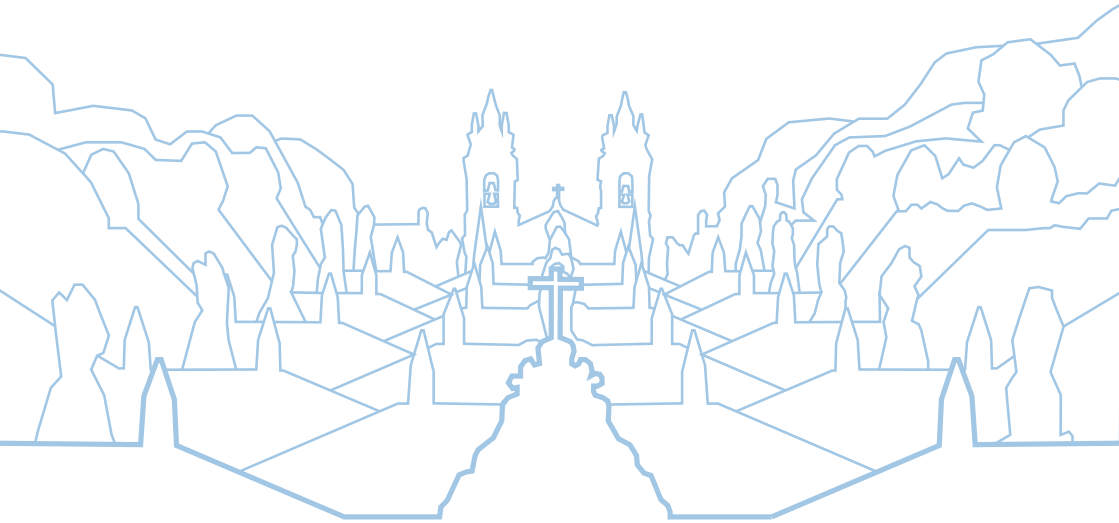
# XVIII CONGRESSO SPNR

16/17/18 de Nov 2023

Sociedade Portuguesa de Neurorradiologia Diagnóstica e Terapêutica

## Avanços em Neurorradiologia

# Programa Científico



Braga

Escola de Medicina da Universidade do Minho

Organização do Serviço de Neurorradiologia do Hospital de Braga

SPNR
SOCIEDADE PORTUGUESA DE NEURORRADIOLOGIA DIAGNÓSTICA E TERAPÊUTICA

# Índice

# Boas-Vindas

Caros Colegas,

Temos o prazer de vos anunciar o XVIII Congresso da Sociedade Portuguesa de Neurorradiologia Diagnóstica e Terapêutica (SPNR), que terá lugar entre 16 e 18 de novembro de 2023, no Anfiteatro 1, da Escola de Ciências de Saúde da Universidade do Minho, Braga.

Este ano a organização está a cargo do Serviço de Neurorradiologia do Hospital de Braga, em associação com as Sociedades Portuguesas de Neurociências e de Neurorradiologia.

Elaboramos um programa abrangente, sobre inovações e atualizações nas vertentes diagnóstica e terapêutica.
Estarão presentes neste congresso palestrantes de renome, nacionais e estrangeiros, de proveniências e formações diversas, não só em neurorradiologia mas também em outras especialidades com quem partilhamos o interesse pelas neurociências, espelhando assim a mais-valia da avaliação multidisciplinar destas patologias.

Como sempre, contamos com a atividade científica de cada centro de Neurorradiologia, partilhando a sua experiência, através da apresentação de trabalhos científicos sob a forma de comunicações orais ou pósteres, cujos resumos serão publicados na revista Neuroradiology.
Também contamos com a vossa presença no jantar do congresso no dia 17!

Desejamos que cada um encontre neste programa um incentivo para participar com entusiasmo neste congresso, na esperança que este promova a colaboração crescente entre os membros da comunidade neurorradiológica e demais especialidades congéneres.
Toda a informação sobre o congresso será atualizada no sítio oficial da SPNR.

Esperamos por todos em Braga!

Com os nossos melhores cumprimentos,

Pela Comissão Organizadora do XVIII Congresso da Sociedade Portuguesa de Neurorradiologia (SPNR)

**Jaime Rocha**

# Comissões

Presidente do Congresso: Jaime Rocha, Hospital de Braga, EPE

| Comissão Organizadora | Comissão Científica |
|---|---|
| Serviço de Neurorradiologia do Hospital de Braga, EPE | Ana Filipa Geraldo, CHVNG/E, EPE<br>Ângelo Carneiro, HB, EPE<br>Bruno Moreira, CHP, EPE<br>Duarte Vieira, CHUSJ, EPE<br>João Soares Fernandes, HB, EPE<br>José Manuel Amorim, HB, EPE<br>Miguel Quintas Neves, HB, EPE<br>Tiago Gil Oliveira, EM-UM; HB, EPE |

## Secretariado:

Isabel Gregório - Sociedade Portuguesa de Neurorradiologia Diagnóstica e Terapêutica – SPNR
R. Coronel Júlio Veiga Simão, 3025-307 Coimbra – Portugal
Telefone: +351 239497160 | Telemóvel: +351 927811456
Telemóvel SPNR MB WAY: 925 246 670
secretariado.spnr@gmail.com
https://xviiicspnr.org

## Logística:

Organideia, Lda.
https://organideia.com
geral@organideia.com

# Informações Úteis

## Apresentação de Comunicações Orais (Slide Desk)

Se vai apresentar uma Comunicação Oral, por favor, entregue o seu trabalho em USB disk ou outro suporte digital o quanto antes no "Slide Desk", **não poderão ser usados os próprios computadores para fazer a apresentação.**
Terá à sua disposição um computador onde poderá rever a sua apresentação, caso o pretenda.

**Horário do Slide Desk:**
16 de novembro - 13:30h -18:30h
17 de novembro - 08:00h -19:30h
18 de novembro - 08:00h – 16:00h

## Apresentação de Poster

Se vai apresentar um poster, por favor afixe-o no placard que tem o número do seu poster. Pode consultar na lista de posteres qual é o número do seu. Terá os meios adequados no placard para a afixação.

## Acesso à Internet

Wi-Fi network: med@guest
Password: 2020!med

## Local:

Auditório A 0.01 da Escola de Medicina da Universidade do Minho, Braga – Portugal

## Coffee Breaks e Almoços

Átrio da escola

## Exposição Técnica

Átrio da escola

## Estacionamento

Disponível o Parque P4 – Consultas externas (1km do local do Congresso)
Tarifa: 5,50€/dia

## Jantar do Congresso

O jantar terá lugar no Hotel Meliã pelas 20:00h, 17 de novembro de 2023.

# Programa

## Quinta-feira, 16 novembro 2023

**13:30h - Abertura do Secretariado | Opening registration**

**14:00h – Sessão de Abertura | Opening Session**

**Dr. João Oliveira |** President of the Administrative Council of Hospital de Braga, Braga – Portugal

**Prof. Dr. Jorge Correia Pinto |** President of the School of Medicine of Universidade do Minho, Braga – Portugal

**Dr. Rui Manaças |** President of SPNR

**Dr. Jaime Rocha |** Congress President

**14:15h - Isabel Fragata –** Novas dinâmicas da especialidade a nível nacional | New dynamics of the medical specialty at a national level
*Neuroradiology Department, Hospital Center of Central Lisbon, Lisbon – Portugal*

**14:30h - Nuno Sousa –** Neurorradiologia – Da clínica à investigação | Neuroradiology – From clinical practice to research
*2CA Braga – Clinical Academic Centre, School of Medicine of Universidade do Minho, Braga – Portugal*

**14:45h - Eike Piechowiak –** Physiopathology of spontaneous intracranial hypotension
*University Institute of Diagnostic and Interventional Neuroradiology, Inselspital, Bern University Hospital, University of Bern, Bern – Switzerland*

**15:30h - Eike Piechowiak –** Treatment of spontaneous intracranial hypotension
*University Institute of Diagnostic and Interventional Neuroradiology, Inselspital, Bern University Hospital, University of Bern, Bern – Switzerland*

**Moderadores | Moderators:**
**Carlos Andrade –** *Neurology Department, Centro Hospitalar Universitário do Porto, Porto – Portugal*
**Ângelo Carneiro -** *Department Neuroradiology Hospital de Braga, Braga – Portugal*

**16:15h - Coffee break + Exposição de posters | Poster Session**

**16:45h - Simpósio Medtronic (Dr. Vitor Moura Gonçalves) –** Ablação térmica por radiofrequência de tumores da coluna vertebral | Radiofrequency Thermal Ablation of Spinal Tumors

**17:15h - Comunicações orais**

***7 minutos por apresentação***

1. DIFFUSION TENSOR IMAGING OF THE BRACHIAL PLEXUS - Sofia Bettencourt |*Neurology Department, Hospital de São José, Centro Hospitalar Universitário de Lisboa Central*
2. CEREBROVASCULAR LOAD AND ITS CORRELATION WITH MÉNIÈRE'S DISEASE: A CASE-CONTROL STUDY - João Tarrio |*Neurorradiology Department, Centro Hospitalar Universitário de Santo António*
3. THE CHALLENGE OF BRAIN IMAGING IN NEONATAL SEIZURES – A CASE STUDY FROM A TERTIARY CARE HOSPITAL - Sílvia Reigada | *Funcional Unit of Neurorradiology, Department of medical image, Centro Hospitalar Universitário de Coimbra*
4. NEUROIMAGING FINDINGS IN THE SPECTRUM OF MOG ANTIBODY – ASSOCIATED DISEASE IN THE PEDIATRIC POPULATION: THE EXPERIENCE OF A TERTIARY CENTER - Ana Isabel Pereira de Almeida | *Neurology Department, Centro Hospitalar Universitário de Santo António*
5. GLUTARIC ACIDURIA TYPE 1: 8 CASES FROM OUR CENTER - Rita Silveira de Sousa | | *Funcional Unit of Neurorradiology, Department of medical image, Centro Hospitalar Universitário de Coimbra*

**-5 minutos para discussão-**

6. TUBULINOPATHIES – PATHOPHYSIOLOGIC, GENETIC AND NEUROIMAGING CONSIDERATIONS; A CASE SERIES FROM PORTUGUESE PEDIATRIC REFERENCE CENTERS - André Araújo | *Neurorradiology Diagnostic Unit, Centro Hospitalar Vila Nova de Gaia/Espinho*
7. FRONTAL HEMIMEGALENCEPHALY: MULTIPARAMETRIC ANALYSIS AND LITERATURE REVIEW - Ana Isabel Almeida | *Neurology Department, Centro Hospitalar e Universitário de São João*
8. CASE-BASED REVIEW OF CENTRAL NERVOUS SYSTEM LYMPHOMA MR IMAGING: MISDIAGNOSES AND A PRACTICAL ROADMAP FOR DIAGNOSIS - Cristiano Esteves | *Neurology Department, Hospital Santa Maria, Centro Hospitalar Universitário Lisboa Norte*
9. INTER-RATER AGREEMENT AND APPLICABILITY OF THE NEW RANO CLASSIFICATION SYSTEM FOR EXTENT OF RESSECTION IN GLIOBLASTOMA IN CLINICAL PRACTICE - Francisca Rodrigues | *Neurorradiology Diagnostic Unit, Centro Hospitalar Vila Nova de Gaia/Espinho*

**-5 minutos para discussão-**

**Moderadores|Moderators:**
**Ana Filipa Geraldo** - *Imaging Department, Centro Hospitalar Vila Nova de Gaia/Espinho*
**Rui Manaças** - *Portuguese Society of Neuroradiology*

**18:30h – Fecho da Sessão | Session Closure**

## Sexta-feira, 17 novembro 2023

**08:00h – Abertura do secretariado | Opening registration**

**08:30h - Zsolt Kulcsár** – Tumors embolization
*Neuroradiology Department of University Hospital Zurich, University of Zurich, Zurich – Switzerland*

**09:15h - Zsolt Kulcsár** – Diagnosis and Treatment of subdural haematomas
*Neuroradiology Department of University Hospital Zurich, University of Zurich, Zurich – Switzerland*

**Moderadores | Moderators:**
**Luísa Biscoito -** *Neuroradiology Department, Hospital Universitário Santa Maria, Lisbon – Portugal*
**Carlos Alegria -** *Neurosurgery Department Hospital de Braga, Braga – Portugal*

**09:45h - Bruno Moreira –** Patologia da base do crânio – tumoral e não tumoral | Skull base pathology – tumoral and non-tumoral
*Neuroradiology Department, Centro Hospitalar Universitário do Porto – Porto, Portugal*

**Moderadores | Moderators:**
**Luís Dias -** ORL Department of Hospital de Braga, EPE, Braga – Portugal
**Bruno Cunha -** Neuroradiology Department, Hospital de Braga, EPE, Braga – Portugal

**10:30h** - **Coffee break + Exposição de posters | Poster Session**

**11:00h** - **Alex Rovira –** MRI in the assessment of chronic inflammation in Multiple Sclerosis
*Neuroradiology Group, Vall d'Hebron Research Institute, Barcelona – Spain*

**11:45h** – **Alex Rovira –** Longitudinal extensive transverse myelitis: differential diagnosis
*Neuroradiology Group, Vall d'Hebron Research Institute, Barcelona – Spain*

**Moderadores | Moderators:**
**João Cerqueira -** School of Medicine of Univrsidade do Minho and Hospital de Braga, Braga – Portugal
**João Soares Fernandes -** Neuroradiology Department of Hospital de Braga, Braga – Portugal

**12:30h** – **Simpósio Siemens (Dr. Alejandro Tomasello) –** Novos workflows na abordagem ao tratamento do AVC e o impacto de equipamentos multimodalidade | New workflows in approaching stroke treatment and the impact of multimodality equipment
*Neuroradiology Department, Hospital Vall d'Hebron, Universitat Autoònoma de Barcelona, Barcelona – Spain*

**13:00h** – **Almoço | Lunch**

**14:00h** – **Sofia Reimão –** Doenças neurodegenerativas e diagnóstico diferencial | Neurodegenerative diseases and differential diagnosis
*Neurological Imaging Department, Centro Hospitalar Universitário de Lisboa Norte – Lisbon, Portugal*

**Moderador | Moderator:**
**Tiago Gil Oliveira -** *School of Medicine of Universidade do Minho and Department Neuroradiology of Hospital de Braga, Braga – Portugal*

**14:30h** – **Joshua Hirsch –** Minimal invasive treatments in spine (virtual session)
*Massachusetts General Hospital, Boston, USA*

**Moderadores | Moderators:**
**Miguel Batista -** *Local Health Unit of Matosinhos, Matosinhos – Portugal*
***Pedro Varanda -*** *Director of the Orthopedics Department of Hospital de Braga, Braga -Portugal*

**15:30h – Coffee break + Exposição de posters | Poster Session**

**15:30h** – **Simpósio Dermworks (Dr. Santiago Guelbenzu Morte) –** Descompressão percutânea do disco a laser | Percutaneous laser disc decompression
Radiology Department, Miguel Servet University Hospital, Zaragoza – Spain

**16:00h – Simpósio Roche (Prof. Sónia Batista and Dra. Catarina Pinto) –** Changing the paradigm in multiple sclerosis: Communication opportunities between Neuroradiologists and Neurologists
*Neurologist, Centro Hospitalar Universitário de Coimbra | Neurorradiologist, Centro Hospitalar e Universitário de Santo António – Portugal*

**16:30h - Comunicações orais**

***7 minutos por apresentação***

1. NONINVASIVE PREDICTION OF LANGUAGE LATERALIZATION THROUGH ARCUATE FASCICULUS TRACTOGRAPHY - Denil Tribovance | *Neurorradiology Department, Hospital Garcia de Horta*
2. ARTERIAL SPIN LABELING: APPLICABILITY AND INTERPRETATION - Mariana Ribeiro dos Santos | *Neurorradiology Department, Hospital de Braga*
3. ARTERIAL SPIN LABELLING: COLOURING THE IMAGIOLOGICAL DIAGNOSIS IN PSYCHIATRIC DISORDERS - Ricardo João Gaspar Pires | *Funcional Unit of Neurorradiology, Department of medical image, Centro Hospitalar Universitário de Coimbra*
4. ADVANCED TECHNIQUES IN DEEP BRAIN STIMULATION FOR MOVEMENT DISORDERS - José Maria Matos Sousa | *Neurorradiology Department, Centro Hospitalar e Universitário de São João*
5. ADVANCED TECHNIQUES IN EPILEPSY - José Maria Matos Sousa |*Neurorradiology Department, Centro Hospitalar e Universitário de São João*

**-5 Minutos para discussão-**

6. SOCIAL MEMORY AND ITS FUNCTIONAL NEURAL CORRELATES IN MULTIPLE SCLEROSIS - André Magalhães | *School of Medicine, Universidade do Minho*
7. CEREBRAL AMYLOID ANGIOPATHY: THE IMPACT OF BOSTON CRITERIA 2.0 ON THE INVESTIGATION OF TRANSIENT FOCAL NEUROLOGICAL EPISODES - Liliana Igreja | *Neurorradiology Department, Centro Hospitalar Universitário de Santo António*
8. INFLUENCE OF MICROANGIOPATHY ON BRAIN ATROPHY PATTERNS IN ALZHEIMER'S DISEASE AND PRIMARY AGE-RELATED TAUOPATHY - Miguel Quintas Neves | Neurorradiology Department, Hospital de Braga
9. NEUROIMAGING FINDINGS IN ANTI-LGI1 ENCEPHALITIS: A SYSTEMATIC REVIEW AND META-ANALYSIS - Francisco Almeida | *Neurorradiology Department, Centro Hospitalar Universitário de Santo António*
10. NEUROPATHOLOGICAL DETERMINANTS OF ALZHEIMER'S DISEASE MRI RADIOMICS - Francisco Almeida | *Neurorradiology Department , Centro Hospitalar Universitário de Santo António*

**-5 Minutos para discussão-**

**Moderadoras | Moderators:**
**Ana Mafalda Reis -** Neurorradiology Department of, Local Unit of Saúde de Matosinhos
**Sofia Reimão -** *Neurological Imaging Department, Centro Hospitalar Universitário Lisboa Norte*

**19:30 – Fecho da Sessão | Session Closure**

**20:00 – Jantar do Congresso – Hotel Meliã | Congress Dinner at Hotel Meliã**

## Sábado, 18 novembro 2023

### 08:00h - Abertura do Secretariado | Opening registration

### 08:30h - Comunicações orais

### 6 minutos para apresentação + 2 minutos para discussão

1. PERFUSION IMAGING TO IDENTIFY SALVAGEABLE BRAIN TISSUE IN PATIENTS WITH CEREBRAL VENOUS THROMBOSIS – STUDY PROTOCOL - Sara Rosa | *Neurorradiology Department, Hospital de São José, Centro Hospitalar Universitário de Lisboa Central*
2. PEDIATRIC CEREBRAL VENOUS THROMBOSIS: RETROSPECTIVE STUDY OF A SINGLE CENTER EXPERIENCE - Joana Freitas | *Neurorradiology Department, Hospital Santa Maria, Centro Hospitalar Universitário Lisboa*
3. ONE CENTER'S EXPERIENCE IN ENDOVASCULAR TREATMENT OF ISOLATED EXTRACRANIAL INTERNAL CAROTID ARTERY OCCLUSION - André Araújo | *Diagnostic Neuroradiology Unit, Centro Hospitalar Vila Nova de Gaia/Espinho*
4. FUNCTIONAL OUTCOME OF PATIENTS SUBMITTED TO THROMBECTOMY OVER A 7-YEAR PERIOD IN A REGIONAL STROKE NETWORK - Carolina Maia | *Funcional Unit of Neurorradiology, Department of medical image, Centro Hospitalar Universitário de Coimbra*
5. PREDICTING ANTERIOR CIRCULATION STROKE FUNCTIONAL OUTCOMES AFTER MECHANICAL THROMBECTOMY USING A GENERATIVE LANGUAGE MODEL: THE CHATGPT'S CRYSTAL BALL - Tiago Pedro | *Neurorradiology Department, Centro Hospitalar e Universitário de São João*
6. NET WATER UPTAKE IN ACUTE ISCHEMIC STROKE – A BETTER OUTCOME PREDICTOR? - Maria Ribeiro Gomes | *Neurorradiology Department, Hospital Santa Maria, Centro Hospitalar Universitário Lisboa Norte*
7. BLISTER-LIKE ANEURYSMS: A SINGLE-CENTER EXPERIENCE OF A RARE TYPE OF INTRACRANIAL ANEURYSMS - Tiago Pedro |*Neurorradiology Department, Centro Hospitalar e Universitário de São João*

**Moderadores | Moderators:**
**José Amorim** – *Neurorradiology Department, Hospital de Braga*
**Egídio Machado** - *Neurorradiologia Unit of HUC*

**09:30h -** Luis Filipe de Souza Godoy – Nova classificação dos tumores do SNC | New classification of the CNS tumors
*Radiology Department, Israeli Hospital Albert Einstein, São Paulo – Brasil*

**10:15 - Luis Filipe de Souza Godoy –** Diagnóstico diferencial dos tumores glioneurais e neuronais mistos | Differential diagnosis of glioneuronal and mixed neuronal tumors
*Radiology Department, Israeli Hospital Albert Einstein, São Paulo – Brasil*

**Moderadores | Moderators:**
**Inês Carreiro -** *CHUC Neuroradiology Department, Coimbra – Portugal*
**Miguel Neves -** *Neuroradiology Department of Hospital de Braga, Braga – Portugal*

**11:00h – Coffee Break + Exposição de Posters | Poster Session**

**11:30h – Daniela Jardim –** Técnicas avançadas em neuro-oncologia | Advanced imaging techniques in neuro-oncology
*Neuroradiology Department, Centro Hospitalar Universitário de Coimbra, Coimbra – Portugal*

**Moderadores | Moderators:**
**Cristina Ramos** *– Neuroradiology Department, Centro Hospitalar Universitário do Porto, Porto – Portugal*
**Duarte Vieira –** *Neuroradiology Department, Centro Hospitalar Universitário de São João, Porto – Portugal*

**12:00h – Entrega de prémios | Award Ceremony**

**12:15h – Sessão de encerramento | Closing Session**

**12:30h – Alomoço | Lunch**

**13.30h – Reunião administrativa da SPNR | SPNR administrative meeting**

**14:30h – EVENTO SATÉLITE:** Da investigação em ciência fundamental à investigação clínica **| SATELLITE EVENT:** From fundamental research to clinical research

**14:30h – Sessão de abertura | Opening session**

**Dr. Rui Manaças -** President of SPNR

**Tiago Gil Oliveira -** President of the Portuguese Society for Neuroscience

**14:40h – Joana Cabral –** What can resting-state fMRI tell us about brain function?
*Life and Health Sciences Research Institute, School of Medicine da Universidade do Minho, Braga – Portugal*

**15:20h – Sven Haller –** Application of AI in clinical neuroradiology: practical considerations and medicolegal aspects
Cornavin Medical Imaging Center, Genève, – Switzerland

**16:00h - Debate –** Basic neuroscience research and its translation in Neuroradiology **| Discussion –** Basic neuroscience research and its translation in Neuroradiology

# Comunicações Orais

## DIFFUSION TENSOR IMAGING OF THE BRACHIAL PLEXUS

**Sofia Bettencourt** - sofiar@campus.ul.pt
*Neuroradiology Department, Hospital de São José, Lisbon University Hospital Center, R. José António Serrano, 1150-199, Lisbon, Portugal*
**Sónia Afonso**[2], **Daniela Jardim Pereira**[2,3]
*2.Institute of Nuclear Sciences Applied to Health (ICNAS), University of Coimbra, Av. Bissaya Barreto - Praceta Prof. Mota Pinto 3000-075 Coimbra, Portugal*
*3.Funtional Unit of Neurorradiology, Coimbra University Hospital Center, Av. Bissaya Barreto - Praceta Prof. Mota Pinto 3000-075 Coimbra, Portugal*

**Introduction:** In recent years, diffusion tensor imaging has established a clinical role in the study of the central nervous system and, while still presenting some limitations due to the technical complexity of the acquisition methods, it is also showing promising results when applied to peripheral nerve system. Until recently, the assessment of nerve conduction in peripheral nerves was primarily conducted through neurophysiological studies such as electroneurography and electromyography, which, while useful, are invasive and subject to interobserver variability. Diffusion tensor imaging (DTI) and tractography of peripheral nerves provide a novel technique to localize and grade nerve injury, by assessing the integrity of the nerve fibers and hold promise as markers of early nerve regeneration, prior to clinical and electrodiagnostic evidence of recovery.

