XVI Congresso da Sociedade Portuguesa de Neurorradiologia/XVI Portuguese Society Annual Congress

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09:45-10:30 Comunicações orais/Scientific papers

ORL 1
09:45 CO.ORL 1.1. CT Poschl reformat. Its value for the Fenestral Otosclerosis - J. Cruz Maurício
09:55 CO.ORL 1.2. Temporomandibular joint disorders: What to look for in anterior disc displacement - Maria Inês de Sá
10:05 CO.ORL 1.3. Temporal bone paragangliomas: imaging features and endovascular treatment strategies - JB Madureira
10:15 CO.ORL 1.4. Time-resolved MR Angiography in the diagnosis of gluomus tympanicum tumors - Denil Tribovane

10:30-11:00 Café/ Coffee/ Discussão de posters/Posters Discussion - Joana Graça, Tiago Batista e Daniela Jardim Pereira
11:00-12:30 SESSÃO 2/Session 2 – Moderadores/ Moderators: Alexandra Lopes e Luís Cerqueira
11:00-11:15 Malformações do Ouvido. Dos Genes à Anatomia - Catarina Brito (HBA)
11:20-11:35 A OM Crónica: colesteatomatosa e não colesteatomatosa - Luís Cardoso (CHVNG)
11:40-12:05 Abordagem cirúrgica do ouvido médio: vias de acesso e técnicas cirúrgicas - Felipe Freire (ORL-HFF)
12:10-12:30 Simposyum Industry MC Medical/ Stryker “Tratamento de aneurismas: Stent & Coils Vs Diversor de Fluxo” - Dr. Mario Martínez-Galdámez
12:30-14:00h Almoço do Congresso/Lunch Congress
14:00-14:15 Vascularização e Lesões vasculares do Ouvido - Luísa Biscoito (CHLN)
14:20-14:35 Acufeno Pulsátil - José Manuel Amorim (HBraga)
14:40-14:55 Hipoacusia Congênita e Hipoacusia na Idade Pediátrica - Luisa Monteiro (ORL-HLU)
15:10-15:25 Implantes cocleares: indicações e o que é que o ORL precisa de saber - Luisa Monteiro (ORL-HLU)
15:25-16:25 Comunicações orais/ Scientific papers

PED
15:25 CO.PED 1. A pictorial review of posterior fossa malformations in fetal MRI - Pedro Bem
15:35 CO.PED 2. Characterization of torcular pseudomass in Fetal MRI - Pedro Bem
15:45 CO.PED 3. Parry Romberg Syndrome and Linear Scleroderma ‘en coup de sabre’ – A Pictorial Review - Pedro Brandão
15:55 CO.PED 4. Application of the MRI classification system (MRICS) on the Cerebral Palsy Portuguese population - João Gonçalves
16:05 CO.PED 5. Pediatric Post-COVID-19 Acute Disseminated Encephalomyelitis – literature review and case report - Inês Prisco
16:25-16:45 Symposium Industry CERENOVUS Johnson & Johnson Medical "Nimbus: a solution for tough clots" - Eng. Ana R. Domingues
16:45-17:15 Café/ Coffee/ Discussão de posters/ Posters Discussion – Joana Graça, Tiago Batista e Daniela Jardim Pereira

ORL 2
18:00-19:30 Comunicações Orais/ Scientific papers
18:00 CO.ORL 2.1. Preoperative CT evaluation of chronic otitis media complicated by cholesteatoma: a pilot assay towards structured reporting - Miguel Q. Neves
18:10 CO.ORL 2.2. Visualization of endolymphatic hydrops in the differential diagnosis between vestibular migraine and Ménière’s Disease - Ricardo G. Pires
18:20 CO.ORL 2.3. Imaging findings in congenital and childhood hearing loss, including the brain - Eduarda Pinto
18:30 CO.ORL 2.4. Anterior skull base and sinonasal involving tumors - Bruno Cunha
18:40 CO.ORL 2.5. Patologia do Ouvido – A Pictorial Review - João Jacinto (CHLC)
19:00 CO.ORL 2.7. Ossicular chain reconstruction: typical CT findings - Inês Freire
19:30-20:30 Discussão de posters/Posters Discussion – Joana Graça, Tiago Batista e Daniela Jardim Pereira

12:00 Jantar do Congresso/Congress Dinner
Sábado/Saturday 20 novembro/november 2021
08:30 Abertura Secretariado/Open
09:00-10:30 SESSÃO 5 – Moderadores/ Moderators:
Pedro Soares e Luís Cardoso
09:00-09:15 Patologia Traumática do Ouvido - Luís Cerqueira (CHLC)
09:15-09:30 Apex Petroso. Lesões e Pseudo-lesões - Cristina Marques (HGO)
09:30-09:45 Patologia Tumoral do Ouvido - Hugo Estibeiro (ORL, IPO Lisboa)
10:00-10:30 Comunicações orais/ Scientific papers

TUM
10:00 CO.TUM 1. Not everything that looks like a tumor is a neoplasm - João Tarrio
10:10 CO.TUM 2. Dural-based mass lesions: A pictorial essay - Gonçalo Almeida
10:20 CO.TUM 3. Solitary Tumors of Posterior Fossa in Adults - Joana Freitas
10:30-11:00 Café/ Discussão de posters - Joana Graça, Tiago Batista e Daniela Jardim Pereira
11:00-12:40 Painel sobre Via Verde do AVC - Ouvir o AVC - onde estamos?
Moderador: Luísa Biscoito e Rui Manaças
Gonçalo Basilio (CHLN), João Reis(CHLC), Pedro Vilela (HGO), Gabriel Branco (CHLO), Egídio Machado (CHUC), José Manuel Amorim (HBraga), Manuel Q.Ribeiro (CHVNG), Maria Luís (CHSJ), Vasco Abreu (CHUP)
12:40-13:00 Symposium Industry Medtronic: “Viz.ai: The role of Artificial Intelligence in Stroke Diagnosis” - Professor Manoj Ramachandran, Co-founder Viz.ai Developers, London, England”
13:00-14:00 Almoço do Congresso
14:00-16:30 SESSÃO 6 – Moderadores/Moderators:
Inês Carreiro e Pedro Vilela
14:00-15:30 Comunicações Orais/ Scientific papers
VASC/RAQ
14:00 CO.VASC 1. Influence of low hemoglobin levels on short-term functional outcome in patients submitted to mechanical thrombectomy - Diogo A. Marques
14:10 CO.VASC 2. Comparison of safety and technical success between transradial and femoral approaches for neurointerventional procedures - João A. Saraiva
14:20 CO.VASC 3. Intraosseous clival arteriovenous fistulas - João Ramos
14:30 CO.VASC 4. Hyperacute intracranial stenting in acute ischemic stroke - Sofia Bettencourt
14:40 CO.VASC 5. Intra-Arterial Chemotherapy in Retinoblastoma: Alternatives to Direct Ophthalmic Artery Catheterization - Carolina Maia
14:50 CO.VASC 6. Fly and treat – ruptured aneurysm endovascular treatment in Madeira Island - Alexandra Rodrigues

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Introduction: Intra-articular disorders of the temporo-mandibular joint (TMJ) have been defined as an abnormal positional relationship between the disc and the condyle. Anterior disc displacement is the most common intra-articular disorder, and it can be associated with pain and functional limitations. Posterior and pure sideways disc displacements are rare. There are two types of Anterior disc displacement: with reduction (DDWR) or without reduction (DDWOR). The Anterior disc displacement without reduction occurs during mouth opening movement as the disc returns to its normal position, producing a “click”. The Anterior disc displacement without reduction occurs when the disc remains anteriorly displaced at maximum mouth opening. Over time the disc may become deformed, assuming a round, irregular or flattening morphology. Joint effusion may be present and advance/irreversible osteoarthritic changes such as condylar flattening, osteophytes, erosions and sclerosis may occur. Magnetic resonance (RM) imaging is the method of choice to evaluate TMJ disorders, including the use of sagittal oblique proton density-weighted and T2 SPACE in both closed-and open-mouth positions.

Methods: We collected several cases of TMJ disorders in a tertiary care center and analyzed in detail the MRI images related with anterior disc displacement. We aimed to identify the characteristics of anterior disc displacement and their associated signs in order to stratify the approach that neuroradiologists should undertake when faced with these cases.

Final considerations: The evaluation of TMJ MRI images should include several important steps in order to detect early signs of TMJ dysfunctions, thereby avoiding their evolution to irreversible osteoarthritic changes. The neuroradiologist should (1) evaluate the position of the disc; (2) differentiate between DDWR vs DDWOR; (3) disk morphology; (4) presence of joint effusion (5) osteoarthritic changes.

Conclusion: Pöschl reformat must always integrate EVO imaging protocol considering relevant contribution for the pathophysiology of hearing loss, specifically when prothesis is present. Pöschl reformat must be complementary to the tonal audiometry.

CO.ORL 1.2. Temporomandibular joint disorders: What to look for in anterior disc displacement

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Guilherme Martins, Graça Sá, Rita Sousa
Hospital Santa Maria

Introduction: Intra-articular disorders of the temporomandibular joint (TMJ) have been defined as an abnormal positional relationship between the disc and the condyle. Anterior disc displacement is the most common intra-articular disorder, and it can be associated with pain and functional limitations. Posterior and pure sideways disc displacements are rare. There are two types of Anterior disc displacement: with reduction (DDWR) or without reduction (DDWOR). The Anterior disc displacement with reduction occurs during mouth opening movement as the disc returns to its normal position, producing a “click”. The Anterior disc displacement without reduction occurs when the disc remains anteriorly displaced at maximum mouth opening. Over time the disc may become deformed, assuming a round, irregular or flattening morphology. Joint effusion may be present and advance/irreversible osteoarthritic changes such as condylar flattening, osteophytes, erosions and sclerosis may occur. Magnetic resonance (RM) imaging is the method of choice to evaluate TMJ disorders, including the use of sagittal oblique proton density-weighted and T2 SPACE in both closed-and open-mouth positions.

