Neuroradiology
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ABSTRACTS

XLIV Neuroradiology Congress

Pamplona, Spain (October 22-24, 2015)

Spanish Society of Neuroradiology (SENR)
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2015 Activities of the Spanish Society of Neuroradiology

Several scientific events were held in 2014, among which the following stand out.

- The XI National Course of Neuroradiology was held in Barcelona in February. It was devoted to brain tumor pathology and had an attendance of 235 participants.
- The SENR held its XLIV Annual Meeting in Pamplona on 22–24 October 2015 under the presidency of Teresa Cabada and Pablo Dominguez, with over 230 participants. This Annual Meeting included an advanced course in Vascular diseases, attended not only by Neuroradiologists but also by General Ragiologists and Neurologists. In addition to Spanish neuroradiologists, two very well known international neuroradiologists, Fernando Viñuela and Madja Thurnher, President of ESNR, were among the invited speakers.

2015 Honorary Members of the Spanish Society of Neuroradiology

Dr. Fernando Viñuela

Fernando Viñuela was born in Mercedes, Uruguay, where he studied Medicine and obtained his Medical Degree in 1970.

He moved to Canada and worked as Neuroradiologist at the London University Hospital, Ontario, from 1974 to 1985. In Canada Dr. Viñuela begins his career as a Interventional Neuroradiologist. In 1985 he moves to UCLA, Los Angeles, as professor of Radiology and Chief of the Interventional Neuroradiology Unit, where he develops the rest of his career until last year, when he moves to Brazil to organize and coordinate an extensive programme dedicated to brain ischemia assistance in the private sector.

Fernando Viñuela has been one of the leading world experts in Interventional Neuroradiology, participating in the development of the well known GDC detachable coils and the Onyx liquid embolic system. He also developed a mechanical thrombus extraction system, a novelty in its days and precursor of the current treatment systems.

Fernando has dedicated his life to Interventional Neuroradiology with a vast experience in aneurysmal and AVMs treatment.

He is author or co-author of over 400 papers in the most prestigious international Journals.

Dr. Viñuela is member of multiple Neuroradiologic Societies, including American Society of Neuroradiology, American society of Interventional radiology, a founding member of the Sociedad Ibero Americana de Neuroradiología (SILAN) in 1989, and a reference in interventional neuroradiology for the Spanish speaking countries.

Dr. Luis Nombela

Luis Nombela was born in Carriches (Toledo- Spain), he studied Medicine in Madrid. He started his medical career in the University Hospital "Puerta de Hierro", in Madrid as a pupil of Dr. Parera, in Madrid. After attending a symposium where Dr. Viñuela was lecturing he moved with his family to Canada where he completed his medical training at the University Department of Clinical Neurosciences of the University Hospital in London, Ontario, where he learned from major figures such as Charles Drake (Neurosurgery), Henry Barnett (Neurology) and Alan J. Fox, Fernando Viñuela and David Pelz in Neuroradiology.

In 1994, Dr. Luis Nombela was appointed as Chief of Neuroradiology in Madrid´s University Hospital "Puerta de Hierro de Madrid" where he developed the last years of his career until his retirement in 2014. Dr. Nombela was a pioneer and leader in Spain, implementing and developing different neurointerventional procedures.

Luis Nombela was also engaged in teaching and he is partly responsible of the profesional training of the latest generation of Spanish Neuroraiologits.

2016 Future Activities of the Spanish Society of Neuroradiology

1. The next XII National Course of Neuroradiology, devoted to brain vascular pathology will take place on 18 and 19 February in Madrid. The course will address classical topics, such as brain ischemia and hemorrhage diagnosis and an update in advanced procedures such as endovascular treatment in acute intracranial thrombosis and extracranal vascular disease. The goal of the course is to review the pathophysiology and classification of ischemia, as well as to further the knowledge of the different diagnostic imaging techniques and to learn about neurointerventional procedures.
2. The next XLV Annual Meeting, chaired by Dr. Reverte, will take place in Valencia on 27 to 29 October,. It will include a pre-congress course about neck and cranial base pathology, that will be discussed from a diagnostic and therapeutic point of view.

ABSTRACTS

C0032 Stroke CT perfusion: 4 years experience in a specialised single center

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Introduction/Objectives: Determine the responsiveness of the radiology department related to the usage of computed tomography perfusion (CT-P) in the management of the stroke protocol implemented in our single specialized center.

Materials and Methods: Retrospective study analysis in patients diagnose with stoke, using CT-P for the management of hyperacute and acute cerebral stroke. Patients electronically medical records, Picture Archiving and Communication System (PACS) and the radiological reports were used to search the variables analyzed.

We analyzed the lapse time between the beginning of the symptoms of cerebral stroke, the activation of the stoke protocol and the arrival to the emergency room, the performing of CT-P and the administration of endovenous fibrinolytic (rTPA).

Results: A total of 105 cases were obtained from July 2012 through April of 2015. A mean age of 69,62 ? 13,94 years; 48, 70% male and 51,3% women.

Time intervals:

Beginning of the symptoms	- arrival emergency room, mean 2:12:36 hrs.
	- CT-P, mean 03:19:39 hrs.
	- rTPA, 3:43:43 hrs
arrival emergency room	- CT-P, mean 1:05:27 hrs.
	- rTPA, mean 1:53:38 hrs.
	- rTPA, mean 0:46:24 hrs.

In the 105 stroke cases a 48,7% presented penumbra areas and/or ischemic core, 49,57% didn't presented any radiological findings in CT-P, and 2% of the patients presented a poor radiological technique or presented movement artifacts. a 24,35% patients presented a wake-up stroke or undetermined the beginning of the cerebral stroke symptoms.

Conclusions: Its necessary the collaboration between the emergency room, neurology department , radiology department and laboratory department for the proper and efficient management of the acute and hyperacute cerebral stroke protocol.

C0034 Evaluation of cranial computerized tomography after acute stroke endovascular treatment: tips and tricks for detection of complications

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Introduction/Objectives:

- To achieve a systematic approach to evaluate brain CT performed after endovascular treatment of acute stroke.
- To recognize the main CT findings of the subsequent complications, possible pitfalls and mimics.

Materials and Methods: Ischemic stroke is the third cause of death in developed countries. 80% of strokes are ischemic and are caused by clots coming from heart and proximal arteries.

Acute stroke endovascular treatment is becoming more and more important with the development of specialized Neurovascular units working 24/24 hours. More than 10% of the patients will have some type of complication after or during the procedure.

It is important to take into account that patients who benefit from this treatments have usually chronic diseases and high scores on the NIHSS rate which increases the possibility of complications.

Results: Stroke embolectomy can sometimes includes aggressive maneuvers and high doses of iodinated contrast to finally remove the clot.

The most common complication is intracranial bleeding (symptomatic or asymptomatic) and it should not be misdiagnosed because of contrast extravasation. Other complications are hyperperfusion syndrome, re-occlusion, brain edema, refractory hypertension intracranial syndrome or subsequent encephalopathy due to high doses of iodinated contrast.

The success on accurate interpretation settles on the basis of multidisciplinary work up and the knowledge of complications appear on the image taking care of pitfalls and mimics.

Conclusions: Evaluation of brain CT after endovascular acute stroke treatment has to be done carefully taking into account the patient background and actual episode timing.

C0042 IGG4-related disease in the head and neck: imaging findings and literature review

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Introduction/Objectives: IgG4-related disease is a recently described autoimmune condition that courses with fibroinflammatory lesions, has characteristic histopathological features and commonly affects the head and neck region. In 2011, a consensus of criteria for diagnosis of IgG4-related disease was estabilished and although histologic confirmation is the gold standard, CT and MR imaging play an important diagnostic role.

Materials and Methods: We reviewed the imaging features of IgG4-related head and neck disease and compared them to three cases of our institution with histological confirmed IgG4-related disease.

In relation to the image features on CT and MR we focused on location, number of lesions, extension, enhacing pattern, local invasion of structures and post-treatment evolution.

Results: IgG4-related disease commonly involves the head and neck, in particular the salivary glands, lacrimal glands, orbits, thyroid gland, lymph nodes, sinonasal cavities, pituitary stalk and less commonly involves larynx and meninges. At CT, organs may demonstrate enlargement or decreased attenuation and at T2-weighted MR images, hypointensity with moderate enhacing.

Case one presented a T2 hyponintense lesion with moderate enhancement located at the pterigoid region with infiltration of the left lateral rectus muscle, the ipsilateral cavernous sinus and the dural sheet of the left temporal fossa.

Case two is a patient with a medical history of bilateral ocular excision due injury, that manifestated with T2 hypointense enhancing lesions at both orbital cavities.

Case three presented with bilateral lacrimal and parotid gland enlargement as well as bilateral extraocular muscles enlargement.

Conclusions: The head and neck is commonly affected site by IgG4- related disease and though there are no specific imaging manifestations this entity should be present in the differential diagnosis of locally invasive enhacing T2- hypointense lesions. Because of the excellent response to glucocorticoids and good prognosis of patients, radiologists should be aware of imaging findings to facilitate an early diagnosis and treatment.

C0046 Hypertrofic olivary degeneration a diagnostic imaging

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Introduction/Objectives: The hypertrophic olivary degeneration (HOD) is a rare transinaptic degeneration that shows a lesion in the dentato-rubral-olivary fibers of Guillain-Mollaret triangle. Damage anywhere along these fibers can explain some neurological deficits like palate or eye myoclonus, tremor dentato-rubral also called Holmes tremor or even asymptomatic.

The aim of this topic is to know the Guillain-Mollaret triangle's anatomy and the imaging findings in magnetic resonance (MRI).

Materials and Methods: We retrospectively reviewed cases of HOD, MRI were collected and literature reviewed.

Results: HOD is an infrequent issue and with a broad spectrum of symptoms but has some imaging features quite specific. Three stages are been described with MRI specific for each one that are correlated histologically.

Hyperintensity with/without inferior olivary nucleus in T2 and brainstem or cerebellar lesion. In T1, T1 with contrast or diffusion sequences there is not olivary damage or.

Recently it has been described new findings in magnetic susceptibility sequences (red nucleus degeneration), perfusion (hyperperfusion of inferor olivary nucleus damaged) and diffusion tensor (hight radial diffusivity because of demielinitation and axial diffusivity because of hyperthrofy.

Differential diagnosis includes vascular process but also inflamatori/infectious and tumor.

Conclusions: Recognise the MRI as well as the differential diagnosis should improve acurate diagnostic of HOD because of the variability of symptoms, even asymptomatic.

C0047 Brain hernation secondary to transsphenoidal surgery

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Introduction/Objectives: The transsphenoidal approach is most commonly used in surgery as pituitary macroadenomas and other masses. Postoperative complications are described in routine monitoring for these patients. One of these complications is the herniation of the suprasellar structures occupying the sella and adjacent structures .

The aim of this exhibition is to know the anatomic relationships of the structures located in the sella and its vicinity as well as the imaging findings in sellar herniation after transsphenoidal surgery.

Materials and Methods: Regional anatomy of the sella and the optic chiasm and its relations with adjacent anatomical structures is reviewed.

Imaging findings of a secondary sellar suprasellar hernia surgery showing the herniated structures and the associated pathology are shown and the published literature was reviewed.
Results: Transsphenoidal surgery is the choice in the case of sellar masses as pituitary adenomas that do not respond to medical treatment or are > 10 mm.

The sella is a bony structure where is located the pituitary gland. Prolactinoma is the most frequent adenoma (prolactine secreting). MRI findings show a herniation of suprasellar structures after 10 years of transsphenoidal surgery secondary to macroadenoma producing prolactin.

Conclusions: Transsphenoidal surgery seems to be a safe procedure, with a mortality rate < 1%. However, a significant number of complications occur, one of them is the herniation of the suprasellar structures. As radiologist we must know this structures and its normal location to recognize early herniations.

C0049 Physical basis and clinical applications of diffusion tensor imaging (DTI) in spinal cord

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Introduction/Objectives: Review the physical basis of diffusion tensor imaging (DTI) and technical adjustments for its application in the spinal cord.