**Methods:** In our study, we aimed to replicate findings from existing literature using MRI protocols conducted on 3T Siemens Magnetom Prisma Fit equipment. The methods we employed encompassed the acquisition of imaging data, preprocessing of the acquired data, and the application of tractography using DSI Studio. Our tractography approach was limited by fractional anisotropy, allowing us to represent nerve roots based on a defined anisotropy threshold. Additionally, a maximum turning angle limit was defined to restrict tractography propagation when these limits were exceeded. Following the application of these methods on a healthy subject, we successfully obtained representations of the brachial plexus. Our results were consistent with findings in the literature, and we achieved fractional anisotropy (FA) and mean diffusivity (MD) values that fell within the expected range for healthy individuals.

**Conclusion:** In conclusion, our study allowed us to obtain representations of the brachial plexus and derive relevant quantitative metrics, consistent with those reported in the literature. This advancement provides a valuable tool for studying patient population across various clinical scenarios, including traumatic injuries, nerve compression and non-traumatic neuropathies.

# CEREBROVASCULAR LOAD AND ITS CORRELATION WITH MÉNIÈRE'S DISEASE: A CASE-CONTROL STUDY

**João Tarrio** - joaotarrio@gmail.com
*Neuroradiology Department, Centro Hospitalar Universitário de Santo António, Porto, Portugal; Neuroradiology Department, Hospital Central do Funchal Dr. Nélio Mendonça, Madeira, Portugal*
**Francisco Alves de Sousa**[1], **Ana Nóbrega Pinto**[1], **Luís Meireles**[1], **Ângela Reis Rego**[1], **Bruno Moreira**[2]
*1. Otorhinolaryngology and Head & Neck Surgery Department, Centro Hospitalar Universitário de Santo António, Porto, Portugal;*
*2. Neuroradiology Department, Centro Hospitalar Universitário de Santo António, Porto, Portugal*

**Introduction:** Currently, no widely accepted model explains the pathogenesis of Ménière's disease (MD). However, the vascular hypothesis for MD has gained renewed attention. The objective of this study was to compare the total magnetic resonance imaging (MRI) cerebrovascular load of MD patients with controls.

**Methods:** In this retrospective study, we collected data from MRI of MD patients, including small-vessel disease (SVD), cortical strokes, and baseline vascular risk factors. Subsequently, we conducted a comparative analysis between MD and age-matched controls.

**Results:** A total of 145 participants were enrolled (70 MD and 75 controls), 41.4% males. Mean age at MRI was 56.2±13.6 years. No significant differences were detected in the overall prevalence of comorbidities between MD and controls ($p>0.05$). The presence of cortical strokes did not significantly differ between MD and controls (10% vs. 4%, respectively, $p=0.154$). The MD group showed higher mean SVD scores comparing to controls (SVD-3: 0.56±0.9 in MD vs. 0.29±0.6 in controls, $p=0.041$; SVD-3 low-Fazekas: 1.10±0.8 in MD vs. 0.71±0.7 in controls, $p=0.002$; SVD-3 low-enlarged perivascular spaces (EPVS): 1.21±0.9 in MD vs. 0.76±0.8 in controls, $p=0.002$; SVD-3 low-Fazekas+low-EPVS: 1.79±0.9 in MD vs. 1.21±0.9 in controls, $p<0.001$). This association remained significant even after adjusting for confounding variables such as age, gender, and comorbidities in a binary logistic model where MD was considered the dependent variable (OR=1.746, $p=0.045$ for SVD-3; OR=2.495, $p=0.002$ for SVD-3 low-Fazekas; OR=2.234, $p=0.001$ for SVD-3 low-EPVS; OR=2.428, $p<0.001$ for SVD-3 low-Fazekas+low-EPVS).

**Conclusions:** As far as we know, this is the first study that has compared an MD population to controls in terms of cerebrovascular load. The presence of cerebrovascular dysfunction may have an impact on the incidence of MD. Additional research is essential to validate the relationship between cerebrovascular disease and MD.

# THE CHALLENGE OF BRAIN IMAGING IN NEONATAL SEIZURES - A CASE STUDY FROM A TERTIARY CARE HOSPITAL

**Sílvia Reigada** - silvialexr@hotmail.com
*Unidade Funcional de Neurorradiologia, Serviço de Imagem Médica, CHUC, Coimbra, Portugal*
**Inês Silva Costa[1]; Constança Santos[2]; Joana Ribeiro[3]; Filipe Palavra[4]; Joana Amaral[5]; Cristina Pereira[6]; Rui Pedro Pais[7]; Conceição Robalo[8]**
*1 Centro de Desenvolvimento da Criança, Hospital Pediátrico de Coimbra, CHUC, Coimbra, Portugal;*
*2 Centro de Desenvolvimento da Criança, Hospital Pediátrico de Coimbra, CHUC, Coimbra, Portugal;*
*3 Centro de Desenvolvimento da Criança, Hospital Pediátrico de Coimbra, CHUC, Coimbra, Portugal;*
*4 Centro de Desenvolvimento da Criança, Hospital Pediátrico de Coimbra, CHUC, Coimbra, Portugal;*
*5 Centro de Desenvolvimento da Criança, Hospital Pediátrico de Coimbra, CHUC, Coimbra, Portugal;*
*6 Centro de Desenvolvimento da Criança, Hospital Pediátrico de Coimbra, CHUC, Coimbra, Portugal;*
*7 Unidade Funcional de Neurorradiologia, Serviço de Imagem Médica, CHUC, Coimbra, Portugal;*
*8 Centro de Desenvolvimento da Criança, Hospital Pediátrico de Coimbra, CHUC, Coimbra, Portugal*

**Introduction:** Neonatal seizures occur in 1-5 out of 1000 newborns. Given the wide range of etiological causes, the imaging characteristics underlying neonatal seizures pose a challenge. The aim of this study is to characterize the clinical and imaging aspects of neonatal seizures recorded over 5 years in a tertiary hospital.

**Methods:** A retrospective analysis of clinical, neurophysiological, and imaging data was conducted for all newborns with neonatal seizures, translated electroencephalographically, between 2010 and 2015, with a minimum 7- year follow-up period.

**Results:** During the study period, 85 newborns with neonatal seizures were recorded, 87.0% within the first 48 hours of life. 87.0% of patients underwent Magnetic Resonance Imaging (MRI), 63.5% within the first 7 days of life. Among them, 83.8% exhibited pathological findings, with the most common being: hypoxic-ischemic encephalopathy (85.1%), hemorrhage (8,1%) and ischemic stroke (6.8%). Diffusion restriction in basal ganglia nuclei was associated with worse neurological outcomes (p=0.008). Reevaluation through MRI was performed in 32 newborns; 7 showed no changes, all of whom had normal first neuroimaging. Two newborns exhibited pathological findings after an initially normal MRI.During follow-up, motor sequelae were observed in 34.1% of children, and the mortality rate during the follow-up period was 16.5%.

**Conclusion:** Neuroimaging emerges as a crucial method for identifying the causes of neonatal seizures, which are mainly linked to hypoxia, consistent with prior research. Additionally, it enables early identification of indicators for unfavorable neurological outcomes and demonstrates negative predictive value for future lesions, when performed timely.

# NEUROIMAGING FINDINGS IN THE SPECTRUM OF MOG ANTIBODY – ASSOCIATED DISEASE IN THE PEDIATRIC POPULATION: THE EXPERIENCE OF A TERTIARY CENTER

**Ana Isabel Pereira de Almeida** - gemeasanaisabel@gmail.com
*Serviço de Neurorradiologia, Centro Hospitalar Universitário de Santo António, Largo Prof. Abel Salazar, 4099-001 Porto – Portugal*
**Joana Lopes, António Costa, Joana Martins, Sónia Figueiroa, Catarina Pinto**
*1 - Serviço de Neurologia, Centro Hospitalar Universitário de Santo António, Largo Prof. Abel Salazar, 4099-001 Porto - Portugal;*
*2 - Serviço de Neurologia, Centro Hospitalar Universitário de Santo António, Largo Prof. Abel Salazar, 4099-001 Porto - Portugal;*
*3 - Serviço de Neuropediatria, Centro Hospitalar Universitário de Santo António, Largo Prof. Abel Salazar, 4099-001 Porto - Portugal;*
*4 - Serviço de Neuropediatria, Centro Hospitalar Universitário de Santo António, Largo Prof. Abel Salazar, 4099-001 Porto - Portugal;*
*5 - Serviço de Neurorradiologia, Centro Hospitalar Universitário de Santo António, Largo Prof. Abel Salazar, 4099-001 Porto - Portugal*

**Introduction:** In last years, the interest in the role of antibodies against the myelin oligodendrocyte glycoprotein (MOG-Abs) as a biomarker for central nervous system (CNS) demyelinating diseases has been growing. The spread of antibody testing has led to the increasing expansion of clinical phenotypes associated with MOG-Abs. Materials and methods: Retrospective analysis of a cohort of patients followed at the Centro Materno Infantil do Norte, between 2016-2023, for demyelinating diseases of the CNS with positive MOG-Abs (testing carried out in the CHUdSA Immunology laboratory).

**Results:** 12 patients were included, of whom 6 were male and 6 female; the mean age at presentation was 6 years. Acute disseminated encephalomyelitis (ADEM) was the most common presentation, 33.3% of patients presented with encephalitis and 8.3% with optic neuritis. Poorly demarcated and generalized lesions involving the deep grey matter, subcortical white matter and brainstem, including the cerebellar peduncles were the most common feature reported on MRI at initial presentation. Among all the children with an initially abnormal spinal MRI, the most common pattern was longitudinally extensive transverse myelitis. Four patients had recurrence with antibody positivity and with the same presentation syndrome as the initial episode, except for one case of ADEM that recurred with optic neuritis.

**Conclusion:** Disease associated with MOG- Abs is a recently recognized entity in the spectrum of inflammatory demyelinating diseases that includes pediatric demyelinating or encephalitic syndromes, highlighting the need to recognize the different patterns in order to narrow down the differential diagnosis.

# GLUTARIC ACIDURIA TYPE 1: 8 CASES FROM OUR CENTER

**Rita Silveira de Sousa** - ritadesousaofficial@gmail.com
*Centro Hospitalar e Universitário de Coimbra, 3004-561, Portugal*
**Sílvia Reigada, Francisco Miguel Rodrigues, Sílvia Carvalho, Sara Ferreira, Luísa Diogo**
*1 Centro Hospitalar e Universitário de Coimbra, 3004-561, Portugal;*
*2 Centro Hospitalar e Universitário de Coimbra, 3004-561, Portugal;*
*3 Centro Hospitalar e Universitário de Coimbra, 3004-561, Portugal;*
*4 Hospital Pediátrico de Coimbra, 3000-062, Portugal;*
*5 Hospital Pediátrico de Coimbra, 3000-062, Portugal*

**Introduction/ Objectives:** Glutaric aciduria type 1 (GA-1) is an organic acidemia, caused by deficiency of glutaryl-coenzyme A dehydrogenase, that results in the accumulation of the amino acids lysine, hydroxylysine, tryptophan and their intermediate breakdown products. This disorder can present early in childhood with macrocephaly and an acute encephalopathic crisis, insidious dystonia or asymptomatically. Its early detection is essential as it is a treatable condition with damaging neurologic consequences. We aim to describe the MR imaging abnormalities in GA-1.

**Materials / Methods:** Retrospective analysis of the clinical records of patients diagnosed with GA-1 at Hospital Pediátrico de Coimbra.

**Results:** Eight patients with GA-1 were included in our study. Two were detected through neonatal screening, which integrated GA-1 in 2005; four cases were diagnosed through clinical investigation; and two adults were diagnosed after their newborn screening, that indicated low free carnitine levels secondary to the mother's condition. The main presenting symptoms were macrocephaly (6/8) and axial hypotonia (6/8), in the first year of life. One death was observed at 4 years of age in consequence of acute metabolic acidosis. Six patients underwent brain MRI, in one only brain CT was available, and in other no imaging exam was performed until date. Characteristic MRI findings included bilateral widened sylvian fissures, diffuse white matter abnormalities and symmetric basal ganglia lesions. Central tegmental tract and dentate nuclei affection, myelination delay and an enlargement of the ventricular system was also observed.

**Conclusion:** Neurotoxicity of excessive glutaric acid leads to the characteristic imagiologic presentation of GA-1 on brain MRI, making it a useful tool when a child presents with macrocephaly and neurologic abnormalities that require investigation, regardless of previous neonatal screening.

# TUBULINOPATHIES - PATHOPHYSIOLOGIC, GENETIC AND NEUROIMAGING CONSIDERATIONS; A CASE SERIES FROM PORTUGUESE PEDIATRIC REFERENCE CENTERS

**André Araújo** - andrearaujo27@gmail.com
*CHVNG, R. Conceição Fernandes S/N, 4434-502 Vila Nova de Gaia, Portugal*
**Mafalda Melo**[1], **Alexandra Rodrigues**[2], **Diana Antunes**[1], **Joana Nunes**[3], **Ana Filipa Geraldo**[3], **Carla Conceição**[2]
*1Serviço de Genética, Centro Hospitalar Lisboa Central,*
*2 Serviço de Neurorradiologia, Centro Hospitalar Lisboa Central,*
*3 Unidade de Neurorradiologia Diagnóstica, Serviço de Imagiologia, Centro Hospitalar de Vila Nova de Gaia*

**Introduction:** Tubulinopathies comprise a wide and overlapping group of genetic diseases caused by pathogenic variants in genes encoding different isotypes of tubulin or microtubule-associated proteins that result in a variety of brain malformations. The recent evolution in genetic research and the knowledge of this kind of disorders has increased its awareness, enabling its earlier diagnosis.

**Material and methods:** A total of 9 patients from two pediatric reference centers in Portugal were included. Genetically confirmed tubulinopathy patients were reviewed regarding the main clinical manifestations and genetic characteristics. Neuroradiological features associated with tubulinopathies will be described, including the current background on genetic-phenotypic correlations as well as a pictorial review with emphasis on common patterns that may raise the suspicion of tubulinopathies.

**Results:** The clinical features of the tubulinopathies include non-specific motor and intellectual disabilities. Individuals with milder clinical expression survive into adulthood, while those with more severe disease may die at a young age. As there is no pathognomonic clinical feature associated with tubulinopathies, imaging studies and respective neuroradiological findings play a crucial role in the diagnosis. Tubulinopathies imaging manifestations include a spectrum of cortical developmental malformations (CDM), commissural anomalies; hypoplasia of the internal capsules, mostly the anterior limbs [absent anterior limb of the internal capsule (ALIC) sign], anomalies of the deep gray nuclei; hippocampal anomalies; hypoplasia of the brainstem, cerebellar hemispheres, and vermis; and corticospinal tracts and cranial nerves hypoplasia.

**Conclusions:** Tubulinopathies are heterogeneously presenting genetic diseases, with a wide spectrum of clinical and imaging manifestations, with many genes involved in its pathophysiology. This review of genetically-proven tubulinopathy patients demonstrates the relevance of a systematic imaging approach of brain MRI evaluation, in such a way that its knowledge and recognition can constitute the first step in suggesting the diagnosis of this complex group of pathologies.

# FRONTAL HEMIMEGALENCEPHALY: MULTIPARAMETRIC ANALYSIS AND LITERATURE REVIEW

**Ana Isabel Almeida** - a.almeida.isabel@gmail.com
*Neuroradiology Department, Centro Hospitalar e Universitário de São João, Alameda Prof. Hernâni Monteiro, 4200–319, Porto, Portugal*
**Sofia Vedor**[1], **Sara Carvalho**[1], **Catarina Caldeiras**[2], **Duarte Vieira**[1], **Luísa Sampaio**[1,3]
*1. Neuroradiology Department, Centro Hospitalar e Universitário de São João, Alameda Prof. Hernâni Monteiro, 4200–319, Porto, Portugal;*
*2. Neurology Department, Centro Hospitalar e Universitário de São João, Alameda Prof. Hernâni Monteiro, 4200–319, Porto, Portugal;*
*3. Faculty of Medicine, University of Porto, Alameda Prof. Hernâni Monteiro, 4200–319, Porto, Portugal*

**Introduction:** Hemimegalencephaly is a congenital brain malformation characterized by unilateral megalencephaly involving one or almost one entire brain hemisphere, commonly accompanied by cortical dysplasia, resulting in intractable epilepsy and profound disability. Lobar hemimegalencephaly involves up to three cerebral lobes. In contrast to the occipital-lobe-predominant type, frontal-lobe-predominant hemimegalencephaly (FHMEG) is rare, with limited published data regarding this condition.

**Objective and methods:** Multiparametric analysis of one pediatric case of FHMEG and literature review, adding details to the imagiological characteristics of this entity.

**Results:** Two-year-old male toddler presented global developmental delay and tonic-clonic seizures at 8 months of age. Electroencephalogram showed frequent left frontal epileptiform discharges. Brain MRI revealed enlargement of the left frontal lobe with cortical thickening and blurring of the grey-white matter boundary, ipsilateral thickening of the genu of the corpus callosum, left lateralization of the fornix, and asymmetrical frontal horns of the lateral ventricles. Quantitative brain volumetry (vol2Brain®) confirmed the frontal lobes asymmetry (ratio of the left/right frontal lobes = 1.14). 18FFDG-PET/PET-CT depicted hypometabolism on the left prefrontal cortex. The metabolic and genetic studies were unremarkable. A FHMEG was diagnosed and surgical frontal disconnection was performed. We found a total of 14 cases of FHMEG previously published (median age: 2 years old; IQR 9), with only one paper specifically focusing on FHMEG. The imagiological findings were consistent with our case, including the three volumetric MRI analyses reported (ratios from 1.05 to 1.19). There are no reports of 18FFDG-PET/PET-CT evaluation in this condition; our case is the first to highlight regional hypometabolism using this technique.

**Conclusion:** FHMEG has been scarcely recognized in the literature. We describe the imagiological features of this entity, focusing on the utility of multiparametric evaluation for the diagnosis. An early diagnosis and prompt surgical approach may provide better epilepsy control and psychomotor development.

# CASE-BASED REVIEW OF CENTRAL NERVOUS SYSTEM LYMPHOMA MR IMAGING: MISDIAGNOSES AND A PRACTICAL ROADMAP FOR DIAGNOSIS

**Cristiano Esteves** - cristiano.esteves@chln.min-saude.pt
*Department of Neuroradiology, Hospital Santa Maria*
*Centro Hospitalar Universitário Lisboa Norte, Lisbon, Portugal*
**Maria Ribeiro Gomes[1]; Ângelo Neto Dias[1]; Rafael Roque[2]; Graça Sá[1]; Carla Guerreiro[1,3].**
*1 Department of Neuroradiology, Hospital Santa Maria, Centro Hospitalar Universitário Lisboa Norte, Lisbon, Portugal;*
*2 Neuropathology Unit - Neurology Department, Centro Hospitalar Universitário Lisboa Norte, Lisbon, Portugal;*
*3 Imaging University Clinic, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal*

**Introduction:** Central nervous system lymphoma (CNSL) is a rare and aggressive form of non-Hodgkin lymphoma, classified as primary or secondary based on systemic lymphoma presence. Both can exhibit unusual radiological findings, being often misdiagnosed. We aimed to characterize the initial neuroimaging features of CNSL and develop a practical roadmap for diagnosis.

**Methods:** We retrospectively reviewed all patients with CNSL histological diagnosis (2016-2023) at our tertiary center. Lesions' morpho-dimensional and signal characteristics were evaluated. Diffusion (mean ADC) and T2* perfusion [relative cerebral blood volume (rCBV)] were analyzed.

**Results:** A total of 42 cases were enrolled, with a median age of 71 years old (range 29–91). In 40% (n=14/35) of patients, lymphoma was misdiagnosed as another tumor, infection, or demyelinating disorder. Histological diagnoses were diffuse large B cell lymphoma (n=36/42), small lymphocytic lymphoma (n=2/42), follicular lymphoma (n=2/42), intravascular lymphoma (n=1/42) and non-specified lymphoma (n=1/42). Thirty-four patients had primary CNSL and 5 secondary CNSL. Three patients were immunosuppressed. Brain parenchyma was more affected (n=35), than extra-axial (n=4) or spinal cord (n=1) structures. Most parenchymal lesions were multiple (n=18/35), supratentorial (n=24/35) and located in cortical/subcortical (n=19/35) and/or deep white matter (n=19/35), with frequent corpus callosum involvement (n=16/35). All patients had enhancing lesions. On T2WI, 15 of 35 lesions were iso/hypointense. The mean ADC value was low (0.60±0.13×10-3mm2/s) in all parenchymal tumors, even on misdiagnosed tumors (mean ADC 0.66±0.18×10-3mm2/s). rCBV ratio mean was 3.5±2.8, with an overshoot recovery value in 4/11 cases.

**Conclusion:** CNS lymphoma typically presents as multiple or solitary supratentorial lesions in deep white matter and corpus callosum, with gadolinium enhancement and low ADC values. However, atypical radiological features leading to misdiagnosis represented 40% of our histologically diagnosed cases. Low ADC values in atypical lesions should raise the suspicion of lymphoma and prompt early biopsy, which significantly impacts management and prognosis.

# INTER-RATER AGREEMENT AND APPLICABILITY OF THE NEW RANO CLASSIFICATION SYSTEM FOR EXTENT OF RESSECTION IN GLIOBLASTOMA IN CLINICAL PRACTICE

**Francisca Garrido Rodrigues Barreto Guimarães**-fg.guimaraes04@gmail.com
*Departamento de Neurorradiologia Diagnóstica, Serviço de Imagiologia, Centro Hospitalar Vila Nova de Gaia/Espinho, 4434-502, Portugal*
**Isa Barbosa, João Ramos, Ana Filipa Geraldo, Tiago Parreira, Rúben Maia**
*Departamento de Neurorradiologia Diagnóstica, Serviço de Imagiologia*
*Centro Hospitalar Vila Nova de Gaia/Espinho, 4434-502, Portugal*

**Purpose:** The new 2023 RANO classification system stratifies extent of resection (EOR) in glioblastoma into classes of prognostic value, providing clear volumetric definitions based on absolute residual tumor volume (RTV), including "supramaximal resection" (Class1), of greater survival benefit. Changes in surgical EOR warrant reliable methods of RTV assessment, agreed-upon among peers. We aimed to assess early post- operative RTVs, apply RANO classes and test for inter-rater agreement (IRa).

**Material and Methods:** All patients diagnosed with glioblastoma IDH wild-type with first-resection surgery performed during 2022 in CHVNG/E and early post-operative MRI available were retrospectively included. Clinical data was collected. Contrast-enhancing and non-enhancing RTVs (CEt and nCEt) were segmented on post-surgical MRI using Syngo.via by four raters (two residents and two specialists) independently. EOR was categorized into RANO classes. Intraclass correlation coefficient (ICC) and Fleiss Kappa (k) were used to assess IRa on volumetrics and RANO classes, respectively.

**Results:** Fourteen patients were included (mean age at diagnosis= 63□10 years-old, ten were male). Cross-rater mean CEt was 11.17cm3 and nCEt was 11.72cm3. IRa was excellent for CEt (ICC=0.961) and poor for nCEt (ICC=0.661) between all raters. Specialists and residents disagreed regarding nCEt (ICC=0.609), with larger mean nCEt measured by specialists (16.75cm3 vs. 8.73cm3, p=0.026). Greater disagreement was observed between specialists regarding nCEt (ICC=0.675) than between residents (ICC=0.744). Mean CEt and nCEt for each patient, classified 5 as maximal resection and 9 as submaximal resection. IRa for RANO class was moderate (κ=0.431), lowest for Class 1 (κ =0.075). Level of expertise did not increase agreement.

**Conclusion:** CEt IRa was high despite surgical artifacts and anatomic distortion. Conversely, nCEt IRa was overall poor and remained poor with higher expertise. RANO class IRa was moderate, and particularly low for Class1. These results suggest challenges in RANO's classification application and highlight the need for standardized guidelines regarding nCEt assessment.

# NONINVASIVE PREDICTION OF LANGUAGE LATERALIZATION THROUGH ARCUATE FASCICULUS TRACTOGRAPHY

**Denil Tribovane** - deniltribovane@hotmail.com
*Serviço de Neurorradiologia, Hospital Garcia de Orta, Almada, Portugal*
**João Tarrio**[1], **Daniela Jardim Pereira**[2]
*1 Unidade de Neurorradiologia, Hospital Central do Funchal – Dr. Nélio Mendonça, Funchal, Portugal,*
*2 Área Funcional de Neurorradiologia, Centro Hospitalar Universitário de Coimbra, Coimbra, Portugal*

**Introduction:** The lateralization of language function, whether it is predominantly left-lateralized (typical) or right- lateralized (atypical), is a crucial aspect of brain organization. Functional magnetic resonance imaging (fMRI) is the standard method for determining hemispheric language dominance. Recently, diffusion tensor imaging (DTI) studies have revealed significant asymmetry of the arcuate fasciculus (AF), shedding new light on its connectivity and role in language processing. This study investigates the correlation between AF asymmetry depicted by DTI and language lateralization observed through fMRI.