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CO.ORL 1.3. Temporal bone paragangliomas: imaging features and endovascular treatment strategies

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Proença FB, Manuel C, Sousa R, Reimão S, Biscoito L
Hypoacusis. Head MRI and angiography showed a hyperwash-out. Patient was treated with radiosurgery.

Background: TBP are slow-growing hypervascular tumors originating from neural-crest cells located at the jugular fossa, cochlear promontory and along the paths of the Arnold and Jacobson nerves. They are commonly named according to their location in jugular, jugulotympanic or tympanic paragangliomas. TBP are the most common tumors of the middle ear, but represent less than 0.5% of the head and neck tumors.

Case 1: 68 years-old woman with headache, ear fullness, hypoacusis and tinnitus. Head CT and MRI showed a soft tissue mass near the cochlear promontory with intense enhancement, suggestive of a tympanic paraganglioma. Preoperative embolization with particles was performed successfully excluding the tumoral blush. Complete tumor resection was attained with low intraoperative blood losses.

Case 2: 53 years-old woman with left sided tinnitus. Head MRI showed a hypervascular lesion near the left jugular foramen compatible with a jugular paraganglioma. Angiography demonstrated an early blush from branches of the left external carotid and vertebral arteries with a fast wash-out. Patient was treated with radiosurgery.

Case 3: 56 years-old woman with schizophrenia and hypoacusis. Head MRI and angiography showed a hypervascular lesion compatible with a jugulotympanic paraganglioma located in the jugular foramen and tympanic segment of the temporal bone. The lesion had extension to the posterior fossa and hypoglossal channel and was irrigated from branches of both internal and external carotids. Patient was treated with radiosurgery.

Conclusion: TBP are benign tumors that might have a poor prognosis due to proximity to cranial nerves, inner ear, jugular vein and internal carotid artery and growth into the posterior fossa. Accurate imaging assessment of local extension and vascularization patterns is essential for treatment planning.

CO.ORL 1.4. Time-resolved MR Angiography in the diagnosis of glomus tympanicum tumors
Denil Tribovane - deniltribovane@hotmail.com

Purpose: To describe the common imaging features of temporal bone paragangliomas (TBP). To summarize the role of angiography in the diagnosis and treatment of TBP.

Introduction: Glomus tympanicum (GT) tumors, are the most common benign tumors of the middle ear, most commonly seen in middle-aged women. This tumor arises from neural crest tissue along the tympanic branch of cranial nerve IX known as the Jacobson nerve. Clinically, patients present most frequently with hearing loss and tinnitus. On inspection, the visualization of a red mass behind an intact eardrum should raise suspicion for a GT, but CT and MRI have become essential for identifying the tumor, location and defining the extent of disease for staging. In this study we aimed to assess the use of time-resolved contrast enhanced magnetic resonance angiography (CEMRA) for detection of small GT tumors. Material and methods. Three patients with small GT tumors were investigated in this study (2 female and 1 male, average age of 60 years). All of the patients presented with pulsatile tinnitus and hearing loss and underwent routine brain MRI examination protocol, followed by with time-resolved CE-MRA and post-contrast T1 sequences.

Results: After contrast administration, in all cases, an intense and homogeneous tumor blush was demonstrated. Tumor volumes ranged from 0.11 to 0.82 cm³ (mean 0.38 cm³, SD 0.38), and all of them were classified as Fisch-Mattox type B. Concerning contrast dynamics, all glomus tumors showed an early and rapid enhancement after contrast administration. Concerning contrast dynamics, the glomus tumors showed rapid uptake of contrast in the arterial phase, a high peak contrast and rapid washout.

Conclusions: The characteristic contrast enhancement of glomus tumors can be helpful in the diagnostic workup of lesions that may mimic these lesions. In our study we showed a typical time-dependent enhancement pattern of GT tumors using time-resolved CE-MRA. This is a non-invasive technique with minimal time demand that easily points out also small lesions, which might be useful in screening investigations.

COMUNICAÇÕES ORAIS/Scientific Papers PED 1 – DIA/DAY 19 [15:25-16:15]
CO.PED 1. A pictorial review of posterior fossa malformations in fetal MRI
Pedro Bem - Bem.pedro@gmail.com
Unidade Local De Saúde Matosinhos – Hospital Pedro Hispano
André Miguel Miranda; Joana Nunes; Carla Conceição; Ana Filipa Geraldo
Centro Hospitalar Vila Nova Gaia/Espinho Centro; Hospitalar Universitário Lisboa Central – Hospital Dona Estefânia

Posterior fossa malformations (PFM) represent a large and frequent group of pathologies in pediatric neuroradiology, and it is essential for neuroradiologists to be familiarized with the main imaging findings of these entities in fetal MRI. Our goal is to systematize the main PFM and how they present in fetal MRI and to correlate the imaging findings with post-natal MRI, autopsy results, genetic studies and clinical outcome, when available.

A total of 818 fetal MRIs, performed between January 2012 and September 2021, from two Portuguese Hospital Centres (Centro Hospitalar de Vila Nova de Gaia – Espinho and Centro Hospitalar Lisboa Central – Hospital Dona Estefânia) were reviewed. MR findings were divided
in five different groups: 1) predominantly vermian involvement, 2) global cerebellar involvement, 3) unilateral cerebellar involvement, 4) cerebellar and brainstem involvement and 5) predominantly brainstem involvement and representative cases from the different categories were selected for pictorial review.

Recognition of the main PFM and their main imaging features on fetal MRI as well as their associated neurological prognosis is paramount for an early and accurate prenatal diagnosis and counseling.

**CO.PED 2. Characterization of Torcular Pseudomass in Fetal MRI**

Pedro Bem - bem.pedro@gmail.com

Unidade Local de Saúde de Matosinhos - Hospital Pedro Hispano

André Miguel Miranda, André Araújo, Conceição Brito, Joana Nunes, Ana Filipa Geraldo

Centro Hospitalar Vila Nova de Gaia e Espinho

The torcular pseudomass (TP) is an incidental extra-axial midline mass located between the torcula and the occipital squama in the pediatric population younger than 3 years. While presumed a developmental feature, no characterization of this structure has been previously performed in fetal MRI. We present a single-center retrospective study of fetal MRIs performed between Jan 2014 and Jun 2021 in a tertiary center to determine the frequency of detection, imaging features, and longitudinal changes of TP during fetal life and early childhood. TP was orderly classified as “absent”, “focal”, “crescent” or “bulky” based on morphology and size by two independent reviewers. Follow-up fetal and postnatal MRI were reviewed, and TP classified as “stable”, “regression” or “progression”. A total of 209 fetal MRI were evaluated (median gestational age (GA) 28 weeks (w), range 19-37). TP was absent in 7% (median GA 33w; range 21-37) and present as “focal” mass in 15% (median GA 32w; range 19 -37), “crescent” in 44% (median GA 27w; range 21-36) and “bulky” in 34% (median GA 24w; range 19-35) of cases.

Average GA was statistically different between TP categories (p<0.0001) and inversely associated with TP size. Follow-up fetal MRI were available in 10% of cases (n=21; median 4w interval; range 0-10) and TP was classified as “stable” in 67%, while “regression” and “progression” were identified in 28% and 5% of cases, respectively. At least one post-natal MRI was available in 6% of fetuses (n=12, median 11 months, range 1-36) and TP remained “stable” in 33% and regressed in 67%. TP is thus highly prevalent in fetal population and shows a natural involutive pattern already in utero, although may persist in early infancy. While a developmental feature, TP embryological origin and histological characterization remain elusive and warrant further research.

**CO.PED 3. Parry-Romberg Syndrome and Linear Scleroderma en coup de sabre – A Pictorial Review**

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Carla Conceição

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**Introduction:** Parry-Romberg syndrome (PRS), also known as progressive hemifacial atrophy, is a rare disorder characterized by insidious atrophy of the skin and subcutaneous tissue that may develop to affect the underlying musculature and bone structures, with or without neurologic involvement. Typically presents in children and young adults and may slowly progress over a variable period. Precise etiology remains uncertain, but it shares many clinical and imaging features with linear scleroderma en coup de sabre (LScs), making both entities commonly discussed as related autoimmune conditions.

**Cases:** We searched our hospital database for patients diagnosed with PRS/LScs and reviewed their clinical data and MR images. Then, we selected cases to illustrate a variety of intracranial imaging features, in addition to typical facial or scalp findings, including subtle T2 white matter hyperintensities, hemispheric brain atrophy, and vascular abnormalities (such as innumerable unilateral microhemorrhages and a case of stroke attributable to the diagnosis of scleroderma because other etiologies were excluded).

**Discussion & Conclusion:** Despite the characteristic facial morphological changes that often suggest the diagnosis, these may be minor or even undetectable in the early phase. Moreover, only a minority of patients develop neurological or ophthalmological symptoms with disease progression. Due to its rarity and variable presentation, certain MR imaging findings must be considered to raise diagnostic suspicion of PRS/LScs. Extracranial assessment is essential to primarily determine the involvement of the skin, and eventually deeper structures. Intracranially, several findings have been reported in PRS/LScs, usually ipsilateral to the affected hemiface, and include white matter signal abnormalities and microhemorrhages, as shown. Even in the absence of cutaneous lesions or facial asymmetry, PRS/LScs must be included in the differential diagnostic considerations when there is evidence of these unilateral multifocal MRI signal changes, which can sometimes be clinically occult.

**CO.PED 4. Application of the MRI classification system (MRICS) on the Cerebral Palsy Portuguese population**

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Neuroradiology Department, Hospital de São José, Centro Hospitalar Lisboa Central, Lisbon, Portugal; Neuroradiology Department, Hospital Dr. Nélio Mendonça, SESARAM E.P.E., Funchal, Portugal
Alexandra Rodrigues1,2; Teresa Folha3; Daniel Virella4; Carla Conceição1 on behalf of the National Surveillance of Cerebral Palsy in Portugal among 5-year-old Children, Federação das Associações Portuguesas de Paralisia Cerebral (FAPPC) and Surveillance of Cerebral Palsy in Europe (SCPE).

