives
• Review the anatomy of the temporal lobe and its correlation with MR images
• Detail imaging protocol to be used in patients with epilepsy
• Describe the main entities that involve temporal epilepsy
• Provide other temporal lobe abnormalities that may present with seizures

Materials and Methods
From clinical data and findings of the electroencephalogram (EEG) may make therapeutic decisions in patients with seizures. However, MRI has a fundamental role in the study of possible structural lesions causing seizures.
Results
In this presentation we review the main cortical and hippocampal alterations that clinically lead temporal epilepsy. We also reviewed other alterations in the brain parenchyma may present as seizures, such as cavernomas, transsphenoidal encephalocele, ...
Conclusions
In clinical practice it is essential a specific MRI protocol to the structural characterization of brain lesions associated with epilepsy, and allowing specific treatment operation in each case.

C0184 EXTRACRANIAL CAROTID DISSECTIONS: CLINICAL PRESENTATION, DIAGNOSIS AND TREATMENT APPROACH

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Introduction/Objectives
Although carotid dissections (CD) represent only 2% of ischemic strokes, they are the cause of 25% of strokes in patients under the age of 45. The objective of the study is to evaluate the clinical presentation, diagnostic methods, cerebral angiography (CA) findings, different treatment alternatives and clinical outcomes of patients in our setting.
Materials and Methods
Retrospective study of CD in two tertiary-level reference hospitals between 1994 and 2013, with CA performed in all patients.
Results
155 patients were included (72.3% males, mean age: 44.2 ± 11.5 years); 181 with CD (16.8% bilateral, 41.3% left carotid, 82.6% spontaneous). The most frequent clinical presentation was: 38.3% severe stroke, 33.1% headache, 15.6% minor stroke, 20.7% TIA, 13% Horner's syndrome and 6.5% lower cranial pairs. In clinical development, 20.8% of patients presented an mRS >2 at 90 days (4% of the patients died).
The mean time between clinical presentation and the CA was 21.6 ± 70.7 days. The findings on the CA were: reduced flow (85.7%: flame-shaped occlusion, string sign or stenosis) pseudoaneurysms (14%) and direct findings (2%: intimal flap or double lumen). In 26% of cases, the location of the CD extended to the intrapetrous carotid. 33.6% presented an intracranial embolism on the CA. In 63.3%, one or several branches of the circle of Willis compensated the intracerebral flow. The most frequent treatment was warfarin (47%), followed by antiplatelet aggregants in 28%. Endovascular treatment was performed in 10.4%.
Conclusions
CDs are a significant cause of stroke, especially in young adults. Conservative management, with medical treatment (anticoagulant or antiplatelet) is the treatment of choice.

C0185 DIFFERENTIAL CHARACTERISTICS OF SPONTANEOUS AND TRAUMATIC CAROTID DISSECTIONS

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Introduction/Objectives
Analyze the differential characteristics (age, clinical presentation, angiographic findings and clinical outcome) between spontaneous carotid dissections (SCD) and traumatic (TCD).
Materials and Methods
We carried out a retrospective analysis of 151 patients (127 SCD vs 28 TCD) in two tertiary hospitals.
Results
SCD patients were older than the TCD (SCD median = 46 vs TCD median = 33.5 years, **P** = 0.000). There were no significant differences with respect to sex (**P** = 0.459), location (**P** = 0.863) and associated diseases (**P** = 0.507). Clinically, the most frequent form of presentation was stroke (67.9% in TCD vs 53.5% in SCD, **P** = 0.120). Patients with SCD showed no cranial nerve injury (0% vs 7.9%, P = 0.128), with less frequent headache (21.4% vs 35.4%, **P** = 0.112) and Horner's syndrome (7.1% vs 18.1 %, **P** = 0.123) in the TCD.
Cerebral arteriography was performed much earlier in patients with TCD that SCD (3.5 vs 6 days, **P** = 0.066). The presence of stenosis and / or occlusion was very similar (92.5% vs 80.8%) in SCD and TCD respectively. The pseudoaneurysm was more frequent in the TCD (19.2% vs 7.5%, **P** = 0.077). The functional outcome at 90 days (mRS) was similar (**P** = 0.309). Only 16 cases were dealt with stents, 11 in spontaneous dissection (8.7%) and 5 in traumatic (17.9%).The most common medical treatment was warfarin (TCD = 28.6%, SCD = 48.4%)
Conclusions
The presence of headache, Horner's syndrome and cranial nerve injury is more common in SCD. Pseudoaneurysms are more frequent in the TCD. TCD occur in younger patients, presenting no worse prognosis than SCD. The usual medical treatment in our environment is warfarin, relegated endovascular treatment with stents to those patients with poor clinical outcome.