**Materials and Methods:** This retrospective, single-center study analyzed 3 Tesla brain MRI studies performed on patients from 2016 to 2022 using language task-dependent fMRI and DTI. Exclusion criteria were patients with language impairment or structural abnormalities that could compromise the fibers involved in the AF. Inter-observer agreement in the assessment of language lateralization by DTI and fMRI was evaluated using Cohen's kappa. AF lateralization, determined from DTI parameters (fractional anisotropy and number of tracts) was assessed using an independent samples T-test. The relationship between fMRI-determined language lateralization and DTI-derived AF lateralization was assessed using Pearson´s correlation coefficient. Statistical significance was set at $p<0.05$.

**Results:** A total of 31 patients were included in the study, 13 female and 18 male, with a mean age of 43.65 (SD=18.23) years. AF fibers were asymmetrically distributed between cerebral hemispheres ($p=0.015$) with good inter-observer agreement ($\kappa = 1$, $p<0.001$). The number of tracts in the AF, as revealed by DTI, exhibited a statistically significant positive correlation with language lateralization determined by fMRI ($r=0.558$, $p<0.001$).

**Conclusion:** Our study demonstrates a significant correlation between the asymmetry in the number of tracts of the AF, as observed through DTI, and language lateralization, as measured by fMRI. These findings may have significant implications for clinical assessment and treatment planning, particularly for non-cooperative patients with neurological conditions.

# ARTERIAL SPIN LABELING: APPLICABILITY AND INTERPRETATION

**Mariana Ribeiro dos Santos** - marianaribsantos@hotmail.com
*Hospital de Braga*
**Lázaro Luís Faria do Amaral**
*Hospital da Beneficiência Portuguesa de São Paulo, São Paulo, Brasil*

**Introduction:** Arterial Spin Labeling (ASL) is an emerging non-invasive magnetic resonance imaging (MRI) technique for measuring cerebral perfusion (blood flow), whose main advantage is that no contrast agent is required. The purpose of this presentation is to detail and added values of ASL sequence in differential diagnosis, including vascular, tumoral, inflammatory and infection diseases and sometimes in the follow-up of certain disorders, such as treated arteriovenous malformations, by revealing the location of eventual residual nidus.

**Methods:** Case-based review of MRI findings in a series of patients, demonstrating changes in ASL sequence, useful in diagnosis.

**Results:** The clinical applications of this MR technique are broad, including vascular disorders (arterial stenosis, ischemic stroke, vascular malformation), tumors (helpful in distinguishing high-grade vs low-grade gliomas, hemangioblastomas and assessment of treatment response), dementia and neurodegenerative disorders (such as, corticobasal degeneration), inflammatory and infectious diseases and miscellaneous disorders (migraine, epilepsy, posterior reversible encephalopathy syndrome). In our series we demonstrate entities where ASL had an important role in the diagnosis, mainly when the conventional MRI sequences are unremarkable.

**Discussion/Conclusion:** ASL perfusion has a wide variety of clinical applications, being especially attractive for vulnerable patients (elderly, pediatric population, oncological patients with difficult venous access and patients with renal insufficiency or gadolinium allergy). Knowledge of clinical context and the interpretation of ASL findings help the neuroradiologist to have a practical approach and narrow the differential diagnosis.

# ARTERIAL SPIN LABELLING: COLOURING THE IMAGIOLOGICAL DIAGNOSIS IN PSYCHIATRIC DISORDERS

**Ricardo João Gaspar Pires** - ricardogasparpires@gmail.com
*Unidade Funcional de Neurorradiologia, Serviço de Imagem Médica, Centro Hospitalar Universitário de Coimbra, Praceta Professor Mota Pinto, 3004-561 Coimbra, Portugal*
**Brigite Wildenberg**[1]**; Daniela Jardim Pereira**[2]
*1 Centro de Responsabilidade Integrado de Psiquiatria, Centro Hospitalar Universitário de Coimbra, Praceta Professor Mota Pinto, 3004-561 Coimbra, Portugal;*
*2 Unidade Funcional de Neurorradiologia, Serviço de Imagem Médica, Centro Hospitalar Universitário de Coimbra, Praceta Professor Mota Pinto, 3004-561 Coimbra, Portugal*

**Introduction/Objectives:** Arterial Spin Labelling (ASL) is a non-invasive, non-contrast alternative to conventional perfusion, which has gained popularity in situations where contrast administration is contra- indicated or not recommended. We aim to review technical concepts and explore emerging clinical applications of ASL, especially in psychiatry.

**Methods:** Non-systematic review, searching PubMed and other databases including MeSH terms "Arterial Spin Labeling" AND {"Psychiatry"}.

**Results:** ASL uses a radiofrequency pulse to label water molecules, which act like an endogenous contrast agent, allowing quantification of cerebral blood flow (CBF). This perfusion analysis can be considered a proxy for metabolic and synaptic function, which is of interest in studying pathophysiological patterns in neuropsychiatric disorders. In depression, CBF was altered in executive, affective, and motor networks, and a hypoperfusion pattern of the default mode network was found. Another study, using machine-learning models based on CBF, used an automatic classifier capable of differentiating major depression from healthy controls. In schizophrenia, there are convergent results showing reduced CBF in the frontal lobe, including middle and inferior frontal gyri – instrumental regions for regulating complex behaviour; perfusion is also sometimes abnormal in other brain regions, correlating to different symptoms. In post-traumatic stress disorder, there is some evidence suggesting the potential of ASL to distinguish between subtypes. ASL has limitations, such as suffering from a relatively low signal-to-noise ratio, further amplified by lack of cooperation, vascular disease and technique-specific artifacts. Assumptions regarding tagging efficiency, post-labelling delay and CBF quantification are based on normal populations; their translation to disease states has not been sufficiently explored.

**Conclusions:** The potential of ASL for clinical practice is undeniable, though limited by current technology standards. In the future, it may aid the diagnosis of neuro/psychiatric disorders; distinguishing drug resistant pathology from non-drug resistant; characterization of cognitive deficits; and differentiating phenotypes and subtypes of psychiatric disorders.

# ADVANCED TECHNIQUES IN DEEP BRAIN STIMULATION FOR MOVEMENT DISORDERS

**José Maria Matos Sousa** - sousa.jose99@gmail.com
*Department of Neuroradiology, Centro Hospitalar Universitário de São João, E.P.E., Porto, Portugal*
**Sara Carvalho; Ana Isabel Almeida; Carina Reis**
*Department of Neuroradiology, Centro Hospitalar Universitário de São João, E.P.E., Porto, Portugal*

**Introduction:** Deep brain stimulation (DBS) is a well-established procedure for the treatment of movement disorders. During planning, target definition is essential to achieve maximum efficacy. Evolution of MR 3D imaging allowed the transition from a coordinate-based system to direct visualization. However, there are still limitations in visualizing some targets. Segmentation and tractography emerge as additional tools in target determination, with fiber-tracking algorithms that can be deterministic, probabilistic, or a combination of both. We aim to demonstrate the advantages of combined tractography, Fast-Grey-Matter-Acquisition-T1- Inversion-Recovery (FGATIR) sequence and T2-SPACE in DBS planning.

**Methods:** Images were acquired on a 3T Siemens Vida scanner with a 32-channel coil and processed offline and using the Brainlab algorithm. Constrained spherical deconvolution (CSD) based tractography is an advanced probabilistic technique that allows the representation of multiple fiber populations per voxel. FGATIR provides high-resolution visualization of targets with significant increase in gray/white matter differentiation. T2-SPACE enables the detection of the subthalamic nucleus (STN) based on hypointensity due to iron concentration.

**Results:** Parkinson's Disease: The use of FGATIR overcame the inherent difficulty in distinguishing the anatomical boundaries between the substantia nigra and the STN. Additionally, the reconstruction of the hyperdirect pathway (connecting the motor cortex to the STN) using advanced probabilistic tractography based on CSD enhances the identification of the posterior third of the STN.

**Essential Tremor:** Reconstructing the Dentato-Rubro-Thalamic-pathway using a combined approach of probabilistic-CSD and deterministic tractography improves the identification of the ventral intermediate nucleus (VIM), surpassing the limitations of deterministic tractography in representing crossings and branching fibres. Additionally, we can represent the bundle in its expected anatomical location, slightly anterior to the representation by deterministic tractography.

**Dystonia:** The use of FGATIR allows for high anatomical definition of pallidal subdivisions.

**Conclusion:** The use of advanced techniques enhances DBS planning in movement disorders, enabling more precise and effective implantation.

# ADVANCED TECHNIQUES IN EPILEPSY

**José Maria Matos Sousa** - sousa.jose99@gmail.com
*Department of Neuroradiology, Centro Hospitalar Universitário de São João*
**Sofia Vedor; Tiago Pedro; José Manuel Dias da Costa; Duarte Vieira**
*Department of Neuroradiology, Centro Hospitalar Universitário de São João, E.P.E., Porto, Portugal*

**Introduction:** The identification of an epileptogenic lesion in imaging studies significantly impacts the patient's outcome - seizure-free rates practically half in MRI-negative patients. Despite technological advances in imaging, the detection rate of cortical migration abnormalities remains low. The 3D-EDGE sequence (1st inversion of MP2RAGE) directly studies the corticomedullary junction, enhancing the detection of cortical dysplasias. Interictal pcASL is a non-invasive complement that can help localize the epileptogenic zone, characterized by hypoperfusion in dysplastic areas. The use of deep learning (Deep Resolve Boost - DRB) in coronal sequences targeted at the hippocampus improves image resolution and increases the detection rates of epileptogenic lesions. Finally, resting-sate fMRI (rsfMRI) is an advanced technique that does not require patient collaboration and is an important alternative to depicting eloquent areas for pre-surgical mapping.

**Methods:** The MP2RAGE, pcASL, and DRB sequences were added to the epilepsy protocol recommended by the International League Against Epilepsy. Images were acquired on a 3T Siemens VIDA scanner with a 32- channel coil. Fusing pcASL and volumetric sequences is one step in the post-processing cascade. RsfMRI is acquired for 8 minutes, and then post-processed offline using complex neuroimaging suite.

**Results:** The incorporation of the MP2RAGE, pcASL and DRB sequences into our epilepsy imaging protocol has significantly improved our ability to detect epileptogenic lesions. This advancement in imaging technology has the potential improve patient outcomes, particularly in cases where traditional imaging methods have fallen short. Resting-state fMRI has emerged as a valuable tool in our arsenal of advanced techniques. Its non-invasive nature and independence from patient collaboration make it particularly advantageous for pre-surgical mapping.

**Conclusion:** Our results indicate a notable increase in the detection rate of cortical dysplasias and a more accurate localization of epileptogenic zones, providing a solid foundation for informed clinical and surgical decisions in epilepsy management.

# SOCIAL MEMORY AND ITS FUNCTIONAL NEURAL CORRELATES IN MULTIPLE SCLEROSIS

**André Magalhães** - andre.maia.magalhaes@gmail.com
*School of Medicine of University of Minho, 4710-057, Portugal*
**Matthew Schafer**[1], **Daniela Schiller**[1], **Torcato Meira**[2, 3]
*1 - Icahn School of Medicine at Mount Sinai, 10029, United States of America;*
*2 - Neuroradiology Department of Hospital de Braga, 4710-243, Portugal;*
*3 - School of Medicine of University of Minho, 4710-057, Portugal*

**Introduction/Aims:** While cognitive impairment is becoming more acknowledged in Multiple Sclerosis (MS), the cognitive function of social memory has not yet been explored. This study seeks to assess whether individuals with MS experience deficits in social memory and to identify the functional neural mechanisms associated.

**Materials and Methods:** In this ongoing project, MS patients (n = 10 minimum) and controls (n = 10 minimum; age-, gender- and education level-matched) have performed an innovative task developed in the Schiller lab (Mount Sinai, New York, USA) that allows two-dimensional mapping of social navigation, which triggers the activity of the hippocampus during memory-driven interactions with virtual characters. Using a similar task, we seek to evaluate social navigation (indicative of social memory) in MS patients and controls. Furthermore, to investigate how the brain tracks social navigation, participants have done the task monitored with functional magnetic resonance imaging. Hence, we hypothesize that MS patients have impaired social navigation when compared to healthy controls and that some of the correlations between task-related measures and the activity of the hippocampus (and other areas) will be disrupted.

**Results:** By analyzing the pattern of interactions between the participants and the virtual characters, we have found that the participants significantly discriminate those. Functional correlates are under analysis and will be presented.

**Conclusions:** These results suggest a new tool to assess social navigation (memory) in MS, which can be correlated with regional brain activity.

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# CEREBRAL AMYLOID ANGIOPATHY: THE IMPACT OF BOSTON CRITERIA 2.0 ON THE INVESTIGATION OF TRANSIENT FOCAL NEUROLOGICAL EPISODES

**Liliana Igreja** - lilianaigreja@gmail.com
*Centro Hospitalar Universitário de Santo António (CHUdSA), Largo do Prof. Abel Salazar, 4099-001 Porto, Portugal*
**Ana Rita Martins Neto**[2]**; Luís Maia**[1]**; Rui Felgueiras**[1]
*1 - Centro Hospitalar Universitário de Santo António (CHUdSA), Largo do Prof. Abel Salazar, 4099-001 Porto, Portugal;*
*2 - Instituto de Ciências Biomédicas Abel Salazar - Universidade do Porto, Rua Jorge Viterbo Ferreira 228, 4050-313 Porto, Portugal*

**Introduction / Objectives:** Transient focal neurological episodes (TFNE) are brief, recurrent and stereotyped clinical symptoms. Cerebral amyloid angiopathy (CAA) is a rare cause of TFNE, being more frequent in the elderly and can be diagnosed using clinical and imaging criteria. In 2022, the Boston criteria used until then were revised, originating version 2.0, which now allows the diagnosis of possible CAA in patients with white matter features in the absence of hemorrhagic markers. Our objective was to compare the applicability of the Boston criteria v2.0 with the previous v1.5, within the same population of patients with TFNE as clinical presentation.

**Methods:** A pre-existing database from a study on TFNE was used, which corresponds to a consecutive and prospective hospital cohort of 507 adult patients who recurred to the emergency department of CHUdSA with TFNE between November 2019 and March 2021. Of these, 278 were reassessed in a neurology appointment and an MRI was performed as clinically needed. Patients over 50 years and who underwent an MRI were selected, and classified according to the criteria v2.0 and v1.5.

**Results:** 70 patients were included. Due to technical and co-pathology issues, 7 patients were excluded (n=63). In 3 patients, another diagnosis other than CAA, was established. None of the patients presented AAC diagnostic criteria according to criteria v1.5, in the absence of haemorrhagic markers. In contrast, 27 (45,0%) patients were included in the diagnosis of possible AAC due to non-haemorrhagic markers, such as hyperintensities of the WM in a multispot pattern (92.6%) and prominent enlarged PVS in the centrum semiovale (44.4%).

**Conclusions:** Non-hemorrhagic markers were associated with a significant higher number of new diagnoses of possible CAA. However, their low specificity due to common association with other disorders and uncertainty in counting WM lesions raises questions about their applicability in clinical practice.

# INFLUENCE OF MICROANGIOPATHY ON BRAIN ATROPHY PATTERNS IN ALZHEIMER'S DISEASE AND PRIMARY AGE-RELATED TAUOPATHY

**Miguel Quintas Neves** - mlqneves@gmail.com
*Neuroradiology Department of Hospital de Braga, 4710-243, Portugal; Life and Health Sciences Research Institute (ICVS), School of Medicine, University of Minho, 4710-057, Portugal*
**Francisco Almeida[2,3]; Merilee Teylan[4]; Kathryn Gauthreaux[4]; Charles Mock[4]; Walter Kukull[4]; John Crary[5]; Tiago Gil Oliveira[1,2]**
*1 Neuroradiology Department of Hospital de Braga, 4710-243, Portugal;*
*2 Life and Health Sciences Research Institute (ICVS), School of Medicine, University of Minho, 4710-057, Portugal;*
*3 Department of Neuroradiology, Centro Hospitalar Universitário do Porto,4050-366, Portugal;*
*4 Department of Epidemiology, National Alzheimer's Coordinating Center, University of Washington, Seattle, WA, USA;*
*5 Neuropathology Brain Bank & Research Core, Department of Pathology, Nash Family Department of Neuroscience, Department of Artificial Intelligence & Human Health, Friedman Brain Institute, Ronald M. Loeb Center for Alzheimer's Disease, Icahn School of Medicine at Mount Sinai, New York, NY, USA*

**Introduction:** Brain vascular pathology is an important comorbidity in Alzheimer's disease (AD), with white matter damage independently predicting cognitive impairment. However, it is still unknown how vascular pathology differentially affects primary age-related tauopathy (PART) compared to AD.

**Aims:** Our study compared brain microangiopathic burden, evaluated by in vivo MRI, with neuropathological findings and patterns of brain atrophy in patients with definite PART and AD, and assessed the relationship between brain microangiopathy and the degree of clinical impairment.

**Materials and methods:** Clinical information, brain MRI (T1 and T2-FLAIR acquisitions) and neuropathological data were obtained from the National Alzheimer's Coordinating Centre ongoing study, with a total sample of 167 patients identified, that were divided according to the presence of neuritic plaques in Consortium to Establish a Registry for Alzheimer's disease (CERAD) 0 to 3. Microangiopathic burden and brain atrophy were evaluated by two certified neuroradiologists, using, respectively, the Fazekas score and a previously validated visual rating scale to assess brain regional atrophy.

**Results:** In AD patients, significant correlations were found between the Fazekas score (deep and periventricular) and atrophy in various brain regions, particularly the medial temporal lobe. In PART patients, significant correlations were also found between the Fazekas score and atrophy in various brain regions, however, with a differential regional pattern, mainly involving the fronto-insular region and to a lesser degree the medial temporal lobe. For this specific cohort, no significant correlations were found between the Fazekas score and the degree of clinical impairment.

**Conclusions:** Our results show that PART presents different pathological consequences at the brain microvascular level compared to AD and further support PART as an independent pathological entity from AD.

# NEUROIMAGING FINDINGS IN ANTI-LGI1 ENCEPHALITIS: A SYSTEMATIC REVIEW AND META-ANALYSIS

**Francisco Almeida** - franciscojcga@gmail.com
*Centro Hospitalar Universitário de Santo António*
**Ana I. Pereira**[1], **Catarina Mendes-Pinto**[1], **Joana Lopes**[4], **João Moura**[4], **Gonçalo Videira**[4], **Raquel Samões**[4,5*], **Tiago Gil Oliveira**[2,3,6*]
*1 Department of Neuroradiology, Centro Hospitalar Universitário de Santo António, Porto, Portugal.*
*2 Life and Health Sciences Research Institute (ICVS), School of Medicine, University of Minho, Braga, Portugal.*
*3ICVS/3B's—PT Government Associate Laboratory, Braga/Guimarães, Portugal.*
*4 Department of Neurology, Centro Hospitalar Universitário de Santo António, Porto, Portugal.*
*5 Unit for Multidisciplinary Research in Biomedicine, Instituto de Ciências Biomédicas de Abel Salazar da Universidade do Porto, Porto, Portugal.*
*6 Department of Neuroradiology, Hospital de Braga, Braga, Portugal.*
** Equally contributing authors.*

**Background:** Antibodies against Leucine-Rich Glioma Inactivated protein 1 (LGI1) constitute the second most common form of autoimmune encephalitis. On MRI, it may show T2/FLAIR hyperintensities of the medial temporal lobe (T2/FLAIR-MTL), involve the basal ganglia (BG) or be unremarkable. We performed a systematic review and meta-analysis of MRI abnormalities in anti-LGI1 encephalitis. A human brain map of LGI1 gene expression was generated using the Allen Human Brain Atlas.

**Methods:** PubMed was searched with the terms "LGI1" and "encephalitis" from inception to April 7th 2022. 29 research papers with more than 10 anti-LGI1 encephalitis patients and MRI data were included. Pooled prevalence estimates were calculated using Freeman-Tukey Double-Arcsine transformation. Meta-analysis used Dersimonian-Laird random-effects models.

**Results:** Of 1267 patients, T2/FLAIR-MTL hyperintensities were present in 54% (95%CI [0.48; 0.59]; I2=75%). Of 358 patients, 25% showed bilateral (95%CI [0.17; 0.34]; I2=65%) and 24% unilateral T2/FLAIR-MTL abnormalities (95%CI [0.16; 0.32]; I2=64%). Of 612 patients, BG abnormalities were present in 10% (95%CI [0.06; 0.15]; I2=67%). LGI1 expression was highest in the amygdala, hippocampus and caudate nucleus.

**Conclusions:** T2/FLAIR-MTL hyperintensities were present in around half of anti-LGI1 patients. Prevalence of unilateral and bilateral presentations was similar, suggesting unilaterality should raise suspicion of this disease in the appropriate clinical context. Around 10% showed BG abnormalities, indicating special attention should be given to this region. LGI1 regional expression coincided with the most frequently reported MRI abnormalities. Regional specificity might be partially determined by expression levels of the target protein.

# NEUROPATHOLOGICAL DETERMINANTS OF ALZHEIMER'S DISEASE MRI RADIOMICS

**Francisco Almeida** - franciscojcga@gmail.com
*Department of Neuroradiology, Centro Hospitalar Universitário de Santo António, Porto, Portugal.*
**Tiago Jesus**[1,2,4], **Paulo Jorge Alves**[1,2,4], **Pedro Bettencourt**[1,2,4], **Ana Coelho**[1,2], **Miguel Quintas- Neves**[1,2,5], **Kathryn Gauthreaux**[6], **Victor Alves**[4], **Charles N. Mock**[6], **Walter A. Kukull**[6], **John F. Crary**[7], **Tiago Gil Oliveira**[1,2,5]
*1 Life and Health Sciences Research Institute (ICVS), School of Medicine, University of Minho, Braga, Portugal.*
*2 ICVS/3B's—PT Government Associate Laboratory, Braga/Guimarães, Portugal.*
*3 Department of Neuroradiology, Centro Hospitalar Universitário do Porto, Porto, Portugal.*
*4 Center Algoritmi, LASI, University of Minho, 4710-057 Braga, Portugal.*
*5 Department of Neuroradiology, Hospital de Braga, Braga, Portugal.*
*6 Department of Epidemiology, National Alzheimer's Coordinating Center, University of Washington, Seattle, Washington.*
*7 Neuropathology Brain Bank & Research Core, Department of Pathology, Nash Family Department of Neuroscience, Department of Artificial Intelligence & Human Health, Friedman Brain Institute, Ronald M. Loeb Center for Alzheimer's Disease, Icahn School of Medicine at Mount Sinai, New York, New York.*

Alzheimer's disease (AD) is the most common cause of dementia. Brain atrophy, specifically of the medial temporal regions, was for many years used as a sensitive marker of neurodegeneration in AD and included in the diagnostic criteria but appears late in the pathophysiological course of disease. The signal encoded on MRI, however, even in traditional and widely used sequences, provides more information than was is currently used at the clinical level. Radiomics refers to the extraction of quantitative metrics, or features, from the MR image, thereby allowing the quantification of "sub-visual" information, which can be tested for correlations with biological variables. Here, we take advantage of a post-mortem assessed AD population with ante-mortem MRI to evaluate the neuropathological determinants of radiomic features in AD-relevant brain regions. The cohort was composed of 214 patients from the National Alzheimer's Coordinating Center. Freesurfer was used to obtain bilateral entorhinal cortex, hippocampal and inferior temporal regional segmentations. PyRadiomics was used to extract radiomic features for each of the three regions. The sample was divided across Braak stages (neurofibrillary tangle topography), CERAD scores (neuritic plaque deposition severity) and CDR global (dementia severity). Radiomic features were compared between groups and a LASSO model was trained to predict Braak stage. Radiomic features were sensitive to tau pathology (Braak stage) and cognitive impairment (CDR global) within most advanced Braak stages, but not to neuritic plaque burden across the three regions. Radiomic features performed better than volume alone in distinguishing Braak group I-IV versus V-VI in the entorhinal and hippocampus (entorhinal cortex achieved an area under the curve (AUC) of 0.79 vs 0.76 for volume; hippocampus AUC of 0.76 versus 0.73; inferior temporal lobe AUC of 0.71 vs 0.71). MRI radiomics is sensitive to tau pathology in AD and might be useful in predicting Braak stage.