Show the main clinical applications of DTI for assessing spinal cord pathology.

Materials and Methods: Description of the basic DTI sequence and its technical parameters for the acquisition of a DTI study on spinal cord.

Bibliographic update of the main applications of DTI for the assessment of spinal cord lesions.

Illustrate, by own examples, the usefulness and limitations of DTI for the study of spinal cord in different clinical scenarios.

Results: Several examples of spinal cord lesions approach using DTI are exposed, including congenital spinal cord pathology, traumatic and compressive myelopathy, demyelinating lesions among other myelitis (including apparently normal spinal cord) and spinal cord tumors. The utility of 3D reconstruction (tractography) and derived parameters such as fraction anisotropy (FA) and mean diffusivity (MD) is highlighted.
FA and MD could be considered as biomarkers of health and disease, being able also to predict response and monitoring treatment.

Conclusions: The DTI approach for the evaluation of spinal cord lesions allows to improve the characterization of these

lesions both from a morphological point of view (through 3D reconstructions) and from their functional characteristics by using parameters derived from this acquisition (FA and MD) which may be used as biomarkers.

DTI is a promising tool in the assessment of normal appearing white matter in cases of clnical discordance with radiological findings.

C0050 MR imaging findings in neuro-lyme disease

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Introduction/Objectives: Lyme disease is a tick-transmitted inflammatory disease caused by the spirochete Borrelia burgdorferi. It can affect multiple systems such as the skin, peripheral nervous system, central nervous system, musculoskeletal system, heart and eyes.The MR imaging findings are usually focal lesions in the white matter of the brain, nerve-root and/or meningeal enhancement.

Materials and Methods: The main objective of this review is to give an insight into the literature and highlight the epidemiology features, clinical manifestations and diagnosis of the nervous system affection secondary to Lyme disease, putting special emphasis on the diagnostic neuroimaging.

Results: Lyme disease occurs in three stages. In stage 1 patients may have flu-like symptoms with a characteristic enlarging target-like rash (erythema chronicum migrans). Stage 2 presents 1 to 4 months after infection, and consists of cardiac and neurologic symptoms. Stage 3 occurs up to a few years later, and manifests as arthritic and chronic neurologic symptoms. Neurologic symptoms are highly variable and include aseptic meningitis, radiculoneuropathies, myelopathies, polyneuropathies, facial nerve palsies, as well as encephalopathy.

Because of limited utility of microbiologic techniques, diagnosis is usually based on characteristic clinical picture and a positive antibody response to B. burgdorferi.

Neuroimaging may be completely normal even in patients with known Lyme disease who have neurologic manifestation. The most common abnormality seen on MR is multiple bilateral periventricular and/or subcortical foci of T2 prolongation, multiple enhancing cranial nerves (third, fifth, and seventh cranial nerve), nerve root and/or meningeal enhancement.

Conclusions: The diagnosis of Lyme neuroborreliosis is difficult and is essentially clinical, based on a history of tick exposure, epidemiology, clinical signs and serologic confirmation. Positive MR findings in patients with neuro-Lyme disease are unsual and non-specific. In the proper clinical setting, Lyme disease should be considered in the differential diagnosis of focal lesions in the white matter of the brain, nerve root and/or menigeal enhancement.

C0059 in or out? extra axial pathology

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Introduction/Objectives: Extra-axial pathology is outside the brain parenchyma where several structures are located; meningeal structures (pachymenix; form by dura mater, and leptomeninges form by pia mater and arachnoid), blood, vessels, bone. The etiology is varied; congenital, infectious, inflammatory and tumoral.

The purpose of this comunication is to review and to provide a better knowledge of extra-axial pathology by using some real cases.

Materials and Methods: We retrospectively reviewed several cases of extraaxial pathology of multiple etiology; tumoral, vascular, traumatic, infectious… MRI findings were collected and literature reviewed.

Results: Extra-axial lesions are located outside brain parenchyma and not always is easy to distinguish from intra-axial lesions. There are some imaging features that provide clues to recognize extra-axial pathology. In subaracnoid space; cleft sign, intervening pial vessels (arteries or veins). In brain parenchyma; absence of a claw sign, intervening cortex between mass and white matter and white matter bucling sign. Finally, in bone and menige; dural tail sign, and bone changes like invasion or destruction.

The etiology includes vascular pathology (subarachnoid, subdural or extradural haemorrhage), tumoral (meningeal tumor, haemangiopericytoma, metastatic tumours), pituitary tumours (adenoma, craneopharyngioma), pineal tumours, cranial nerve

schwannomas (trigeminal schwanoma, acoustic schwanoma), cyst (arachnoid, epidermoid), infectious (abscess).

Conclusions: Extra-axial lesions have some dificulty but also specific features. Recognize the anatomy and imaging findings as well as the differential diagnosis should improve its diagnostic accuracy.

C0060 Acute myelopathy: what we should know?

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Introduction/Objectives: Acute myelopahy is a neurological condition that involves spinal cord lesion. It is a severe and often difficult pathology to diagnose that may compromise the patient's life and autonomy.

The signs and symptoms can be dificult to recognise, and delayed diagnosis can worsen the prognosis.

The aim of this topic is to know when we should consider the diagnosis of an acute myelopathy, what and where is the cause and how we can make the correct diagnosis.

Materials and Methods: We retrospectively reviewed several cases of acute myelopathy of multiple etiology showing the CT and MRI findings in each one. Also literature was reviewed.

Results: Approach to acute myelopathy always needs neuroimaging to confirm and to locate the lesion or lesions (multiple lesions must be considered in many cases).

Magnetic resonance imaging (MRI) is the best choice for diagnosis and often shows T2 hyperintensity focal or difuse, and gadolinium enhancement. However, CT with sagital and coronal reconstructions is useful in traumatic myelopathy when there is bony injury.

Acute mielopathy may have multiple etiology; congenital lesions, neurodegenerative, infections, inflammatory, vascular, tumoral or trauma. Clinical symptoms and signs depend on which level (or levels) cord is affected. Also there are an anatomic distinction among extradural (this is the primary aim of radiological evaluation because extrinsic compression may need surgical treatment), intradural and intramedullary lesions.

Conclusions: Acute myelopathy is a pathology with a wide clinical and etiological spectrum.

The CT or MRI findings may have therapeutic implications so it is very important to recognise and locate the lesion or lesions.

C0063 Unusual causes of ischemic stroke

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Introduction/Objectives: Ischemic strokes of uncommon cause are those that have a different etiology to atherosclerotic, cardioembolic or small vessel disease. Account for 5-10% ofall strokes. In their etiology, non-inflammatory vascular disease (arterialdissection, fibromuscular dysplasia), inflammatory and infectiousvasculopathy (temporal arteritis, neurosyphilis), hereditary diseases (MELAS, CADASIL, FABRY), hematological disorders (thrombophilic states, thrombocytopenia) and drug abuse are present.

Materials and Methods: In joint collaboration, the departments of Radiology and Neurology of our institucion, have collected and reviewed the cases treated in our hospital in recent years with a diagnosis of ischemic stroke of uncommon cause. Among all of them the most illustrative cases (that better show in the different forms of imaging the different etiologies of such stokes) have been selected.

Results: The ischemic stroke may be the presentation of the underlying disease or occur during the course of it. The prognosis is generally better than in other strokes and in these patients the presence of cardiovascular risk factors is less common. Cases of the following conditionsare presented: CADASIL disease, carotid dissection, Rendu-Osler-Weber disease, vasculitis, tumoral arterial cerebral compression, posterior reversible encephalopathy syndrome, MELAS syndrome, FABRY disease and acute posterior multifocal placoid pigment epitheliopathy.

Conclusions: Ischemic strokes of uncommon cause are rare and are more common in adults and young people. Their prognosis is generally better than in other strokes. It is very important to establish an early and correct diagnosis because this acute arterial brain event may be the presentation of the underlying disease, which require a different treatment. Neuroradiology plays a key role not only in diagnosis but also often in their treatment.

C0064 Re-endoscopic third ventriculostomy: role of magnetic resonance in its follow-up

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Introduction/Objectives: Endoscopic Third Ventriculostomy (ETV) is the treatment of choice of non-communicant hydrocephaly in pediatric patients.

We analyse the results of pediatric re-ETV performed in our institution, studying the role of MR in the diagnosis and follow-up of these patients.

Materials and Methods: We reviewed the pediatric re-ETV cases performed in our hospital from July 2005 to May 2015. Clinical history, imaging studies, and surgical confirmation of these cases were studied.

Results: We analyse 14 re-ETV patients with ages ranging from 10 months to 14.3 years. Hydrocephaly was secondary to space occupying lesion in the posterior fossa (28%), myelomeningocele (21%), previous cerebral hemorrhage (21%), congenital stenosis of Sylvian aqueduct (21.5%), and meningitis (7%). After the first ETV, one patient presented an early ETV failure and 13 patients showed a delayed failure with a 19 month follow-up interval; three of them were detected by MR exclusively. After re-ETV, ventricular size remained stable or was reduced with visible flow through the stoma in specific T2 and cine MR sequences in all cases. In the long term there were 4 failures with a 72% success rate of re-ETV.

Conclusions: Along with the clinical examination, the intracranial pressure, and the electroencephalogram, MR is an essential tool in the diagnosis of ETV failure, helping to decide about the need of re-ETV, and the follow-up of re-ETVs.

C0068 Changes in microvascular permeability predic overall survival in recurrent glioblastoma treated with bevacizumab

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Introduction/Objectives: Bevacizumab is a chemotherapy frequently used in the setting of recurrent glioblastoma. Antiangiogenic treatment causes a rapid decline in the contrast-enhancing tumor that is attributable to the normalization of abnormally permeable tumor vessels. However, only a fraction of patients really respond to therapy. The aim of this study is to evaluate whether changes in DSC perfusion MRI derived microvascular permeability between baseline and the first follow-up after treatment could predict overall survival in recurrent glioblastoma.

Materials and Methods: We conducted a retrospective analysis of the DSC perfusion MRI of 30 patients with recurrent glioblastomas treated with bevacizumab as second line chemotherapy.

Post-processing was performed using the Olea Sphere software (Olea Medical, Marseille). Whole brain rCBV and rCBV leakage corrected were generated for all patients at baseline and at the first follow-up after treatment. We assessed if bevacizumab produced changes in microvascular permeability (rCBV-rCBV leakage corrected) and if these changes correlated with overall survival.

The relationship of survival to changes in microvascular permeability was analyzed univariately by using Kaplan-Meier curves.

Results: The study included 20 male and 10 female patients, with age ranging from 31 to 74 years. We have demonstrated that bevacizumab diminishes permeability ($p=0.023$). For those patients with decreased permeability, the mean and median overall survival was 6.712 and 6.2 months, respectively. For patients without changes in permeability, the mean and median overall survival was respectively 15.596 and 8.570 months. Decreased permeability at the fist follow-up had a significant influence on survival. We also proved that age and permeability were independent predictors of survival.

Conclusions: Decreased permeability at the follow-up correlates with improved overall survival. We can then set a MRI marker that predicts survival in recurrent glioblastoma treated with antiangiogenics.

C0074 Complex arteriovenous fistula with aggressive presentation. Transvenous embolization with volumetric coils

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Introduction/Objectives: Dural arteriovenous fistulas (D-AVF) are uncommon lesions which could originate due to previous venous sinus thrombosis. The most feared consequence is intracranial hemorrhage, but it could have other manifestations depending on the location and venous drainage. We present a case of rare and aggressive manifestation in the form of seizures, diffuse encephalopathy and refractory intracranial hypertension. Currently the endovascular treatment is the preferred one for this type of disease.

Materials and Methods: 74 year-old man with history of sagittal sinus thrombosis five years earlier, initially treated with oral anticoagulants. During follow-up he complained of intermittent headache and pulsatile tinnitus and he had a papilledema in the neurological exam. After a physical effort, he suffered a worsening of symptoms: impaired level of consciousness, seizures, diffuse encephalopathy and severe intracranial hypertension.