C0186 PIXEL-BY-PIXEL COMPARISON OF KTRANS AND ESTIMATES OF CEREBRAL BLOOD VOLUME FROM DCE AND DSC-MR IN HIGH GRADE GLIOMAS

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Introduction/Objectives
Estimates of blood volume and transfer constant (Ktrans) are parameters commonly used to characterize hemodynamic properties of brain lesions. The purposes of this study are to (1) compare values of Ktrans and estimates of blood volume in gliomas on a pixel-by-pixel basis in order to comprehend if they provide different information (2) compare estimates of blood volume obtained by dynamic contrast-enhanced MR (DCE-MR) and dynamic susceptibility contrast-enhanced MR (DSC-MR).
Materials and Methods
Thirty-two patients with biopsy proven grade IV glioma underwent DCE-MR and DSC-MR and parametric maps of Ktrans, plasma volume (Vp) and CBV maps were calculated. The Spearman's rank correlation coefficients between matching values of CBV, Ktrans and Vp were calculated on a pixel by pixel basis. Comparison of mean values of normalized CBV and Vp was performed.
Results
Weak but significant correlation (P < 0.01) was noted for all comparisons. Spearman's rank correlation coefficients were as follows: Ktrans vs CBV, S = 0.113; Ktrans vs Vp, S = 0. 256; CBV vs Vp, S = 0. 437. We found a statistically significant difference (P < 0.01)

Conclusions
The finding of only weak correlation between estimates of microvascular density (Vp and CBV) and Ktrans suggests that they provide different information. Estimates of blood volume obtained by using DCE-MR are significantly higher than those obtained by DSC-MR in human gliomas most likely due to the effect of contrast leakage.
Acknowledgments, conflicts of interest
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C0187 ENDOVASCULAR TREATMENT OF EXTRACRANIAL CAROTID DISSECTIONS. EXPERIENCE OF 4 HOSPITALS

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Introduction/Objectives
Medical treatment is the treatment of choice in carotid dissections (CDs). In acute stroke with NIH scale score > 8, failure of medical treatment, haemodynamic insufficiency, symptomatic pseudoaneurysms or stenosis, the alternative is endovascular treatment. Our objective is to evaluate the results of endovascular treatment and the clinical outcome.
Materials and Methods
Retrospective study (2004-2014) of endovascular treatment of CDs in four tertiary-level reference hospitals
Results
The results from 30 patients were analysed (80% male, mean age: 46.1 ± 14.3 years, 80% spontaneous CD, 40% left internal carotid dissection (ICA), 30 % bilateral CDs). 46.7% patients required general anaesthesia. In 19 patients (63.3%), treatment was given in the acute phase. In two patients both ICA dissections were treated. There were no significant differences in age between those treated in the acute and non-acute phases (p: .468). The overall median rating on the NIH scale was 10.8 (2.9 in non-acute phase, 15.8 in acute phase **P** = 0.000). Of the 19 patients treated in the acute phase (50% had been treated with IV rTPA), in 9 patients (47.4%) mechanical thrombectomy with endoprosthesis and extracranial stenting was performed. In the other 10 patients, extracranial ICA patency was restored with endoprostheses. In 36% of patients treated in the acute phase, an endoprosthesis was placed in the extracranial and intrapetrous segments of the ICA. In five patients (16.6%), a pseudoaneurysm treatment was performed with overlapping endoprostheses (4 patients). In the rest of the patients, 6 were treated for stenosis and one for occlusion of both carotids. 69.6% of the patients treated in the acute phase presented mRS at 90 days ≤ 2.
Conclusions
In those CDs in which medical treatment fails, endovascular treatment is feasible, safe and has a good clinical outcome at 90 days.