# PERFUSION IMAGING TO IDENTIFY SALVAGEABLE BRAIN TISSUE IN PATIENTS WITH CEREBRAL VENOUS THROMBOSIS – STUDY PROTOCOL

**Sara Rosa** - saradbrosa@gmail.com
*Departamento de Neurorradiologia, Hospital de São José, Centro Hospitalar Universitário de Lisboa Central; Rua José António Serrano, 1150-199 Lisboa; Portugal*
**Isabel Fragata**[1,2], **Lia Lucas Neto**[3,4], **Marta Carvalho**[5,6], **Leonor Dias**[5,6], **João Sargento Freitas**[7,8], **César Nunes**[7]; **Denis Gabriel**[9], **Vítor Tedim Cruz**[10], **Diana Aguiar de Sousa**[1,4]
*1 Centro Hospitalar Universitário de Lisboa Central, Rua José António Serrano, 1150-199 Lisboa, Portugal;*
*2 NOVA Medical School, Campo dos Mártires da Pátria 130, 1169-056 Lisboa, Portugal;*
*3 Centro Hospitalar Universitário de Lisboa Norte, Av. Prof. Egas Moniz MB, 1649-028 Lisboa, Portugal;*
*4 Faculdade de Medicina da Universidade de Lisboa, Av. Prof. Egas Moniz MB, 1649-028 Lisboa, Portugal;*
*5 Centro Hospitalar Universitário de São João, Alameda Prof. Hernâni Monteiro, 4200-319 Porto, Portugal;*
*6 Faculdade de Medicina da Universidade do Porto, Alameda Prof. Hernâni Monteiro, 4200-319 Porto, Portugal;*
*7 Centro Hospitalar e Universitário de Coimbra, Praceta Professor Mota Pinto, 3004-561 Coimbra, Portugal;*
*8 Faculdade de Medicina da Universidade de Coimbra, R. Larga 2, 3000-370 Coimbra, Portugal;*
*9 Centro Hospitalar Universitário de Santo António, Largo do Prof. Abel Salazar, 4099-001 Porto, Portugal;*
*10 Hospital Pedro Hispano, R. de Dr. Eduardo Torres, 4464-513 Sra. da Hora, Portugal*

**Background and Aims:** Cerebral venous thrombosis (CVT) is a less common type of stroke that predominantly affects women of fertile age. Under optimal medical treatment, 15% of patients die or become dependent, up to one-third suffer from post-CVT cognitive impairment and 30% are unable to return to work in the 10 years after the acute event. Invasive interventions, particularly endovascular treatment, are promising, but have shown limited success due to lack of robust patient selection criteria. Perfusion imaging has been used to select patients with ischemic stroke for endovascular treatment, but there is scarce data regarding its use in CVT. We will hereby present our protocol designed to explore perfusion imaging changes in CVT patients and investigate their value as predictors of brain tissue fate.

**Methods:** Prospective, multicenter, observational cohort study of 70 adult patients with CVT. Dynamic susceptibility contrast perfusion magnetic resonance imaging (MRI) will assess perfusion values and BBB leakage rates for each outcome group. The study aims to define perfusion and BBB leakage thresholds for predicting primary outcomes of early imaging deterioration and progression towards established infarction. Secondarily, functional, occupational and cognitive outcomes will be associated with imaging changes.

**Expected Results:** We expect to find an association between perfusion imaging changes, specifically increase of time to drain, with worse parenchymal outcome, namely progression towards infarction. We believe these results will be crucial for developing a model for patient selection in future clinical trials involving recanalization therapies.

# PEDIATRIC CEREBRAL VENOUS THROMBOSIS: RETROSPECTIVE STUDY OF A SINGLE CENTER EXPERIENCE

**Joana Freitas** - joanaccfreitas@gmail.com
*Neuroimaging Department of Centro Hospitalar Universitário Lisboa Norte, Av. Prof. Egas Moniz MB, 1649-028 Lisboa, Portugal*
**Hugo Cadilha**[1], **Ângelo Neto Dias**[1], **Lia Lucas Neto**[1,2]
*1 Neuroimaging Department of Centro Hospitalar Universitário Lisboa Norte, Av. Prof. Egas Moniz MB, 1649-028 Lisboa, Portugal;*
*2 Anatomy Department, Lisbon School of Medicine, Lisbon, Portugal*

**Objectives:** Cerebral venous thrombosis (CVT) is a rare and severe condition, in which blood clots form in the veins and/or sinuses that drain blood from the brain. CVT can affect both children and adults, but there is limited research focusing on the pediatric population. This study aims to analyze the etiology, clinical course, management, and outcomes of pediatric patients with CVT at a tertiary care center. Also, to characterize its imaging features.

**Methods:** We conducted a five-year retrospective single-center observational study of imaging-confirmed CVT in pediatric patients, aged 0 to 18 years. Patient information was retrieved from the neuroimaging department database, including demographics, clinical presentation, neuroimaging findings, prothrombotic factors, treatment approaches, outcomes, and recanalization rates.

**Results:** Twenty-one children were included (62% male). The mean age was 13 years. The most common symptoms included headache (38%) and seizures (29%). Trauma was the primary underlying etiology, followed by local infection (mainly otomastoiditis). CVT diagnoses were based on veno-computed tomography (CT) and/or magnetic resonance imaging (MRI) with venography. In 62%, multiple sinuses were involved, with the transverse sinus most affected. In four cases, there was a parenchymal infarct, one of them with hemorrhagic transformation. Anticoagulant therapy was initiated in 76% of cases and 24% of cases were managed conservatively. Positive prothrombotic factors were present in 43% of cases. There were no recorded fatalities related to TVC.

**Conclusion:** There might be differences in the presentation of CVT since children often exhibit nonspecific symptoms. Also, the underlying causes differ; in children, it is often associated with trauma or acute infections, and in adults is commonly linked to pro-thrombotic risk factors. Treatment approaches are generally similar, involving anticoagulation and addressing the underlying causes. However, managing CVT in children may require a multidisciplinary approach, considering the unique challenges in pediatric patients.

# ONE CENTER'S EXPERIENCE IN ENDOVASCULAR TREATMENT OF ISOLATED EXTRACRANIAL INTERNAL CAROTID ARTERY OCCLUSION

**André Araújo** - andrearaujo27@gmail.com
*CHVNG, R. Conceição Fernandes S/N, 4434-502 Vila Nova de Gaia, Portugal*
**André Araújo, Francisca Guimarães, Isa Barbosa, André Miranda, Pedro Pires, Marta Rodrigues, Sérgio Castro, Manuel Ribeiro**
*Neuroradiology Unit, Department of Radiology, Centro Hospitalar Vila Nova de Gaia/Espinho (CHVNG/E), Portugal*

**Introduction:** Acute internal carotid artery (ICA) occlusion, with open carotid-T, is a less common cause of stroke without an established management strategy. Clinical presentation ranges from absence of deficits to total anterior circulation stroke, with variable outcomes. EVT is feasible although not widely studied in randomized trials. EVT is promising in terms of safety and outcomes but further studies are warranted to establish it as standard of care.

**Materials and methods:** All ICA occlusions admitted due to symptomatic stroke with onset less than 24h that underwent EVT, from January 2018 to Dezember 2022 were included. Patients with intracranial occlusion on admission CTA were excluded.

**Results:** 56 patients were included of which 37 were female (65%). Mean age was 71.9 ± 13.9 years old. Median NIHSS and mRS at admission were 11 [0-24] and 0 [0-3], respectively. Median ASPECTS was 10 [5-10]. Successful revascularization rate was achieved in 43 patients (76,8%). Stenting was employed in 14 patients. We identified 9 patients (16%) with distal embolization during the procedure none of which required rescue therapy. No radiological or symptomatic parenchymal hemorrhages were identified. The etiology was attributed to atherosclerosis in 30 patients (53,6%), cardioembolism in 18 patients (31,2%), dissection in 2 patients (3,6%) and undetermined in 6 patients (10,7%). Median NIHSS at 24h was 5 [0-24]. The percentage of patients with mRS 0-2 at 3 months was 55,4% (31/56) and mRS 0-3 was 71,4% (40/56). 3 patients were lost to follow-up.

**Conclusion:** EVT in acute extracranial ICA occlusions is safe and feasible, with an overall low complication rate, even when periprocedural double antiplatelet therapy was employed. Further studies are needed to assess the full potential of endovascular approach in these cases, namely by comparison with a control group with acute extracranial occlusion receiving conservative treatment.

# FUNCTIONAL OUTCOME OF PATIENTS SUBMITTED TO THROMBECTOMY OVER A 7-YEAR PERIOD IN A REGIONAL STROKE NETWORK

**Carolina Maia** - carolinamaia.areal@gmail.com
*Medical Image Department, Neuroradiology Unit, Centro Hospitalar e Universitário de Coimbra, Coimbra, Portugal*
**Carolina Fernandes**[2], **Ana Carolina Chaves**[1], **Henrique Queirós**[1], **Ricardo Gaspar**[1], **José Alves**[2], **Catarina Bernardes**[2], **João Sousa**[2], **João Sargento-Freitas**[2], **Gustavo Santo**[2], **César Nunes**[1], **Ricardo Veiga**[1], **Egídio Machado**[1]
*1 Medical Image Department, Neuroradiology Unit, Centro Hospitalar e Universitário de Coimbra, Coimbra, Portugal;*
*2 Neurology Department, Centro Hospitalar e Universitário de Coimbra, Coimbra, Portugal*

**Background:** Acute stroke patients with large vessel occlusion (LVO) who are initially admitted to an endovascular treatment (EVT) capable center may have better prognosis than patients admitted to a primary hospital (PH). Regional Stroke Network (RSN) can help to mitigate this difference.

**Aim:** To compare the functional outcome between patients submitted do EVT initially admitted to a PH and to a comprehensive stroke center (CSC), over a 7-year period.

**Methods:** Retrospective analysis of clinical and imaging data from all patients with LVO admitted to a single CSC and submitted to EVT between 1/01/2016 and 31/12/2022 in a RSN. Baseline characteristics, performance metrics, procedural and functional outcomes were analyzed. Functional outcome at 90 days was determined by modified Rankin Scale (mRS). Logistic regression was performed including year of treatment and type of hospital admission as covariates.

**Results:** Of 2250 patients with LVO submitted to EVT, 59.9% (n=1348) were initially admitted to a PH, and 40.1% (n=902) to a CSC. Regarding baseline characteristics between both groups, there was no significant difference in age and sex. In patients initially admitted to a PH, median time Door-to-Door (DtD) was 176 min and there was a significant difference with patients admitted to CSC in median time Symptoms-to-Recanalization (StR) (391 versus 309 min, $P<0.001$). During this period, successful revascularization was achieved more often ($P<0.001$) and functional outcome significantly improved ($P<0.001$) with no influence of the admission site ($P=0.305$).

**Conclusion:** Admission site has no significant influence in functional outcome of stroke patients with LVO submitted to EVT and it has been improving in the last 7 years.

# PREDICTING ANTERIOR CIRCULATION STROKE FUNCTIONAL OUTCOMES AFTER MECHANICAL THROMBECTOMY USING A GENERATIVE LANGUAGE MODEL: THE CHATGPT'S CRYSTAL

**Tiago Pedro** - tiagoliveirapedro@hotmail.com
*Department of Neuroradiology, Centro Hospitalar Universitário de São João, Porto, Portugal*
**José Maria Tourais**[1], **Luísa Fonseca**[2,3], **Manuel Guilherme Gama**[2,3], **Goreti Moreira**[2,3], **Mariana Pintalhão**[2,3], **Paulo Castro Chaves**[2,3], **Ana Aires**[3,4,5], **Gonçalo Alves**[1,6], **Luís Augusto**[1,6], **Luís Albuquerque**[1,6], **Pedro Castro**[3,4,5], **Maria Luís Silva**[1,6]
*1Department of Neuroradiology, Centro Hospitalar Universitário de São João, Porto, Portugal 2Department of Medicine, University of Porto, Porto, Portugal 3Stroke Unit and Department of Internal Medicine, Centro Hospitalar Universitário de São João, Porto, Portugal 4Department of Neurology, Centro Hospitalar Universitário de São João, Porto, Portugal 5Department of Clinical Neurosciences and Mental Health, Faculty of Medicine, University of Porto, Porto, Portugal 6Centro de Referência em Neurorradiologia de Intervenção na Doença Cerebrovascular, Centro Hospitalar Universitário de São João, Porto, Portugal*

**Background:** Timely intervention and accurate prediction of functional outcomes are crucial in stroke management. Mechanical thrombectomy (MT) revolutionized acute ischemic stroke management, but predicting post-procedure disability remains challenging. We evaluated the performance of the generative language model ChatGPT in predicting the functional outcome of AIS patients three months post- thrombectomy.

**Methods:** We retrospectively analyzed clinical, neuroimaging, and procedure-related data from 163 AIS patients treated with MT. ChatGPT predicted the 3-month modified Rankin Scale (mRS) score for each patient. We assessed the agreement between ChatGPT's exact and categorized predictions and the true mRS scores using Cohen's kappa. Subgroup analysis explored factors influencing prediction accuracy with a

**Results:** ChatGPT demonstrated fair (κ=0.354, 95% CI 0.260-0.448) and moderate (κ=0.494, 95% CI 0.378-0.610) agreement with the true mRS scores at 3 months after acute ischemic stroke for exact and grouped estimates, respectively. The model accurately predicted 49.1% of exact mRS scores at 3 months after acute ischemic stroke and up to 70.6% within one level of tolerance. Agreement was higher for patients with shorter last-time-seen-well-to-door delay, intracranial carotid artery and M1 occlusions, and better modified treatment in cerebral infarction (mTICI) scores. The Bland–Altman plot showed a bias close to zero (-0.01). Inaccurate predictions were associated with female sex (p=0.040), lower NIHSS scores (p=0.018), and the lack of thrombolysis administration (p=0.045).

**Conclusions:** ChatGPT showed adequate overall agreement in predicting short-term functional outcomes in post-thrombectomy AIS patients. Integrating AI-based models into clinical practice offers promising benefits for optimizing resources, enhancing patient care, and enabling proactive care planning and counseling. However, refining algorithms and fostering human collaboration remains crucial to ensure accuracy and reliability in clinical decision-making.

# NET WATER UPTAKE IN ACUTE ISCHEMIC STROKE – A BETTER OUTCOME PREDICTOR?

**Maria Ribeiro Gomes** - maria.ribeiro.neurorradio@gmail.com
*Hospital de Santa Maria, Av. Prof. Egas Moniz MB 1649-028, Lisboa, Portugal*
**Cristiano Esteves, Carla Guerreiro, Manuel Alberto Correia, Lia Lucas Neto, Graça Sá**
*Hospital de Santa Maria, Av. Prof. Egas Moniz MB 1649-028, Lisboa, Portugal*

**Introduction:** Endovascular thrombectomy (ET) is one of the most effective recanalization approaches in acute large-vessel occlusion stroke. In some selected cases or when its benefit is uncertain, perfusion CT has demonstrated a crucial role in decision-making. Nevertheless, even after careful imaging-based patient selection and successful recanalization, the clinical outcome is variable, making a requirement for better outcome imaging prediction tools. Net water uptake (NWU), a quantitative measure of hypoattenuation on unenhanced computed tomography (NCCT), has been recently studied as a good biomarker of "tissue clock", representing the level of lesion edema.

**Objective:** To assess the value of standardized quantification of NWU on initial NCCT as a predictor of short-term outcomes in patients with complete recanalization post-ET. Methods: One-year retrospective analysis of patients with AIS of the middle cerebral artery, selected for ET based on a CT-perfusion penumbra/core mismatch > 1.8 and achieving a successful recanalization (TICI≥2c). The patients were dichotomized into good versus bad early clinical outcomes, according to 24-hour NIHSS reduction ≥4. For each patient, the core and penumbra volumes were measured in the perfusion CT scan and the NWU was calculated on the NCCT scan corresponding areas.

**Results:** Preliminary analysis in our population (N=21) has demonstrated a significant correlation between penumbra NWU and clinical outcome, with a trend of lower NWU and better outcomes, as previously defined. Additional results will be presented on the correlation between core NWU, perfusion mismatch, hemorrhagic transformation, and clinical outcome.

**Conclusions:** Lower penumbra NWU correlates with a good short-term clinical outcome and strongly indicates this tool's potential prognostic and patient selection value. In an area where the clock is ticking, observing how practical NWU quantification may surpass other more time-consuming advanced imaging techniques, such as perfusion CT scan, will be interesting.

# BLISTER-LIKE ANEURYSMS: A SINGLE-CENTER EXPERIENCE OF A RARE TYPE OF INTRACRANIAL ANEURYSMS

**Tiago Pedro** - tiagoliveirapedro@hotmail.com
*Department of Neuroradiology, Centro Hospitalar Universitário de São João, Porto, Portugal*
**Inês Prisco**[2], **Gonçalo Alves**[1,3], **Luís Augusto**[1,3], **Luís Albuquerque**[1,3], **Maria Luís Silva**[1,3]
*1Department of Neuroradiology, Centro Hospitalar Universitário de São João, Porto, Portugal*
*2Department of Neuroradiology, Hospital Pedro Hispano, Unidade Local de Saúde de Matosinhos, Porto, Portugal*
*3Centro de Referência em Neurorradiologia de Intervenção na Doença Cerebrovascular, Centro Hospitalar Universitário de São João, Porto, Portugal*

**Background:** Blister-like aneurysms (BLAs) are rare intracranial aneurysms (<1%) with thin, fragile walls and poorly defined necks. They are difficult to detect and may grow rapidly, posing a therapeutic challenge. Methods: We retrospectively reviewed patients diagnosed with BLAs between 2019 and 2023. Typical BLAs were defined as small aneurysms (<3 mm) arising from non-branching sites of the internal carotid artery (ICA), with atypical BLAs occurring elsewhere.

**Results:** Of the 14 patients diagnosed with BLAs, only 4 (29%) were located in the ICA. The majority of BLAs (57%) were discovered incidentally, while only four cases (43%) were directly linked with Subarachnoid Hemorrhage (SAH). Atypical BLAs were found equally in the Middle Cerebral Artery (MCA) and in the Anterior Cerebral Artery (ACA) in 30% of the cases. All four ruptured BLAs were found outside the ICA. All treated BLAs achieved at least partial occlusion, and those managed conservatively remained stable during follow-up assessments. In all cases where BLAs were treated, a favorable outcome (modified Rankin scale (mRS) score of 0-1) was achieved.

**Conclusion:** Our study suggests that atypical BLAs are more common than previously thought and may present with rupture more frequently than those located in the ICA. Therefore, when dealing with diffuse SAH with inconclusive CTA or DSA, it is wise to investigate the entire circle of Willis. Furthermore, our results indicate that treatment of BLAs, regardless of location, is associated with favorable outcomes. Larger prospective studies are needed to confirm these findings and to further elucidate the optimal treatment strategies for BLAs in different locations.

# Posters

## P01 | A NOVEL TASK TO ASSESS SOCIAL MEMORY IN MULTIPLE SCLEROSIS AND ITS BRAIN INJURY CORRELATES

**Torcato Meira -** torcatomeira14@gmail.com
*Neuroradiology Department of Hospital de Braga, 4710-243, Portugal;*
*School of Medicine of University of Minho, 4710-057, Portugal*
**André Magalhães**[1], **Matthew Schafer**[2], **Daniela Schiller**[2]
*1 - School of Medicine of University of Minho, 4710-057, Portugal;*
*2 - Icahn School of Medicine at Mount Sinai, 1002, United States of America*

**Introduction/Aims:** Even though cognitive impairment is increasingly recognized in Multiple Sclerosis (MS), the memory ofother individuals (social memory) has never been evaluated. This work aimed to determine whether patients with MS exhibit social memory deficits and their association with brain lesion load.

**Materials and Methods:** MS patients (n = 15) and controls (n = 12; age-, gender- and education level-matched) performed an innovative task developed in the Schiller lab (Mount Sinai, New York, USA) to evaluate social navigation/memory. In the form of a "choose-your-own-adventure" game, this task simulates social interactions using virtual characters, allowing the construction of a two-dimensional "map" of those relationships (defined by the coordinates "power" and "affiliation"). The final position of the characters in the map can then be defined by a vector, whose length and angle were measured. Furthermore, the task was performed while acquiring brain neuroimaging data through MRI, allowing automatic measurement of lesion load (volume and number of hyperintense lesions in T2 FLAIR). At the end of the task, participants were also asked to explicitly construct a "map" of the characters (defined by the same coordinates). Groups were compared using Student's t-test and two-way ANOVA for social navigation/memory performance; simple linear regression models were built to predict scores of characters' discrimination (as indicative of social memory) by the lesion load variables.

**Results:** The volume (but not the number) of lesions was found to be a significant predictor of the social discrimination capacity of MS patients (inversely correlated), when considering the social vector length obtained in an explicit manner.

**Conclusions**: These results suggest a new tool to assess social navigation (memory) in MS and define the volume of brain injuries as a predictor of this neglected cognitive function.

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# P02 | UNVEILING THE ENIGMA: GIANT DERMOID CYSTS OF THE POSTERIOR FOSSA

**Inês Santos Freire** - sfreire.ines@gmail.com

*Centro Hospitalar e Universitário Lisboa Central (CHLC) - Hospital de São José, 1150-199, Lisboa, Portugal*

**João Gonçalves, Rodrigo Lindeza, Amets Iraneta, Carla Conceição**

*1 Neuroradiology Department – Centro Hospitalar e Universitário Lisboa Central (CHLC), Lisbon, Portugal; 2 Neuroradiology Department – Hospital Central do Funchal, Funchal, Portugal; 3 Neurosurgery Department – Centro Hospitalar e Universitário Lisboa Central (CHLC), Lisbon, Portugal*

**Introduction and Purpose:** An intracranial dermoid cyst (DC) is an inclusion cyst derived from embryonic ectodermal remnants caused by incomplete cleavage of neural tube. DCs arise during the third to fifth gestational week and represent less than 1% of intracranial masses. Most intracranial DCs are almost always extraaxial, usually in the midline, and most common in children/young adults. They have a predilection for the suprasellar cistern, followed by the posterior fossa and frontonasal region. DCs grow very slowly and only a few reach or exceed the size of 5 cm, referred to as giant dermoid cysts (GDCs). Symptoms are mainly location dependent. The purpose of this work is to illustrate the findings that can be found in neuroimaging in patients with DCs.

**Methods:** The authors present two pediatric cases of female patients with GDCs of the midline posterior fossa, with progressive symptoms/signs of intracranial hypertension.

**Results and Discussion**: Most DCs are hypodense and appear almost identical to fat on CT scans. Calcification may be present and they may rupture (chemical meningitis). MRI is the preferred method of investigation. DCs resemble fat on imaging, but signal intensity varies with fat and dermal appendages content, generally appearing heterogeneously hyperintense on T1 and T2/FLAIR. In the cases presented, the lesions have different signal from that described in the literature, with predominate hyposignal on T1 and diffusion restriction, however they have a typical multi-layered appearance (onion-skin like), which may correspond to the linear/striated lamellae of keratinaceous debris and hair. Another diagnostic clue includes the sinus tract that connects the median occipital cranial vault to the lesion. Both patients underwent surgical resection with histological confirmation.

**Conclusions:** DCs are uncommon lesions that may present with atypical imaging features. Its onion-skin appearance and the presence of an associated sinus tract can help in its differential diagnosis.

# P03 | IMAGING FINDINGS OF HOYERAAL-HREIDARSSON SYNDROME: A CASE REPORT

**Sofia Bettencourt** - sofiar@campus.ul.pt
*Neuroradiology Department, Hospital de São José,*
*Centro Hospitalar de Lisboa Central, R. José António Serrano, 1150-199 Lisbon, Portugal*
**Pedro Brandão**[1], **Carla Conceição**[1]
*1. Neuroradiology Department, Hospital de São José, Centro Hospitalar de Lisboa Central, R. José António Serrano, 1150-199 Lisbon, Portugal*

**Introduction:** Pontocerebellar hypoplasias represent a rare and diverse group of disorders. Applying a pattern recognition approach, particularly based on imaging, aids in narrowing the differential diagnosis and alongside with clinical context, can guide genetic investigation. This case report focuses on Hoyeraal-Hreidarsson syndrome, a severe variant of dyskeratosis congenita, a hereditary telomere maintenance defect involving telomerase dysfunction and impaired proliferation of hematopoietic stem cells. Clinical presentation includes intrauterine growth retardation, bone marrow failure, immunodeficiency, and neoplasias. Imaging features encompass cerebellar hypoplasia, supratentorial calcifications, delayed myelination and thin corpus callosum.