Results: Initial cranial CT scan showed diffuse cerebral edema. Afterwards, brain MRI revealed diffuse serpiginous subarachnoid images (right occipital region predominantly), with partial venous thrombosis of the right temporal vessels. Arteriography confirmed the existence of D-AVF with arterial contribution from external carotid artery (deep mastoid branches, occipital and temporal petrous arteries) and retrograde drainage to partially thrombosed sagittal and transverse sinus. Endovascular treatment consistent in closing the transverse sinus with volumetric coils. Complete resolution of D-AVF and symptoms was achieved.

Conclusions: The treatment of D-AVF can be complex and requires a multidisciplinary approach. The volumetric coils, because of higher packing density, may be useful to sacrifice large vessels as a simple and non-expensive method.

C0078 Influence of carotid stenosis in CT perfusion

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Introduction/Objectives: Cerebral CT perfusion (CTP) is a useful diagnostic technique for determining the ischemic penumbra in patients with acute stroke. A possible interpretation pitfall of the mismatch area is the presence of extracranial carotid disease. Carotid artery stenting solves the stenosis causing hemodynamic changes in the brain circulation that are not yet known in depth.

Materials and Methods: This is a prospective, non-randomized study designed to analyze the hemodynamic consequences of carotid stenosis (CS) and the changes produced after CAS. We selected 25 patients with internal CS and performed CTP to asses changes before and after CAS in the superficial (s-MCA) and deep middle cerebral artery territory (d-MCA). We used interhemispheric ratios of cerebral blood flow (rCBF) and cerebral blood volume (rCBV), and interhemispheric differences of time to peak (dTTP), mean transit time (dMTT) and TMax (dTMax) to reduce intra individual variability.

Results: rCBV, dMTT, dTTP and dTMax showed significant changes from prestenting to poststenting study in both sMCA and dMCA territory. There was no significant change of CBV in all studied territories.

In 5 patients we found CTP asymmetries potentially misinterpreted out of an appropriate clinic setting as ischemic penumbras.Within the subgroup of ≥ 90 % stenosis, false penumbras were found in 5/6 of the cases , while in the <90 % subgroup no false penumbras were found (0/9). This translates into a 6 times more probable correct interpretation of the perfusion color-coded maps if the carotid stenosis is <90 % compared to those with ≥ 90 % stenosis (CI 95 % occur in patients with stenosis: 2.029926 - 17.73464) , p = 0.002.

Conclusions: CS, especially if it is > 90 %, can alter CTP parameters. This should be taken into consideration for its right interpretation.

C0079 False ischemic penumbras in CT brain perfusion studies

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Introduction/Objectives: CT brain perfusión studies allows calculation different parameters for differentiating between an ischemic penumbra, which might benefit from intravasculaer therapy with trombolytic agents, and infartec tissue, which would not benefit from such therapy.

The are diffent possible causes of false penumbras, each of which produces a different pattern at imaging: upstream flow restiction, evolution of ischemic change, vascular disregulation, positioning of the patient's head at an angle during image adquisition and variant anatomy in the circle of Willis.

Materials and Methods: Retrospective study in patients with acute stroke with CT brain perfusión study.

Results: From July 2012 to April 2015, CT brain perfusión was performed in 105 patients. Mean age 69,62, SD 13,94 years; 48,70% men and 51,3% women.

48,7% of the patiens presented ischemic penumbra and infarcted tissue and in 49,57% the was no penumbra. 2% of the cases were missed due to movement or technique failure.

In 6 patients (5,71%) CT brain perfusión showed false ischemic penumbra: 3 due to upstream flow restiction, 2 due to evolution of ischemic change and in 1 patient due to vascular disregulation (HANDL).

Conclusions: Identification of false positive results of CT perfusin imaging may help reduce morbidity related to unnecessary administration of thrombolytic agents.

Best AC, Acosta NR, Fraser JE, Borges MT, Brega KA, Anderson T et al.

Recognizing false ischemic penumbras in CT brain perfusion studies. Radiographics 2011, 32(4):1179-96.

C0081 Acute medullary compression on call

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Introduction/Objectives: In disorders affecting the spinal cord, Magnetic Resonance (MR) is the main character, being spinal cord compression its main indication in emergency.

The compression pathology of the spinal cord is a very serious problem that requires special attention and an accurate and quick diagnosis to prevent any irreversible cord damage

Materials and Methods: A set of cases with spinal cord compression has been reviewed to see the main indications of urgent MR when you are on call, what the indicated sequences are and what are you looking for when you have one of this cases on your hands.

Results: Sudden onset of acute myelopathy is caused most of the times by a traumatism, by displacement of one or more bone fragments into the medullary canal; discal hernias are another common cause, seeing the protruding disc fragment compressing the medulla, and, other subacute pathologies like the abscesses, infectious diseases and the neoplasias are other habitual causes in the acute radiology.

Vascular etiology must be taken into account to find a right differential diagnosis.

A good physical exploration and a right anamnesis are necessary to help the radiologist to detect possible lesions, as most of them, if not detected early, could become a bad forecast. It is necessary know "what" and "where" to look, and clinical symptoms are fundamental for that.

Conclusions: Facing any medullary syndrome it is necessary to determinate time of evolution, guide the possible etiology and define the lesion level.

In medicine, findings may be unpredictable, and the radiologist must be prepared to see a quite broad spectrum of pathologies and to be able to detect the lesion, identifying the compressive damage that needs urgent radiotherapy or surgery because time, in this kind of pathologies, may change the life of the patients.

Acknowledgments, conflicts of interest

I want to thank to all the staff of the Radiodiagnostic department of Merida's Hospital, especially to Dra. Raquel Esteban and her invaluable work with the residents.

C0084 Late endovascular recanalization of stroke using imaging techniques for patients selection

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Introduction/Objectives: Endovascular recanalization treatment is excluded for stroke patients after 8 hours of stroke onset. This time limitation does not take into consideration the fact that some patients still have capacity for recovering with reperfusion. The aim of our study was to assess the clinical outcomes at 90 days among patients selected by imaging methods treated beyond eight hours after the onset of symptoms.

Materials and Methods: We propose a prospective, comparative, randomized, controlled and double blind Phase II Clinical Trial. Our hypothesis is that endovascular treatment on patients after 8 hours of stroke onset, being selected at least by CT and angio-CT, present better progress within 3 months than patients not receiving endovascular treatment.

Patients with a relevant intracranial proximal arterial occlusion of the anterior circulation, who can be treated beyond 8 hours after stroke onset, are eligible. All patients will be recruited sequentially over a year.

A multivariate analysis will be performed to evaluate impact of clinical and radiologic parameters. The statistical significance will be set on 0,05.

Results: 20 patients will be randomly assigned 1:1 to endovascular and no endovascular treatment.

The primary outcome is to compare the mRS assessment within 3 months period between both groups. Secondary outcomes are clinical characteristics association with patient's evolution, to evaluate the best imaging method for prognostic to better distinguish what patients will be treated and to evaluate final infarct size by comparing it with the initial one and the degree of haemorrhagic transformations.

Conclusions: Endovascular treatment on patients after 8 hours of stroke onset, being selected at least by CT and angio-CT, present better progress within 3 months than patients not receiving endovascular treatment

TRIAL REGISTRATION: ESTUDIO FCO-REI-2015

C0087 Foix Alajouanine syndrome as rare cause of weakness in the lower limbs: our experience

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Introduction/Objectives: Foix- Alajouanine syndrome, also known as spinal dural arteriovenous fistulas, is characterized by slow-flow extramedullary vascular lesions affecting mostly the lower thoracic and lumbar spinal. Represents the most common type of spinal vascular malformation, and the majority of affected patients are men older than 50- 60 years.

The symptoms are nonspecific: weakness and lower limb dysesthesias, intermittent sciatica…Progression to severe myelopathy or paraplegia is slow. These vague symptoms make the diagnosis complicated, thus MRI of the spine and angiography are essential for diagnosis and treatment.

The aim of this publication is to present two patients with dural arteriovenous fistula, making a review of the radiographic features, clinical presentation, differential diagnosis and treatment

Materials and Methods: The first patient was a 83 year old woman with weakness and dysesthesias of lower limbs during the last three months, with spontaneous falls. The physical examination revealed a decrease in strength and sensitivity of lower limbs.

The other case was a 81 year old male with sciatica during the last four days, worsening with exercise.

The main differential diagnoses should be made with transverse myelitis, spinal cord infarct, intramedullary neoplasm and CSF flow artefact

Results: In both cases thoracolumbar MRI showed the typical findings: diffuse multilevel intramedullary hiperintensity on T2 representing cord edema with relative sparing in the periphery of cord, and serpinginous intradural exramedullary flow voids along the dorsal aspect of the spinal cord.

Spinal angiography is the "gold standard" for optimal analysis of the anatomical, morphologic and angio-architectural features necessary for the therapeutic decisions. In our cases the diagnosis was suspected by MRI and confirmed by angiography, and the treatment was endovascular embolization.

Conclusions: Foix- Alajouanine syndrome is a rare cause of sciatica and weakness of lower limbs, but an early diagnosis is essential, angriography and MRI play an essential role in both definitive diagnosis and treatment

Acknowledgments, conflicts of interest

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Declaro que no existen conflictos de interés.

C0088 Percutaneous treatment of symptomatic synovial cyst

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Introduction/Objectives: Facet joint synovial cysts are benign and relatively common. When they are located within the spine, they usually cause symptoms of radiculalgia due to compression of the adjacent nerve root. Facet joint synovial cysts are detected at MRI and occasionally at CT.

Materials and Methods: The classical treatment for facet joint synovial cysts is surgery (laminectomy, facetectomy, and resection of the cyst). We currently treat intraspinal cysts in symptomatic patients percutaneously under CT fluoroscopy guidance, regardless of the size of the cyst.

We do not aim to resect the cyst; rather, we aim to rupture the cyst by inserting a small caliber (22G) needle into the facet joint and expanding the cyst.

Results: We have treated 33 patients. The results have been satisfactory in about 75%: we achieved complete rupture of the cyst in 65% of the cases, partial rupture in 24%, and no rupture in 11%.

Conclusions: Percutaneous treatment guided by CT fluoroscopy is safe, efficacious, and has few complications.

In the absence of symptoms, we perform follow-up MRI 3 to 6 months after treatment. In patients with persistent symptoms, we do MRI earlier and can repeat the treatment procedure if necessary.

C0089 Radiation therapy to the cns: late collateral damage

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Introduction/Objectives: To review the spectrum of central nervous system (CNS) chronic side effects and changes after radiotherapy.

Materials and Methods: We retrospectively review the radiologic appearance of multiple CNS chronic side effects and changes after radiotherapy and their posible radiologic differential diagnosis.

Results: Complications due to high dose or frequent radiotherapy sessions have been seen in whole brain. Although the development of new neurological symptoms suggest tumor recurrence, treatment side effects should also be considered.

Atrophy and diffuse leucoencephalopathy due to white matter demyelination are the most commonly encountered.

Brain radionecrosis can mimic tumor recurrence. Advanced MR techniques such as perfusion, spectroscopy and diffusion tensor imaging can help to achieve the correct diagnosis.

Radiation-induced vascular injury include large arteries atherosclerosis and thrombosis; radiation-induced cavernomas; and the infrequent mineralizing microangiopathy.

Bone radionecrosis in skull and face has also been described.

Stroke-like migraine attacks after radiation therapy (SMART) is a recently described entity with poorly understood pathophysiology. MR shows a non specific diffuse gyral swelling and enhancement in the parieto-occipital regions that can contribute to the suspicion of this exclusion diagnosis.

Radiation induced tumors such as meningiomas, often multiple, can occur even 35 years after radiotherapy; radiation-induced sarcomas, frequently high-graded (malignant fibrous histiocytoma and osteosarcoma) can originate in either the irradiated bone or soft tissues.

Conclusions: Radiologists should be aware of the whole spectrum of radiation-induced lesions because their early recognition can significantly improve the patient management.