C0189 EXTRACRANIAL AND INTRACRANIAL COMPLICATIONS OF OTITIS MEDIA

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Introduction/Objectives
Complications of Otitis Media (COM) are potentially life-threatening and every patient with suspected complications should be clinically evaluated by an otolaryngologist and imaging should be discussed with a dedicated head and neck radiologist. However, most cases appear during emergency practice, and every neuroradiologist should be able to identify and report possible COM.
Materials and Methods
Retrospective revision of nine cases that collectively represent the major extracranial and intracranial COM. An analysis of the medical records, microbiology results and imaging findings of each patient was performed.
Results
Our patients had between eleven months and 86 years-old. Regarding intracranial complications, three of them presented sigmoid sinus thrombosis that extended throughout the jugular vein in two cases: one due to **Pseudomonas aerugionosa** and the other due to **Klebsiella oxytoca** and **Enterococcus avium**. Two patients had meningitis: one pneumococcal and the other due to **Citrobacter koseri** (which later evolved to meningoencephalitis with a cerebral abscess). Another patient presented a cerebral abscess due to **Morganella morganii**. We also present two cases that developed temporal epidural empyemas and in both there were also extracranial infections: one presented a subperiosteal abscess (group A **β-hemolytic streptococcus**) and the other an arthritis of the temporomandibular joint. Two patients presented facial nerve paralysis but a disruption of the facial canal´s walls was only seen in one. There was also a labyrinthine fistula.
Conclusions
Although **Streptococcus pneumoniae** and **Staphylococcus aureus** are the most frequent pathogens isolated in microbiology of otitis media, in our series complications arose due to less frequent organisms. Moreover, several cases with intracranial complications also had extracranial ones, making it imperative for the neuroradiologist not only to perform brain studies but also to include head and neck dedicated sequences in the protocol.

C0192 DETECTION OF FOCAL CORTICAL DYSPLASIAS (FCD)WITH MRI: COMPARISON BETWEEN 1.5T AND 3T

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Introduction/Objectives
Evidence of FCD has high prognostic value in patients with refractory seizures, so its detection using MRI is essential for the surgical decision. MRI 1.5T with a specific protocol has improved results, especially in reference centres, but a significant percentage continues to be very difficult to detect with 1.5 T. 3T magnets increase the quality of image, so it is expected to increase the detection of FCD. The objective of this work is to compare the percentage of detection (PD) of FCD between 1.5T MRI (including the reading by expert) and 3T MRI, both globally as according to the type/size.
Materials and Methods
The MRI report provided by the patient has used for 1.5T(L1.5T) as well as the reading of the same MR by a Neuroradiologist with over 10 years of experience in epilepsy (L1.5Texp) which also read 3TMRI (L3T).The PD are retrospectively obtained with CI95 by using the Wilson's method, in 50 cases with histological diagnosis of FCD (type I/II). The PD of the 3

readings were compared with the McNemar Test. The PD according to type (I/II) or DCF size (+/-2cm) were compared with Pearson/Fisher test.

Results

The PD in the 3 readings: L1.5T (34%), L1.5Texp (50%), L3T (76%), show significant differences. There are no differences according to the type of DCF. However, the DCF type II

Conclusions

The highest quality image (3T), as well as the reading by an expert, significantly improve the detection of FCD, contributing to optimize treatment. The relative low sensitivity of this surgical serie as well as the poor differences in PD according to the FCD type , are probably due to the increased frequency of small DCF, of very difficult screening MRI.

C0193 PROMINENT INFERIOR INTERCAVERNOUS SINUS MIMICKING A FOCAL PITUITARY LESION

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Introduction/Objectives

Intercavernous venous communications may act as mimickers of pituitary pathology. Variations in size and morphology of these veins are present in normal subjects. Distension of the intracranial veins including intercavernous sinuses is a common finding in patients with intracranial hypotension. The purpose of this series is to describe clinical and imaging findings in 11 cases of enlarged inferior intercavernous sinuses (IICS) mimicking focal pituitary lesions on the sagittal T1 sequence in order to (1) raise awareness of this important imaging entity, and (2) highlight features that allow for prospective differentiation between inferior intercavernous sinus distention and true pituitary pathology.