**Case Report:** We present a case of a boy born by emergency cesarean section at 30 weeks of gestation due to complications including placental abruption and decreased fetal movement. The newborn had a low birth weight and microcephaly. He required a 34-day stay in the neonatal Intensive Care Unit due to respiratory distress syndrome, sepsis and anemia. At 8 months of age, he was admitted to our hospital with a three-week history of oral and skin lesions, and fever for the last two days. Physical examination revealed microcephaly, developmental delay, poor ponderal progression and leukoplakia. Laboratory tests revealed pancytopenia and elevated inflammatory markers. Head CT scan showed a very small cerebellum and pons, calcifications in the internal capsule, ventricular and subarachnoid space enlargement. Brain MRI confirmed pons and cerebellar hypoplasia and revealed discrete hyperintensity of the white matter, particularly in the internal capsule and central region of the centrum semiovale. The prominent pontocerebellar hypoplasia, alongside with the clinical history and supra-tentorial calcifications suggested Hoyeraal-Hreidarsson syndrome as a potential diagnostic hypothesis. Subsequent genetic testing confirmed two mutations in the RTEL1 gene, one of which was likely pathogenic.

**Conclusion:** Cerebellar hypoplasia is a key characteristic of Hoyeraal-Hreidarsson syndrome. Clinical features and imaging characteristics, namely brain calcifications can aid in the diagnosis of this syndrome.

# P04 | IMAGING OF PETROUS APEX LESIONS

**Joana Freitas** - joanaccfreitas@gmail.com
*Serviço de Imagiologia Neurológica, Centro Hospitalar Universitário Lisboa Norte, Lisboa Portugal*
**Hugo Cadilha, Maria Inês de Sá, Filipa Proença**
*Serviço de Imagiologia Neurológica, Centro Hospitalar Universitário Lisboa Norte, Lisboa Portugal*

**Introduction:** The petrous apex, a complex anatomical region at the central skull base, contains important neuro-vascular structures, making it susceptible to a diverse spectrum of pathologies. These lesions can be categorized into developmental, inflammatory, benign, and malignant tumors, vascular lesions, and osseous dysplasias. Additionally, anatomic variants or pseudo lesions can be mistaken for pathologic conditions. Symptoms result from compression of nearby neurovascular structures, like cranial nerves, the internal carotid artery, or the brainstem. Imaging modalities like computed tomography (CT) and magnetic resonance imaging (MRI) play a pivotal role in the diagnosis and characterization of these lesions. CT offers excellent bone detail, while MRI provides superior soft tissue contrast. Additionally, advanced imaging sequences such as diffusion-weighted imaging, magnetic resonance angiography, and spectroscopy contribute valuable information regarding lesion composition and vascularity.

**Objectives:** Review the petrous apex anatomy and imaging findings of the lesions arising from this region. Methods: A pictorial review of petrous apex lesions was performed with examples from our center. Results: Through a comprehensive array of CT and MRI images, we present a detailed overview of the most common petrous apex lesions.

**Conclusion:** Imaging plays an important role in the diagnosis and management of petrous apex lesions, providing information about the origin and extent of the lesions, as well as their relationship to important anatomic structures. Familiarity with the anatomy of the petrous apex and of the radiological features of lesions that can occur there is essential for clinicians and radiologists to make informed decisions regarding treatment strategies. Furthermore, the ability to distinguish normal variants that may mimic pathology can prevent unnecessary invasive diagnostic procedures or treatments.

# P05 | ENDOVASCULAR APPROACH TO EXTERNAL CAROTID ARTERY PSEUDOANEURYSM IN A PATIENT WITH CERVICAL GUNSHOT INJURY

**Tiago Pedro** - tiagoliveirapedro@hotmail.com

*Department of Neuroradiology, Centro Hospitalar Universitário de São João, Porto, Portugal*

**Inês Prisco**[2], **Luís Albuquerque**[1,3], **Maria Luís Silva**[1,3]

*1Department of Neuroradiology, Centro Hospitalar Universitário de São João, Porto, Portugal*

*2Department of Neuroradiology, Hospital Pedro Hispano, Unidade Local de Saúde de Matosinhos, Porto, Portugal*

*3Centro de Referência em Neurorradiologia de Intervenção na Doença Cerebrovascular, Centro Hospitalar Universitário de São João, Porto, Portugal*

We report a case of a 22-year-old man who was presented with a gunshot wound to the right cervical region. During the physical examination, it was documented an entry wound in the right zygomatic area and suspected active bleeding in the adjacent soft tissues. Head and maxillofacial CT were performed at admission, documenting mandibular ramus and right transverse C1 apophysis fractures. Right jugular vein thrombosis and post-contrast retromandibular enhancement contiguous with the right external carotid artery (ECA) were noted, suggesting a plausible local vessel rupture. Initial digital subtraction angiography revealed an unusual variant of independent origin of the neuromeningeal and pharyngeal trunks of the ascending pharyngeal artery. Subsequently, a right ECA pseudoaneurysm with a common trunk laceration and active bleeding in the right parotid region was documented. Remarkably, we preserved the maxillary and superficial temporal arteries, along with the neuromeningeal trunk, with retrograde filling of these vessels. Our approach involved endovascular treatment, employing the positioning of a microcatheter and microguide for catheterization of the common trunk of the ECA. Commencing from the bleeding point, we successfully managed the pseudoaneurysm by coiling the rupture site until achieving complete hemostasis. Literature indicates that approximately 25% of penetrating neck trauma cases involve vascular injury, predominantly affecting the carotid artery. Bleeding constitutes the primary clinical presentation in 80% of ECA lesions, as seen in this case. While reports on endovascular treatment outcomes for traumatic ECA lesions are limited, the conventional methods typically involve balloon occlusion, embolization, or stent deployment. This case illustrates the favorable outcomes achievable through endovascular treatment for ECA pseudoaneurysms as a viable alternative to surgical intervention.

# P06 | DETERMINANTS OF THE NORMAL IMAGING FEATURES OF THE OPTIC NERVE AND OPHTHALMIC VESSELS

**David Berhanu** - davidb@campus.ul.pt
*Faculdade de Medicina da Universidade de Lisboa, Lisboa, Portugal*
**Luís Abegão Pinto, Inês Carneiro, Isabel Fragata, Joana Tavares Ferreira, Lia Lucas Neto**
*1 Faculdade de Medicina da Universidade de Lisboa, Lisboa, Portugal;*
*2 Centro Hospitalar Universitário Lisboa Norte, Lisboa, Portugal;*
*3 Centro Hospitalar Universitário Lisboa Central, Lisboa, Portugal;*
*4 Faculdade de Medicina da Universidade de Lisboa, Lisboa, Portugal;*
*5 Faculdade de Medicina da Universidade de Lisboa, Lisboa, Portugal*

**Introduction:** There are significant discrepancies in the normal optic nerve sheath diameter (ONSD) and Doppler imaging parameters of the ophthalmic vessels reported in the literature, and their characteristics have not been studied in a single population of healthy individuals. We aimed to determine the imaging features of the ONSD and retrobulbar vessels in a healthy population, assess their determinants and estimate the reliability of a standardised measurement protocol using ultrasonography.

**Methods:** We measured the mean values of the ONSD in supine and sitting position and the Doppler imaging parameters of the ophthalmic, central retinal and short posterior ciliary arteries. Inter-observer reliability was assessed using intraclass correlation coefficient (ICC). Linear regression models were fitted to predict the effect of demographic and clinical determinants on the imaging features.

**Results:** Fifty measurements were obtained for each observer. The mean ONSD was 5.89mm and ONSD was larger in males ($p<0.001$) and increased with heart rate ($p=0.001$). Also, there was a mean ONSD reduction of 0.23mm when assessed in sitting position ($p<0.001$). Doppler analysis showed higher peak-systolic velocity and resistive index in the ophthalmic artery (35.6cm/s vs. 12.0cm/s; 0.78 vs. 0.70) compared to the central retinal artery ($p<0.001$). Resistive indices lowered in the ophthalmic artery with increasing age ($p=0.007$) and systolic blood pressure ($p=0.047$) and increased in the central retinal artery with heart rate ($p=0.022$) and in males ($p=0.015$), similarly to the ONSD. ICC estimates indicated 'good' inter-observer reliability of the ONSD and the ophthalmic and central retinal arteries velocities and resistance.

**Conclusions:** Our findings suggest a reference for the normal imaging features of the ONSD and ophthalmic vessels in a single healthy population. Heterogeneity in demographics and ultrasonographic positioning significantly impacts imaging features and may justify the discrepancies in the literature, however a standardised ultrasonography protocol can provide reliable measurements of retrobulbar structures.

# P07 | HERPETIC ENCEPHALITIS AS A TRIGGER FOR AUTOIMMUNE ENCEPHALITIS

**Ana Isabel Pereira de Almeida** - gemeasanaisabel@gmail.com
*Serviço de Neurorradiologia, Centro Hospitalar Universitário de Santo António, Largo Prof. Abel Salazar, 4099-001 Porto - Portugal*
**Liliana Igreja; Luís Botelho; Raquel Samões**
*1: Serviço de Neurorradiologia, Centro Hospitalar Universitário de Santo António, Largo Prof. Abel Salazar, 4099-001 Porto - Portugal;*
*2: Serviço de Neurologia, Centro Hospitalar Universitário de Santo António, Largo Prof. Abel Salazar, 4099-001 Porto - Portugal;*
*3: Serviço de Neurorradiologia, Centro Hospitalar Universitário de Santo António, Largo Prof. Abel Salazar, 4099-001 Porto - Portugal*

**Introduction / Objectives:** Anti-N-methyl-D-aspartate receptor (NMDAR) encephalitis is a well-recognized autoimmune disease of the central nervous system characterized by the production of antibodies against NMDA receptors. Previous studies have shown that approximately 27% of herpes simplex (HVS) encephalitis patients produce anti-NMDAR antibodies within 3 months. Here, we report a case of NMDAR encephalitis as a complication after initial HSV encephalitis.

**Material and Methods:** Retrospective review of clinical, imaging and analytical findings through medical records.

**Results:** An 81-year-old man presented with motor aphasia, right homonymous hemianopsia, right hemiparesis, right focal motor crises and fever. Magnetic resonance imaging (MRI) showed a left parietal cortical-subcortical hypersignal on T2/FLAIR; in the cerebrospinal fluid (CSF) there was a slight increase in protein, no pleocytosis and negative virology. The patient was admitted to continue the etiological investigation and began to recover, without targeted treatment, from all neurological deficits, except for a slight motor dysphasia. Two weeks after admission, the fever recurred, headaches appeared and the motor dysphasia worsened. A new lumbar puncture now revealed HSV1-PCR positivity in the CSF, suggesting a diagnosis of viral encephalitis, for which the patient was treated with acyclovir with a consequent improvement in symptoms. Three months later, he returned with memory complaints and mood disturbances. MRI revealed a greater extent of the left parietal lesion at this stage, with enhancement and the appearance of a new cortical-subcortical lesion, hyperintense on T2/FLAIR in the left temporal region. CSF analysis during this second presentation showed the presence of anti-NMDA antibodies, suggesting a subsequent development of autoimmune encephalitis. HSV-1 PCR was negative in CSF, and there was an increase of IgG HSV antibody index consistent with prior HSV infection.

**Conclusions:** This case report also highlights the need to test for NMDAR antibodies in post-HSV encephalitis relapses in adults.

# P08 | CYTOTOXIC LESIONS OF THE CORPUS CALLOSUM DUE TO FOLFIRINOX CHEMOTHERAPY

**Mafalda Delgado Soares** - mafalda.ds3@gmail.com
*Centro Hospitalar e Universitário de Lisboa Central, 1800-020 Lisboa, Portugal*
**Sara Rosa**[1], **Sofia Bettencourt**[1], **Rita Ferreira**[1], **Mariana Sardinha**[1], **Margarida Dias**[1], **Bruno Cunha**[2]
*1 Centro Hospitalar e Universitário de Lisboa Central, 1800-020 Lisboa, Portugal;*
*2 Hospital de Braga, 4710-243 Braga, Portugal*

**Introduction:** Cytotoxic lesions of the corpus callosum (CLOCCs) have gained attention due to their various clinical presentations and potential neurotoxic etiologies, including chemotherapy agents. The splenium connects visual areas across cerebral hemispheres and plays a vital role in processing visual cues. Previously, these reversible lesions were associated with mild encephalitis or encephalopathy, but in fact, they belong to a broader spectrum encompassing various syndromes. Often triggered by cytokinopathy, CLOCCs are usually hyperintense on T2/FLAIR, non-enhancing and show diffusion restriction.

**Clinical Case:** A 47-year-old woman with pancreatic ductal adenocarcinoma undergoing FOLFIRINOX chemotherapy developed strabismus and dizziness two days post-chemo. Neurological examination identified an incomplete wall-eyed bilateral internuclear ophthalmoplegia – a rare finding. Neuroimaging revealed restricted diffusion involving the splenium of the corpus callosum, discreetly hyperintense on T2/FLAIR, non-enhancing and without significant associated mass effect. Neurotoxicity and encephalopathy related to 5-FU were considered, leading to hospitalization. Ammonia levels and liver function were normal. Following discontinuation of the drug, the patient had a fast full clinical recovery and a follow-up MRI confirmed total resolution of splenium lesions. Posteriorly, she completed six cycles of Gemcitabine, uneventfully.

**Conclusions:** This case highlights the spectrum of CLOCCs and the potential neurotoxicity of chemotherapy agents, specifically 5-FU. The patient's unique presentation of bilateral internuclear ophthalmoplegia, enriches the understanding of its manifestations. While mechanisms underlying CLOCCs remain intricate, this case emphasizes the need to consider toxic etiologies alongside conventional triggers. Swift symptom resolution post-5-FU discontinuation underscores its transient nature and the importance of accurate diagnosis. Further research into the neurological effects of chemotherapeutic agents, especially 5-FU, on the corpus callosum is crucial. This report also serves as a reminder for healthcare practitioners to remain vigilant for atypical neurological presentations in patients undergoing chemotherapy, considering CLOCCs in the differential diagnosis.

# P09 | NEUROLEPTIC MALIGNANT SYNDROME – A CASE REPORT WITH SELECTIVE CEREBELLAR AND BASAL GANGLIA INJURY

**Maria Inês de Sá** - ines_fs_6@hotmail.com
*Department of Neuroradiology, Hospital de Santa Maria, Centro Hospitalar Universitário Lisboa Norte. Avenida Prof. Egas Moniz, 1649-035, Lisbon, Portugal*
**Joana Freitas, Guilherme Martins, Graça Sá, Filipa Proença**
*Department of Neuroradiology, Hospital de Santa Maria, Centro Hospitalar Universitário Lisboa Norte. Avenida Prof. Egas Moniz, 1649-035, Lisbon, Portugal*

**Introduction:** Neuroleptic Malignant Syndrome (NMS) is a rare but potentially life-threatening condition associated with the use of neuroleptic medications. It is characterized clinically by altered mental state, hyperpyrexia, muscular rigidity, autonomic dysfunction, elevation of serum creatine kinase and leukocytosis. It most often occurs in the setting of initiating or changing doses of antipsychotic medications.

**Results:** We present a case of an 85-year-old woman admitted to our hospital with depression of consciousness (GCS 9), with rapid progression to a coma (GSC 4). Her medical history included depression under antipsychotic treatment and osteoporosis. Neuroimaging exams were performed and showed extensive symmetric bilateral areas of hypodensity in the bilateral cerebellar hemispheres, bilateral globus pallidus and right putamen. The vascular study was normal. Laboratory tests showed marked elevations in creatine kinase, C-reactive protein, liver enzymes, renal function tests and leukocytosis. The patient was diagnosed with NMS and all antipsychotic medications were discontinued. Unfortunately, the patient died two days later.

**Conclusion:** Imaging findings in NMS have not been well described, as only a very few cases have been reported worldwide. Published cases described brain lesions in multiple areas, primarily in the cerebellum, but also in the basal ganglia, corpus callosum and cerebral lobes. In some cases, the brain changes were reversible, while others had a tragic outcome like in our patient. Differential diagnosis includes opioid neurotoxicity like CHANTER (Cerebellar, Hippocampal, and basal nuclei transient edema with restricted diffusion) syndrome, heroin-induced leukoencephalopathy, hypoxicischemic encephalopathy, and posterior reversible encephalopathy syndrome (PRES). It is crucial to be aware of all the medical history including the medication and the neuroimaging manifestations of metabolic disorders to avoid any delays in diagnosis and to prevent fatal outcomes.

# P10 | A PICTORAL REVIEW OF SKULL LESIONS

**Sílvia Reigada** - silvialexr@hotmail.com
*Unidade Funcional de Neurorradiologia, Serviço de Imagem Médica, CHUC, Coimbra, Portugal*
[1] **Carolina Chaves;** [2] **Ricardo Gaspar,** [3] **Pedro Barradas**
*1 Unidade Funcional de Neurorradiologia, Serviço de Imagem Médica, CHUC, Coimbra, Portugal;*
*2 Unidade Funcional de Neurorradiologia, Serviço de Imagem Médica, CHUC, Coimbra, Portugal;*
*3 Unidade Funcional de Neurorradiologia, Serviço de Imagem Médica, CHUC, Coimbra, Portugal;*

**Introduction:** Calvarial lesions are usually found incidentally during brain computed tomography (CT) or magnetic resonance imaging (MRI). Most are asymptomatic and benign. Nonetheless, distinguishing benign from malignant lesions is often challenging for the neuroradiologist. Imaging findings, including morphology, growth pattern, the lesion's margin, bone destruction and invasion of adjacent structures, are important to determine its nature.

**Methods:** Revision of various radiological skull lesions from the imaging database of our tertiary referral centre (CHUC). Results In this review we present several cases of benign and malignant calvarial lesions, including fibrous dysplasia, Langerhans cell histiocytosis, intraosseous meningioma, Paget disease, multiple myeloma, plasmocytoma and metastasis. We describe the key imagiological features associated with each lesion, using mainly CT and MRI images. Additionally, we incorporate pertinent clinical features, such as age and patient history, which are fundamental to translate the imagiological findings into an accurate diagnosis.

**Conclusion:** The skull can be affected by a wide range of benign and malignant neoplasms. In general, benign tumors have well-defined borders, a narrow transition zone and sclerotic margins. Malignant tumors, on the other hand, tend to have poorly defined margins, a wide transition zone, aggressive periosteal reaction and may lead to dramatic bone destruction, with intra or extracranial extension. An accurate diagnosis requires knowledge of these features and plays a critical role in determining the treatment plan of calvarial lesions.

# P11 | "HARD HEADED": A PICTORIAL REVIEW OF INTRACRANIAL CALCIFICATIONS

**Sílvia Reigada** - silvialexr@hotmail.com
*Unidade Funcional de Neurorradiologia, Serviço de Imagem Médica, CHUC, Coimbra, Portugal*
[1] **Rita de Sousa;** [2] **Bruno Gomes;**
*1 Unidade Funcional de Neurorradiologia, Serviço de Imagem Médica, CHUC, Coimbra, Portugal;*
*2 Unidade Funcional de Neurorradiologia, Serviço de Imagem Médica, CHUC, Coimbra, Portugal*

**Introduction:** Intracranial calcifications are deposits of calcium salts that accumulate in the brain, often visible on CT or MRI. Determining the cause of intracranial calcifications can represent a challenge. Key factors for diagnosis include the calcifications' anatomical location, distribution, dimensions, and morphology, along with the patient's clinical history and age. This pictorial essay aims to illustrate diverse types of intracranial calcifications and their respective origins.

**Methods**: Revision of various intracranial calcifications from the imaging database of our tertiary referral centre (CHUC). Results In this review we present several cases of physiological and pathological intracranial calcifications, including congenital, infectious, endocrine, metabolic, vascular and neoplastic conditions. Our objective was to provide a comprehensive review of the key features exhibited by each lesion, such as appearance, size and location using mainly CT and MRI images. Furthermore, we integrated relevant clinical details, including patient age, medical history, and symptoms, crucial information for precise diagnosis.

**Conclusion:** Benign calcifications are common and rarely cause symptoms, but in certain cases, especially when associated with specific diseases, they can indicate serious underlying conditions such as tumors or metabolic disorders. Accurate diagnosis and assessment of the clinical context are essential to determine the cause of intracranial calcifications and plan the appropriate approach for the patient.

# P12 | RETINAL FIBRE LOSS PREDICTS LESION VOLUME LATERALIZATION IN MULTIPLE SCLEROSIS

**David Berhanu** - davidb@campus.ul.pt

*Faculdade de Medicina da Universidade de Lisboa, Lisboa, Portugal*

**Sara Matos, André Jorge, Inês Pais, Ana Inês Martins, Inês Correia, Carla Cecília Nunes, Maria Carmo Macário, Lívia Sousa, Sónia Batista, Isabel Santana, João Lemos, Daniela Jardim Pereira**

*1 Faculdade de Medicina da Universidade de Lisboa, Portugal;*

*2 Serviço de Imagiologia Neurológica, Centro Hospitalar Universitário Lisboa Norte, Portugal;*

*3 Neurology Department, Coimbra University Hospital Centre, Portugal;*

*4 Faculty of Medicine, Coimbra University, Portugal;*

*5 Área Funcional de Neurorradiologia, Serviço de Imagem Médica, Centro Hospitalar Universitário de Coimbra, Portugal;*

*6 Coimbra Institute for Biomedical Imaging and Translational Research (CIBIT), Universidade de Coimbra, Portugal*

**Introduction:** Optical coherence tomography (OCT) fibre loss in the retinal nerve fibre layer (RNFL) correlates with overall MRI lesion load in patients with Multiple Sclerosis (MS) and may be a biomarker of disease progression in MS. RNFL vertical sectors are anatomically associated with the temporal hemiretinas and project on the ipsilateral hemisphere, while the horizontal sectors are associated with the nasal hemiretinas and contralateral hemisphere. Despite this association, the impact of somatotopy of retinal layers in brain imaging is unclear. We hypothesized that vertical RNFL sectors (superior/inferior) correlate with lesion load in the ipsilateral hemisphere and horizontal RNFL sectors (right/left) correlate with lesion load in the contralateral hemisphere.

**Methods:** We collected the RNFL from OCT in patients with MS followed at a tertiary university hospital. We determined lesion volume and created hemispheric and occipital masks using the lesion segmentation toolbox for the Statistics Parametric Mapping software and the Harvard-Oxford atlas as reference. Correlation between lesion load and thickness of RNFL sectors was assessed using Spearman correlation coefficient.

**Results:** A total of 55 patients were included. There was an inverse correlation between the thickness of the inferior RNFL in the right eye and lesion volume in the right hemisphere ($r=-0.68$, $p<0.001$) and of the thickness of the temporal RNFL in the left eye and lesion volume in the right occipital lobe ($r=-0.65$, $p=0.012$).

**Conclusions:** Our study suggests an association of specific RNFL sectors and lateralization of brain lesions along their anatomical pathways, which may propose OCT as a reliable biomarker for brain lesion load in MS. This effect is at least partly mediated by lesions in the occipital lobe, as evidenced by its correlation with the temporal RNFL and despite the lack of a consistent effect, suggest a real association supported by the known neuroanatomical pathways underlying this mechanism.

# P13 | ACHONDROPLASIA CT AND MR IMAGING: CRANIOFACIAL ABNORMALITIES

**Carolina Chaves** - anacbchaves@gmail.com
*Centro Hospitalar e Universitário de Coimbra, Coimbra, Portugal*
**Carolina Maia**[1], **Henrique Queirós**[1], **Rita Sousa**[1], **Sílvia Carvalho**[1], **Rui Pedro Pais**[1], **Paula Gouveia**[1], **Joana Pinto**[1], **Egídio Machado**[1], **César Nunes**[1]
*1 - Centro Hospitalar e Universitário de Coimbra, Coimbra, Portugal*

**Introduction:** Achondroplasia is a congenital genetic disorder and the most common form of short-limb dwarfism. It is caused by mutations of the FGFR3 gene, and has a rate of occurrence of 1 in 25,000 births, is inherited as an autosomal dominant trait. However, approximately 80% of the cases are sporadic. The phenotypic changes are mainly attributed to the abnormal cartilage growth plate differentiation due to inhibited proliferation of chondrocytes, decreased cellular hypertrophy, and decreased cartilage matrix production, leading to a significant reduction of bone development. The diagnosis is made by clinical suspicion and specific features found in imaging, and can be confirmed by genetic testing. Apart from the several recognized physical features of this syndrome, achondroplasia can also affect the central nervous system and lead to some important clinical conditions.

**Methods:** We present, summarize and illustrate with cases from our center the multiple and complex craniofacial characteristics of this disorder.

**Results:** The craniofacial features of achondroplasia include: frontal bossing; midface hypoplasia; depressed nasal bridge; relative mandibular prognathism and class III dental malocclusion; macrocephaly; enlarged suprasellar cistern; more vertical straight sinus; ventriculomegaly with stretching of corpus callosum; foramen magnum stenosis; short clivus and short carotid canals; poor pneumatized mastoid air cells and narrowing of the jugular foramina. Each of these conditions leads to various complications such as difficulty breathing, snoring, nasal congestion and sleep apnea, hydrocephalus, otitis media, sinusitis, upper-airway obstruction and difficulty in intubation.