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2 - Neuroradiology Department, Hospital Dr. Nélio Mendonça, SESARAM E.P.E., Funchal, Portugal;
3 - Departamento de Epidemiologia, Instituto Nacional de Saúde Doutor Ricardo Jorge, Lisbon, Portugal;
4 - Centro de Investigação, Centro Hospitalar de Lisboa Central, Lisboa, Portugal

Introduction: Cerebral palsy (CP) is a clinical diagnosis, based upon neurological symptoms and a motor disorder causing an activity limitation. Although neuroimaging is not a prerequisite for the diagnosis of CP according to the Surveillance of Cerebral Palsy in Europe (SCPE), abnormalities are found in over 80% of these patients and MRI is recommended as a part of diagnostic work-up. Characterizing these lesions can elucidate the pathogenic patterns responsible for PC and the structure-function relationship, as well as allowing us to establish a prognosis. Thus, SCPE developed a qualitative classification system called MRI Classification System (MRICS) to standardize the different patterns of CP, categorized from A to E.

Objectives: To present the distribution of Portuguese children with CP in the different categories of the MRICS, as well as unveil the process of classification to the Portuguese neuroradiology community so as to improve the process of categorization.

Materials and methods: Data analysis from active surveillance of 5-years-old children with CP born between 2001 and 2012, residing in Portugal (Programa de Vigilância Nacional da Paralisia Cerebral - PVNPC5A). Classification of MRI based on the predominant pattern responsible for CP, according to the MRICS.

Results: From a total of 2216 registered children, MRI was performed in 1443 and 1253 were classified based on the report. MRI predominant patterns were: A. Malformations 15% (n=190), B. predominant white matter 38% (n=481), C. predominant gray matter 30% (n=378), D. Miscellaneous 11% (n=132) and E. Normal 6% (n=72). Some clinical data correlation with imaging is also presented.

Conclusion: Neuroimaging is of great importance in the diagnosis of CP. Concise MRI reports of CP children may help improve the establishment of prognosis and early intervention.

CO.PED 5. Pediatric Post-COVID-19 Acute Disseminated Encephalomyelitis – literature review and case report

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We report a case of a 13-years-old female presenting to the hospital with a month-long history of dizziness, headache, visual disturbance and gait changes. She had a history of COVID infection two months prior. Apart from that there was no other personal significant clinical background but there was family history of multiple sclerosis. On neurological examination, the patient was slower at responses and inattentive and pancebellar syndrome was perceived, involving nystagmus, right dysmetria and ataxic gait without meningeal signs.

Head-CT was performed right away, showing multiple supratentorial hypodensities with cortical and subcortical involvement, characterized later by brain and spine MRI that showed multiple rounded T2-hyperintense lesions, on both centrum semiovale’s, right thalamus, brainstem and right cerebellar peduncle, associated with perilesional edema and discrete mass effect; there were different associated enhancement patterns, presenting with both solid and incomplete ring enhancement and there was no associated diffusion restriction. Although there were no spinal lesions, there was subtle dural and cauda equina roots enhancement. Cerebral Spinal Fluid analysis revealed positive Oligoclonal Bands. Based on clinical and imaging findings, acute disseminated encephalomyelitis (ADEM) along with root involvement was the first diagnosis hypothesis, although demyelinating and infectious causes were also considered. Endovenous corticotherapy was then initiated, with good clinical response and the child was discharged 10 days after the admission.

This case illustrates not only the importance of clinical-imagiological correlation but also the possible complications that must be taken into account after COVID-19 disease with different imagiological confounding characteristics. Although neurological manifestations of SARS-CoV-2 infection in pediatric patients have been reported in the acute and post-infectious stages, ADEM typically presents in children following a viral illness at a mean age of three to seven years. According to the literature, the majority of these patients have minimal to no neurologic deficits at longterm follow-up.
Background: Computed tomography (CT) of the temporal bone remains paramount in the preoperative evaluation of chronic otitis media complicated by cholesteatoma, as it can provide crucial information to the surgeon, preventing complications and improving clinical care. However, common practice is based on unstructured radiological reports that might underreport crucial landmarks or important anatomical variations.

Purpose: Retrospectively review preoperative radiological reports of patients who underwent surgery for suspected cholesteatoma and provide a structured template that takes into account the most commonly underreported and reproducible landmarks.

Methods: Our database was reviewed for patients with suspected cholesteatoma who underwent preoperative CT of the temporal bone; cases without histological confirmation of cholesteatoma and/or with previous ear surgery were excluded. Radiological reports were reviewed and compared to a structured template provided by ENT surgeons. The landmarks reported in less than 50% of the cases were independently evaluated by 2 raters with at least 5 years of experience in head and neck radiology, followed by interclass correlation coefficient (ICC) and k of Cohen calculation. Results: Twenty-six patients were included, with a median age of 49 years; 62% were female. The landmarks reported less frequently that showed higher interrater agreement were: tympanic sinus (k=0.77; 95% CI:0.54-1.01) and facial recess patency (k=0.72; 95% CI:0.44-1.01), sigmoid sinus distance to external auditory canal (ICC=0.79; 95% CI:0.55-0.91), Eustachian tube (k=1; 95% CI:1-1), oval window niche (k=0.84; 95% CI:0.63-1.05) and subocculear canaliculus patency (k=1.00; 95% CI:1-1), incudomalleolar joint and geniculate ganglion integrity (k=1.00; 95% CI:1-1, for both), sigmoid sinus integrity near pneumatization (k=0.85; 95% CI:0.64-1.05), bone thickness above jugular bulb (ICC=0.67; 95% CI:0.27-0.85) and Prussak space patency (k=0.7; 95% CI:0.39-1.00).

Conclusions: We suggest a template for structured preoperative reporting of chronic otitis media potentially complicated by cholesteatoma, that includes landmarks/variations which presented moderate to excellent reproducibility between raters.

CO.ORL 2.2. Visualization of endolymphatic hydrops in the differential diagnosis between vestibular migraine and Ménière’s Disease

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Objective: To assess the value of our endolymphatic hydrops (EH) MRI protocol for the differential diagnosis between vestibular migraine (VM) and Ménière’s Disease (MD).

Methods: 38 patients (32 female; age 21-75 years) with diagnostic criteria of VM (n=27) and MD (n=11) underwent a 3D IR 4h post-gadobutrol administration on a 3T MR scanner. Visual assessment of EH grading was performed and correlated with clinical and audiometric parameters.

Results: Auditory symptoms were present in 11/11 of MD group, and 16/27 of VM group. Imaging was compatible with EH in 11 patients with MD (100%), and 2 with suspected VM (7%, 1 describing auditory symptoms). There was an association between the laterality of EH and the laterality of hearing loss (Fisher’s exact test, p<0.005) and a strong correlation between hearing loss and EH grade (Kendall’s Tauβ, p<0.05).

Discussion: EH has been reported in both clinical entities; however, as suggested by the results, EH shows very high association with MD, being ubiquitous in our sample of suspected cases, while only present in a small minority of VM. In fact, one of the 2 cases of suspected VM demonstrated auditory symptoms and EH, and the diagnosis has meanwhile been reconsidered (MD or an overlap between both). We also found a strong correlation between the EH stage and the hearing loss grade, which can be useful when interpreting imaging findings.

Conclusion: The described MRI protocol is a valuable diagnostic instrument, allowing a good depiction of EH and distinction between vestibular migraine and Ménière’s Disease, being capable of shifting the diagnosis made purely by clinical symptoms. It also represents a tool for anatomical characterization, with potential to reveal other characteristic findings of these entities in the future.

CO.ORL 2.3. Imaging findings in congenital and childhood hearing loss, including the brain

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Centro Hospitalar Universitário do Porto

Catarina Pinto, João Tarrio, Daniel Dias, Bruno Moreira

Centro Hospitalar Universitário do Porto

Introduction: Congenital and childhood hearing loss may be acquired, mainly due to congenital infections, or
genetic, the latter representing the majority in developed countries. Some of these are related with syndromes, in which multiple organs may be affected, including intracranial abnormalities.

**Methods:** We intended to characterize the ear and brain image findings (CT and/or MRI) of the patients with genetic/syndromic hearing loss, studied in our centre.

**Results:** We included seven cases, consisting in two CHARGE syndromes (CHD7 gene), one branchiooto renal syndrome (EYA1 gene), one velocardiofacial syndrome (del22q11.2), two Goldenhar syndrome and an incomplete partition type 3 (X-linked deafness). In CHARGE syndrome, abnormalities included hypoplasia of cochlea and vestibule, absent semicircular canals, stenotic cochlear aperture, atretic/hypoplastic oval and round windows, stapes hypoplasia; associated findings were absence of the olfactory bulbs/sulci, pituitary hypoplasia and ocular colobomas. Branchiooto renal syndrome was characterized by cochlear hypoplasia and absent posterior semicircular canals. The case with incomplete partition type III, had an associated hypothalamic malformation. In the 22q11.2 deletion syndrome, abnormalities included dysmorphic stapes and incus, dense/thickened stapes and lateral semicircular canals dysplasia. Goldenhar syndrome findings included atretic external auditory canal, underdevelopment of tympanic cavity, absent/dysmorphic ossicles, oval window aplasia, dysplastic lateral semicircular canal and anomalous course of the facial nerve.

**Conclusion:** Genetic and syndromic causes of hearing loss are characterized by variable abnormalities of the inner, middle, and external ear, but some of these are specific of a certain disease. Knowledge of the ear abnormalities and possible associated intracranial changes may lead to an early diagnosis.

**CO.ORL 2.4. Anterior skull base and sinonasal involving tumors**

**Methods:** We provide a small case series of tumors with anterior skull base and sinonasal extension, discuss the imaging role in these tumors and describe some suggestive imaging features of the most frequent entities.