Materials and Methods

Clinical history and imaging findings of a series of 11 cases of distended IICS mimicking focal pituitary lesions were reviewed. IICS enlargement was confirmed by presence of one or more of the following: (1) clear visualization of enlarged IICS on coronal images, (2) filling of the IICS on MR venography or (3) resolution on follow up imaging with resolution of other signs of intracranial hypotension.

Results

Out of 11 cases of enlarged IICS, 7 patients had other clinical and imaging findings consistent with intracranial hypotension. In 3 cases, enlarged IICS was an incidental finding in patients imaged due to unrelated pathology. 1 patient showed IICS enlargement in association with a Chiari II malformation.

On sagittal T1 images, the prominent IICS showed a crescent shape in 5 cases, a rounded shape in 5 cases and a triangular shape in 1 case. T1 signal was high in 1 case and low in 10 cases. In 3 cases, the IICS measured greater than 3mm.

Conclusions

Enlargement of the IICS may be caused by intracranial hypotension but can also be found as a normal or incidental anatomic variant. Recognition of this anatomical structure is important to avoid mistaking it for a focal pituitary lesion.

C0196 INTRACRANIAL MENINGIOMAS TREATED BY RADIOSURGERY OR OPEN SURGERY: CLINICAL AND IMAGING ASSESSMENT

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Introduction/Objectives

To study imaging features and clinical behavior of cranial meningiomas on patients requiring open surgery or radiosurgery during 2013 in our centre.

Materials and Methods

This is a retrospective study of patients that required open surgery or radiosurgery in our centre during 2013 because of an intracranial meningioma.

Following variables were analyzed: age and sex distribution, the presence of symptoms at the time of diagnosis, MR/CT features, surgery indications, surgery outcomes and complications. A revision of the literature was performed.

Results

We had 24 patients, of those 16 were women and 8 men. 16 present symptoms at the time of diagnosis. Most of them showed typical imaging findings by different techniques. 5 of them were treated with radiosurgery and maintained stable since nowadays. There were 19 open surgeries; 9 completed resections and 9 partial resections, 1 intraoperative defunction. Only 3 patients suffered treatment complications.

Conclusions

Intracranial meningioma is a common benign pathology that usually does not require any treatment. Treatments are open surgery or radiosurgery depending on established protocols. Complications are rare and severity varies according to localization.

C0204 INFRATENTORIAL BRAIN TUMORS IN CHILDREN: THE ROLE OF CONVENTIONAL AND ADVANCE MAGNETIC RESONANCE IMAGING (MRI)

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Introduction/Objectives

Brain tumors are the most common solid tumor in children and the second most common neoplasm in childhood after hematological malignancies; however they are the leading cause of morbidity and mortality.

Approximately 50% of all intracranial neoplasms in children are found within the posterior fossa.

The aim of this exhibit is to review the principal infratentorial neoplasms in pediatric age and to illustrate their most specific conventional and advance magnetic resonance imaging (MRI) findings and the main differential diagnosis.

Materials and Methods

We reviewed all the pediatric posterior fossa tumors diagnosed in our hospital from 2005 to 2012, and we founded 28 patients (15 male, 54% and 13 female, 46%), whom their age ranged from 0 – 8 years old with the mean age 7.5 years.

Conventional and advanced MR imaging techniques (perfusion imaging, diffusion-weighted imaging, and MR spectroscopy) were performed in the initial evaluation of these patients.

Results

The MRI evaluation and histopathological reports showed 13 medulloblastomas (46%), 7 juvenile pilocytic astrocytomas (25%), 4 brain stem gliomas (15%), 2 atypical teratoid rhabdoid tumors (7%), 1 case of infratentorial ependymoma (3%) and 1 case of ganglioglioma (3%).