**Conclusion:** In our educational exhibition we illustrate numerous imaging findings of the typical achondroplasia craniofacial anomalies which neuroradiologists should be aware of, since they are important for the recognition and management of the associated complications.

# P14 | CARBON MONOXIDE POISONING: EARLY BRAIN CT AND MR IMAGING FEATURES

**Carolina Chaves** - anacbchaves@gmail.com
*Centro Hospitalar e Universitário de Coimbra, Coimbra, Portugal*
**Carolina Maia**[1], **Henrique Queirós**[1], **Francisco Millet Barros**[2], **Cristina Moura**[1], **Paula Gouveia**[1], **Egídio Machado**[1], **César Nunes**[1]
*1 - Unidade Funcional de Neurorradiologia, Serviço de Imagem Médica, Centro Hospitalar e Universitário de Coimbra, Coimbra, Portugal; 2*
*2 – Serviço de Neurologia, Centro Hospitalar e Universitário de Coimbra, Coimbra, Portugal;*

**Introduction:** Carbon monoxide (CO) is an odorless and colorless gas, formed by the incomplete combustion of fuels, and is one of the most common causes of morbidity related to toxic exposure. The toxicity of CO is related to its higher affinity to hemoglobin (Hgb), and levels of CO-Hgb that are higher than 20% can cause hypoxia and cell death1. Symptoms of CO poisoning include headaches, dizziness, nausea, vomiting, altered mental status, coma and death. Patients who survive CO toxic exposure can develop delayed encephalopathy, cognitive impairment, memory deficits and Parkinson-like symptoms.

**Methods:** We report a case of incidental CO toxic exposure and perform a review of the literature.

**Results:** A 67-year-old female was admitted in the emergency department, after being found at home with altered level of consciousness, nausea and vomiting. The neurologic exam showed decreased consciousness. A brain CT was performed, revealing a bilateral hypodensity in globi pallidi. Brain MRI showed subtle bilateral hypointensity on T1-weighted sequences and hyperintensity on FLAIR in the globi pallidi, predominantly in the left side. DWI and ADC disclosed restricted diffusion in the affected areas. These imaging findings were compatible with CO poisoning and further clinical investigation confirmed the exposure from a domestic water heater.

**Conclusion:** CO poisoning diagnosis can be difficult, considering that the acute symptoms can resemble other diseases. Careful history taking and imaging are important key features for the correct diagnosis. MRI is the most sensitive technique for early detection and NECT in the first hours may be normal. Bilateral lesion of globi pallidi is the classic sign of CO toxic exposure, since these structures are extremely prone to damage due to hypoxia. The putamina, caudate nuclei and cerebral white matter are less commonly affected. Regions of involvement show hypodensity on NECT, hypointensity on T1-WI, hyperintensity on T2/FLAIR and restricted diffusion.

# P15 | HYPERTROPHIC OLIVARY DEGENERATION SECONDARY TO PROGRESSIVE SUPRANUCLEAR PALSY: A RARE CAUSE FOR A RARE CONDITION

**Rodrigo Lindeza** - rodrigo.lindeza@gmail.com
*Centro Hospitalar Universitário de Lisboa Central; Lisboa; Portugal*
**Alexandra Rodrigues; Sara Rosa; Carolina Gavancho; José Lourenço Rosa; Teresa Morais**
*Centro Hospitalar Universitário de Lisboa Central; Lisboa; Portugal*

**Introduction/Aim:** Hypertrophic Olivary Degeneration (HOD) is a rare form of transsynaptic dysfunction of the Guillain-Mollaret Triangle (GMT), consisting of the inferior olivary nucleus (ION), contralateral dentate nucleus, and ipsilateral red nucleus, as well as their three connecting neuronal tracts. Lesions in the dentatorubral or central tegmental tracts functionally deafferent the olives, causing its vacuolar cytoplasmic degeneration and subsequently neuronal enlargement and ION hypertrophy. Clinically, symptomatic palatal myoclonus is virtually pathognomonic of this diagnosis. Its main causes are vascular, tumoral, or traumatic lesions affecting the GMT. In progressive supranuclear palsy (PSP), the dentato-olivary system is consistently affected, which may lead to HOD. The aim of this work is to analyze a case of HOD caused by PSP and illustrate its neuroimaging findings.

**Methods:** We present a case from our centre of HOD with a likely cause of PSP.

**Results:** A 69-year-old man was referred to our Neurology outpatient clinic due to marked gait instability. Neurological examination revealed gait ataxia, altered smooth pursuit eye movements, dysarthria, dysphagia, as well as tremor of the soft palate. Magnetic resonance imaging (MRI) showed bilateral hyperintensity in the ION, without diffusion restriction or post-contrast signal enhancement, suggestive of HOD, with no evidence of vascular, traumatic or tumoral infratentorial lesions. MRI also revealed an atrophic midbrain, with widening of the interpeduncular angle and a slightly concave superior surface, resembling the hummingbird sign. The clinical and imaging pattern of this patient is suggestive of PSP, which we assume could be the cause of HOD after excluding its more prevalent etiologies.

**Conclusions:** HOD is a rare neurodegenerative condition characterized by T2-hyperintensity with or without enlargement of the ION. There are few cases described in the literature of HOD secondary to PSP. Recognition of this imaging pattern is important to avoid misdiagnosis and prevent unnecessary interventions.

# P16 | MULTIPLE SCLEROTIC VERTEBRAL LESIONS – A CLUE TO THINK IN RARE DIFFERENTIAL DIAGNOSIS

**Mariana Ribeiro dos Santos** - marianaribsantos@hotmail.com
*Hospital de Braga*
**João Saraiva, Ricardo Martins**
*Hospital de Braga*

**Introduction:** Sclelerotic bone lesions are alterations of the bone density / attenuation on computed tomography (CT), characterized by high density. The differential diagnosis of multiple sclerotic lesions is often challenging for neuroradiologists and magnetic resonance imaging can be helpful in narrowing the differential diagnosis, based on certain imaging findings.

**Methods:** Here, we present two clinical cases of two young adults, with the same clinical complaint.

**Results:** A 33-year-old man presented to the emergency department due to a 2-month lumbar pain with no neurologic deficits. Physical examination, was unremarkable with no abnormalities on neurological examination. CT of the lumbar spine revealed multiple sclerotic bone lesions, predominantly in the sacroiliac region, but also in the vertebral bodies and surrounding the hip joints. MRI and PET scan were performed and the patient underwent biopsy of a sacral lesion, which demonstrated trabecular bone with thickened trabeculae, excluding a malignant process and suggesting osteopoikilosis. A 48-year-old man, with a history of stroke 3-month before, presented to the emergency department due to refractory lumbar pain. CT of the lumbar spine depicted multiple sclerotic lesions. MRI of the lumbar spine depicted, additionally, diffuse bone marrow signal with enhancement of the cauda nerve roots. Furthermore, the history of recent stroke and the age of the patient suggested osteosclerosing myeloma (eventually associated with POEMS syndrome). The patient went further investigation and physical examination and laboratory results confirmed the suspected diagnosis.

**Conclusion:** These cases show rare entities that presented by multiple sclerotic vertebral lesions, that should be remembered in the differential diagnosis of lumbar pain, especially in young adult patients. MRI study was fundamental to narrow the differential diagnosis.

# P17 | INTRATHORACIC EXTRAMEDULLARY HEMATOPOIESIS: A PICTORIAL REVIEW FROM OUR CENTER

**Henrique Coimbra Queirós** - henriqueclq@gmail.com
*Centro Hospitalar e Universitário de Coimbra, 3004-561 Coimbra, Portugal*
**Pedro Henrique Barradas, Francisco Miguel Rodrigues, Ricardo Veiga**
*Centro Hospitalar e Universitário de Coimbra, 3004-561 Coimbra, Portugal*

**Introduction** Extramedullary hematopoiesis (EMH) occurs as a compensatory response in various hemoglobinopathies and myeloproliferative disorders. The most common sites of involvement are the spleen, liver, and lymph nodes. Intrathoracic extramedullary hematopoiesis (IEH) is rare, usually asymptomatic, and often incidentally detected in the posterior mediastinum. Lesions can be unilateral or bilateral and multifocality is common. Noninvasive studies can safely establish the diagnosis of IEH when typical radiological findings are present in a proper clinical setting.

**Methods:** Description of 5 cases from our center and a brief literature review.

**Results:** Case 1: a 54-year-old male with beta(β)-thalassemia and bilateral paravertebral masses, undergoing regular blood transfusions. Follow-up examination (MRI) showed stabilization.

Case 2: a 59-year-old female with hereditary spherocytosis. Lumbar MRI showed a paravertebral mass, compatible with IEH.

Case 3: a 73-year-old female with primary myelofibrosis, under a ruxolitinib and blood transfusion protocol. Previous examinations (chest CT) have shown a paravertebral mass with no extension to the spinal canal or neural foramina. Follow-up examination (MRI) was similar, suggestive of IEH.

Case 4: an 83-year-old male with primary myelofibrosis, with a previous thoracolumbar CT showing multiple paravertebral masses and a large dorsal epidural lesion. Follow-up examination (MRI) confirmed an elongated epidural mass compressing the thoracic spinal cord between T4-T11 and additional large paravertebral masses intrathoracic and in the presacral space.

Case 5: a 45-year-old male with beta(β)-thalassemia, undergoing regular blood transfusions. Follow-up examination (MRI) showed reduction of bilateral paravertebral masses, compatible with IEH.

**Conclusions**: Radiological and clinical features of EMH vary depending on location, lesion activity and lesion age. Although thoracic involvement is usually asymptomatic, epidural lesions can cause spinal cord compression. It is important to recognize IEH in the differential diagnosis of a posterior mediastinal mass, since a correct diagnosis can avoid unnecessary invasive studies, particularly in an asymptomatic patient.

# P18 | CERVICOCRANIAL ARTERY DISSECTION - DISSECTING THE IMAGES!

**Sara Rosa** - saradbrosa@gmail.com

*Departamento de Neurorradiologia, Hospital de São José, Centro Hospitalar Universitário de Lisboa Central; Rua José António Serrano, 1150-199 Lisboa; Portugal*

**Mafalda Soares**[1], **Isabel Fragata**[2,3], **Diana Aguiar de Sousa**[4,5]

*1. Departamento de Neurologia, Hospital de São José, Centro Hospitalar Universitário de Lisboa Central (CHULC), Rua José António Serrano, 1150-199 Lisboa, Portugal;*

*2. Departamento de Neurorradiologia, Hospital de São José, Centro Hospitalar Universitário de Lisboa Central, Rua José António Serrano, 1150-199 Lisboa, Portugal;*

*3. NOVA Medical School, Campo dos Mártires da Pátria 130, 1169-056 Lisboa, Portugal;*

*4. Unidade CerebroVascular, Hospital de São José, Rua José António Serrano, 1150-199 Lisboa, Portugal;*

*5 Faculdade de Medicina da Universidade de Lisboa, Av. Prof. Egas Moniz MB, 1649-028 Lisboa, Lisboa*

**Background and Aims:** Cervicocranial Artery Dissection (CCAD) is an important cause of ischemic stroke in young adults. Diagnosis is usually made with computed tomography angiography (CTA), contrast-enhanced magnetic resonance angiography (MRA) or digital subtraction angiography (DSA). Typical imaging findings include flame-shaped stenosis or occlusion, presence of a visible intimal flap, double lumen sign, intramural hematoma and pseudoaneurysm. We aim to describe the imaging presentation of CCAD and understand which imaging findings are associated with acute vessel occlusion.

**Methods:** Observational retrospective study reviewing clinical and imaging data from patients admitted to CHULC's Stroke Unit with the diagnosis of CCAD from 2015 to 2022. Imaging studies were analyzed for dissection's location, imaging characteristics, presence of acute vessel occlusion (AVO), and ischemic/hemorrhagic stroke. Chi-square tests were performed to explore associations.

**Results:** We included 114 patients (mean age 48 $\pm$ 11 years). Dissection originated in cervical arteries in 96% (71% - internal carotid artery; 29% - vertebral artery) and intracranially in 4% of patients. Two patients presented with simultaneous dissection of two distinct arteries. Diagnosis was based on CTA (48%), DSA (33%), MRA without fat saturation (FS) (10%), with FS (8%) or ultrasound (1%). Imaging findings leading to diagnosis were tapering stenosis or occlusion (78%), double lumen sign (19%), intramural hematoma (14%), intimal flap (7%) and pseudoaneurysm (5%). 73% of patients presented with AVO and 76% with acute ischemic stroke, 32% of which were only detected on MRI. We found an association between the presence of intramural hematoma and AVO (p-value<0.05).

**Conclusion:** The majority of CCAD diagnoses relied on CTA. The incidence of patients presenting with AVO at our center was more than twice as high as reported in existing literature, likely due to our center serving as a referral hub for endovascular treatments. Intramural hematoma was associated with AVO.

# P19 | A LOOK AT FOCAL CORTICAL DYSPLASIA THROUGH EDGE-ENHANCING GRADIENT ECHO MRI SEQUENCE – A CASE REPORT

**Isa Duarte Barbosa** - isa96barbosa@gmail.com

*Diagnostic Neuroradiology Unit, Radiology Department, Centro Hospitalar de Vila Nova de Gaia e Espinho, 4434 -502, Portugal*

**Francisca Guimarães, Andrea Cabral, Ana Filipa Geraldo, Tiago Parreira, Guilherme Silva**

*1 Diagnostic Neuroradiology Unit, Radiology Department, Centro Hospitalar de Vila Nova de Gaia e Espinho, 4434 -502, Portugal;*

*2 Neurology Department, Centro Hospitalar de Vila Nova de Gaia e Espinho, 4434-502, Portugal;*

*3 - Diagnostic Neuroradiology Unit, Radiology Department, Centro Hospitalar de Vila Nova de Gaia e Espinho, 4434 -502, Portugal;*

*4 - Diagnostic Neuroradiology Unit, Radiology Department, Centro Hospitalar de Vila Nova de Gaia e Espinho, 4434-502, Portugal;*

*5 - Diagnostic Neuroradiology Unit, Radiology Department, Centro Hospitalar de Vila Nova de Gaia e Espinho, 4434-502, Portugal*

**Purpose:** Although detecting an epileptogenic lesion on imaging significantly changes treatment planning and response (1), around 30% of patients with focal cortical dysplasia (FCD) (the third most common etiology of drug-resistant epilepsy in adults) still have an MRI considered negative (2). In order to facilitate FCD diagnosis, in 2020 Middlebrooks et al introduced the three-dimensional Edge-Enhancing Gradient Echo (3D-EDGE) sequence, based on the equivalent opposing polarity of grey matter (GM) and white matter (WM) longitudinal magnetization signal intensities after an inversion pulse, that creates a narrow strip of void signal in the GM-WM boundary and, subsequently, highlights abnormalities in this region potentially related with FCD. Using 3T MRI, the authors successfully identified five cases of FCD (4 with prior negative MRI) (1). Later in 2023, using 7T MRI, the success of this approach was reassured (3). We report our experience, through a case, using 3D-EDGE sequence for the diagnosis of FCD in epilepsy.

**Materials and Methods:** We present a 31-year-old male patient diagnosed with epilepsy with tonic-clonic generalized seizures beginning at age 23, left temporal epileptiform activity on EEG and multiple previous negative MRIs.

**Results:** The patient was scanned on a 1.5T MRI Siemens AERA under the epilepsy protocol, including 3D-EDGE (available in our hospital setting since 2021). On T2/FLAIR, a subtle hyperintensity in the cortex and subcortical WM of the left anterior temporal region was suspected. 3D-EDGE imaging demonstrated a more conspicuous enlargement of the GM-WM boundary in the corresponding location, corroborating the diagnosis of FCD.

**Conclusion:** 3D-EDGE MRI sequence can improve detection of GM-WM junction abnormalities associated with FCD, thereby potentially increasing confidence about diagnosis. Although time-consuming and relatively hard to interpret by itself, it may be a valuable addition to epilepsy protocol, especially in suspected cases of FCD, minimizing non-value-added repetition of MRI or additional expensive studies.

# P20 | THE LESSONS LEARNED FROM THE ASSESSMENT OF CSF DYNAMICS IN NORMAL PRESSURE HYDROCEPHALUS PATIENTS

**Carolina Maia** - carolinamaia.areal@gmail.com
*Medical Image Department, Neuroradiology Unit, Centro Hospitalar e Universitário de Coimbra, Coimbra, Portugal*
**Daniela Jardim Pereira**
*Medical Image Department, Neuroradiology Unit, Centro Hospitalar e Universitário de Coimbra, Coimbra, Portugal*

**Introduction:** The treatment of choice in Normal Pressure Hydrocephalus (NPH) is a ventriculoperitoneal shunt (VPS) surgery. Phase-contrast magnetic resonance imaging (PC-MRI) measures phase shifts in the changing signal intensity from moving protons which allows the assessment of CSF flow during the cardiac cycle. Increased CSF stroke volume through the cerebral aqueduct has been proposed as a possible indicator of positive surgical outcome in NPH patients; however, consensus is lacking.

**Objective:** To review the assessment of CSF dynamics in NPH patients in our center and evaluate the imaging report's impact on therapeutic decisions. Methods: A retrospective analysis of clinical and imaging data from all patients with clinical features of NPH from our institution database, who had undergone PCMRI since 2018, was performed. We considered a cut-off value for aqueductal stroke volume (ASV) of 42 µl, above which patients with NPH were thought to benefit from VPS.

**Results:** From the 31 patients who performed PC-MRI, 17 (57%) had a suspected NPH based on clinical features. The mean age of patients was 73 years old and 59% were male. The mean ASV value was 52 µl. Seven (41%) patients had an ASV > 42 µl and 2 (29%) of these patients underwent surgical treatment, 2 (29%) were still awaiting a therapeutic decision and 3 (43%) were managed conservatively. Of the patients surgically treated, only one had an ASV < 42 µl. All patients reported clinical improvement after surgery.

**Conclusion:** Our experience of studying CSF dynamics in NPH patients requiring shunting, combined with all the recent progress made in producing evidence on the clinical utility of CSF dynamics, has led to reconsidering the relationship between CSF circulation testing and clinical improvement. However, despite many open questions and limitations, PC-MRI remains an accessible sequence, which offers additional data for decision-making between surgical and conservative treatment.

# P21 | NEURORADIOLOGY MNEMONICS - A WAY TO REMEMBER

**Francisca Sena Batista** - franciscafsenabatista@gmail.com
*Hospital Garcia de Orta, Avenida Torrado da Silva, 2805-267 Almada, Portugal*
**Filipa Castelão, Diogo Vaz Pinto, Lígia Neves, Cristina Rios**
*Hospital Garcia de Orta, Avenida Torrado da Silva, 2805-267 Almada, Portugal*

**Introduction:** Mnemonic is a technique that assists human memory with information retention and retrieval. The majority of them are acronyms or initialisms which reduce a lengthy set of terms to a single, easy-to-remember word or short phrase. Mnemonics are used in different fields, including medicine, being a useful memory tool during clinical work. In Neuroradiology, these memory aids can help recall long lists of differential diagnosis or features of complex syndromes. However, the specific image appearance of each entity on a differential has to be consolidated, otherwise, mnemonics become useless.

**Methods and Materials:** We present a review of useful mnemonics in Neuroradiology, covering differential diagnosis lists, major imaging features or syndromic disorders, and illustrate each with key images to consolidate their clinical utility. We selected some mnemonics and will use them in order to do a picture review of radiology characteristics of cerebral and spinal mass/neoplastic lesions, neurocutaneous syndromes, gadolinium enhancing patterns and intracranial hyper- and hypotension.

**Conclusions:** Mnemonic systems are techniques or strategies consciously used to improve memory. They serve to learn, consolidate or recall information and can be useful for radiologists and radiologists in training. We want to exemplify some neuroradiological mnemonics that can be used during our practise, that help recall syndromes features and long differential diagnosis.

# P22 | POMS AND THE MAJOR DIFFERENCES TO ADULT MS

**Francisca Sena Batista** - franciscafsenabatista@gmail.com
*Hospital Garcia de Orta, Avenida Torrado da Silva, 2805-267 Almada, Portugal*
**Filipa Castelão, Rosa Couto, Mariana C.Diogo, Lígia Neves, Cristina**
*Rios Hospital Garcia de Orta, Avenida Torrado da Silva, 2805-267 Almada, Portugal*

**Introduction:** Pediatric Onset Multiple Sclerosis (POMS) is relatively rare, defined as two or more episodes of CNS demyelination separated by more than 30 days, involving more than one area in patients under 18 years. It is estimated that 5-10% patients have symptoms during childhood, manly between 13-16 years. POMS often has an atypical presentation from that of aduts. Further, it can mimic other demyelinating diseases such acute disseminated encephalomyelitis (ADEM), neuromyelitis optica spectrum disorders (NMOSD) and MOG associated disorders (MOGAD), making diagnosis challenging.

**Methods and Materials:** We will present a summary of disease course, diagnostic criteria and image finding in POMS, with illustrative cases and main differential diagnosis examples mentioned above.

**Conclusions:** MRI is an essential modality for diagnosis of demyelinating diseases and studies have been made in order to distinguish MS from monophasic demyelination in children. Pediatric MS brain MRI scans at disease onset exhibit some differentiating features compared with adult-onset MS, and the McDonald criteria include a specific focus on POMS features. The lower incidence of MS in childhood, the different clinical phenotype at disease presentation, and the higher incidence of other demyelinating diseases in this age group (such as ADEM) contributes to decreased awareness and delayed diagnosis. Neuroradiologists should be aware of the specific MRI features and the diagnosis criteria of this entity in order to do a prompt diagnosis.

# P23 | ON THE CREST OF AESTHETIC: FACIAL FILLERS ON IMAGING

**Alexandra Rodrigues** - alexandraslrodrigues@gmail.com
*Neuroradiology department, Centro Hospitalar Universitário de Lisboa Central, Lisboa, Portugal*
*Neuroradiology Unit, Hospital Central do Funchal, Funchal, Portugal*
**Pedro Brandão**[1], **Inês Freire**[1], **Bruno Cunha**[2], **João Jacinto**[1], **Carla Conceição**[1]
*(1) Neuroradiology department, Centro Hospitalar Universitário de Lisboa Central, Lisboa, Portugal*
*(2) Neuroradiology department, Hospital de Braga*

**Introduction:** Dermal fillers have become increasingly popular for cosmetic procedures, from lip augmentation to wrinkle reduction and facial contouring. The hyaluronic acid fillers market is set to more than double from 2023 to 2030, mirroring the substantial increase in Google searches for labial filling in Portugal since early 2022. Expectedly, these dermal fillers and related complications will be more frequently encountered in our daily imaging practice. We aim to provide a comprehensive analysis of the imaging characteristics and complications associated with commonly used dermal fillers in the face while highlighting common diagnostic pitfalls.

**Methods:** We collected and analyzed cases involving various dermal fillers, including hyaluronic acid and calcium hydroxyapatite, administered in areas such as the nasolabial folds, jawline contouring, melomental folds, vermilion border, and malar area, and conducted an examination of associated complications.

**Results/Discussion:** The most common injection techniques include tunneling, droplet and stretching. Calcium hydroxyapatite filler injections exhibit distinctive calcifications, which were most clearly visualized through CT imaging. In contrast, hyaluronic acid fillers displayed signal intensity patterns indicative of high water content on MRI scans. We summarized the most common complications, including the development of dermal granulomas and infection. Common pitfalls include distinguishing orofacial tumors, lacrimal gland tumors, venolymphatic malformations, lymphoma, sarcoidosis, and dermatomyositis from dermal filler effects.

**Conclusion:** Awareness of dermal filler imaging characteristics is important to distinguish common dermal fillers from pathological conditions.

# P24 | UNVEILING THE ENIGMA: A PICTORIAL ODYSSEY THROUGH ADULT ORBITAL LESIONS

**Filipa Maria Neves Castelão** - fcastelao@gmail.com
*Serviço de Neurorradiologia, Hospital Garcia de Orta, Almada 2805-267, Portugal*
**Francisca Sena Batista, Diogo Pinto, Cristina Marques, Ana Cristina Rios**
*Serviço de Neurorradiologia, Hospital Garcia de Orta, Almada 2805-267, Portugal*

In the adult population, orbital lesions present a broad range of both benign and malignant pathologies, posing significant challenges in terms of diagnosis, management, and treatment. Imaging examinations play a pivotal role in lesion assessment. When it comes to evaluating orbital conditions through imaging, it is essential to adopt a comprehensive approach that meticulously considers the specific anatomical compartments involved. The orbital space comprises four distinct compartments: the globe, intraconal and extraconal spaces, and the optic nerve sheath complex. Furthermore, when investigating a confirmed or suspected tumor, it is crucial to take into account the diverse tissues from which tumors may originate. While multislice CT with intravenous contrast can yield high-quality images for most orbital tumors, gadolinium-enhanced MRI excels in its capacity to distinguish soft tissue from surrounding structures, offering more precise tissue characterization. The authors intend to conduct a review of the primary orbital pathologies based on their respective compartments and complement this with clinical case illustrations.