C0093 Carotid Doppler ultrasonography in patients with normal tension glaucoma

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Introduction/Objectives: Nomal tension glaucoma (NTG) is a progressive chronic optic neuropathy with intraocular pressures (IOP) lesser than 22 mm Hg, without clear-cut cause. This study evaluates the association of carotid artery pathology in patients with NTG.

Materials and Methods: Retrospective series of 51 patients (102 common carotid arteries and 102 internal carotid arteries) with NTG. We registered the presence of atheromatous plaques. In case of stenotic segments, they were classified into significant (higher than 70%) or not significant (between 50-70%).

Results: 2 patients (4%) showed significant ICA stenosis. 2 patients (4%) showed total occlusion of one of the ICA. 38 patients (74%) presented with carotid atheromatosis; of them, 25 patients (49%) showed calcific atheromatosus plaques, 9 patients (18%) had lipidic plaques and 4 patients (8%) mixed plaques.

Conclusions: We found carotid artery lesions in 74% of patients with NTG. 6 patients (12%) presented with some degree of carotid artery stenosis or internal carotid artery occlusion. We think carotid artery Doppler ultrasonography should be part of the diagnostic work-up in patients with NTG.

C0094 Beyond the proximal cerebral artery occlusions: catheter 3 MAX

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Introduction/Objectives:

- To show our experience with a series of cases in which the 3MAX catheter was used for the treatment of acute ischemic stroke with occlusion in distal vessels.
- To show that an endovascular approach is possible for the treatment of occlusions located beyond the proximal vessels of the brain. internal carotid, MCA (M1 and proximal M2) or basilar) which are nowadays the mainstream indications.
- To express the need of evaluating the risk / benefit ratio considering the previous clinical baseline.

Materials and Methods: The rapid evolution of the devices used in neurointervention has been astonishing: from the first reports of the usefulness of mechanical thrombectomy as a safe and effective technique for the treatment of acute ischemic stroke to the recently published randomized trials that prove its superiority over iv thrombolysis in selected patients. This evolution has led to an exponential development of its techniques.

An extensive research work has compared the different devices that have been coming out to the market and the different methodologies employed by them to reach the highest quality of the neurointerventional process.

In this article we present four cases from our center in which distal occlusions were recanalized by a 3MAX device.

Results: Max system are aspiration thrombectomy devices that can be used by a single operator, without the need for a large proximal balloon guide and which is delivered over a microwire. It has an excellent navigability and allows for very distal catheterizations. Its therapeutic window is about 8 hours since symptom onset.

No procedure related complications were registered in our short series of cases.

Conclusions: We can go one step further in the endovascular treatment of acute stroke and treat patients with occlusions in more distal branches in selected cases.

The 3 MAX device allows for a safe access to these branches.

C0098 Paranasal sinuses ct: "red flags"

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Introduction/Objectives: Review of frequent nasosinusal pathology, identifying significant clinical aspects. Detection of malignancy signs: how to guess its origin and possible intracranial extension.

Materials and Methods

- We have checked sinonasal cavities biopsies between 2011 and 2015 and the behaviour of each pathology in different imaging modalities.

Results

- 49 inflammatory process, 1 adenoid cystic carcinoma, 2 epidermoid carcinomas, 1 neurofibroma, 1 inverted polyp and 1 juvenile angiofibroma.

Conclusions: A large knowledge of senonasal anatomy and normal nasociliary drainage pathways is essential to understand inflammatory disease.

There are rare entities (tumours, encephalocele…) that may mimic chronic inflammation changes, so a deep evaluation of bone structure integrity is needed, even though bone remodeling could be normal in this context.

Acknowledgments, conflicts of interest

Pathology Service

C0099 Acquired cholesteatoma: CT findings, surgical and pathology correlation

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Introduction/Objectives: To describe CT findings in acquired cholestetomas and its correlation with surgical and pathology descriptions.

Materials and Methods: We have done a revision of cholesteatomas biopsies between 2013 and 2015, their behaviour in CT and surgical findings.

Results: CT findings: opacification of mastoid air cells (97%), soft-tissue mass (90%) and bony erosion (90%). Bone structure affected were: scutum (83%), ossicular (73%), Tegmen tympani (27%) and lateral semicircular canal (10%).

Most common symptoms were persistent o recurrent otorrhea and hearing loss.

There was a good correlation between CT and surgery/ pathology findings in 97% of cases.

Conclusions: Its important to provide the ORL surgeon with an adequate description of CT findings in acquired cholesteatomas. CT gives essential information for surgical planning, being the imaging modality chosen in patients with clinical suspicion of cholesteatoma.

Acknowledgments, conflicts of interest

Pathology Service

C0100 Giant intracranial aneurism: endovascular approach

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Introduction/Objectives: Review of the endovascular techniques that are currently being used in the treatment of giant intracranial aneurysm, with emphasising in flow diverter devices.

Materials and Methods: From two cases of giant intracranial aneurysms successfully treated with flow diverter devices in

our hospital, we have done a revision of literature about this concern, analyzing different endovasular techniques; indications and contraindications of each one of them.

Results: First case: 67 year woman with blurry vision secondary to a giant supraclinoid aneurysm (maximum diameter 23 x 21 mm), that was treated with a flow diverter device (Pipeline) redirecting blood flow. A persistent remnant was treated on a second time with another flow diverter device achieving a total exclusion of the aneurismal sac.

Second case: 40 year man with headache. MR showed a fusiform giant aneurysm of cavernous-ophthalmic carotid (maximum diameter 45 x 40 mm). Two flow diverter devices were satisfactory implanted. The patency of the carotid artery and the thromboses of more than 75% of the aneurism sac was confirmed after the procedure. In 6 month angiographic control, treatment of possible remnant will be discuss.

Conclusions: A giant intracranial aneurysm is a life threatening pathology becoming a challenge. Surgery has been replaced by endovascular treatment in most of cases using several techniques. The selection of the optimal one depends on clinical and anatomic factors. Flow diverter stents give a chance to otherwise untreatable intracranial aneurysms.

Acknowledgments, conflicts of interest

None

C0101 Atipical meningiomas: pictorial review and characterization by conventional RM

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Introduction/Objectives: To present a pictorial review of the main features of atypical meningiomas to direct their diagnosis and management and to establish the correlation between lesions suggestive of atypical meningiomas image and its result by pathology (AP).

Materials and Methods: We reviewed the literature about the different image criteria established as atypical meningiomas:

- multiple lobes
- borders,
- changes cystic necrosis or intralesional hemorrhage,
- marked peritumoral vasogenic edema,
- venous sinus invasion ,
- cortical invasion with osteolytic lesions,
- heterogeneous contrast enhancement .
- atypical locations (intraventricular, intradiploic, optic nerve, multicenter spread (meningiomatosis).

We perfomed a cross-sectional and retrospective analysis of head injury suspicious of atypical meningiomas by basic RM, diagnosed in our hospital between 2010 and 2012, where 55 cases were performed.

All of them were operated on, and after that a radio-pathologic correlation was established. Sensitivity (S), specificity (E), positive predictive value (PPV), negative predictive value (NPV) of the basic RM and prevalence(Pv) and concordance by Kappa index (K) were calculated.

Results: Of all the injuries defined as atypical (24) by MRI were confirmed as atypical by AP 10 cases and were FP 14 cases, resulting in S 100% and E 70% with a VPP42% and a NPV 100%, and a Pv 18% in our sample and a K value: between 0.1458 and 0.5219.

Conclusions: The basic MRI is a sensitive but non-specific test for the diagnosis of atypical meningiomas, showing a weak force according to the AP, so to improve the characterization of these lesions, imaging should be used to expand the study using advanced MRI techniques (i.e. perfussion analisys or spectroscopia).

C0102 The role of multimodal CT in decompressive hemicraniectomy after malignant middle cerebral artery brain infarction

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Introduction/Objectives: To evaluate the role of multimodal CT in predicting malignant middle cerebral artery (MCA) brain infarction(MBI) and its contribution to establish the indication of early decompressive surgery.

Materials and Methods: This is a retrospective study of 9 patients diagnosed of MBI and treated with early decompressive surgery at our hospital in the last 2 years.

Clinical data (table 1) and radiological findings (table 2)

Results

- Disparity was noticed between noncontrast CT ASPECTS and cerebral blood volume (CBV)ASPECTS, as expected because of the higher ability of perfusion CT to predict final infarct volume.
- Evaluated on CBV map perfusion CT, two patients showed infarction of >50 percent of the rostral half of MCA territory, including basal ganglia; one showed > 50 percent, and the rest showed infarction of >2/3 or the whole MCA territory. Another patient showed hypodensity on noncontrast CT involving >50 percent of the MCA territory (table 2 and figures)
- All patients showed poor collateral circulation at CTA and a considerable thrombus length (hyperdense MCA sign in the native scan) either at carotid-T and/or M1 segment of the MCA.

Conclusions:

- If volumetry software is not available, perfusion CT ASPECTS, better than noncontrast CT ASPECTS, helps to give a more accurate extension of brain infarction.
- Patients with hypodensity on head CT involving >50 percent, or involvement in CBV map in perfusion CT > 2/3, of the MCA territory, are more likely to develop MBI.
- Patients with involvement of >50% of the rostral part of MCA territory, including basal ganglia, on perfusion CT, may also develop MBI.
- Additional CT findings that must also be evaluated include infarction of additional vascular territories, poor collateral circulation and thrombus length.

C0104 Monitoring of tumor lesions in patients with epilepsy using MRI: changes seen during follow up

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Introduction/Objectives: Although most focal lesions in patients with epilepsy are benign, some times it is a challenge to distinguish which could have an aggressive course. Our purpose is to identify the morphological findings during MRI follow-up that could help in the decision of long term radiological follow-up without biopsy or surgery.

Materials and Methods: Retrospectively were reviewed 763 epileptic patients. 20 patients met the inclusion criteria of focal lesion and follow-up by MRI during 4 or more years, a posterior descriptive analysis was performed based on growth, new contrast enhancement foci and morphological changes (defined as changes in initial appearance excluding tumour size or enhancement) and vasogenic edema.

Results: In 17 patients the lesions were in the temporal lobe (85%), 1 was in the insula, 1 was in the parietal lobe and 1 had an intraventricular location. The follow-up ranged from 4-14 years. Three patients had histological confirmation by biopsy (1 low-grade glioma) or surgical resection for poor pharmacological control (2 low-grade neuroepithelial tumors). In the remaining lesions a presumptive diagnosis was made (unspecified lesion, dysplasia, hamartoma, DNET, ganglioglioma, low-grade glioma). Only 5 patients (25%) had changes during the follow-up: 1 patient showed a gradual decrease in tumour size after 9 years follow-up, in 1 patient there was cystic degeneration after 9 years follow-up and 3 patient revealed new contrast enhancement foci within the lesions in 3-8 years follow-up (2-4 years of further follow-up was performed without identifying other changes), 1 with a new calcification within the tumour. None of these lesions had increased in size and there was no vasogenic edema. No biopsy or resection were performed in these 5 patients with changes in tumour appearances.

Conclusions: Expectant management and image follow-up could be appropriated in patients with chronic epilepsy related to tumours which had radiological appearances changes such new enhancement, cystic degeneration and decrease in size.

C0106 Metastatic head and neck tumors: uncommon lesions from common sources

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Introduction/Objectives: Metastatic lesions in the head and neck can represent the first evidence of distant spread from a malignant primary tumor, so they are important for diagnosis and treatment.

The overall incidence of metastatic lesions in the head and neck is unknown, although some authors estimate it about 1%. The tumors that most often metastasize to this region are lung, breast, renal, prostate, and colon cancers.

Diagnosing these lesions is challenging because they have no pathognomic signs or symptoms and can be mistaken for benign processes.

Objectives:

1. To describe the different radiologic presentations of metastases to the head and neck.
2. To review the locations and histopathologic subtypes of the primary tumors that most commonly metastasize to the head and neck.

Materials and Methods: We selected from our center's database patients diagnosed with metastases to the head and neck in the period comprising 2007 through 2015. We excluded local ENT tumors and lymphoproliferative neoplasms. We reviewed the imaging studies, mostly computed tomography and magnetic resonance imaging, of head and neck metastases.