Conclusions

Magnetic resonance imaging is the primary imaging modality used for the assessment of posterior fossa tumors in pediatric age because it provides superior delineation of their location, characterization and extension pattern.

Although the definitive diagnosis is obtained by histological analysis, advanced MRI techniques such as diffusion and perfusion weighted images and spectrocopy provides valuable presurgical information.

C0216 VEIN OF GALEN ANEURYSMAL MALFORMATION: REVIEW OF OUR CASES

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Introduction/Objectives
Vein of Galen aneurysmal malformation (VGAM) is a rare congenital anomaly and is characterized by multiple arteriovenous connections draining into a markedly enlarged median draining vein, the median prosencephalic vein of Markowski, embryonic precursor of the vein of Galen. We can distinguish two variants depending on the angioarchitecture: choroidal type, the most common, and mural type.
Our goal is to review the cases of our hospital, assess the associated anomalies, evaluate the clinical and angiographic outcomes after treatment and follow up of neurodevelopmental.
Materials and Methods
4 patients who received endovascular treatment in our hospital in the last 10 years were reviewed. The variables analyzed were: epidemiological variables, imaging findings and type of malformation, Bicêtre score, associated anomalies, type of treatment and its complications, as well as cognitive development and evolution.
Results
All four patients were born at term, two of them diagnosed in the neonatal period. According to the classification of Lasjaunias in one patient was mural malformation type and in three patients was choroidal malformation type. In all cases treatment was performed by transarterial embolization, using glue, coils, or both, in a single or several procedures. One of them also received treatment with radiosurgery. Two patients presented postprocedure bleeding, and one of them developed a severe seizure disorder.
At follow-up one patient died a few days after birth and three of the four patients had a favorable outcome.
A moderate-term angiographic follow-up in the three patients who survived has shown partial or nearly complete obliteration.
The characteristics associated with a worse outcome were neonatal presentation, presence of heart failure and choroidal angioarchitecture.
Conclusions
Endovascular therapy is an appropriate alternative for the management of VAGM. Morbidity and mortality decreases significantly with this treatment.

C0217 VALUE OF PET/MRI FUSION IN THE DETECTION OF FOCAL CORTICAL DYSPLASIAS (FCD): COMPARISON WITH 3T MRI AND PET

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Introduction/Objectives
Focal cortical dysplasias (FCD), an important cause of refractory epilepsy, are difficult to detect with standard brain imaging. 3TMRI and PET improve the ability to detect FCD in comparison to 1.5TMRI, but their sensitivity is still limited, especially for small lesions. PET-MRI fusion (PET/MRI) might further improve these results. The aim of this study was to compare the sensitivity of PET/MRI with those of PET and 3TMRI separately.
Materials and Methods
50 cases with pathologically confirmed FCD, recruited consecutively in an epilepsy unit, were analyzed. The proportions of detection (PD) were calculated for the 3 techniques (MRI, PET, PET/MRI), and for 3TMRI reviewed after PET/MRI reading (3TMRI2r). PD were compared using the chi-square test for the whole sample, and stratified according to FCD type (I/II) and lesion size (+/-2 cm) as well.
Results
We did not find differences between PD of 3TMRI and PET (76% vs 60%), while PET/MRI showed significant higher sensitivity (98%). 3TMRI2r (94%) improved the results obtained with 3TMRI.
According to lesion size, PET showed a significantly higher PD of +2 cm vs -2 cm lesions (31% vs 87%), while 3TMRI did not show relevant differences, except for FCD type II (71% vs 100%). We did not find significant differences neither between the PD of FCD type I and type II with 3TMRI, but PET was better in detecting type I (85% vs 55%).
Conclusions
The fusion of PET/MRI is better than 3TMRI and PET separately for the detection of FCD. Second look of 3RMRI after reading PET/MRI allows to detect overlooked subtle lesions, relatively frequent in our series
PET/MRI detected the majority of FCD in this series, including small lesions, which are very difficult to detect with 3TMRI or PET. The high proportion of small lesions in our series may explain the small difference in 3TMRI PD between FCD type I and II.