**Results:** Anterior skull base and sinonasal involving tumors can originate from: the intracranial compartment, such as meningioma; the anterior skull base itself, including osseous tumors; or, more frequently, the sinonasal tract – sinonasal tumors. In larger tumors, assessing its origin may be challenging. Sinonasal tumors include carcinomas and its continuously updating histologic subtypes, salivary gland tumors, olfactory neuroblastomas, mucosal melanoma, as well as hematomymphoid and sarcomatous tumors. Diagnosis usually requires histopathology. Nonetheless, imaging plays an essential role in the management of these patients. Complementary use of CT and MR allow for accurate tumor evaluation and recognition of tumor-mimics. It is mandatory to recognize signs of malignancy, such as bony destruction, low T2 signal, low apparent diffusion coefficient values and perineural spread. However, small malignant tumors imaged on an early phase may show paradoxical benign features. Imaging of the neck is important for detection of nodal metastases. Finally, detailed evaluation of tumor extension is crucial for surgical planning.

**CO.ORL 2.6. Temporal bone paragangliomas – a Portuguese center experience**

**Methods:** A retrospective study was conducted which included patients with the diagnosis of TBP followed at our centre between 2010 and 2019. Data regarding demographics, clinical aspects, imaging, treatment modality and follow-up was collected.

**Results:** Thirty-one patients were identified (age at diagnosis 59.3±14.0 years old), 29 being female. According to the Modified Fisch classification, paragangliomas were classified as A (n=2), B (n=8) and C (n=21). Intracranial disease (class D) was observed in 11 patients. Deafness (45%) and pulsatile tinnitus (55%) were the most common symptoms at presentation. Treatment decision was as follows: 26(83.9%)
surgery, 1(3.2%) radiosurgery and 4(12.9%) “wait-and-scan” strategy. 19(61.3%) patients performed pre-surgical angiography. The number of arterial feeders varied between 1 and 5, arising mainly from the ascending pharyngeal, posterior auricular and occipital arteries. Pre-surgical embolization percentage varied inversely with the number of arterial feeders (p=0.04), with no significant relation with the size of the lesion. Complete surgical excision was achieved in 24(92.3%) of the patients, 19(79.2%) of which did not show residual/relapsing disease at follow-up. Residual/relapsing paragangliomas were larger, of tympanojugular type, graded more commonly as class C2, showed an intracranial component and more often a carotico-typanic branch of the internal carotid artery as an arterial feeder comparing with non-relapsing lesions (p<0.05). Embolization percentage, complete surgical excision and lower cranial nerve palsies at presentation did not significantly differ between both.

Conclusion: Our case-series presents clinico-imagiological information of a TBP population presenting at an expertise centre for 10 years. We suggest some prognostic factors regarding residual/relapsing paragangliomas, such as the initial size, intracranial disease or the presence of a carotico-typanic branch at angiography.

CO.ORL 2.7. Ossicular chain reconstruction: typical CT findings
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Introduction and Purpose: Ossicular chain is composed by three ossicles (malleus, incus, and stapes) responsible for mechanical amplification of vibrations transmitted by tympanic membrane to the cochlea. Disruption of ossicular chain has multiple causes, ranging from congenital malformations, trauma, or middle ear pathology (mainly infectious), with subsequent conductive hearing loss. Ossiculoplasty is the surgical reconstruction of ossicular chain that aims to correct conductive hearing loss. Autografts and synthetic prostheses are used in this procedure. In case of failure, the main causes can be demonstrated on CT scan. The purpose of this work is to identify and distinguish the different autografts and synthetic prostheses used for ossicular chain reconstruction through CT exams.

Methods: The authors present several CT images of patients undergoing ossiculoplasty with the most commonly used autografts and synthetic prostheses, which can be identified by their characteristic configuration.

Results and Discussion: The type of autografts and synthetic prostheses used is usually determined by the pathology and extent of the ossicular damage. Stapedectomy can be identified on CT extending from the lenticular process of the incus to the oval window. In uncodestapedional joint disease, an incus interposition graft can be the solution. When a more extensive reconstruction is needed, a partial ossicular replacement prosthesis (PORP) or a total ossicular replacement prosthesis (TORP) can be used. PORP extends from tympanic membrane to stapes capitulum, while TORP extends from tympanic membrane to stapes footplate. In both cases, autografts can also be used. Post-surgical evaluations can detect subluxations, extrusions or fractures, among others.

Conclusions: It is important for the neuroradiologist to be familiar with the different autografts and synthetic prostheses frequently used for ossiculoplasty. CT assessment is crucial in the postoperative evaluation of ossiculoplasty failure.

COMUNICAÇÕES ORAIS/Scientific Papers TUM - DIA 20/DAY 20 |10:00-10:30|
CO.TUM 1. Not everything that looks like a tumor is a neoplasm
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Introduction: The differential diagnosis between inflammatory and tumoral lesions of the central nervous system (CNS) is challenging. We will focus on two types of inflammatory lesions that mimic neoplasms on imaging. Tumefactive demyelinating lesion is a rare locally aggressive form of demyelination, usually manifested by a solitary lesion, larger than 2 cm, with little mass effect or surrounding edema, contrast enhancement in an open-ring pattern, high ADC values and relatively low CBV. Baló concentric sclerosis is a rare and severe monophasic demyelinating disease, appearing as a rounded lesion with a characteristic “onion bulb” appearance on MRI.

Objective: approach the problematic differential diagnosis between inflammatory and tumoral lesions of the CNS. Methods: This retrospective study reviewed clinical and imaging data from four distinct cases from our hospital center: a 31-year-old female with 2-month history of headaches due to intracranial hypertension and behavioral changes, followed by epileptic seizures; a 44-year-old man with acute onset expression aphasia with progressive worsening; a 74-year-old female with subacute focal epilepsy and behavioral changes; and a 59-year-old male with subacute aphasia and motor deficit, followed by epileptic seizures. The four had mass lesions on MRI, with characteristics suggestive of tumoral and/or inflammatory lesions, whose histological examination determined the final diagnosis: two different inflammatory lesions mimicking tumors, a diffuse...
Dural-based mass lesions comprise a variety of neoplastic and non-neoplastic lesions. Neoplastic entities are the most common and include both primary lesions (such as meningiomas) and dural metastases. Non-neoplastic lesions include granulomatous, autoimmune and idiopathic entities. The aim of this work is to provide a pictorial review of dural-based mass lesions based on illustrative cases from our institution, excluding typical meningiomas (WHO grade I) with common imaging features. Careful assessment of neuroimaging is essential to avoid unnecessary surgical interventions.

**Results:** Neuroimaging findings may be suggestive of pseudotumor, namely peculiar enhancement (eg, incomplete ring, linear/perivascular), pattern of restricted diffusion and hemorrhage on T2* GRE / SWI (vasculitis-like, gyriform, siderosis). It is important to use spectroscopy and perfusion MRI and consider follow-up imaging after steroids.

**Conclusions:** Clinical and laboratory data as well as neuroimaging findings are an essential part of this complex diagnostic puzzle. Using patient demographics, tumor location and imaging characteristics, it is easy to narrow the list of possible diagnoses.

**Conclusion:** The differential diagnosis of dural-based mass lesions is extensive and includes a variety of neoplastic and nonneoplastic entities, besides typical meningiomas. A significant proportion of lesions may show similar imaging features. Therefore, clinical, laboratorial and histologic findings are important to establish the correct diagnosis and provide the best possible therapeutic approach.
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Introduction: It is known that anemia has a negative impact in multiple ischemic mechanisms. Anemia has recently been identified as an independent risk factor for ischemic stroke, causing worse functional outcomes and increasing mortality rates. The author aimed to analyze the effects of low hemoglobin levels on admission of stroke patient undergoing mechanical thrombectomy.

Methods: In this retrospective study, we collected data from patients who were submitted to mechanical thrombectomy in 2019. We compared the functional outcome [modified Rankin Scale] and the reduction of NIHSS score at hospital discharge in patients with different levels of Hb on hospital admission.

Results and Discussion: 44 of all patients were female (53%). The median age of the subjects was 79 (13) years old. The majority of subjects suffered a severe stroke (75%). Approximately one-third (34.9%) of all patients had Hb levels equal or below 12.5 g/dL (24.1% had Hb 12.5-10 g/dL; 10.8% had Hb ≤10 g/dL). There was a statistically significant improvement on the NIHSS pre-procedure and on discharge in all hemoglobin groups, except patients with Hb ≤10 g/dL [Hb ≥ 12.5 g/dL – p value <0.001; Hb 12.5-10 g/dL – p value 0.02; Hb ≤10 g/dL – p value 0.396]. It seems to exist an apparent correlation between low hemoglobin levels and lower improvement on NIHSS values, however we did not verify a statistically significant difference between the groups. Concerning the functional outcome and mortality, there was not a statistically significant difference between the groups.

Conclusion: With this study we suggest that there is a questionable beneficial effect of mechanical thrombectomy in patients with Hb 10 g/dL, we didn’t verify a significant difference in functional outcome or mortality.

CO.VASC 2. Comparison of safety and technical success between transradial and femoral approaches for neurointerventional procedures
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Background: Despite evidence supporting the safety and efficacy of transradial approach for neuroendovascular procedures, femoral access remains the most widely used route.

Purpose: To compare the safety and technical success of transradial and transfemoral approaches for neurointervention.

Methods: We performed a retrospective analysis of patients who were submitted to mechanical thrombectomy (MT), aneurysm treatment (AT), carotid artery stenting (CAS) and/or diagnostic cerebral angiography (DCA) between July 2020 and September 2021 at a single centre. For each procedural category, transradial and transfemoral groups were compared according to crossover to an alternative route, radiation dose, contrast volume, and puncture site complications.