# P25 | POSTERIOR FOSSA PROGRESSIVE MULTIFOCAL LEUKOENCEPHALOPATHY – A CASE REPORT

**Francisco Miguel Rodrigues** - fmiguelmsvrodrigues@gmail.com
*Serviço de Imagem Médica - Centro Hospitalar e Universitário de Coimbra, Praceta Professor Mota Pinto, 3004-561 Coimbra, Portugal*
**Rita de Sousa, Henrique Queirós, Pedro Barradas, Rui Pedro Pais**
*Serviço de Imagem Médica - Centro Hospitalar e Universitário de Coimbra, Praceta Professor Mota Pinto, 3004-561 Coimbra, Portugal*

**Introduction:** Progressive multifocal leukoencephalopathy (PML) is a demyelinating disease of the central nervous system characterized by activation of the John Cunningham human polyomavirus (JCV) in states of severe immunosuppression, resulting in a heterogeneous presentation of neurological and cognitive symptoms, often leading to death resulting from infection and progressive lysis of oligodendrocytes. The diagnosis of PML is made through a combination of factors, including clinical findings, imaging results, and detection of JC viral DNA in cerebrospinal fluid (CSF) through polymerase chain reaction analysis. Brain magnetic resonance imaging (MRI) is often the first step in diagnosis, showing patchy lesions hyperintense on T2/FLAIR and hypointense on T1. Our case describes a rare type of PML affecting the posterior fossa in an HIV-positive patient on dolutegravir and ritonavir-boosted darunavir.

**Methods:** We report a case of PML, from our database, diagnosed with the aid of neuroimaging studies.

**Results:** A 55-year-old man presented at the emergency department with AKIN 3 post-renal acute kidney injury with metabolic acidosis. Relevant findings in his medical history included HIV infection diagnosis in 2021, thrombocytopenia, microcytic and hypochromic anemia and mild splenomegaly. Neurological examination revealed cerebellar dysarthria and ataxia of his right arm and leg. Brain MRI revealed extensive areas of cerebellar T2 and FLAIR hypersignal, extending to the cerebellar peduncles and brain stem. In the diffusion sequence, doubtful foci of restriction in the left middle cerebellar peduncle were admitted. These lesions presented corresponding low signal on T1, with no associated enhancement after contrast administration or significant mass effect, suggesting PML, confirmed later by detection of JC virus DNA in CSF.

**Conclusion:** Our case shows a relatively rare presentation of PML in the posterior fossa structures in an immunocompromised patient presenting with de novo posterior fossa neurological symptoms. MRI was an important step towards reaching proper diagnosis.

# P26 | INCIDENTAL HIBERNOMA – YOU SHOULD POKE THE BEAR

**Ana Sofia Lopes Coelho** - annerabit@msn.com
*Hospital Central do Funchal - Dr. Nélio Mendonça, 9000-177 Funchal, Portugal*
**Carolina Figueira; José Franco; Hugo Mota Dória**
*Hospital Central do Funchal - Dr. Nélio Mendonça, 9000-177 Funchal, Portugal*

Hibernomas are rare benign tumors that originate from fetal brown fat. These tumors grow slowly and are typically asymptomatic. Their definitive diagnosis is histological. Treatment involves complete surgical excision. A 43-year-old female consulted her primary care doctor due to persistent lower back pain. A lumbar spine MRI revealed mild degenerative changes in the L4-L5 and L5-S1 spaces, as well as a space-occupying lesion in the paravertebral soft tissues. Such lesion was located superficially and slightly medial to the spinous processes of L1 to L3. It appeared hyperintense on both T1 and T2-weighted images, however, mainly on T1-weighted images, it was slightly hypointense relative to the subcutaneous fat and hyperintense relative to the paravertebral muscles. On the T2-STIR weighted images hypersignal was mostly suppressed except in the central portion, where post-contrast enhancement was greatest. Flowvoids were noted within the non-adipose central area and at the periphery. Such characteristics fall within the group of lipomatous tumors. It showed a distinct signal from subcutaneous fat, evocative of brown fat with non-adipocytic areas and vascular structures. The leading hypothesis was that of a hibernoma, although differential diagnosis include atypical lipomatous tumor/welldifferentiated liposarcoma. Histological characterization was suggested, but not performed yet at the time of writing this case report. Hibernomas are one of the least well-known tumors of lipomatous origin. Although benign, from an imaging perspective, they are differentially diagnosed with liposarcomas and rhabdomyomas. It is therefore imperative to emphasize in the MRI report that histological characterization remains crucial to rule out malignant lesions.

# P27 | THREE-IN-A-ROW: THE CHALLENGE OF SUSAC SYNDROME

**Francisca Garrido Rodrigues Barreto Guimarães** - fg.guimaraes04@gmail.com
*Unidade de Neurorradiologia, Serviço de Imagiologia, Centro Hospitalar Vila Nova de Gaia/Espinho, 4434-502, Portugal*
**Isa Barbosa**[1], **Sofia Teixeira**[2], **Mariana Rocha**[3], **Rúben Maia**[1], **Marta Rodrigues**[1], **Pedro Pires**[1], **Andreia Costa**[4], **Ana Filipa Geraldo**[1], **Guilherme Silva**[1], **Dália Meira**[2]
*1Unidade de Neurorradiologia, Serviço de Imagiologia, Centro Hospitalar Vila Nova de Gaia/Espinho, 4434-502, Portugal;*
*2 Serviço de Oftalmologia, Centro Hospitalar Vila Nova de Gaia/Espinho, 4434-502, Portugal;*
*3 Serviço de Neurologia, Centro Hospitalar Vila Nova de Gaia/Espinho, 4434-502, Portugal; 4 Serviço de Neurologia, Centro Hospitalar Universitário de São João, 4200-319, Portugal*

**Purpose:** Susac syndrome is a rare retinocochleocerebral vasculopathy coursing with microinfarcts, preferably affecting young to middle-aged women. The full clinical triad of encephalopathy, neurosensorial hearing loss and branch retinal artery occlusions (BRAOs) presents initially in only about 15% of patients. Our objective is to emphasize the importance of early recognition of this entity.

**Material and Methods:** Case report of a 31year-old female, status post-partum, with history of migraine with aura, diagnosed with Susac syndrome.

**Results:** Patient was initially admitted for acute stroke (NIHSS 3: dysarthria, right central facial palsy) and worsening headache. Initial brain CT showed unspecific frontal horn periventricular hypodensities. MR demonstrated acute ischemic foci involving the internal capsule and splenium of corpus callosum (CC) and a chronic striatum lacuna. Cerebral digital subtraction angiography was normal. Systemic conditions were excluded. Subsequent transient visual and sensitive complaints prompted re-evaluation with normal neurologic examination and fundoscopy. CSF analysis revealed elevated protein without pleocytosis. Follow-up MR showed new ischemic foci in the body of CC and cerebellum and areas of leptomeningeal enhancement. Paroxystic nonspecific visual complaints motivated ophthalmological evaluation. Fluorescein angiography revealed multiple BRAOs in both eyes and areas of arterial wall hyperfluorescence. Optic coherence tomography showed selective loss of inner retinal layers. Paroxysms of vertigo and tinnitus ensued. Audiogram demonstrated left-sided neurosensorial hearing loss. Diagnosis of Susac syndrome was established considering the European Susac Consortium 2016 diagnostic criteria. The patient was treated with prednisolone, IVIG and rituximab showing marked clinical improvement.

**Conclusion:** Diagnosing Susac syndrome is challenging given its rarity, lack of specific biomarkers and heterogeneous presentation, often with a significant delay until final diagnosis. In addition to at least one rounded central callosal lesion, mandatory for diagnosis, features such as leptomeningeal enhancement, as described, support the diagnosis. Early ophthalmological evaluation should be considered to look for presence of pathognomonic features.

# P28 | CRANIO-FACIAL ANOMALIES IN FETAL MR - A PICTORIAL REVIEW

**Fátima Hierro** - fatimashierro@gmail.com

*Hospital Pedro Hispano, Unidade Local de Saúde de Matosinhos, Rua Dr. Eduardo Torres, Matosinhos, Portugal*

**André Miranda**[1], **Mariana Leal**[2], **Jorge Castro**[2], **Joana Nunes**[1], **Ana Filipa Geraldo**[1]

*1Unidade de Neurorradiologia Diagnóstica, Serviço de Radiologia, CHVNG/E, Porto, Portugal*
*2Serviço de Ginecologia e Obstetrícia, CHVNG/E, Porto, Portugal*

**Introduction:** The facial embryologic development is a complex process involving five facial processes, occurring before the 12th week of gestation. Any disruption may lead to anomalies of the lips, nose, palate, eyes or ears. When a cranio-facial anomaly is suspected on US, a fetal MRI may be warranted to better delineate the anomaly itself and to detect possible extracranial and/or intracranial associations.

**Methods:** All consecutive fetal MRI studies performed between July 2010 and July 2023 in a single center tertiary institution where reviewed and key-images from cases with hcrano-facial anomalies were selected for a pictorial review. Clinical data were recorded and correlation with postnatal imaging and/or anatomopathological data was performed, whenever available.

**Results:** From n=521 fetal MRI studies, 18 (3,5%) presented with head and neck anomalies. Of these 18, n=5 (28%) had an unilateral or bilateral cleft lip associated with a cleft palate, n=3 (n=17%) showed an isolated cleft lip, n=2 (11%) with a Binder phenotype, n=1 (n=6%) with a frontonasal encephalocele, n=1 with anencephaly, n=1 with a dacriocystocele, n=1 with a suspected nasal bone hypoplasia, and n=1 with hypertelorism. Of these 18, n=4 (22%) were terminated - the anencephaly, the frontonasal encephalocele, the arhinia (frontonasal dysplasia) and the two Binder phenotypes were confirmed at autopsy. Of the remainder of cases, the dacryocystocele had resolved and the facial veno-lymphatic malformation is being treated using staged embolization. The cleft lip and palate cases were managed surgically in early childhood.

**Conclusion:** Here we illustrate a vast array of cranio-facial anomalies detectable by fetal MR. Due to the potencial severity of these malformations and the impact on the viability of these fetuses, with the inherent medicolegal implications, the early detection is of the utmost importance.

# P29 | AGENESIA COMPLETA DO CORPO CALOSO (ACCC) EM GESTAÇÃO GEMELAR BICORIÓNICA

**Valentina Teixeira Ribeiro** - valentina.ribeiro97@gmail.com
*Hospital Senhora da Oliveira*
**Ana Sofia Carneiro; Mara Macieira; Diogo Cunha; Elsa Pereira**
*Hospital Senhora da Oliveira Guimarães*

35anos, primigesta com gestação gemelar bicoriónica espontânea. A ecografia do 1° trimestre não revelou alterações, com rastreio combinado para aneuploidias em ambos os fetos. O teste pré-natal não invasivo foi negativo. Na ecografia do 2° trimestre foi diagnosticada ACCC com ventriculomegalia ligeira bilateral no feto2. A RMN cerebral fetal diagnosticou polimicrogiria além das alterações observadas anteriormente, e a pesquisa por microarray após amniocentese encontrou-se uma deleção do braço longo do cromossoma 13 em mosaico. Às 24S5D é internada por insuficiência cervical, tendo sido realizado feticídio seletivo diferido às 28S3D e posteriormente cumprido ciclo de maturação pulmonar fetal e tocólise. Parto eutócico às 29S6D com nadomorto e nado-vivo do sexo feminino com 1430g, APGAR 9/10/10 e gasometrias do cordão umbilical sem acidose metabólica.

# P30 | THROUGH THE MAGNIFYING GLASS: IMAGING FINDINGS IN CONGENITAL FIBROSIS OF EXTRA-OCULAR MUSCLES SYNDROME (CFEOM-1) WITH KIF21A MUTATION

**André Miguel Miranda** - andre.miranda@chvng.min-saude.pt
*Unidade de Neuroradiologia Diagnóstica, Centro Hospitalar Vila Nova de Gaia/Espinho*
**Maria Inês Prisco**[1,2], **Joana Ferreira Braga**[3], **Ana Filipa Geraldo**[1]
*1 Unidade de Neurorradiologia Diagnóstica, Serviço de Radiologia, Centro Hospitalar de Vila Nova de Gaia/Espinho, Vila Nova de Gaia;*
*2-Serviço de Neurorradiologia, Unidade Local de Saúde de Matosinhos, Matosinhos;*
*3-Serviço de Oftalmologia, Centro Hospitalar de Vila Nova de Gaia, Vila Nova de Gaia*

Congenital Fibrosis of Extra-Ocular Muscles (CFEOM-1) is a group of rare, congenital, and non-progressive restrictive ophthalmoplegias, belonging to the umbrella of congenital cranial dysinnervation disorders. This condition is genetically heterogeneous, but mutations in KIF21A gene (encoding a microtubule associated kinesin motor protein) represent the most common cause of CFEOM worldwide (>50% of the cases) and is inherited in an autosomal dominant manner. Due to abnormal development of the III nerve nuclei, there is dysinnervation, fibrotic changes and atrophy of all extra-ocular muscles (except IV and VI pair, which have variable impairment) and levator palpebrae superior muscle.

**Material and methods:** We report a case of a 16-year-old girl born in China, currently living in Portugal, presenting to Ophthalmology Consultation due to long-term ophthalmologic complaints and diagnosed with CFEOM-1. Results: On physical examination, the patient presented nystagmus, non-progressive restrictive ophthalmoplegia mainly involving the vertical gaze, strabismus, bilateral ptosis, which was worse on the left side, and chin-up abnormal head posture. Brain and orbital MRI were performed, showing bilateral optic nerve hypoplasia/atrophy, extra-ocular muscles atrophy (mainly involving the superior rectus muscles), III and VI cranial nerve aplasia as well as cerebellar atrophy, mainly involving the vermis and superior cerebellar hemispheres. There were no supratentorial abnormalities. Genetic study was positive for a pathogenic variant in the KIF21A gene, which is linked to CFEOM-1.

**Conclusion:** Neuroradiologists should keep this entity in mind when evaluating non-progressive restrictive ophthalmoplegias in children. In suspicious cases, alongside orbital MRI, it is important to include T2 highresolution sequences (ie, CISS/FIESTA/DRIVE) to evaluate the cistern segments of III, IV and VI cranial nerves. Regarding the definitive diagnosis, correlation with genetic study is mandatory, although association with cerebellar atrophy may be a clue to pathogenic variants in KIF21A.

# P31 | NEUROIMAGING GUIDE TO RESPONSE ASSESSMENT IN PEDIATRIC INTRACRANIAL EPENDYMOMA USING THE NEW RESPONSE ASSESSMENT IN PEDIATRIC NEURO-ONCOLOGY (RAPNO) CRITERIA

**André Miguel Miranda** - andre.miranda@chvng.min-saude.pt
*Unidade de Neurorradiologia Diagnóstica, Centro Hospitalar Vila Nova Gaia/Espinho, Vila Nova de Gaia, Portugal*
**Andrea Rossi**[2], **Ana Filipa Geraldo**[1]
*1Unidade de Neurorradiologia Diagnóstica, Centro Hospitalar Vila Nova Gaia/Espinho, Vila Nova de Gaia, Portugal;*
*2 Neuroradiology Unit, Istituto Giannina Gaslini, Genova, Italy*

**Background:** Ependymomas are WHO grade I-III central nervous system tumors that continue to pose significant cancer-related morbidity in the pediatric population. Although maximal surgical resection with or without adjuvant radiation is the established standard of care, recurrence still affects up to 50% of patients. The 2022 Response Assessment in Pediatric Neuro-Oncology (RAPNO) criteria offer an objective framework for guiding patient follow-up and treatment decisions in clinical trials. Aim: This presentation aims to provide a pictorial review of the practical application of the 2022 RAPNO criteria for pediatric intracranial ependymomas.

**Methods:** We conducted a retrospective review of pediatric intracranial ependymoma cases diagnosed and treated between 2000 and 2023 at a tertiary center. We have selected key images to illustrate the application of the 2022 RAPNO criteria for pediatric intracranial ependymomas.

**Results:** A total of 40 pediatric intracranial ependymoma cases were evaluated. Immediate postoperative imaging or early follow-up scans were utilized to classify the extent of resection as gross total, near total (5 mm). Recurrences at follow-up were categorized as either local or metastatic, and early or late (occurring >5 years after upfront treatment completion). Measurable disease was defined as tumoral component having at least one axis measuring at least 1 cm or twice the MRI slice thickness. Other tumoral tissue or leptomeningeal disease were considered non-measurable. Overall response was classified as complete or partial response, stable disease, or progressive disease based on neuroimaging evaluation as well as clinical and laboratory information, as standardized.

**Conclusion:** We present a comprehensive neuroimaging guide for systematically evaluating treatment response in pediatric intracranial ependymoma utilizing the latest 2022 RAPNO criteria. The consistent and reproducible application of these criteria by neuroradiologists is imperative for accurately assessing the effectiveness of therapies and guiding second-line treatments and patient follow-up.

# P32 | CEREBOVASCULAR COMPLICATIONS OF INFECTIONS: PRATICAL ESSENTIALS AND CAN´T MISS IMAGING SIGNS

**Diogo Vaz Pinto** - dvpinto27@gmail.com
*Serviço de Neurorradiologia do Hospital Garcia de Orta, Hospital Garcia de Orta, Av. Torrado da Silva, 2805-267 Almada, Portugal*
**Filipa Castelão, Francisca Sena Batista**

**Objectives:** To offer a clear overview of cerebrovascular complications from systemic infections (CVCI), emphasizing key imaging signs allowing early diagnosis.

**Methods:** Literature review of studies discussing CVCI, focusing on those highlighting selected complications.

**Results:** Three complications were chosen because of frequency, distinct management (multiple imaging assessments), treatment (endovascular) and outcome.

· Mycotic aneurysms: Saccular, often irregular, pseudo-aneurysms (3-5% of all aneurysms) from bacterial or fungal infection, more commonly in the middle cerebral arteries. Digital Subtraction Angiography (DSA) is gold-standard for diagnosis and follow-up but they can also be observed on Magnetic Resonance Imaging (MRI) with surrounding edema. They have a propensity for rupture with clinical features of subarachnoid hemorrhage or intracerebral hemorrhage.

· Vasculitis: More often triggered by immune-mediated responses than by direct invasion of the vessel wall. Inflammation can result in vessel wall thickening, post-contrast enhancement, and luminal width changes (narrowing or aneurysms), as seen on Computed Tomography (CT) Computed Tomography Angiography (CTA) and MRI. DSA (pathognomonic beads-on-a-string luminal pattern) offers the highest sensitivity, especially in assessing the extent of vascular involvement.

· Septic emboli and thrombosis: From hematogenous spread of an infected clot causing embolic cerebral infarction, most commonly from infectious endocarditis, to cerebral venous sinus thrombosis (CVST) from direct infectious spread (infections represent up to 10% of etiologies of CVST). Diffusion weighted imaging (DWI) analysis is essential for embolic causes and non-contrast CT, MRI and Magnetic Resonance Venography are paramount for diagnosis and delineating the full extent of thrombosis. While uncommon, these can lead to severe morbidity and mortality if not identified and managed promptly.

**Conclusion:** While infections can lead to various cerebrovascular complications, these stand out for their clinical significance. For neuroradiologists, quickly recognizing their specific imaging markers is essential to optimize timely intervention and improve patient outcomes.

# P33 | A PRACTICAL AND UNCOMPLICATED APPROACH TO MULTIPLE SCLEROSIS: WHAT DOES THE NEUROLOGIST EXPECT FORM THE NEURORADIOLOGIST?

**Mariana Ribeiro dos Santos** - marianaribsantos@hotmail.com
*Hospital de Braga*
**Larissa Aguiar, Antônio José da Rocha**
*Neuroradiology Department, Hospital Beneficiência Portuguesa de São Paulo, São Paulo, Brazil;*
*Neuroradiology Department, Diagnósticos da América, Brazil;*
*Neuroradiology Department, Irmandade da Santa Casa de Misericórdia de São Paulo, São Paulo, Brazil*

**Introduction:** Multiple sclerosis (MS) is the most common acquired chronic inflammatory demyelinating disease, affecting the central nervous system. MRI is an essential tool for longitudinal monitoring in these patients, to evaluate disease activity, lesion count and cerebral atrophy.

**Objective:** Standardize imaging interpretation in patients with MS during treatment through the implementation of structured reporting.

**Results:** The main objective of monitoring patients with MS through MRI is to evaluate treatment effectiveness. Active disease state in MS is defined by the presence of new clinical symptoms or changes on MRI suggestive of new activity, such as lesions with gadolinium uptake and / or new or enlarging lesions on T2/FLAIR sequences. Another important aspect of follow-up imaging is the evaluation of disease progression to predict the clinical outcome, assessing the presence of lesions with a paramagnetic rim on magnetic susceptibility-based sequences, the brain atrophy and the presence or increase of black holes. Finally, additional findings, such as signs of progressive multifocal leukoencephalopathy or other opportunistic infections in immunosuppressed patients or even primary central nervous system lymphoma should be excluded. Therefore, we propose a structured report that objectively evaluate these parameters, making the neurologist's interpretation during the consultation more practical.

**Conclusion:** The structured report on MRI follow-up MS patients allows the Neurologist to focus on the main parameters with the most clinical importance, particularly those that motivate changes in treatment. Additionally, the structured report is an excellent tool for fellow training, allowing complete imaging assessment of the disease.

# P34 | MIDDLE MENINGEAL ARTERY EMBOLIZATION TO TREAT CHRONIC SUBDURAL HEMATOMAS, ON THE BRINK OF A NEW ERA - A CASE REPORT AND LITERATURE REVIEW

**Hugo Loureiro Cadilha** - hcadilha@gmail.com
*Centro Hospitalar Universitário Lisboa Norte*
**Joana Freitas, Guilherme Ribeiro Martins, Carla Guerreiro, Francisco Raposo, Lia Lucas Neto**
*1 Centro Hospitalar Universitário Lisboa Norte,*
*2 Centro Hospitalar Universitário Lisboa Norte,*
*3 Centro Hospitalar Universitário Lisboa Norte,*
*4 Centro Hospitalar Universitário do Algarve,*
*5 Centro Hospitalar Universitário Lisboa Norte*

**Case Descripton:** A middle-aged woman with history of thrombophilia due to elevated coagulation factor VIII levels, with multiple prior deep venous thrombosis and anticoagulated with acenocoumarol, presented with headache and altered mental status after falling one week prior. Head computed tomography revealed bilateral subacute subdural hematomas, with significant mass effect. She was submitted to surgical drainage with bilateral parietal burr holes and improved neurologically. During the early post-operative period she suffered from left lower limb deep venous thrombosis, requiring early reintroduction of anticoagulation therapy. After being discharged without neurological deficits, the patient was admitted two weeks later in a coma, with bilateral mydriasis, VI cranial pair bilateral deficit, and chronic bilateral subdural hematomas with significant mass effect.

Five days after a second surgical drainage, the hematomas relapsed. In the context of relapsing, surgically evacuated chronic subdural hematomas, we performed selective bilateral middle meningeal artery embolization as an adjunct therapy. Using a femoral access, the anterior and posterior branches of both middle meningeal arteries were selectively catheterized. The microcatheter was placed distally to prevent embolization of ophthalmic collaterals and of the petrosal branch supplying the facial nerve. We administered 100-300 μm embospheres until reduced distal flow was achieved on all branches. No periprocedural complications were observed. The patient improved clinically and both subdural hematomas were progressively reabsorbed in the following 8 months. Four years after the procedure, there were still no relapses.

**Discussion/Conclusion:** We leverage this case report to review the present role of middle meningeal artery embolization in the management of chronic subdural hematomas, discuss the technical evolution of the procedure, and demonstrate the multiple ongoing clinical trials that might aid in altering the standard future management of these patients.