C0218 PROCESSING SPEED IN MULTIPLE SCLEROSIS DEPENDS ON WHITE MATTER INTEGRITY

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Introduction/Objectives
Multiple sclerosis (MS) is associated with impairments in cognitive functions, but information processing speed is considered the main deficit in this disease. The aim of the current study was to investigate the brain white matter integrity in patients with preserved and impaired processing speed.
Materials and Methods
We recruited 28 patients diagnosed with MS. Participants were assessed with the 3 and 6 letter version of the Salthouse Perceptual Comparison Test (SPCT). Two groups were created based on the sum of total correct responses in the test. A processing speed impaired group (n = 11, mean age = 4 and the remaining patients to the processing speed preserved group (n = 17, mean age = 44). No significant differences were found in age, years of education, gender, type of multiple sclerosis or evolution time between groups. Diffusion tensor images were acquired on a Philips Achieva 3T TX. Region of interest analysis was performed after running Tract-based spatial statistics (TBSS) as implemented in FSL. Six white matter tracts were defined on the TBSS skeleton: callosal body, fornix, cingulum, inferior longitudinal fasciculus, superior longitudinal fasciculus, uncinate fasciculus and optic radiation. ANCOVA analysis was performed for FA group comparisons between patients with impaired and preserved PS including the score on the Expanded Disability Status Scale.

Results
The results showed significant differences between groups in mean brain fractional anisotropy values (**F** = 6.31, **p** = 0.02). Patients with impaired processing speed had lower mean fractional anisotropy in comparison with patients with preserved processing speed (? = 0.28, **S.D** = 0.03) (? = 0.31, **S.D** = 0.02). Significant differences were found and lower fractional anisotropy values in MS with impaired processing speed in some of the selected tracts: callosal body (**F** = 4.94, **p** = 0.04), left cingulum (**p** = 0.02), right cingulum (**p** = 0.01), right inferior longitudinal fasciculus (**p** = 0.02), left uncinate fasciculus (**p** = 0.4), right uncinate fasciculus (**p** = 0.02).
Conclusions
Patients with MS and processing speed impairment show lower whole brain white matter integrity.

C0219 ANGIOPLASTY AND STENTING FOR SYMPTOMATIC INTRACRANIAL ATHEROSCLEROTIC STENOSIS: PERIPROCEDURAL ASSOCIATED RISK AND OUTCOME IN OUR CENTRE

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Introduction/Objectives
Intracranial atherosclerotic arterial stenosis is a major cause of stroke. The SAMMPRIS trial showed that the aggressive medical treatment arm (AMT arm) did substantially better than the Wingspan Stenting plus aggressive medical management arm (WS+ arm). Complications in the first 30 days post intervention led to the disparity between treatment arms, however, the results of of this trial has ever been reproduced.
The goal of our study is to report the immediate and long-term outcomes of patients with ≥ 70 % symptomatic intracranial atherosclerotic stenosis treated with balloon angioplasty and/or stent placement in our centre.
Materials and Methods
his is a retrospective review of patients treated with ballon angioplasty and/or stenting (Wingspan stent system.) for angiographically proven intracranial atherosclerotic stenosis (≥ 70 % stenosis) between 2007 and july 2014. All patients received the best medical treatment before. The procedures were performed with the patient under general anesthesia and antithrombotic therapy.
Results
31 patients were treated (19 male and 12 female), with ages between 34 and 87 years. All procedures was performed within the first 35 days after the symptomatic event.
The occlusion site was: middle cerebral artery (13 patients), internal carotid artery (12), cerebral posterior artery (1) and vertebrobasilar artery (5)
Technical and periprocedural success was achieved in all cases (7 PTA, and 24 PTA + Stent). The 30-day stroke/death rate was 9.68% (3 hemorrhagic strokes). 28 patients had clinical follow-up ≥ 1 year. During follow-up, restenosis rate was 22.5% (7 cases), 5 patients developed ischemic events: 4 of them in the same territory (12.9 %), and required new treatment.
Conclusions
Balloon angioplasty/stent placement for intracranial atherosclerotic stenosis is a safe and effective technique, and like other single centre series, our outcomes are better than those in the SAMMPRIS trial.