Results: We show the different radiologic patterns of metastases to the head and neck region, including those involving lymph nodes and those located outside them (extranodal). We analyze their characteristics and locations, and we correlate the imaging findings with the histopathologic findings.

Conclusions: Metastases to the head and neck are uncommon and difficult to diagnose. Although most cases require biopsy for the diagnosis, sometimes the radiologic presentation can suggest their metastatic origin.

C0112 Atypical presentations of brain metastases: pictorial review

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Introduction/Objectives: The incidence of brain metastases has increased in recent years in correlation with increased survival in cancer patients. Likewise, advances in magnetic resonance imaging (MRI), such as 3D spin-echo and contrast-enhanced FLAIR sequences, have improved and facilitated the detection of these lesions.

Brain metastases typically present as multiple nodular lesions in the parenchyma with homogeneous or ring enhancement and profuse edematous reaction around the lesions that is disproportionate to their size. Brain metastases are typically hypointense on T1-weighted images and hyperintense on T2-weighted images. They typically have high ADC values on diffusion-weighted images, increased rCBV in solid areas on dynamic susceptibility contrast-enhanced MRI, and choline and lipid peaks on MR spectroscopy.

Materials and Methods: We reviewed the cranial CT and MRI studies in patients diagnosed with intra- or extra-parenchymal intracranial metastases at our hospital in the last 10 years (2005-2015), focusing especially on findings that diverge from the typical imaging pattern.

Results: Findings that diverge from the typical presentation are not uncommon on CT and MRI and can make the diagnosis more difficult. Cystic or calcified lesions on CT, atypical MRI signal (T1 hyperintensity and/or T2 hypointensity in gradient-echo sequences), low ADC values, miliary dissemination, or unusual locations such as isolated leptomeningeal lesions are not very rare. Unfamiliarity with these presentations can lead to diagnostic errors in which brain metastases are mistaken for non-tumoral cystic lesions, ischemic vascular disease, cerebral amyloid angiopathy, or pyogenic or parasitic infections.

Conclusions: Knowing the atypical presentations of intracranial metastases makes it possible to avoid false-negative diagnoses that delay appropriate oncologic treatment.

C0117 Post-treatment imaging in primary brain tumours: a diagnostic challenge

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Introduction/Objectives

- To review the imaging findings of treatment-related conditions and true tumoral progression in patients with high grade brain gliomas treated with chemo-radiotherapy.
- To establish a distinction between post-treatment effects from progressive disease with advanced magnectic resonance imaging (MRI) techniques.

Materials and Methods: The treatment of Glioblastoma Multiforme and other high-grade gliomas has greatly advanced in recent years and is subject to multiple clinical essays which focus in the improvement of survival for these patients. Therefore it is of the utmost importance to determine whether the elected treatment is being effective, since it determines the continuation or change of these therapies, with its prognostic

implications. Imaging plays an important role in determining the patient's response to therapy, something which has become a true challenge, since the appearance of treatment-related effects frequently overlaps with that of tumour progression.

Specifically in patients treated with both radiation and temozolomide, there are three types of condition that need to be properly differentiated: pseudoprogression, radiation induced necrosis and true tumour progression. Despite its limitations, MRI remains the modality of choice for the follow up of these patients, and there are several studies that have focused in the distinction of these entities with advance MRI techniques such as diffusion weighted imaging (DWI), perfusion weighted imaging (PWI) and spectroscopy, with promising results in the assessment of disease status, with the consequent impact of such conclusions for the patient's life.

Results: Our aim is to show representative cases of these conditions, highlighting the key points which allow discriminating between these entities with MRI and advanced imaging techniques.

Conclusions: Distinction between treatment-related conditions and disease progression is a major diagnostic challenge in Neurooncology, since it affects the implementation or discontinuation of therapy. Advanced imaging techniques in MRI can help in making a proper diagnosis with its subsequent prognosis significance.

C0118 Assessment of cerebral perfusion in Alzheimer's disease: an emerging biomarker for early diagnosis

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Introduction/Objectives: The search for biomarkers in Alzheimer's disease (AD) is among the most relevant research topics of this decade due to the disease high prevalence and associated costs. Arterial Spin Labeling (ASL) perfusion magnetic resonance imaging (MRI) has the potential to become a very useful tool for the study of neurodegenerative diseases. It provides a non-invasive alternative to PET (the imaging technique most commonly used as functional biomarker), at much lower cost. ASL MRI does not involve the use of ionizing radiation, contrast medium or radioisotopes. Thus, the examination can be repeated frequently to track the disease course.

Materials and Methods: In this on-going study, we are using an optimized ASL technique to evaluate cerebral blood flow (CBF) in four age-matched groups of subjects: healthy controls (HC) with no history of neurological disease (n=8), subjects with subjective memory complaints (SMC), but for whom all clinical investigations were normal (n=12), patients diagnosed with amnestic mild cognitive impairment (MCI) (n=14) and patients suffering from mild (early-stage) AD (n=8). All subjects underwent neurological examination, cognitive assessment and brain MRI at 3T. The MRI study included a 3D T1-weighted anatomical imaging sequence followed by the ASL sequence. The ASL images were preprocessed to obtain CBF maps, that were normalized to a template brain and smoothed. CBF maps from the HC and SMC groups were compared with those obtained from the MCI and AD groups, using voxel-wise two-sample T-tests.

Results: MCI and AD subjects showed decreased perfusion ($p<0.05$, FWE-cluster corrected) with respect to HC and SMC groups in parietal and occipital lobes, most significantly in the posterior cingulate (28% CBF decrease, T=4.28) and precuneus (27% CBF decrease, T=3.75).

Conclusions: ASL MRI is a promising technique that could be useful in the management of AD.

Acknowledgments, conflicts of interest

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C0119 What should we look for in premotor region? Clinical standardized functional protocol in brain left premotor gliomas

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Introduction/Objectives: The anatomic location of a glioma influences prognosis and treatment options. There are considerable differences in distributions of gliomas in adults

substantially higher for the frontal and temporal lobes than for other lobes.

It is known that premotor cortex are intimately involved in movement. But language functions are too. This crossroads, motor and language have also been the inspiration to define a specific protocol for tumors in this location.

We present a functional protocol developed for the surgical management of brain gliomas located in left premotor region.

Materials and Methods: We studied 15 patients: 10 high-grade and 5 low-grade gliomas that affected left premotor region. A multidisciplinary team agreed a protocol for easy preoperative handling of these patients. All imaging is performed by using a 1.5T (Philips, Ingenia). Three paradigms' blocks (2 motor and 1 linguistic), 3D image anatomic and Diffusion Tensor Imaging (DTI) are used. The results of analyzing different modalities are derived separately and then are combined together to perform statistical analysis with de Philips's workstation.

Results: In an attempt to develop an optimized and standardized protocol, this examinations have been integrated into routine presurgical planning in our hospital. Complex finger opposition of the right hand alternating with rest paradigm generates a strong activation of cortical motor network in both hemispheres. Complex finger opposition of the right vs left hand identifies primary motor cortex. The verbal fluency–verb generation paradigm, allow us to identify pre- supplementary motor area, generally involved in linguistic planning, in addition to classic language areas and cortex premotor. Assessment of the Arcuate, Frontal Aslant and Corticospinal tracts is very important to avoid damage in eloquent subcortical areas.

Conclusions: It's important to choose the appropriate fMRI paradigms and integrate systematically DTI sequence. This proposed protocol is an easy and fast tool in preoperative planning of patients whit left premotor glioma.

C0120 MRI can avoid misdiagnosis in seronegative antiphospholipid syndrome (SN-APS) of central nervous system (CNS) with small vessel brain injury

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Introduction/Objectives: The main purpose is to define the usefulness of the MRI in the diagnosis of seronegative antiphospholipid syndrome (SN-APS) of central nervous system (CNS) with small vessel brain injury, defined as the presence of clinical and MRI findings suggestive of antiphospholipid syndrome (APS) and persistent negative habitual antiphospholipid antibodies (APA).

Recently, different antibodies directed against other molecules have been found in APS patients.

Materials and Methods: Serie of 42 patients followed between 2011 and 2014.

Control group: 13 patients with confirmed APS of CNS, small vessel brain injury at MRI and presence of habitual APA.Study group: 29 patients with small vessel lesions at MRI and related CNS symptoms, with suspected APS and APA study persistent negative.

These patients didn't have cardiovascular risk factors and thrombophilia study was negative.

We performed non-habitual antiphospholipid antibodies (NH-APA) determinations in Study group.

MRI studies were conducted including T1, T2, FLAIR and diffusion sequences (DWI). The lesions were classified according to the distribution, anatomical location, number and size. We used the Fazekas scale to determine the degree of white matter involvement.

Results: We have found 18 (62%) patients from the study group with presence of NH-APA that allowed the SN-APS diagnosis. The most frequent NH-APA found was the phosphatidylserine/prothrombin complex (IgG isotipe) in 66, 6%.

No differences were found when we compared MRI patterns between NH-APA Study group and APS group. The MRI pattern with more than 6 supratentorial lesions and Fazekas scale equal or more than 2 has been the most consistent finding, and also highly associated with NH-APA.

Conclusions: We have identified a MRI pattern defined by more than 6 supratentorial lesions and Fazekas scale 2 or more in patients with small vessel brain injury associated to APS. In absence of habitual APA, this pattern is highly associated with NH-APA, and the diagnosis of SN-APS should be suggested.

Acknowledgments, conflicts of interest

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C0124 Is the early carotid artery stenting for symptomatic stenosis safe?

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Introduction/Objectives: The benefit of carotid endarterectomy (CEA) has been proven to be dependent of the timing of surgery in relation to the presenting TIA or stroke event. Nowadays, carotid artery stenting and angioplasty (CAS) is an alternative of endarterectomy. However, there is uncertainty about the safety of performing CAS among patients with a recent TIA or stroke.

Materials and Methods: We conducted a retrospective analysis of our prospective database of patients who underwent CAS for severe carotid stenosis since January 2000 to June 2015. Patients were classified as follows: early CAS performed ≤ 2 weeks after symptoms, delayed CAS performed >2 weeks after symptoms and asymptomatic patients. Clinical and radiological features were reviewed. Outcomes were TIA/stroke/myocardial infarction or death up to 30 days after the procedure.

Results: We included 1484 consecutive patients. Of them, 241 (16,1%) were early CAS, 888 (59,8%) delayed CAS and 355 (23,9%) asymptomatic. There was no difference regarding clinical features or carotid stenosis among the three groups, except with peripheral artery disease (p=0,016). The outcomes of TIA/stroke and death were 2,4% (2.9% in early CAS and 2, 1% in delayed CAS). These results were not significantly different, however there was slightly more TIA in early CAS group (6,2% vs 4% in delayed-group and 2,5% in asymptomatic-group, p=0.08).

Conclusions: Our results showed that early CAS can be considered safe when performed in symptomatic patients, favouring an immediate intervention after index ischemic event to avoid the high short-term risk of stroke.

C0125 Carotid artery stenting, our single centre experience over a 15-year period

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Introduction/Objectives: Endovascular treatment of carotid stenosis by introducing a metal stent is an alternative option to carotid endarterectomy. In this study, we report our 15-year experience of carotid stenting in the setting of carotid artery stenosis, focusing on technical nuances and vascular complications in comparison with the world literature.

Materials and Methods: This was a retrospective analysis of 344 patients treated with carotid artery stenting in our hospital between 2000 and 2014. All patients had stenosis of the internal carotid artery diagnosed by doppler ultrasound, CT/MR angiography or diagnostic angiography. Endovascular recanalization was attempted using extracranial stenting (Acculink, Abbott Vascular, EE.UU). All CAS procedures were performed by two interventionalists with many years of experience in CAS technique, with the presence of an anesthetist. Periprocedural complications, and morbidity were globally registered. Follow-up was made by clinical and ultrasound examination in 1, 3, 6, and 12 months after the intervention. After that, follow-up was made annually. Clinical events, including any stroke, myocardial infarction or death, were documented.