# P35 | IMAGING SPECTRUM OF HIPPOCAMPAL LESIONS PRESENTING WITH RESTRICTED DIFFUSION ON MAGNETIC RESONANCE IMAGING

**Gonçalo Almeida** - goncalo.almeida@campus.ul.pt
*Department of Neuroradiology, Centro Hospitalar e Universitário de Lisboa Central, 1150-199 Lisbon, Portugal*
**Pedro Brandão, Carla Conceição, Rui Carvalho**
*1 - Department of Neuroradiology, Centro Hospitalar e Universitário de Lisboa Central, 1150-199 Lisbon, Portugal;*
*2 - Department of Neuroradiology, Centro Hospitalar e Universitário de Lisboa Central, 1150-199 Lisbon, Portugal;*
*3 - Department of Neuroradiology, Centro Hospitalar e Universitário de Lisboa Central, 1150-199 Lisbon, Portugal*

**Introduction:** As one of the most metabolically demanding areas of the brain, the hippocampus is particularly vulnerable to several types of acute brain injury. Excitotoxic brain injury, which represents the common final pathway of acute ischemic, infectious, inflammatory, toxic, metabolic and miscellaneous lesions, may be assessed by diffusion-weighted imaging (DWI) MRI. Compared to other areas of the brain, the hippocampus shows higher density of glutamate receptors, which are known to be involved in the excitotoxic damage pathway. Therefore, the purpose of this work is to present a pictorial essay of cytotoxic lesions of different etiologies involving the hippocampus.

**Material and methods:** Our prospective database was screened and patients with hippocampal lesions presenting with restricted diffusion on DWI sequences were selected.

**Results:** We present 9 illustrative cases of lesions involving the hippocampus and presenting with restricted diffusion. These cases are secondary to acute hypoxia/ischemia (two), infectious lesions (two), toxic injury caused by drugs (one), iatrogenic post-surgical injury (one), metabolic injury (one) and the remaining 2 can be considered miscellaneous in etiology. Ischemic lesions include acute stroke caused by posterior cerebral artery occlusion and acute hypoxicischemic injury following cardiac arrest. Infectious lesions comprise herpes simplex encephalitis and acute necrotizing encephalitis. Toxic injury is shown in a case of vigabatrin toxicity, early post-surgical parenchymal injury is demonstrated following tumor resection and metabolic injury is shown in a case of Mitochondrial Encephalopathy, Lactic Acidosis and Stroke-like episodes (MELAS). Miscellaneous etiology includes cases of status epilepticus and transient global amnesia.

**Conclusion:** The differential diagnosis of hippocampal lesions presenting with restricted diffusion is broad and often not pathognomonic. Considering the patients' medical history, laboratory analysis results and additional imaging features may be helpful in determining the correct diagnosis, providing appropriate treatment and establishing each patient's prognosis.

# P37 | HIV-RELATED PRIMARY CNS LYMPHOMA: A CHAMELEON WITH MULTIPLE FACES

**Liliana Igreja** - lilianaigreja@gmail.com
*Serviço de Neurorradiologia, Centro Hospitalar Universitário de Santo António (CHUdSA), Largo do Prof. Abel Salazar, 4099-001 Porto, Portugal*
**Ana Isabel Pereira**[1], **Francisco Almeida**[1], **Inês Laranjinha**[2], **Eduarda Pinto**[1], **Sofia Pina**[2]
*1. Serviço de Neurorradiologia, Centro Hospitalar Universitário de Santo António (CHUdSA), Largo do Prof. Abel Salazar, 4099-001 Porto, Portugal;*
*2. Serviço de Neurologia, Centro Hospitalar Universitário de Santo António (CHUdSA), Largo do Prof. Abel Salazar, 4099-001 Porto, Portugal*

**Introduction / Objectives:** HIV-related Primary CNS Lymphoma (PCNSL) can be a diagnostic dilemma when presenting with a solitary ring enhancing lesion.

**Results:** A 71-year-old male presented with a several-weeks history of behavioural changes and frequent temporal and spatial disorientation. He also reported asthenia and involuntary weight loss lasting for several-months (consumptive syndrome). He came to the ER after loss of consciousness and urinary incontinence. There were no focal neurological deficits. A head-CT scan revealed a ring-enhancing expansive lesion centered on the right thalamus, with surrounding edema and mass effect. During the initial serologic investigation, he tested positive for anti-Treponema pallidum and VDRL, but also for HIV-1, with a viral load of 699.999copies/mL and a low CD4+ count of 113cells/mm3. Serum IgG Toxoplasma was positive. A brain MRI showed a T2 hyperintense right thalamic lesion, with a peripheral T2 hyposignal / blooming effect, as well as an irregular and thick ring enhancement. No central restricted diffusion was present. Considering its serologic findings, we included in the differential diagnosis cerebral toxoplasmosis, PCNSL, metastasis or eventually neurosyphilis. He was started on anti-retroviral therapy and empiric treatment for toxoplasmosis and syphilis, with no imaging changes after two weeks. Epstein-Barr virus DNA was then positive in his CSF, favoring the diagnosis of a PCNSL, later confirmed by biopsy.

**Conclusions:** A solitary ring-enhancing brain lesion presents a diagnostic dilemma, particularly in a patient with HIV. PCNSL and toxoplasmosis are the most common causes, but other conditions include other opportunistic infections (tuberculosis and cryptococcosis), primary CNS neoplasms and metastases in older patients. However, it is often difficult to distinguish them clinically and radiographically, since in severe immunocompromised patients PCNSL can exhibit variable imaging findings (central necrosis and spontaneous hemorrhage). A brain biopsy is usually reserved for patients who fail to respond to empiric treatment of toxoplasmosis.

# P38 | NEUROSCHISTOSOMIASIS - RARE ETHIOLOGY OF ACUTE MYELOPATHY IN PORTUGAL

**Carla Morgado** - cscmorgado@gmail.com
*Serviço de Neurologia, Hospital de Braga, Braga, Portugal*
**Mariana Santos**[2], **Leonor Francisco**[3], **José Cruz Araújo**[1]
*1 Serviço de Neurologia, Hospital de Braga, Braga, Portugal;*
*2 Serviço de Neurorradiologia, Hospital de Braga, Braga, Portugal;*
*3 Serviço de Neurologia, ULSAM, Viana do Castelo, Portugal*

**Introduction:** Schistosomiasis is an endemic parasitic disease in tropical countries and may infect the central nervous system, more frequently lower thoracic, lumbar and sacral spinal cord segments. Clinically, neuroschistomiasis presents as acute myolopathy syndrome, including lumbar pain, paraparesis/paraplegia, loss of sensation and urinary retention.

**Case report:** A 29-years-old male, from Brazil, living in Portugal since a year ago, presented progressive weakness and loss of sensation in both legs. Additionally, he reported 1-month history of lumbar pain and recent urinary dysfunction. Neurological examination detected flaccid paraparesis and pain hypoesthesia that resembles a radicular pattern. Initial analytical investigation detected only a slight increase in ALT levels. Dorsal and lumbar spinal cord MRI showed a conus medullaris lesion extending superiorly to D6 level, characterized by hyperintense signal on T2/STIR sequences and enhancement on T1-weighted image after gadolinium. No other changes were detected in cervical spinal cord or brain MRI. This radiological pattern raised different possible diagnosis, namely infectious or inflammatory myelitis. Much less likely were the vascular or tumoral causes. The clinical initial investigation was then completed by cytological, biochemical and microbiological liquor analysis, demonstrating a pleocytosis (83 cells) with 1% eosinophils and mild hyperproteinorrachia (0,98 mg/dL). Oligoclonal band detection in CSF, anti-AQP4 and anti-MOG antibodies were negative. Considering the country of origin, additional diagnostic study comprised a broad serological blood analysis was performed, including anti-schistossoma antibody, which was positive. However, ova were not found in urine. A diagnosis of probable neuroschistosomiasis was assumed. Patient was treated with dexamethasone and praziquantel, presenting clinically significant improvement.

**Discussion:** In the global world era, neuroschistosomiasis should be promptly hypothesized as a possible diagnosis in cases of acute myelopathy, especially when cone symptoms are present in patient that come from endemic regions. Early diagnosis determines prompt targeted treatment and clinical prognosis.

# P39 | THE ROLE OF CAROTID DOPPLER ULTRASONOGRAPHY IN SUBCLAVIAN STEAL SYNDROME

**Marta Joana Achada Lima** - mjoanaalima96@gmail.com
*Unidade Local de Saúde de Matosinhos - Hospital Pedro Hispano, Rua de Dr. Eduardo Torres, 4464-513 Sra. da Hora, Portugal*
**Alberto Barbosa, Inês Prisco, Fátima Hierro, Pedro Bem, Miguel Batista, Ana Mafalda Reis.**
*Unidade Local de Saúde de Matosinhos - Hospital Pedro Hispano, Rua de Dr. Eduardo Torres, 4464-513 Sra. da Hora, Portugal*

**Introduction / Objectives**: Subclavian steal syndrome occurs when there is a stenosis or complete blockage of the subclavian artery causing a reverse blood flow in the ipsilateral vertebral artery. This syndrome can be identified and evaluated through a carotid doppler ultrasonography. We reviewed the characteristic signs of this entity on ultrasound, highlighting its importance in clinical practice, especially in identifying the early findings of this phenomenon.

**Materials and Methods:** A review of the most recent literature regarding carotid doppler ultrasonography findings in subclavian steal syndrome was made. Original images of doppler ultrasound from our institution were also included.

**Results:** In normal conditions, vertebral blood flow pattern is similar to that of the internal carotid artery, forward flow throughout the cardiac cycle and relatively high diastolic flow velocities are characteristic. In case of an occlusion or significant stenosis in the subclavian or brachiocephalic artery, the ipsilateral vertebral artery will be filled by the contralateral one through the basilar artery, and therefore, a negative deflection will be seen in the ultrasound. Neurorradiologists must be aware of different grading of subclavian steal syndrome, considering its different ultrasound manifestations. Early in the development of a subclavian steal, a mid-systolic velocity deceleration is noted in the vertebral artery waveform (manifesting as the "bunny waveform sign"). This feature becomes more prominent as the subclavian artery stenosis progresses and eventually results in a period of reverse flow. When there is a complete vertebral artery steal, its waveform shows a complete reverse flow direction throughout the cardiac cycle.

**Conclusion:** Carotid doppler ultrasonography is a non-invasive imaging technique that can detect abnormal blood flow patterns in the carotid and vertebral arteries such as precursory changes in vertebral waveforms in subclavian steal syndrome, allowing for an earlier diagnosis.

# P40 | PRIMARY BRAINSTEM LYMPHOMA – A RARE CAUSE OF CRANIAL NERVES DYSFUNCTION

**Carla Morgado** - cscmorgado@gmail.com
*Serviço de Neurologia, Hospital de Braga, Braga, Portugal*
**Mariana Santos**[2] **Andreia Ferreira**[1], **Luís Rufo Costa**[3], **Sofia Marques**[1], **Ana Filipa Santos**[1], **Isabel Amorim**[1], **Célia Machado**[1]
*1Serviço de Neurologia, Hospital de Braga, Braga, Portugal;*
*2 Serviço de Neurorradiologia, Hospital de Braga, Braga, Portugal;*
*3Serviço de Neurologia, ULSAM, Viana do Castelo, Portugal*

**Introduction:** Primary brainstem lymphoma is a rare clinical entity, counting for less than 3% of total brainstem malignancies. It affects predominantly adults and clinical presentation may include cranial nerves palsies, balance problems, pyramidal weakness, nausea and vomiting. Imagiological diagnosis is challenging as several differential diagnosis should be addressed.

**Case Report:** A 64-years-old male, presented with an history of dysphagia, dysarthria and peripheral right facial paralysis, associated with weight loss and left ear pain. Neurological examination reveals functional impairments of right VII, IX, X, and XII cranial nerves. No signs of sensorial, motor or cerebellar impairments were observed. Initial brain CT study with CT-angiography was unremarkable. CSF analysis showed lymphocytic pleocytosis (191 cells) and hyperproteinorrhaquia (0,95 mg/dL), without changes in cell cytometry or microbiological isolation. MRI revealed an expansive lesion involving brainstem and cerebellar hemispheres, predominantly on the left-side, raising several diagnostic possibilities, namely inflammatory lesion. The patient received high-dose corticosteroid therapy, but maintained progressive clinical worsening. Complete analitical/imagiological investigations for secondary neoplastic lesion, white matter neuroinflammatory and infectious etiologies were negative. The patient presented respiratory arrest and was admitted at the intensive care unit, requiring tracheostomy and continuous ventilatory support. Meanwhile, he developed tetraparesis, severe hearing loss and right face and limb myoclonias. Threeweeks follow-up MRI showed slight increase of the lesion, suggesting an infiltrative lesion, namely, primary CNS lymphoma, posteriorly confirmed by the histopathological analysis.

**Discussion:** Brainstem lesions in adults, despite the similar clinical presentation, requires investigation of a high number of different clinical entities. An extensive workup is needed as brainstem lesions may be due to primary tumors, metastatic masses, infectious/inflammatory lesion. Although challenging, imagiologic diagnosis is critical and can modify the prognosis, allowing early treatment, even in cases of controversial clinical results (as no response to corticosteroid therapy and no malignant cells in liquor).

# P41 | NEONATAL CEREBRAL ULTRASOUND: WHERE PEDIATRICS AND NEURORADIOLOGY MEET

**Marta Joana Achada Lima** - mjoanaalima96@gmail.com
*Serviço de Neurorradiologia da Unidade Local De Saúde Matosinhos – Hospital Pedro Hispano, Rua de Dr. Eduardo Torres, 4464-513 Sra. da Hora, Portugal*
**Alberto Barbosa[2], Fátima Hierro[1], Inês Prisco[1], Pedro Bem[1], Miguel Batista[1], Ana Mafalda Reis[1].**
*1. Serviço de Neurorradiologia da Unidade Local De Saúde Matosinhos – Hospital Pedro Hispano, Rua de Dr. Eduardo Torres, 4464-513 Sra. da Hora, Portugal;*
*2. Serviço de Radiologia da Unidade Local De Saúde Matosinhos – Hospital Pedro Hispano, Rua de Dr. Eduardo Torres, 4464-513 Sra. da Hora, Portugal;*

**Introduction / Objectives:** Neonatal cerebral ultrasound (NCU) is a valuable diagnostic tool, offering non-invasive and readily accessible imaging of the neonatal brain. We reviewed the key aspects of NCU, highlighting its significance in clinical practice and why the neuroradiologist can provide added value.

**Materials and Methods:** A review of the most recent literature regarding the clinical indications and most common imaging findings was made. Original images of neonatal brain ultrasound from our institution were also included.

**Results:** NCU is the first-line imaging method for assessing the neonatal brain, having the advantages of being an inexpensive and safe method, as it does not use ionizing radiation, keeping in mind the ALARA concept in the pediatric population. Even though it has been used primarily for the evaluation of TORCH group infections and intraventricular hemorrhage in at risk infants, recent advances have made it possible for the neuroradiologist to diagnose many congenital malformations and better assess hemorrhagic complications in both term and preterm neonates, as well as hypoxic ischemic encephalopathy and subarachnoid spaces evaluation. To exploit the advantages of NCU, it is imperative that the neuroradiologist is comfortable with the ultrasound technique, normal anatomy and common findings, as well as with the different pathologies and pitfalls. Knowledge of transitory findings and normal evolution or persistence of lesions of several etiologies must be kept in mind since many patients are submitted to serial assessments through NCU. We included some tips and tricks to apply on the day-to-day practice to make the most out of the NCU, and some suggestions on structured reporting to better communicate with clinicians.

**Conclusion:** NCU is an indispensable tool for the neuroradiologist, especially those in the field of pediatric neuroradiology, allowing them to assess and better manage several neonatal neurological conditions.

# P42 | LOW-FLOW VASCULAR MALFORMATION OF THE ORBIT: CASE REPORT

**Marta Joana Achada Lima** - mjoanaalima96@gmail.com
*Serviço de Neurorradiologia da Unidade Local De Saúde Matosinhos – Hospital Pedro Hispano, Rua de Dr. Eduardo Torres, 4464-513 Sra. da Hora, Portugal*
**Marta Joana Lima[1], João Nuno Oliveira[1], Ana Rita Viana[2], Fátima Hierro[1], Pedro Bem[1], Pedro Moniz,[1] Ana Mafalda Reis[1]**
*1. Serviço de Neurorradiologia da Unidade Local De Saúde Matosinhos – Hospital Pedro Hispano, Rua de Dr. Eduardo Torres, 4464-513 Sra. da Hora, Portugal;*
*2. Serviço de Oftalmologia da Unidade Local De Saúde Matosinhos – Hospital Pedro Hispano, Rua de Dr. Eduardo Torres, 4464-513 Sra. da Hora, Portugal*

**Introduction / Objective:** Vascular malformations can be divided into high-flow (such as arterio-venous malformations) and low-flow that encompasses venous (VMs), lymphatic (LMs), and combined lymphatic-venous malformations (LVMs). Imaging plays a crucial role in the diagnosis of orbital LVMs and its intracranial associations, such as developmental venous anomalies or cavernous VMs. Our study aimed to identify the radiological findings that can aid in the diagnosis of these lesions.

**Material and Methods**: We present a rare clinical case of a low-flow vascular malformation of the orbit that was presented at the author's institution.

**Results:** A 20-year-old woman presented with increasing proptosis and discomfort of the right eye for a week. Following an ophthalmologist consultation that suggested the possibility of an orbital mass, the patient underwent CT and MRI of the orbits. The CT showed a well-defined retrobulbar mass, predominantly in the intraconal compartment, isodense with slight peripheral contrast enhancement and no evidence of phlebolitis. The mass pushed the eye forward without deforming it. On the MRI the lesion is T1 isointense, T2 hyperintense with fluid-fluid levels, without restricted diffusion and exhibiting a discrete marginal enhancement after gadolinium administration.

**Conclusion:** The findings suggested a slow-flow vascular malformation, probably lymphatic-dominant lymphatic-venous malformation (LD-LVM). This lesion can present with edema, intra-orbital hemorrhage and proptosis. Valsalva maneuver can enlarge LVM. LD-LVMs are typically well-defined, lobulated masses that conform to the eyeball but displace it as well as the adjacent structures, such as the optic nerve, without bone erosion. They also tend to spread to the intraconal and extraconal space, disrupting normal anatomical boundaries and may extend from or into the cavernous sinus or the optic canal. Classically, LD-LVMs show fluid-fluid levels from blood products. In LVMs, the venous components may be detectable by identification of phleboliths. Management of LD-LVMs includes observation, sclerotherapy, or surgery.

# P43 | UNMASKING FUNGAL RHINOSINUSITIS, A DISEASE WITH MANY FACES

**Pedro Sousa Brandão** - pedrodsbrandao@gmail.com
*Neuroradiology department, Centro Hospitalar Universitário de Lisboa Central, Lisbon, Portugal*
**Sara Rosa** [1]**; Alexandra Rodrigues** [1,2,3]**; João Jacinto** [1]
*1 Neuroradiology department, Centro Hospitalar Universitário de Lisboa Central, Lisbon, Portugal; 2 Neuroradiology Unit, Hospital Central do Funchal, Funchal, Portugal - SESARAM; 3 NOVA Medical School, Universidade Nova de Lisboa, Lisbon, Portugal*

**Introduction**: Fungal rhinosinusitis (FRS) encompasses a diverse group of diseases that pose diagnostic and management challenges. Depending on the presence of mucosal invasion by fungal hyphae, these conditions range from common chronic non-invasive forms, including allergic FRS and mycetoma/fungal ball, to less frequent but severe invasive FRS (acute or chronic). In immunocompromised patients, it is critical to identify imaging signs of disease extension beyond the sinuses to establish the early diagnosis of acute invasive FRS. This allows the prompt initiation of aggressive medico-surgical treatment. Distinguishing between chronic non-invasive and invasive FRS also relies on imaging, given its overlapping clinical symptoms.

**Materials and methods / results:** We selected cases from our institution database illustrating the distinctive features of FRS. In chronic forms, the material within the affected sinuses usually appears hyperdense on non-enhanced CT and exhibits very low T2-weighted signal on MRI, which may mimic air, due to the high metal concentration from fungal organisms and low water content in eosinophilic mucin. Allergic FRS presents with hypertrophic rhinosinusitis with polyposis involving multiple sinuses, and mycetoma-associated hyperdense concretions are usually limited to a single nonexpanded sinus. Insidious sinus wall erosion is often observed in chronic invasive FRS. Acute invasive FRS generally does not display hyperattenuating secretions, in contrast to chronic disease. Additionally, invasive types are characterized by non-enhancing mucosal areas that correspond to fungal invasion/necrotic eschar. We also present some complications of invasive FRS related to bony erosion and/or vascular invasion, as well as imaging follow-up aspects for monitoring treatment response and disease progression.

**Conclusion:** We explore the multifaceted nature of fungal sinonasal disease, highlighting the pivotal role of the radiologist in integrating clinical data and imaging findings to differentiate the different types of FRS. Early diagnosis of acute invasive FRS is key for guiding timely treatment, aiming to improve patient outcomes.

# P44 | NEURORADIOLOGICAL FINDINGS IN CARBON MONOXIDE INTOXICATION

**Diogo Marques** - diogomarques1993@gmail.com
*Hospital Garcia de Orta (Av. Torrado da Silva, 2805-267 Almada, Portugal)*
**Filipa Castelão, Francisca Sena Batista, Ricardo Pimentel, Ana Cristina Rios**
*Hospital Garcia de Orta (Av. Torrado da Silva, 2805-267 Almada, Portugal)*

**Introduction:** Carbon monoxide (CO) intoxication remains a challenging clinical entity with potential longterm neurological sequelae. This case series presents a focused neuroradiological analysis of six patients with confirmed CO intoxication, aiming to elucidate the varied radiological manifestations and their clinical relevance. Our findings shed light on the crucial role of neuroimaging in the assessment and management of CO intoxication cases.

**Methods:** We conducted a retrospective review of six patients admitted to our institution over a thirteen-year period (2010-2023) with a diagnosis of acute CO intoxication. Clinical and neuroradiological data (including computed tomography (CT) and magnetic resonance imaging (MRI)), were examined.

**Results:** Neuroradiological evaluations revealed a spectrum of CO intoxication-related findings. Common findings included bilateral symmetric deep white matter and basal ganglia involvement. Additionally, diffusion-weighted imaging (DWI) showed to be quite sensitive in the evaluation and detection of brain injury during the acute phase. Clinical outcomes were variable, with some patients experiencing complete recovery, while others exhibited persistent neurological deficits (in particular those with extensive white matter involvement).

**Conclusion:** This case series emphasizes the critical role of neuroimaging in the assessment and management of CO intoxication cases. Additionally, it is important to be aware of the multiple differential diagnosis based on the neuroimaging findings, in order to optimize patient outcomes and minimize longterm neurological sequelae.

# P45 | AN UNCOMMON CA(U)SE OF CERVICAL ARTERIAL DISSECTION

**Rodrigo Lindeza** - rodrigo.lindeza@gmail.com
*Centro Hospitalar Universitário de Lisboa Central, Lisboa, Portugal*
**Rosa, Sara**[1]**; Gonçalves, João**[1, 2]**; Nunes, Ana Paiva**[3]**; Fragata, Isabel**[1]
*1- Neuroradiology Department, Centro Hospitalar Universitário Lisboa Central, Lisboa, Portugal;*
*2- Neuroradiology Department – Hospital Central do Funchal, Funchal, Portugal;*
*3- Stroke Unit, Centro Hospitalar Universitário Lisboa Central, Lisboa; Portugal*

**Introduction/Aim:** Cervical arterial dissection (CAD) is a prevalent cause of stroke, especially in in young adults. It consists in the laceration of a vascular wall layer of the carotid or vertebral arteries, with subsequent formation of a mural hematoma. This can lead to brain infarction due to arterial stenosis/occlusion or thromboembolic phenomena. It can be spontaneous in the presence of an underlying vasculopathy or it could result from minor trauma. The aim of this work is to present a case of dissection with an uncommon etiology and illustrate its neuroimaging findings.

**Methods:** We report a case from our stroke centre caused by vertebral artery dissection associated with cervical spondylosis.

**Results:** A 65-year-old woman was admitted to the emergency department with a 24 hour-history of neck pain, accompanied by speech difficulty since waking up. Neurological examination revealed dysarthria and left hemiataxia (NIHSS 3). Computed tomography showed multiple bilateral cortico-subcortical cerebellar hypodensities, and CT angiography identified a non-occlusive thrombus in the V2 segment of the left vertebral artery. She was admitted to the stroke unit for surveillance and etiology investigation. Follow-up CT angiography showed permeabilization of the previously stenosed segment and identified a double lumen where the thrombus was previously located, in proximity to a cervical osteophyte. Considering these imaging findings and after exclusion of other etiologies, we assumed the diagnosis of stroke due to vertebral artery dissection, likely caused by contact with nearby osteophyte.

**Conclusions:** CAD is less common in the elderly. It is associated with different causes in this age group. Although few cases have been reported in the literature, its association with cervical spine degenerative disease should be considered if imaging findings are suggestive.

## Notas

# Patrocinadores