Results: Four-hundred-thirty-two cases were included, comprising 184 MT, 171 DCA, 46 AT and 31 CAS; only procedures with radial puncture attempt ratio higher than 15% were considered for analysis (i.e. DCA – 69%, and AT – 61%). When comparing femoral to radial approaches on AT and DCA procedures performed in 2020 and 2021, only crossover radial-to-femoral was significantly different (DCA: 12% vs. 2%, p=0.012; AT: 25% vs. 0%, p=0.032); all major hematomas requiring blood transfusion/urgent surgery (n=2) occurred following the transfemoral approach.

Conclusions: Our results suggest that AT and DCA can be safely performed by transradial access; moreover, the former can be achieved with reduced doses of contrast material and radiation once a learning plateau is reached.

CO.VASC 3. Intraosseous clival arteriovenous fistulas
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Introduction: Dural arteriovenous fistulas (dAVF) present as anomalous arteriovenous shunts between dural arterial feeders and dural venous sinuses or leptomeningeal veins. Very rarely (<5%), AVF present an intraosseous clival location, potentially mimicking carotid-cavernous fistulas, exhibiting a rich variety of anatomical features with potential implications for endovascular treatment.

Methods: We performed a review of arteriovenous fistulas with intraosseous shunts admitted to Centro Hospitalar de Lisboa Ocidental in the past 10 years. We collected demographic, clinical, angiographic, and follow-up data.

Results: We identified 2 cases, one 67-year-old male (Patient 1) and a 68-year-old female (Patient 2). Both patients presented with left-sided chemois, conjunctival hyperemia and pulsatile tinnitus beginning a few months
prior. Patient 1 also presented paresis of the ipsilateral 6th cranial nerve. Both fistulas were located in the left clival/petro-clival region with bilateral arterial feeders from branches of the external and internal carotid arteries as well as from the vertebral arteries. Both presented retrograde venous drainage to the ipsilateral cavernous sinus and ipsilateral superior ophthalmic vein, with both fistulas being classified as Borden III. Patient 1 was treated via transarterial and transvenous approaches with microspheres and coils. Patient 2 was treated transarterially with EVOH polymer. In both cases, symptoms greatly improved within a few days and the fistulas were shown to be fully resolved in followup angiographies within a couple of months.

**Conclusion:** An intrasosseous clival location for AVF is a rather rare presentation one must be aware of and must adequately prepare for proper treatment. We showed 2 cases successfully cured by endovascular approach (either transarterial, transvenous, or a combined approach).

**CO.VASC 4. Hyperacute intracranial stenting in acute ischemic stroke**

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**Introduction:** Intracranial atherosclerotic occlusion is responsible for nearly 10% of all ischemic strokes and tranitory ischemic attacks in Europe. The optimal treatment for patients presenting with acute stroke due to intracranial atherosclerotic steno-occlusive lesions is still undetermined, however recent studies have shown benefit in endovascular treatment. There are important safety concerns, namely the need for a loading dose of antiplatelet agents, which may increase the risk of haemorrhage, and also perforator stroke and intra-stent thrombosis. We describe our single center experience in hyperacute stenting of intracranial atherosclerotic steno-occlusions.

**Methods:** Retrospective review of clinical and imaging data of acute stroke patients who underwent hyperacute intracranial stenting, within the first 24h after symptom onset, at Hospital São José, from January of 2012 to June of 2021.

**Results:** During a 10-year period, a total of 102 patients with acute stroke and intracranial atherosclerotic steno-occlusive lesions underwent stent placement. From these, 52 patients were treated within 24 hours of symptoms. The median NIHSS was 10 in patients with anterior territory strokes and 12 in posterior territory strokes. Intra-procedural complications were seen in 12 patients (23%), including 6 intra-stent acute thrombosis (12%), five of them solved, and 1 small vessel perforation (2%), that was contained immediately. Post procedural complications included stent occlusion in 9 patients (17%), new ischemic events in 4 patients (8%), ICH in 2 patients (4%) and death in 8 patients (15%). Follow up data was available for 29 patients, with 14 patients showing an mRS≤2 at 3 months (48%).

**Conclusion:** We report a single center experience of hyperacute stenting in intracranial atherosclerotic steno-occlusive lesions, showing a favorable outcome, with low risk of complications. Our experience adds to the growing literature on the efficacy and safety of acute intracranial stenting in acute strokes caused by intracranial atherosclerotic stenoocclusive lesions.

**CO.VASC 5. Intra-Arterial Chemotherapy in Retinoblastoma: Alternatives to Direct Ophthalmic Artery Catheterization**

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**Background:** Intra-arterial chemotherapy (IAC) is currently widely accepted as first line treatment for selected patients with intraocular retinoblastoma (Rb). Typically, IAC is infused following the selective catheterization of the ophthalmic artery (OA) on the affected side. However, it is not always a straightforward procedure, and may require an alternative approach.

**Objective:** To analyze the efficacy and safety of IAC treatment using alternative approaches to OA.

**Methods:** A retrospective analysis of clinical and imaging data from all patients receiving IAC for Rb since 2015 was performed. We recognized 3 different patterns of drug delivery: through direct OA catheterization, through OA catheterization with balloon-assisted occlusion of the external carotid artery (ECA) and through branches of the ECA.

**Results:** We identified 33 consecutive patients with 39 retinoblastomas who underwent 184 IAC procedures overall. The mean age at diagnosis was 15 months and 57.6% of the study population was male. A mean of 5.2 IAC cycles were performed for each patient. Alternative technique for drug delivery was used in 88 cases (47.8%) – through branches of ECA in 15 (8.2%) and use of ECA balloon in 73 (39.7%). Use of alternative approach was statistical higher in patients
that were previously treated with systemic chemotherapy (67.5% versus 31.7%, P<0.001). We report one adverse event correlated with drug administration thought the angular artery (periocular hyperemia). Total globe salvage rate was 82% and statistical analysis did not show any significant difference in the clinical outcome of the eyes (remission versus enucleation) treated with different patterns of drug delivery.

Conclusions: Our findings suggest that alternative routes of intra-arterial chemotherapy for intraocular retinoblastoma appear as effective as the direct drug infusion through the ophthalmic artery, without serious complications associated.

CO.VASC 6. Fly and treat – ruptured aneurysm endovascular treatment in Madeira Island

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Introduction: Aneurysmal subarachnoid hemorrhage (aSAH) is a life-threatening condition that can be treated with endovascular embolization (EE) or surgical clipping. The possibility to discuss and choose the best procedure is directly related with the outcomes. Our findings suggest that alternative routes of intra-arterial chemotherapy for intraocular retinoblastoma appear as effective as the direct drug infusion through the ophthalmic artery, without serious complications associated.

Methods: We collected the data from a prospectively maintained database of aSAH treated with EE at our institution from November 2016 until August 2021.

Results: 26 patients with aSAH were selected to EE during the period of 58 months. The mean age was 57 years and 88% were treated within 72 hours after the ictus. The most frequent aneurysmal location was internal carotid artery, 13 aneurysms had a wide neck and remodeling devices were used in 10 of these; half of the sample had a complete obliteration of the aneurysm. Symptomatic vasospasm was observed in 8 cases and 1 had to be retreated. 45% of the patients had a Modified Rankin Scale at 3 months less than or equal to 2.

Discussion: Concerning aneurysm treatment, the experience of the operators is directly related with the outcomes. Therefore, in remote places as Madeira Island where the incidence of aSAH is low, there are huge difficulties to develop a local specialized team. Transferring the patient abroad can be challenging in the setting of aSAH and sets risks that might be surpassed by experienced interventional neuroradiologists who fly and perform the EE in remote centers.

Conclusion: The paradigm of “Fly and Treat” is a reliable option for endovascular treatment of aneurysms in remote centers, since it does not delay the treatment and good outcomes can be achieved.

CO.VASC 7. Blood test predictors of functional outcome after mechanical thrombectomy treatment in acute ischemic stroke

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Introduction: Mechanical thrombectomy is a well-established acute treatment in ischemic stroke, for which the factors predicting a satisfying functional recovery are not yet fully known. Hence, we aim to evaluate if blood cell count or biochemical measures from admission blood sample of ischemic stroke patients predict their functional state after this interventional treatment.

Methods: Blood laboratory tests of patients with acute ischemic stroke treated with mechanical thrombectomy were collected for a 1-year period (n=119). Controlling for 26 clinical and radiological potential confounders and adjusting significance cutoff for a false discovery rate of 5% with Benjamini-Hochberg method, we used linear regression to assess if levels of glucose, urea, creatinine, aspartate aminotransferase (AST), alanine aminotransferase, lactate dehydrogenase (LDH), creatine kinase (CK), C-reactive protein (CRP), hemoglobin, neutrophils, eosinophils, basophils, lymphocytes, monocytes or platelets are significant predictors of modified Rankin scale (mRS) at 3 months after stroke (primary outcome) or National Institutes of Health Stroke Scale (NIHSS) at 24h (secondary outcome). A multivariate linear regression model adjusted for potential confounders was then created for each outcome in a backward stepwise manner considering significant predictors from univariate analyses (exclusion criterion: P>0.05).

Results: In univariate analyses controlling for potential confounders, urea (P=0.009), AST (P=0.008), LDH (P=0.012) and CRP (P=0.004) were identified as significant predictors of mRS at 3 months, whereas AST (P<0.001) and CK (P=0.005) showed to be significant predictors of NIHSS at 24h. Multivariate model of mRS at 3 months included AST (P=0.013) and urea (P=0.012) as significant predictors, whose removal would decrease coefficient of determination R2 (adjusted for number of predictors) from 52.0% to
43.8%. Multivariate model of NIHSS at 24h included AST (P<0.001) (adjusted R2=63.6%; 52.0% without AST).

Conclusions: Our work might contribute to better prediction of clinical response to acute ischemic stroke approach with mechanical thrombectomy using routinely requested blood measurements.