Results: Three hundred forty four patients were treated with carotid stenting. The mean age was 70.43 years (86% males; range of 44-86 years). Demographic characteristics and risk factors are shown in Table 1. 89.5% of the patients were symptomatic. All patients received antiplatelet medication before the procedure. Angiographic characteristics and procedural data are shown in Table 2.The overall periprocedural major complication rate was 2.3% (Table 3). There was no myocardial infarction in our series. No statistical difference was found between symptomatic or asymptomatic patients. 24 patients (7%) had restenosis during follow-up.

Conclusions: Carotid stenting at an experienced center is a safe procedure to treat carotid stenosis. Our periprocedural complication rate may be comparable and even lower that the rate reported in other clinical trials.

Acknowledgments, conflicts of interest

None

C0127 Pediatric craniopharyngioma: what neursurgeon needs to know

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Introduction/Objectives: Craniopharyngiomas need an accurate surgical approach due to their location and extension.

Radiologists must define their location, extension, margins and consistency to determine the surgical approach and treatment possibilities

Materials and Methods: We can assess Neurosurgeons by identifying:

1. Typical and atypical radiological signs and differential diagnosis of the mass.
2. The location of the tumor:
   - Sellar: inside the sellar region.
   - Pre-chiasmatic: parallel to the anterior cerebral artery and anterior to the chiasma.
   - Retro-chiasmatic: behind the chiasma, encroaching the third ventricle or suprasellar area.
3. The presence of cystic component and its location: suprasellar, retro- chiasmatic and/or extension to the third ventricle. After the traditional treatment, chemotherapy drugs like Bleomicina (more neurotoxic) or alfa-interferon, can be instilled inside the residual cysts through Ommaya reservoir, decreasing the tumor size considerably.

Before the instillation, a Gadolinium enhanced MR is performed through the Ommaya reservoir to determine the end of the reservoir and if there is a connection with the ventricular or cysternal system.

Therefore, on the one hand, mid-line sellar-suprasellar tumors will have an endoscopic transsphenoidal approcah. On the other hand, suprasellar and paramedial tumors will be approached by pterional craniotomy.

Results: We present eight cases of craniopharyngioma.

Four craniopharyngiomas underwent surgery, radiotherapy and chemoterapy with intra-cystic instillation through the Ommaya reservoir, with significant reduction of their size and radiological stability.

Three tumors recurred, requiring re-intervention with posterior healing.

One craniopharyngioma presented stable tumoral remnant.

Finally, six patients underwent transsphenoidal surgical approach, and two patients, who presented large suprasellar and paramedial retro-chiasmatic components, were approached by frontal and pterional craniotomy.

Conclusions: Pediatric craniopharyngiomas present special radiological signs that must be identified in order to guide the neurosurgeon to an accurate approach, an eventual chemoterapy instillation treatment and the prevention of potential complications.

C0128 A heavy weight of clot retrieval: solitaire flow restoration device in acute ischemic stroke

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Introduction/Objectives: Recent reports have indicated the mechanical thrombectomy superiority over other approaches in the management of acute cerebral ischemia. This study aims to analyse the efficacy of the Solitaire, using Stentriever Technology, in acute ischemic stroke patients.

Materials and Methods: Over two years a prospective study of all consecutive patients with an angiographically verified intracranial occlusion, who underwent Solitaire mechanical thrombectomy, was performed. Baseline characteristics, successful recanalization (Thrombolysis in Cerebral Infarction grade ≥2b), procedure time, symptomatic intracranial haemorrhage, dramatic clinical improvement (≥10 points decrease in the NIHSS score at 24 hours) and independent functional outcome (mRS ≤2) at 3 months were recorded.

Results: Seventy-five patients were treated (49.3% female; mean age 67.5±15.8). Median NIHSS score was 18 (8-30) on arrival and 8 (0-30) at 24 hours after the procedure. None of the patients needed anaesthesia or intubation. Thirty-five (60.3%) patients were treated with intravenous tPA before the thrombectomy. On first angiogram the occlusion site was internal carotid artery in 42.7% (n=32), middle cerebral artery in 49.3% (n=37), basilar artery in 5.3% (n=4) and both internal carotid artery and middle cerebral artery in 2.7% (n=2). Angioplasty in proximal internal carotid artery was performed in 20% (n=8) before the retriever was used. Successful recanalization rate was 67.6% (n=48). The mean time from groin puncture to final recanalization was 68±36 min, and from

groin puncture to initial flow restoration 25±18 min. The median number of Solitaire passes was 2 (1-6). We combined Solitaire plus distal aspiration approach in 69.5% (n=41) of cases. Symptomatic intracranial haemorrhage rate was 9.5% (n=7), dramatic clinical improvement was identified in 39.1% (n=27), and favourable outcome at 3 months in 44.7% (n=21). Intra-hospital mortality rate was 10.3% (n=7).

Conclusions: In acute endovascular treatment of stroke the use of Solitaire retriever allows an effective recanalization and a reduced time to flow restoration leading to improved outcomes.

C0130 Decompressive craniectomy in pediatric patients: postsurgical changes and complications

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Introduction/Objectives: Decompressive craniectomy (DC) is a second level treatment for cranial hypertension which has recently started to be performed in pediatric patients. At the moment, DC pediatric criteria are not well established.
We show the CT and MR radiological findings of this surgical procedure, the intra- and extraparenchymal changes after DC and its complications.

Materials and Methods: Retrospective review of patients who underwent DC at our institution between 2009 and 2015.
Our series is made up of seven patients; one patient presented encephalitis, four, severe head trauma, and two, malignant cerebral infarction.

Results: Three bifrontal, two frontal-parietal-temporal and two frontal-parietal and one parietal-temporal DC were performed.
The main findings of radiological improvement after DC were the enlargement of the ventricular system that was present in all patients, and the reduction of edema, that happened in more than 50% of the patients.
The most significant early complications after DC were the expansion of brain contusions, enlargement of extraaxial hemorrhage, cerebral parenchyma herniation through the craniectomy and extensive ischemic infarctions.
As a late complication, necrotic cerebral parenchyma herniation through the craniectomy was visualized.

Conclusions: The removal of a large piece of skull is not an operation without adverse effects; rather numerous complications may arise, and they do so in a sequential fashion following surgical decompression.
CT and MR are indispensable tools in the follow-up of these patients and it is important to know the type of DC performed, and both the normal findings after DC and the radiological manifestations of its complications.

C0131 CT of neoplastic and non-neoplastic laryngeal paralysis. tips for differentiation between vagal and recurrent laryngeal neuropathy

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Introduction/Objectives: Over a half of the patients with vagal or recurrent laryngeal palsies are said to have an idiopathic (or toxic) cause. However, there are some causing lesions we must rule out.
When CT-evaluating a patient with hoarseness, the radiologist must seek useful information about the type of paralysis of each patient, and then look for a possible neoplastic cause.

Materials and Methods: There are several CT signs which are typical of a unilateral laryngeal paralysis. Which are the most accurate ones? Can any of them help us distinguish a central or peripheral vagal neuropathy from a recurrent laryngeal neuropathy?

Results: In order to look for the neuropathy cause, we must be aware of the anatomical course of the vagus and the right and left recurrent laryngeal nerves.

Causing lesions like lung, pharyngo-laryngeal or nerve sheath tumors, vascular dilatations and goiter can be found. Nonetheless, in most of cases a cause won't be seen.

In a laryngeal paralysis, whether we find a cause or not, some signs may be seen:

- Pyriform sinus dilatation
- Medialization and thickening of the aryepiglottic fold
- Laryngeal ventricle dilatation
- And other less frequent signs

The pharyngeal constrictor muscle atrophy (which leads to asymmetric oropharynx dilation and constrictor muscle thinning signs) should make us think of a vagal central paralysis. In these cases, the causing lesion must be sought in the posterior cranial fossa or in the skull base.

When these signs are not present, the paralysis producing lesion should be sought in the peripheral course of the right or left recurrent laryngeal courses.

Conclusions: Awareness of the findings commonly associated to laryngeal paralysis and the specific signs distinguishing the different types of neuropathy can help us find the paralysis causes in the responsible nerve course.

C0134 Diagnostic imaging of schwannomas, a rare type neurogenic tumor

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Introduction/Objectives: To analyse the imaging features of schwannomas requiring surgery in our hospital.

Materials and Methods: Retrospective study of patients undergoing surgery in our hospital between 2012 and 2014 with a diagnosis of schwannoma. Study variables were: age and sex distribution, clinical diagnosis, location, radiological characteristics in different imaging tests, surgical criteria, results and complications of surgery. A review of the literature was also performed.

Results: Of the 18 patients under study 11 were women and 7 men. All schwannomas showed typical manifestations with the different imaging techniques. All patients were surgically treated. Four were partially and 14 fully resected. Only 5 of them had post-treatment complications.

Conclusions: Schwannomas are low-incidence innocent tumours with few postoperative complications.

C0139 Precipitating hydrophobic injectable liquid (PHIL): a new embolic agent for cerebrovascular diseases

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Introduction/Objectives: The PHIL (Precipitating Hydrophobic Injectable Liquid) device is a new non-adhesive liquid embolic agent comprised of a co-polymer dissolved in DMSO (dimethyl sulfoxide). An iodine component is chemically bonded to the co-polymer to provide a radiopacifier element during fluoroscopic visualization.

Objective: To present our preliminary experience using PHIL in endovascular treatment of cerebrovascular diseases.

Materials and Methods: Between December 2014 and May 2015, 12 patients (7 women, 5 men; mean age, 56.6 years; range, 35–73 years) with 6 brain arteriovenous malformations (AVM) (Grading according to Spetzler and Martin was grade I in 1, grade II in 3, and grade III in 1 and IV in 1), 3 dural arteriovenous fistulas (AVDF) (1 tipo I, 1 tipo II y 1 tipo IV), two glomus and one extracraneal AVF were treated with PHIL. Clinical presentation, location and type of AVM or DAVF, Spetler or Cognard/Borden type, injection procedural time, microcatheter used, volume of PHIL injected, complications, immediate angiographic data, premorbid and any neurologic deficits were included in the analysis.

Results: Presentation was hemorrhage in 6, seizures in 1 patient and tinnitus in two. Three of the patients had injection previously of another embolic agent (Onyx). Six patients (3 AVM, 3 AVDF) were successfully treated with complete angiographic exclusion. PHIL injections from a single pedicle ranged from 5 to 45 minutes (mean, 23.6 minutes), and the total amount of PHIL injected ranged from 1.5 to 19 mL. (mean 4.7 ml). A double-lumen balloon microcatheter was used in three patients. One microcatheters with detachable tip retention occurred. One hemorrhagic complications ocurred six days after in the grade IV AVM.

Conclusions: PHIL liquid embolic agent appears to be an alternative embolic material. Further studies are required to fully evaluate its safety and efficacy.

C0140 Imaging characteristics of nodal metastasis in Human Papilloma Virus related carcinomas of the oropharynx

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Introduction/Objectives: The incidence of Human Papilloma Virus (HPV) infection and related squamous cell carcinomas of the oropharynx (SCCOP) is increasing, and patients with HPV-positive SCCOP typically have younger age of onset, limited tobacco exposure and more favourable prognosis than HPV-negative patients.

However, nowadays no imaging modality can determine whether the tumour is HPV positive. The purpose of the study is to asses if HPV-positive and HPV-negative oropharyngeal cancers have consistent differences in pre-treatment nodal characteristics in CECT.

Materials and Methods: A retrospective review of 68 patients with SCCOP and pre-treatment CECT examination was performed by a single radiologist blinded to HPV status and clinical stage. All patients had the HPV status determined by 16 polymerase chain reaction testing.

Clinical characteristics as T-stage, tumour subsite and smoking status were registered. Imaging characteristics for nodal metastases (number, level of nodes, cystic changes, necrotic changes, matted nodes, enhancement, extra capsular spread) were compared by the Chi-square testing.

Results: There were 68 cases with SCCOP, 13 HPV positive (23%) and 57 HPV negative (71%). 17 patients did not have metastatic lymph nodes (13 HPV- , 4 HPV+).

Of the 51 patients with nodal metastases, the 9 patients HPV+ (17.6%) tend to demonstrate intranodal cystic changes and matted lymph nodes (31% in HPV+ vs 11% in HPV-, p= 0.085).

The 42 patients HPV- tend to demonstrate intranodal necrotic changes, (88% in HPV- vs 12 % in HPV+, p=0.161), enhancing nodes (90% in HPV- vs 0 % in HPV+, p 0.006) and extracapsular spread (93 % in HPV- vs 7 % en los HPV+, p=0.184).

Conclusions: Pre treatment CT characteristics of metastatic lymph nodes in oropharyngeal carcinomas can predict HPV status. HPV-positive tumours were more likely to have matted nodes and cystic nodal metastasis, whereas HPV-negative tumours tend to have necrotic changes, enhancement and extracapsular spread.

C0142 Vascular compression syndromes: trigeminal neuralgia and hemifacial spasm

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Introduction/Objectives

Introduction

Trigeminal neuralgia is a distinctive facial pain syndrome that may become recurrent and chronic. It is characterized by unilateral pain following the sensory distribution of cranial nerve V and is often accompanied by a brief facial spasm or tic. Hemifacial spasm represents a segmental myoclonus of muscles innervated by the facial nerve, almost always unilaterally, although bilateral involvement may occur rarely in severe cases. Hemifacial spasm generally begins with brief clonic movements of the orbicularis oculi and spreads over years to other facial muscles. Trigeminal neuralgia and hemifacial spasm can be caused by vascular compression, and subsequently can be cured by microvascular decompression.

Objectives

- To describe the relevant anatomy of the V and VII cranial nerves.
- To review the use of MRI techniques in the evaluation of pathologies of the V and VII cranial nerves, including their relationships with vascular structures that can cause symptoms.
- To discuss the role of microvascular decompression and the main imaging findings in follow-up studies.

Materials and Methods: The authors made a review of the imaging studies performed in the institution of patients with trigeminal neuralgia and hemifacial spasm, correlating with follow-up studies and surgery, and a review of relevant literature.

Results: The results do not apply to this type of poster.

Conclusions: It is important to know the anatomy of the V and VII cranial nerves to make a correct identification of the compression site in trigeminal neuralgia and hemifacial spasm. Preoperative identification of neurovascular compression might predict which patients will benefit from microvascular decompression

C0147 Deficit in brain asymmetry in patients with schizophrenia

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Introduction/Objectives: Differences in brain asymmetry in patients with schizophrenia compared to a healthy control group have been shown in previous studies. However, the results obtained are heterogeneous and sometimes contradictory. A possible explanation for this incongruence is the lack of consensus in the techniques used to assess brain asymmetry. The aim of this research is to reveal possible brain asymmetries associated with schizophrenia. In our case, a standardized method of quantifying brain asymmetry based on voxel-based morphometry (VBM) is applied.

Materials and Methods: T1-weighted brain images of 24 patients with schizophrenia and 26 healthy subjects were acquired. Postprocessing of the data was done with the SPM module, version 8, of the MATLAB software. We followed the methodology for quantifying gray matter asymmetry proposed by Kurth, Gaser and Luders (2015), based on the VBM8 toolbox.

Results: Only a small region of the brain showed a difference in brain asymmetry: patients present decreased gray matter asymmetry in the anterior prefrontal cortex, a region in which healthy subjects present a rightward asymmetry (higher gray matter density on the right anterior prefrontal cortex). The remaining areas of the brain showed no asymmetry differences between both groups.

Conclusions: Our results are in accordance with some studies that have reported a deviation from normal brain asymmetry in schizophrenia samples. Our approach seems appropriate for future studies with larger samples, and potentially could reveal associations between brain asymmetries and cognitive impairments in patients with schizophrenia.

Acknowledgments, conflicts of interest

The authors declare no conflict of interest.

C0149 The immunocompromised host: imaging patterns of CNS infections

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Introduction/Objectives: Infections of the central nervous system (CNS) are a common condition with a high morbidity in the immunocompromised host.

A compromised immune system not only predisposes the host to a higher incidence of infections but considerably broadens the spectrum of responsible pathogens.

Besides the common pathogens in the general population, there are others that are almost exclusive to patients with impaired immunity as Toxoplasma, Cryptococcus or JC virus.

Initial symptoms may be nonspecific as these patients may have a reduced response to infection and therefore less clinical and analytical repercussion. Complementary tests such CT and MRI play therefore a key role in the diagnosis.

The aim of the paper is to review the radiological findings in opportunistic infections of the CNS and determine a possible etiologic classification according to the main finding.

Materials and Methods: We review the imaging tests of immunocompromised patients with CNS infections admitted to our hospital during the past 10 years.

Results: We classify the imaging findings into five categories: mass effect lesions, diffuse involvement of the white matter, meningeal involvement, ventricular involvement and focal parenchymal involvement (encephalitis).

Even though different microorganisms can exhibit a wide overlap of imaging features, there are certain patterns that can point to a specific pathogen so depending on the predominant finding we perform a possible etiologic classification.

Conclusions: CNS opportunistic infections are a common condition with high morbidity and mortality rates. Clinical manifestations in the immunosuppressed patient are often nonspecific so it is important that the radiologist is familiar with the imaging findings that allow establish a diagnosis and an appropriate treatment.

C0150 Primary brain lymphoma, "the great simulator": imaging features

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Introduction/Objectives: To review the imaging features of primary CNS lymphomas, diagnosed at this centre through an intrasurgical biopsy.

Materials and Methods: Retrospective study of patients diagnosed with primary CNS lymphoma through an intraoperative biopsy, in the period covering 2001-2010. The variables under study are the following: age-sex distribution, symptoms at the moment of diagnosis, radiological findings, treatment and complications. The literature is reviewed.

Results: From 12 patients, 9 are men and 3 women, showing all of them symptoms at the moment of diagnosis. 11 show typical radiological manifestations. 4 receive surgery and adjuvant treatment, 5 chemotherapy and 3 no treatment. Only one patient evolves with no complications. The remaining patients: 5 deceased, 3 recurrences, 2 residual seizures, 1 infection for immunosuppression

Conclusions: Primary CNS lymphoma is a malignancy with imaging features which are useful to make a diagnosis. The treatment consists on surgery, chemotherapy and/or radiotherapy. Complications are common and serious.

C0151 Vasospasm after subarachnoid hemorrhage: utility of perfusion CT and CT angiography on diagnosis of delayed cerebral ischemia

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Introduction/Objectives: To evaluate the utility of perfusion CT (PCT) combined with CT angiography (CTA) for the diagnosis of vasospasm and the delayed cerebral ischemia (DCI), by using conventional digital subtraction angiography (DSA) as the gold standard. To correlate PCT and DSA with the final areas of infarction identified in the follow-up Non-contrast CT (NCT).

Materials and Methods: We retrospectively reviewed every patient that underwent endovascular therapy for vasospasm in our institution from 2013 to 2015 with demonstrated angiographic vasospasm in DSA, as our inclusion criteria. All patients arrived with acute subarachnoid hemorrhage (ASH) and underwent in the first few days NCT, PCT and CTA that were independently reviewed for quantification of ASH according to Fisher scale and the risk of DCI according to PCT. We correlate the risk of DCI in perfusion maps with the follow-up NCT performed 24 hours later.

Results: The systematic review identified 9 studies that met our screening criteria, with a mean age of 50 years old. 88% of the patients had ASH grade III or more, according to Fisher scale in the initial NCT. 66% had altered mean transit time (MTT) maps on PCT, however only one patient, had no aneurysm demonstrated, despite he had vasospasm in DSA. DCI occurred in the hemisphere with the lowest initial perfusion according to MTT maps in more than 89% of the patients and was confirmed later in the follow-up NCT.

Conclusions: A CT survey combining NCT, CTA , PCT and follow-up NCT represents an accurate screening test in patients with suspected vasospasm and could help to identify patients with poor outcome who will develop a higher risk of DCI , all in order to select the best management strategy for better outcomes in such patients.

Acknowledgments, conflicts of interest

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C0152 Correlation of cerebral circulation times with clinical outcome in patients with subarachnoid hemorrhage assed with syngo iFlow tool

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Introduction/Objectives: To assess cerebral circulation times (CCTs) in patients with subarachnoid hemorrhage (SAH) and control subjects by using syngo iFlow (which is a tool that allows us to quantify the circulation times with a cerebral angiography) to determine whether vascular abnormalities can be detected in this disease and their prognostic relevance.

Materials and Methods: Between May 2013 and May 2014 we retrospective analized patients with SAH (within the first 24-48 hours after bleeding.) and control subjects (obtained from aneurysm follow-up patients) underwent cerebral angiography postprocessed with syngoiFlow to obtain through different time ratios.CCT was define by different time ratios in seconds: TCC (Total Cerebral Circulation), PCC (Partial Cerebral Circulation), MCC (Macro Cerebral Circulation) and mCC (micro Cerebral Circulation). Patient were classified into 3 groups. Group 0: control subjects; Group 1: non-aneurysmal primary SAH patients and Group 2: aneurysmal SAH patients. Nonparametric statistics were used to compare CCTs ratios and clinical outcomes between those groups and between group 2 and group 0+1.

Results: Fifty-seven patients with SAH [32 female (56.1%); mean age 57±12.73] and 15 control subjects were included. CCTs (TCC, PCC, mCC) were prolonged in patients with aneurysmal SAH (group 2) compared with non-aneurysmal primary SAH (group 1) plus control subjects (group 0). Group 2 compared to group 0+1: TCC [9.58 (7.72-10.91) seconds vs. 6.38 (5.85-6.91)], PCC [6.91 (5.41-8.95) vs. 4.43 (3.90-4.96)] and mCC [5.85 (4.97-7.63) vs. 3.89 (3.37-4.43)] were different with statistically significant difference ($p<0.0001$). In patients with SAH, we did not find any statistical association between CCTs ratios and outcome values.

Conclusions: Patients with aneurysmal SAH have longer cerebral circulation ratios compared to non-aneurysmal primary SAH and with control subjects. However, in SAH patients CCTs measured within the first 24-48 hours after bleeding are not related to clinically relevant outcome values.

Acknowledgments, conflicts of interest

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C0156 Signal abnormalities on susceptibility-weighted mr imaging in patients with clinically isolated syndromes and in subjects with incidental focal white matter lesions

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Introduction/Objectives: To analyze the value of SWI in differentiating clinically isolated syndrome (CIS) patients, from asymptomatic or migraine young adults demonstrating incidental brain focal white matter lesions.

Materials and Methods: 32 patients with CIS, and 21 subjects demonstrating incidental brain MR imaging focal lesions (control group) (mean age 43 years, 90% females) were included in the study. One observer assessed the fulfillment of the McDonald criteria for dissemination in space (DIS), and the presence of lesions showing intralesional susceptibility signal loss (ISS) on SWI sequence. To investigate whether the presence of ISS can aid in the differential diagnosis of patients with CIS from control subjects, we conducted sensitivity, specificity, and accuracy analysis.

Results: DIS was demonstrated in all CIS patients, while only in 14% of the control group. ISS was observed only in 4 subjects in the control group, although only one showed more than 20% of the T2 visible lesions with this signal abnormality. ISS were observed in all CIS patients (all but two with more than 20% of the T2 lesions with this signal abnormality. The presence of ISS (in at least 20% of T2 lesions) achieved a high sensitivity (93%) specificity (95%) and accuracy (94%) for differentiating CIS from controls, although similar results were obtained when considering fulfillment of DIS criteria (sensitivity 100%; specificity 86%, accuracy 94%). Combining the presence of ISS with the McDonald 2010 criteria for DIS achieved 93% of sensitivity, 100% specificity and 96% accuracy in differentiating patients with CIS from subjects with incidental white matter abnormalities.

Conclusions: Intralesional susceptibility signal (ISS) changes on SWI, are constantly present among patients with CIS, and were highly specific in differentiating these patients from subjects showing incidental white matter abnormalities. Combination of presence of ISS loss and current McDonald criteria for DIS improves diagnostic specificity and accuracy.