CO.RAQ1. Percutaneous vertebral biopsies - Assessment case-by-case of our Department
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Introduction: Percutaneous spine biopsy has widely replaced open biopsy during the last 50 years. Closed biopsy is more cost effective, less invasive, and has fewer complications than open procedures. The contributing factors include location and type of lesion, needle system and use of different modalities of imaging as well as the physician’s expertise.

Methods: We analyzed retrospectively 240 percutaneous vertebral biopsies performed in our center, between the years 2016 to 2019, sorting them according to demographic distribution, supporting imaging techniques, vertebral segment and location of biopsy, histopathological results, adjunct treatment and complications.

Results: 43% of our patients were female (n=102), with an average age of 68. Fluoroscopy was the imaging technique most commonly used (99%, n=237). Most of our procedures were performed in the lumbar spine, representing 47% (n=112) of the total biopsies, followed by thoracic spine (42%, n=100). In 93% of biopsies (n=223) we attained sufficient samples for histological analyses. Out of the 240 biopsies, 18 (7.5%) had to be repeated, of which 14 (77.7%) had diagnostic yield. Histologically, 28% (n=67) of samples had no pathological changes and 27% (n=65) had the diagnosis of metastatic disease. We performed adjunct treatment with vertebroplasty in 19% of cases following biopsy, in order to stabilize pathological fractures and palliate pain. Only one patient had a complication following procedure, which was dural tear.

Conclusion: Percutaneous transpedicular vertebral biopsy under local anesthesia is an important tool in the evaluation of vertebral body lesions, and also adjacent para-vertebral tissues, especially in older population and can be performed with minimal morbidity and high diagnostic yield as an outpatient procedure. As current literature dictates, we demonstrated that most of the biopsy samples we took are adequate for histopathological analysis and that metastatic lesions are more prevalent in the tumoral scope.

CO.RAQ2. Computed tomography myelography (CT myelography) - a non-obsolete technique in the age of MRI
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Introduction: Computed tomography myelography (CT myelography) is an important imaging modality that combines the advantages of myelography and the high resolution of CT. Although its relevance has drastically diminished with the advent of MRI, there are still conditions in which it can play a key role. We present two clinical cases where this technique played a vital role in the diagnosis and therapeutic guidance of the patients.

Clinical cases: 47-year-old male with right proximal brachial paresis (mainly depending on the deltoid and infraspinatus muscles) and hypothesia in the deltoid region, with sudden onset and without triggering, associated with decreased osteotendinous reflexes in the ipsilateral upper limb and pyramidal signs in the remaining segments. A 72-year-old woman with multiple previous lumbar surgeries, in the context of degenerative disease, presented with right crural paresis, sensory level through the L1 dermatome, diffusely alive osteotendinous reflexes and urinary incontinence, two weeks after the last surgical manipulation. In both, MRI showed enlargement of the posterior space to the upper thoracic medulla, with its anterior deviation, without changes in its normal signal, but whose etiology has not been clarified. CT myelography, in the first case, revealed dorsal indentation and distal thinning of the medulla (scalpel sign), without associated cystic lesions, suggesting an arachnoid web; in the second case, an intradural extramedullary cystic lesion with late and gradual opacification by contrast was found, favoring the hypothesis of arachnoid cyst; in both cases surgical treatment was decided.

Conclusion: CT myelography provides excellent spatial resolution and anatomical detail of the CSF compartments, also allowing its dynamic study, being crucial in the differential diagnosis between web/ arachnoid adhesions, arachnoid cysts and medullary herniation, in which MRI may be insufficient for the diagnosis.

POSTERS ORL
P.ORL1. Otosclerosis - CT grading
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Introduction: Otosclerosis is a complex and progressive disease that can result in spongiosis or sclerosis of portions of the petrous bone leading to conductive, sensorineural, or mixed hearing loss. Hearing loss from otosclerosis is often
bilateral, and the effect on quality of life can be profound. Otosclerosis may be fenestral, most common, (confined to oval window-a process which begins at a small cleft known as fissula ante fenestram) or retrofenestral (where the bone of cochlea is involved). Imaging plays an important role in the diagnosis and management of otosclerosis. High-resolution CT of the temporal bone using 1-mm (or less) thick sections is the modality of choice. Symons and Fanning have published a CT grading system for otosclerosis: grade 1, solely fenestral, either spongiotic or sclerotic lesions, evident as a thickened staples footplate, and/or decalcified, narrowed or enlarged round or oval windows; grade 2, patchy localized cochlear disease (with or without fenestral involvement) to either the basal cochlear turn (grade 2A), or the middle/apical turns (grade 2B), or both the basal turn and the middle/apical turns (grade 2C); and grade 3, diffuse confluent cochlear involvement of the otic capsule (with or without fenestral involvement).

Methods and Objective: We retrospectively collected and analyzed CT-scan images of patients with otosclerosis and selected examples of the different grades (grade 1, grade 2 and grade 3) according to Symons/Fanning grading system.

Final considerations: Otosclerosis is a progressive cause of hearing loss and early diagnosis of the disease with the correct grading is mandatory to prevent its progression and to choose the appropriate treatment.

P. ORL2. Orbital Lymphoma: 15 years until diagnosis - Case report of an extra-ocular orbital Non-Hodgkin Lymphoma with 15 years of evolution
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Introduction: Lymphomas are part of the differential diagnosis of orbital masses, but their diagnosis is not always easy and can often be protracted. We present a case of a type B non-Hodgkin lymphoma presenting with a story of 15 years of exophthalmos. We further present imaging characteristics and pearls and pitfalls of the differential diagnosis of lacrimal gland region.

Case Report: A 47 year old woman presented with left eye exophthalmus, with 15 years evolution. CT and RMN Orbit were performed, revealing an extra-ocular lacrimal gland region mass, indistinguishable of the lacrimal gland with low SI on T1WI, high SI on T2WI and DWI and homogeneous enhancement. Biopsy of the mass revealed extranodal marginal zone B-cell lymphoma of MALT type (CD20+, bcl2+, CD3-, CD5-, CD23-, CD10-, bcl6-, cyclin D1-). Ocular adnexal lymphomas can be primary or secondary, and may be solitary or multiple, localised or extensive. Imaging characteristics alone do not allow specific diagnosis but can help differentiate between benign and malignant lesions, and help in the decision to intervene or “leave-it-alone”. Being aware of these entities is essential as is recognising main differential diagnosis. We present pearls and pitfalls of differential diagnosis of lacrimal gland region masses, including: lymphoma, rhabdomyosarcoma, lacrimal gland tumors, other head and neck tumours, orbital metastasis (including systemic lymphoma), idiopathic orbital inflammation or Ig-G4 related orbital disease and benign and malignant bone lesions. Imaging evolution is also presented.

Conclusion: Lymphomas are often difficult to diagnose with many different entities presenting with clinical and imagiological overlapping features. We present one case with symptoms going back 15-years from time of diagnosis, emphasising the wide range of clinical presentations. Knowledge of the imaging features of these diverse entities is essential for radiologists in training and specialists alike.

P. ORL3. The petromastoid canal, the discovery of a non-fracture
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The petromastoid canal is located in the petrous portion of the temporal bone, connecting the mastoid antrum to the posterior cranial fossa. Recognizing the existence of this structure aids in avoiding its confusion with a fracture line, especially in cases where it is only visible unilaterally.

It was first described in 1904 by Moret and Rouviere. A slice thickness of 1mm or less guarantees a 100% visualization of this channel. With the advent of high-resolution CT, studies on its dimensions and orientation were carried out.

It can be visualized between the anterior and posterior portions of the superior semicircular canal on a thin slice CT study i. Its medial opening is called the subarcuate fossa and dura mater projects into its lumen.

This channel allows the passage of the subarcuate artery, which is why it is also known as the subarcuate canalculus. Thus, it is a route for the spread of mastoid infection to the intracranial compartment.

Mastoid cell development reaches the subarcuate fossa towards the end of the first year of life. The channel becomes narrower with the child’s development until it reaches the adult caliber at around 5 years of age.

We present a case in which this channel has the characteristic path and a narrow caliber, in accordance to the age of the patient, but which is visible with particular clarity due to bilateral mastoid sclerosis in the region, as a result
of previous surgical interventions (bilateral channel down mastoidectomy).

In the coronal plane, this channel is visible simultaneously with the posterior branch of the superior semicircular channel, giving rise to a cruciform aspect reminiscent of the Cross of Portugal, also known as the Cross of the Order of Christ, in a sailing ship from the Discoveries.

P.ORL4. Temporal meningioma - a rare location with an atypical manifestation
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Introduction: Meningioma is the most common intracranial neoplasm, although it can also appear in extracranial location. However, meningiomas with temporal bone involvement are particularly rare, generally having an intracranial starting point, although their clinical presentation depends on their route of extension. We present a clinical case of a meningioma with inaugural clinical presentation of serous otitis media.

Clinical case: A 48-year-old woman with left conductive hearing loss and associated episodes of otorrhea, with a 3-year evolution, refractory to the medical and surgical treatment. CT scan showed total occupation by soft tissues of the tympanic cavity and mastoid on the left, without destruction of the ossicular chain nor the internal bone limits; however, hyperostosis of the temporal bone was found, particularly in the region of the tegmen tympani, where it had an irregular and permeative appearance. Complementary MRI study revealed en plaque lesion adjacent to the tegmen tympani and extending to the tympanic cavity, with concomitant mastoid inflammatory changes. No lesions were observed in the jugular foramen or in the internal auditory canal. A combined surgical approach with middle ear and eustachian tube clearance was proposed, together with removal of the component in the middle fossa and repair of the tegmen tympani.

Conclusion: Temporal bone meningiomas are rare and can occur by three different routes: through the internal auditory canal, tegmen tympani or the jugular foramina; the last two allow its extension to the tympanic cavity, which may manifest as serous otitis media. It is important to highlight that patients with unexplained serous otitis media and/or resistant to the established therapy, CT scan of the temporal bone is mandatory, and if the findings are suspicious, the study should be complemented with MRI, allowing to exclude/confirm this potential diagnosis and establish its anatomical extent.