C0163 Neuroacanthocytosis: what radiologist should know?

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Introduction/Objectives: Neuroacanthocytosis is a rare group of diseases with neurologic symptoms and acanthocytes in periferic blood.

The aim of this communication is to review and improve the kwoledge of the neuroimaging features of these neurocutaneous syndromes.

Materials and Methods: We reviewed retrospectively cases of neuroacanthocytosis and selected the relevant findings.

MRI findings were collected and literature reviewed.

Results: Neuroacanthocytosis are genetic diseases: Acanthocytic corea, McLeod syndrome (XK), Huntington disease type 2 (HDL2) and pantothenate kinase-associated neurodegeneration (PKAN2). Many times symptoms overlap and diagnosis is difficult.

McLeod síndrome is an X-linked recessive genetic disorder (XK gene) and may affect the brain, blood, nerves, muscle and

heart. The disease develops in patient 50s and the course is slowly progressive. Several symptoms include peripheral neuropathy, chorea, facial tics, seizures, a late-onset dementia, behavioral changes, cardiomyopathy and hemolitic anemia (because of acanthocytes). Elevate creatine kinasa can be seen with myopathy in McLeod syndrome. MRI shows increased T2 signal in the lateral putamen with caudate atrophy and secondary lateral ventricular dilation.

In pantothenate kinase-associated neurodegeneration (PKAN2), also known as neurodegeneration with brain iron accumulation (NBIA1) and previously Hallervorden-Spatz syndrome, there is an excess of iron that progressively builds up in the brain. It is an autosomal recessive disorder. Symptoms begin in childhood, are progressive (death in early adulthood) and include dystonia, dysphagia/dysarthria, rigidity, tremor, dementia, spasticity and weakness. 25% of patients develop post-10 years of age with a course slower and psychiatric and behavioral disturbances. MRI shows iron deposits in the basal ganglia known as eye-of-the-tiger sign; abnormal low T2 signal, due to accumulation of iron in the globus pallidus with a longitudinal stripe of hight signal due to gliosis and spongiosis. It is a classical sign but no patognomonic.

Conclusions: MRI can play a role in diferential diagnosis of neuroacanthocytosis patients because of the difficulty in establishing the diagnosis.

C0170 Spinal involvement in sapho syndrome: findings that neurorradiologists need to know

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Introduction/Objectives: SAPHO syndrome (synovitis, acne, pustulosis, hyperostosis, osteitis) is a rare entity of unknown ethiology, without clear-defined diagnostic criteria that can be found in many different stages in a range of ages from children to adults. Spine involvement is frequent and may simulate infection or tumoral infiltration, leading to a wrong initial management.

Our purpose is to make neuroradiologists aware of the existence of this condition that we consider infra-diagnosed and to analyse radiologic features that could help us orientate the diagnosis.

Materials and Methods: We present four cases of SAPHO that came to our center with back pain and vertebral lesions in the last three years. One of them came derived for second opinion under the suspect of vertebral metastasis. They presented an age ranging from 42 to 62 years old. 1.5T spine MRI was performed in all cases. Findings were retrospectively analysed and contrasted with the literature. Final diagnosis was obtained by anatomopathological examination.

Results: Vertebral injury in SAPHO syndrome produces inflammatory, osteolytic and sclerotic changes, what may lead to wrong diagnostic pathways and thus cause the performance of reiterated biopsies. MRI findings made us suspect SAPHO syndrome so the study was enlarged with body MRI and/or gammagraphy. The combination of images and pathology examination allowed us to ensure the diagnosis of SAPHO. Clinical remission was achieved with nonsteroidal antiinflamatory drugs, corticosteroids and biphosphonates.

Conclusions: Image findings in spinal involvement of SAPHO syndrome shows some features that can help us suspect the diagnosis. We believe this is an infra-diagnosed pathology because of the lack of awareness and we consider that, given its benign course and the good prognosis it implies, neuro-radiologists should have it in mind and need to be trained to differentiate it from other potentially serious pathology, in order to avoid unnecessary aggressive interventions and allowing early treatment to be offered.

C-0173 Utilidad de la rm dinámica en el diagnóstico del carcinoma escamoso de cavidad oral y orofaringe

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Objective: The aim of this study is to assess the utility of dinamic magnetic resonance imaging (MRI) in the squamous carcinomas of the oral cavity and oropharynx and its correlation with the degree of histological differentiation.

Material and methods: A retrospective analysis was performed on the patients diagnosed with squamous carcinomas of the oral cavity and oropharynx who underwent a facial MRI for local staging including dynamic sequences at our hospital between November 2014 and July 2015.

15 patients were included with a median age between 25 and 87 years old.

We performed a cualitative and semi-quantitative assessment of the time-signal intensity curves.

Results: All the lesions showed a type 2 and 3 pattern, but there were no correlation between the cualitative and semi-quantitative assessment of the time-signal intensity curves and the degree of tumour differentiation.

Conclusion: Our study showed no correlation between the dynamic MRI and the degree of tumor differentiation in the squamous carcinomas of the oral cavity and oropharynx.

C0176 Embryologic approach to the spinal cord

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Introduction/Objectives: The development of the neuroaxis relates neural elements of the spinal cord itself with those of the spinal ganglia. Being much larger than in the adult, these components of the posterior root appear to lead part of the posterolateral anatomy and vascularization of the cord. We aim to review the embryology of the different components of the spinal canal in order to better understand its anatomical configuration and relationships.

Materials and Methods: Stained axial cuts of nine embryos and fetusses between 13 and 70 mm CRL (4-11 weeks) have been included in this study. Their anatomic appearance as well as vascular disposition has been examined.

Results: A review of the main steps leading to the anatomy of the spinal cord can help us in a better understanding of the adult configuration. Also an insight in its structural arterial and venous network may give some light in the approach to the vascular relationships of the spinal cord itself as well as the spinal roots.

Conclusions: The relative large size of the spinal ganglia in relationship with the spinal cord, for example, and their likely need for vascular supply, explains the close relationship of the arterial and venous structures around the posterior roots. Dural venous arrangement establishes free wide communication between the spinal elements, representing also an interesting feature.

C0177 The role of multidetector CT in the assessment of reversible cerebral vasoconstriction syndrome

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Introduction/Objectives: Reversible cerebral vasoconstriction syndrome (RCVS) is a rare entity that constitutes the common clinical and radiological presentation of multiple conditions characterized by vasoconstriction of intracranial arteries. The most frequent complication is hemorrhage, followed by stroke and seizures. The diagnosis of RCVS includes clinical and radiological criteria; multifocal vasoconstriction of intracranial arteries demonstrated by angiography, CT angiogram (CTA) or MR angiography is the most significant imaging finding, and the reversibility of these vascular changes before 12 weeks after onset is a fundamental clue to confirm the diagnosis. This work reviews a series of cases of RVCS that were diagnosed with Multidetector CT (MDCT), enhancing the role and advantages of this technique.

Materials and Methods: We reviewed all the cases of RCVS that were diagnosed with MDCT during the period January 2011- April 2015 in our centre.

All patients underwent a CT angiogram at the moment of presentation, and had a short-term follow-up with CT angiogram. The criteria to consider the diagnosis of RCVS were:

- Multifocal segmental vasoconstriction of cerebral arteries.
- Reversibility of these vascular changes within 12 weeks after onset.

Results: Four cases of proven RCVS were identified, including:

- Post-C section RCVS.
- Ectasy-induced RCVS.
- RCVS in a patient with autoinmune anemia.
- PRES associated with RCVS.

Two patients of our series presented with intracerebral hemorrhage. Beside the expected vascular changes on CTA, the perfusion maps obtained in one of these cases demonstrated an area of hypoperfusion.

One patient presented with watershed infarctions, also as a consecuence of hypoperfusion demonstrated on CTA.

Conclusions: Reversible cerebral vasoconstriction syndrome is a challenging condition that can be easily missed in clinical practice. MDCT allows to detect the vascular changes

associated to this entity, providing a non-invasive way to diagnose and monitor the disease, to confirm the clinical suspicion and to identify complications.

C0180 Mechanical thrombectomy after revascat study. Which Patients Are We Treating Now?

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Introduction/Objectives: To analyze the first 44 cases of mechanical thrombectomy performed by our team after the finalization of recruitment for REVASCAT study, emphasizing in characteristics of patients treated, its therapeutic indication and its impact in the prognosis.

Materials and Methods: We conducted a retrospective study including 44 mechanical thrombectomy cases in patients with anterior circulation stroke admitted in our institution between January and August 2015. The demographic data of patients, time between onset of symptoms and interventional procedure (femoral puncture), National Institute of Health Stroke Scale (NIHSS) at emergency room, ASPECT scale at unenhanced CT and vessel occluded were collected. Furthermore, information about each procedure and clinical follow up were also collected.

Results: The median age of patients was 71 years (27-88); twenty-one patients (47,72%) were male. The median of time between onset of symptoms and interventional procedure was 180 min (50-470) and 8 patients (18,18%) had unknown onset time. The median pre-thrombectomy NIHSS score was 17 (8-24). Vascular territories involved were: 14 (31,82%) distal internal carotid artery, 21 (47,73%) M1 segment of middle cerebral artery (MCA), 5 (11,36%) M2 segment of MCA, 3 (6,82%) tandem extra-intracranial occlusion and 1 (2,27%) extracranial carotid artery occlusion. 14 cases (31,81%) would not meet the inclusion criteria for REVASCAT study (unknown onset time, M2 and extracranial carotid artery occlusion).Successful revascularization (TICI 2B-3) was obtained in 37 (84,09%) patients with 4,54% (2/44) procedure complication rate. The median NIHSS score at dischargewas 3 (4 deaths).

Conclusions: Taking in consideration the inclusion criteria used during REVASCAT study, nearly one third of our group of stroke patients would have not benefited from mechanical thrombectomy. Thus, the possibilities to extend its indication in other stroke patients groups such as M2 occlusions or wake-up strokes should be further evaluated due its potential positive impact in the prognosis of these patients.

C0182 Endovascular treatment of aneurysms of the anterior circulation with surpass device. a single center experience

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Introduction/Objectives: We report a retrospective evaluation of the safety and efficacy of Surpass flow diverter, in the endovascular treatment of anterior circulation aneurysms.

Materials and Methods: From December 2013 to May 2015, 10 patients with a total of 12 aneurysms were treated in our center with a Surpass device. Postprocedural technical success, long-term efficacy, immediate and delayed complications and clinical outcome were evaluated.

Results: Successful implantation rate was accomplished in a 90%; the complete aneurysm exclusion rate achieved was of 90%. There was one case of complete acute stent thrombosis with mRs 3 after 6 months, and two cases of transient ischemic attack, whith no permanent deficit. There were two cases of nonsignificant stent stenosis.

Conclusions: The Surpass device is safe and effective in the endovascular treatment of anterior circulation aneurysms.

C0183 Endovascular treatment of dural arteriovenous fistula. Our experience in the last ten years

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Introduction/Objectives: Endovascular embolization is a well-known therapy to treat Dural Arteriovenous Fistula (DAVF), usually essential in the proper management of these patients. Our purpose is to describe the experience of our team in the endovascular treatment of this pathology.

2 Material y Método: We conducted a retrospective study of the last ten years including all cases with DAVF treated by endovascular embolization in our hospital. The demographic data of patients, characteristics of DAVF, type of endovascular

approach, results of endovascular treatment, complications and clinical follow up were collected.

Results: 20 patients with DAVF were threated in our hospital in the last ten years. According to Cognard classification DAVF treated were: 7 (35%) type IIa+b, 4 (20%) type III, 8 (40%) type IV and 1 (5%) type V. Arterial approach alone was used in 16 (80%) cases and combined venous and arterial access in 4 (20%). Complication rate was 10% (2/20). Endovascular treatment successfully occluded DAVF in 17 cases (85%). 2 (10%) cases require surgery to complete occluded DAVF. Only in 1 (5%) patient remain with partial occlusion of the DAVF.

Conclusions: Endovascular embolization is a safe and effective therapy in patients with DAVF.