P.ORL5. Petrous Bone Fractures – Traditional and Otic Capsule Sparing/Violating Classification Systems
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Introduction: The classical classification system of temporal bone fractures classify them as longitudinal, transverse, oblique and mixed, based on fracture orientation in relation to the petrous ridge. (3) Although several studies have been performed to find an association between this traditional classification system and clinical outcomes, they fail to predict petrous bone complications, such as facial nerve paresis or paralysis, cerebrospinal fluid (CSF) leakage, conductive hearing loss (CHL) and sensorineural hearing loss (SNHL). (2) For this reason, a new classification system regarding violation/sparing of the otic capsule was suggested and has been demonstrated by several studies to provide better correlation with clinical prognosis and to aid in deciding the most appropriate therapeutic approach. (2,3,5,)

Objective: To review images of petrous bones fractures and to analyse them with the two classification systems. Methods: We retrospectively analyzed CT-scan images of patients presenting to the emergency room in Santa Maria Hospital, from May 2019 to June 2021, and selected the cases with petrous bone trauma, classifying them by the traditional and otic capsule sparing/violating classification.

Results: We found a total of 44 petrous bone fractures and classified them as 38 (86%) sparing the otic capsule and 6 (14%) violating the otic capsule. From the cases sparing the otic capsule, 19 (50%) were longitudinal, 14 (37%) oblique and 5 (13%) transverse; from the ones violating the otic capsule, 2 (33%) were longitudinal, 0 (0%) oblique and 4 (66%) transverse.

Conclusion: It was possible to classify the petrous bone fractures with the two classification systems. In future studies, it would be interesting to find a correlation between the classification systems and clinical data, such as the possibility of developing new intracranial complications and their severity.

P.ORL7. Labyrinthitis ossificans: a pictorial review
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Introduction: Labyrinthitis ossificans entails abnormal bone formation in the membranous labyrinth following an insult to the cochlea, semicircular canals, vestibule or otic...
capsule. Clinically, it is associated with acquired, irreversible sensorineural hearing loss, dizziness and vertigo. It may be unilateral or bilateral, depending on its etiology, and can be identified as early as 2 weeks after the initial insult. It’s most often caused by infection, trauma, malignant infiltration, autoimmune disease and labyrinthine hemorrhage. Histopathologically, it involves acute inflammation, followed by fibroblastic proliferation, leading to pathological ossification typically seen first in the basal turn of the cochlea. Imaging is key for an accurate and prompt diagnosis, aiding hearing preservation. High-resolution CT shows sclerosis, irregularities or obliteration within the membranous labyrinth. MRI detects fibrous changes as hypointense T2 foci, may be more sensitive to subtle cochlear calcification, and can reveal post-gadolinium membranous labyrinth enhancement preceding ossification. Combining both imaging modalities may yield findings which would be missed by either isolated technique. Labyrinthitis ossificans is present in up to 13% of patients referenced for cochlear implantation. An accurate and detailed report allows the surgeon to plan the side of implantation, the surgical approach and the appropriate type of implant.

**Methods and Objective:** In this pictorial review, we retrospectively analyzed 13 labyrinthitis ossificans cases to display key image findings and highlight crucial features for an appropriate differential diagnosis and preoperative evaluation. Results: Imaging techniques are crucial for an accurate diagnosis of labyrinthitis ossificans. At end stage disease, CT is enough to define the extent of ossification. Subtle findings in earlier stages, like membranous labyrinth fibrosis, can be identified by MRI even prior to calcification.

**Conclusion:** CT and MRI are able to diagnose and stage labyrinthitis ossificans, providing complementary and crucial information to surgical planning.

**P. ORL8. Sinonasal malignant mucosal melanoma:**

**Key diagnostic imaging features**

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**Introduction:** Sinonasal malignant mucosal melanoma (SNMM) is a rare subtype of malignant melanoma, comprising about 4% of all sinonasal malignancies. Most SNMM show T1-hyperintensity and T2-hypointensity on magnetic resonance imaging (MRI), although its imaging features depend on the amount of melanin. In addition, the presence of a “septate pattern” on precontrast T1-weighted imaging (T1WI) with alternating hyperintense and hypointense striations has shown to be a reliable diagnostic imaging feature, enabling the differential diagnosis between SNMM and other sinonasal malignancies.

**Methods:** We present the case of a histologically proven SNMM in a 79 year-old woman.

**Results:** A 79 year-old woman with unremarkable medical history was admitted to our hospital due to left peripheral facial palsy and progressive loss of vision. A CT scan of the brain was performed and showed a space-occupying soft tissue lesion in the right nasal hemifossa, ethmoidal cells and sphenoid sinus, causing bone remodeling and erosion. The lesion extended to the skull base and to the sellar, suprasellar and right parasellar regions, generating mass effect on the frontal brain parenchyma and optic chiasm. On MRI the lesion displayed a “septate pattern” on T1WI and was mainly isointense on T2WI, showing relatively homogeneous enhancement following gadolinium injection.

The patient underwent endoscopic surgery and the nasal and paranasal components of the lesion were removed. Histological examination of the surgical specimen disclosed a malignant melanoma.

**Conclusion:** SNMM is a rare malignant tumor which may present variable imaging features, according to its melanin content. The presence of a “septate pattern” on T1WI may be a key diagnostic imaging feature, allowing the differential diagnosis with other sinonasal malignancies. Recognizing these features may be of crucial importance, as these tumors may benefit from targeted therapy and have a considerably worse outcome compared to other sinonasal malignant tumors.

**P. ORL10. Intestinal-type adenocarcinoma of the nasal cavity and paranasal sinuses in wood dust exposure workers**

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Intestinal-type adenocarcinoma of the nasal cavity and paranasal sinuses is a rare malignant neoplasm, typically originating from the olfactory cleft. It can occur sporadically or associated with occupational hazard, being described in workers exposed to wood dust. There are many histological subtypes, which behave clinically heterogeneously, with a poor overall prognosis, with high rates of recurrence and mortality. Clinically, they usually present as an expansive lesion in the nasal cavity, causing unilateral nasal obstruction, with associated rhinorrhea or epistaxis.

We present a case of a 59-year-old male, that worked in a cork factory, presenting with headache, disorientation and gait disturbance for 1 week, without nasal obstruction or respiratory symptoms.

In this context, imaging studies, revealed a large expansive lesion centered on the right nasal cavity, with expression
in both maxillary sinuses and bilateral intra-orbital expression, as well as extension to the anterior cranial floor with parenchymal invasion, with a necrotic-cystic morphological pattern.

Olfactory neuroblastoma, nasal cavity carcinoma, metastasis or invasive fungal infection, were considered as differential diagnosis (in decreasing order of probability).

The histopathological study revealed an intestinal-type nasal cavity adenocarcinoma, often related to professional exposure to wood dust, with poor long-term prognosis. The standard treatment is surgical resection, with adjuvant chemoradiotherapy. Serial imaging studies 3 months after surgery revealed “de novo” parenchymal tumoral invasion in the bilateral frontal parenchyma, reflecting tumor recurrence. Clinically, the patient evolved unfavorably, with a fatal outcome 6 months after diagnosis.

Intestinal-type adenocarcinoma of the nasal cavity and paranasal sinuses, although uncommon, should be included in the differential diagnoses in the appropriate clinical context, namely in workers exposed to wood dust.

P.ORL11. Congenital Dacryocystocele, a rare cause of respiratory distress in newborns

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Introduction: Congenital dacryocystoceles are a relatively rare congenital malformation, with unilateral cases being more common (75% of cases). Despite being a relatively benign condition, with the majority of cases manifesting with mucopurulent discharge and resolving spontaneously or with conservative treatment, rare cases can have a more severe presentation with infants being unable to breath. Neuroradiologists should be able to help diagnosing this pathology and excluding possible complications associated with it.

Methods: We present two cases from our pediatric hospital of newborns initially suspected of having choanal atresia, who turned out to have bilateral dacryocystoceles.

Results: In the first case, a term newborn was transferred to our hospital with suspected right choanal atresia but clinically well, showing no respiratory distress. In the second case a term newborn showed some breathing difficulty and good saturation only with the aid of an O2 mask. In both cases, a CT scan showed cystic formations in both lacrimal fossae, which extended along nasolacrimal ducts, which were significantly enlarged, into the nasal fossae causing nasal obstruction, consistent with bilateral congenital dacryocystoceles. Neither showed anatomical barriers (mucosal or osseous) suggestive of choanal atresia. The second case was further studied with MRI. No surgical treatment was necessary due to lack of apnea or other serious respiratory manifestations. Both have been treated conservatively with local massages and have shown improvement in subsequent consults.

Discussion: Bilateral congenital dacryocystoceles are a cause of neonatal nasal obstruction and should be considered in infants with respiratory distress. Awareness of its imagiological typical findings is necessary for diagnosis and proper treatment decisions.

P.ORL12. Atresia auris congenita – a clinical case
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Introduction: Atresia auris congenita is an external and middle ear malformation, with an incidence of 1:15000 newborns, bilateral in 20% of cases, which can be associated with polymalformative syndromes. It results from anomalies during embryogenesis, of genetic or ambiental etiology. Characteristic morphopathologic findings include auricle malformation, hypoplasia or aplasia of the external auditory canal (EAC), multiple ossicular malformations, with incudomalleolar fixation and/or fixation of the ossicles in the epitympanic recess. Incudostapedial joint may not be present and facial nerve canal anomalies may coexist. Altmann classification divides this condition in three groups according to the severity of EAC and tympanic cavity hypoplasia, the anomalies of the ossicular chain and the pneumatization of the mastoid. Association with cholesteatoma of the external and middle ear is described in the literature, affecting mainly the cases with most severe EAC hypoplasia.

Clinical case: A 13-year-old boy, with a history of dysmorphic syndrome, which included auricle malformation, and of conductive hearing loss, performed a temporal bone CT scan because of persistent episodes of otorrhea and difficulty in otoscopic evaluation. CT revealed the presence of short and narrow EACs, hypoplastic tympanic cavities, dysmorphic and malpositioned ossicles, fixated in the epitympanum, barely discernible ossicular joints and mastoid hypopneumatization. There were also imaging findings of cholesteatoma, with soft-tissue attenuation in the middle ear and bony erosion of the ossicular chains and scuta. Inner ear was normal. The findings were compatible with first to second degree atresia auris congenita, with a superimposed cholesteatoma.

Conclusion: The precise identification and classification of ear malformations is a useful ability to the neuroradiologist, albeit difficult for the multitude of possible presentations. Furthermore, classification systems enable a standardized and objective evaluation, and may serve as a basis for prognosis and therapeutic decisions.

P.ORL13. Clinical-radiological correlation in aberrant internal carotid artery: as far as the otorhinolaryngologist can see
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Aberrant Internal Carotid Artery (ICA) in the middle ear is a well-recognized, but a rare vascular anomaly of the temporal bone. When the triad of symptoms and signs - pulsatile tinnitus, conductive hearing loss, and a reddish pulsatile retrotympanic mass in the anteroinferior quadrants - are present, suspicion is high, and imaging investigation is the next step. However, typical presentation may not be present, may be discrete, or be part of other pathologies.

We present the case of a 76-year-old woman with a history of recent onset of hypoacusis and pulsatile tinnitus in the left ear after upper airway infection. Initial otomicroscopy revealed otitis media with effusion, and audiological assessment unilateral conductive hearing loss. After resolution of otitis media with effusion, complaints of pulsatile tinnitus persisted and a computed tomography angiography of the head and neck was performed. The main aspect found was a rare anatomical variant called aberrant ICA. On the left, instead of an internal carotid artery, there is a larger ascending pharyngeal artery that, through its branches establishes communication with the internal carotid itself, at the level the horizontal segment of the carotid canal. For better detail, after knowing the result of the imaging study, otoendoscopy was performed with the observation of a slight opacified/white area in the anteroinferior quadrant.

Nowadays, the pressure exerted on physicians to solve problems in the least possible number of contacts with patients, and work schedules with an inadequate volume of patients, can lead to less careful evaluations and more interventional attitudes.

Given the overlapping pathologies, otitis media with effusion and a vascular malformation in the middle ear with an atypical presentation (no persistent conductive hearing loss, nor reddish pulsatile retrotympanic mass), simple procedures such as a myringotomy often performed in the context of consultation could lead to catastrophic hemorrhage.

P.14. Behind the Name: Eponyms in temporal bone imaging
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In medicine, an eponym is a word that is derived from a person's name, typically alluding to an anatomic structure, disease, or syndrome. Eponyms are ubiquitous and numerous throughout the medical literature, namely the neuroradiology lexicon.

Although some authors recommend more descriptive terms instead of using eponyms, the established history and common use of eponyms make it unlikely that they will disappear from the vocabulary. Therefore, neuroradiologists should be familiar with both the eponymous and descriptive names to ensure accurate communication and prevent erroneous identification. Some eponyms describe potentially fatal infections and their urgency should be appreciated. Other eponyms, such as those for inner ear congenital anomalies, are probably best avoided as they can be used imprecisely and cause doubt.

Study of these eponyms provides information about these disease processes and other medical knowledge for use in daily practice. In addition, biographic information about the pertinent physicians can yield insights into the many times surprising origins of these eponyms.

We aimed to review biographic sketches of these physicians and discuss the clinical relevance of the anatomic features, malformations, and syndromes that bear their names.

P.ORL.15. Pre and Postoperative Imaging of the Temporal Bone: what the neuroradiologist should know and report
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The anatomy of the temporal bone is complex and interpreting CT and/or MR imaging examinations performed on patients with a history of middle ear, mastoid and internal auditory canal surgery can be challenging.

Surgical approaches to the temporal bone can be categorized didactically into tympanoplasty and ossicular reconstruction, mastoidectomy, and approaches to the cerebellopontine angle and internal auditory canal. In clinical practice, different approaches can be combined for greater surgical exposure.

Familiarization with the types of highly specialized surgeries practiced by otolaryngologists and their indications, as well as their normal appearance on cross-sectional imaging, is crucial to demystify the pre and postoperative temporal bone. In addition, it allows the neuroradiologist to detect recurrent disease and potential complications, which can be communicated properly to clinicians.

We provide a pictorial review of the more commonly performed neuro-otologic surgical approaches and their
indications as well as the expected postoperative findings on cross-sectional imaging of the temporal bone.

**P.ORL17. A Rare Cause of Neurosensory Hearing Loss and Vestibular Dysfunction: A Case Report**

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Osteomas are indolent benign osseous tumours, rarely occurring in the internal auditory canal (IAC). Although they may constitute incidental findings on asymptomatic patients, they can compromise the IAC’s calibre and affect the vestibulocochlear and facial nerves. The relationship between vestibulocochlear symptomatology and IAC osteomas remains cryptic, with the amalgam of complaints ranging from hearing loss to altered balance.

A 57-year-old woman, with no relevant medical history, was referred to the ENT outpatient clinic following complaints of left side progressive hearing loss, hindered balance, occasional dizziness, and vertigo. Except for abnormal Rinne (bilaterally positive) and Weber (lateralized to the right) tests, physical examination was unremarkable, including otoscopy. Audiogram confirmed left-side severe neurosensory hearing loss. Auditory evoked potentials were normal on the right side and absent on the left side, asymmetry which might suggest that a retrocochlear pathology is accountable for the involvement of the cochlear nerve. Videonystagmography was abnormal on the left, indicating simultaneous involvement of the vestibular nerve, and posturography confirmed imbalance.

Brain MRI showed a T1- and T2-weighted imaging hypointense pedunculated lesion, contiguous with the petrous portion of the temporal bone, without contrast enhancement, suggestive of IAC osteoma. The lesion protruded to the cerebellopontine angle and reduced the calibre of the internal acoustic meatus, contacting the acousticofacial bundle. Subsequent CT examination further supported this diagnosis, showing a smooth-bordered, well-demarcated, peri-centimetre bony mass. A conservative surveillance strategy was preferred.

Although CT is the preferred diagnostic modality for osteomas of the IAC, MR imaging is essential for depicting eventual nerve bundle compression and for the accurate differential diagnosis, particularly with vestibular schwannomas. CT is useful for distinguishing bony lesions, highlighting characteristic findings: osteomas are usually solitary, well-demarcated and pedunculated tumors, with bone marrow delineated by dense bone. Familiarity with this entity is essential to avoid unnecessary workup.

**P.ORL18. Neuroimaging of bisphosphonate-related osteonecrosis of the jaw**

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**Introduction:** Bisphosphonates (BP) are drugs used to treat hypercalcemia secondary to bone resorption conditions with increased osteoclast activity such as malignancy, osteoporosis, Paget disease and fibrous dysplasia. Recently, an association between the chronic use of these drugs and osteonecrosis of the jaw has been recognized, often further complicated with a process of osteomyelitis and infection of the facial soft tissues. The risk is greater for patients with bone malignancy who are likely to have received intravenous BP, instead of oral BP.

**Material and Methods:** We report a case of infected bisphosphonate-related osteonecrosis of the jaw (BRONJ) that presented in our institution.

**Results:** A 51-year-old female with a clinical history of malignant breast cancer with osseous metastases, under long-term intravenous zoledronic acid which had been taken for 7 years, presented in our institution with left facial swelling. Head and neck CT scan revealed osteolytic areas in the left side of the mandible, associated with bone marrow sclerosis and thick periotic reaction of the body and ascending ramus of the mandible. There was also diffuse left hemifacial edema and an abscess was identified in the left masticator space. These findings were compatible with BRONJ, with an associated infectious process. Mandibular surgery debridement was performed and zoledronic acid was suspended.

**Discussion:** The mechanism by which BPs cause osteonecrosis is not proven but it is probably due to a combination of decreased bone remodeling in the jaw, to a degree that impairs the ability to repair the microdamage induced by oral trauma and/or infection. While pain is a typical presenting feature, approximately 1/3 of cases are asymptomatic, as these lesions most likely become symptomatic when the necrotic sites become secondarily infected. Physicians who prescribe bisphosphonates must be aware of this disease with a low prevalence but a potentially high impact.
hemangiomas, lipomas, lipochoristomas, inclusion cysts, metastases, primary adenocarcinomas, melanomas, and MALT lymphomas. Distinction from VSs is often not possible with preoperative imaging, and definitive diagnosis is only made by histopathology after surgery.

**Methods and Results:** We retrospectively searched our hospital database for patients with IAC masses (with or without CPA involvement), and selected cases of common and rare lesions, including presumably vestibular and facial schwannomas, meningioma, metastases, lipoma, and hemangioma. Some of these patients underwent surgical excision and had definitive histopathological diagnosis. Clinical data and CT/MR images were collected and discussed.

**Discussion & Conclusion:** Advances in neuroimaging have led to the detection of an increasing number of smaller tumors in the IAC, but VS and meningiomas still account for the vast majority of these. Other rare lesions may occur within or involve the IAC, and most of them are misdiagnosed preoperatively as VSs. Although definitive diagnosis is made by histopathological examination, there are some imaging clues and pitfalls that should not be missed by the neuroradiologist. Moreover, imaging plays an essential role in evaluating lesion size and extension, and mass effect on the adjacent structures, which is critical for treatment planning.

**P.ORL21. Restricted Diffusion of External Acoustic Meatus as a Manifestation of Chronic Intracanalar Foreign Body**

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**Introduction:** The presence of foreign bodies inside the external acoustic meatus (EAM) is a relative common problem in the pediatric age, however is unusual in the adult population.

**Clinical case:** A 52 years old male presented with 3 to 4 days progressive symptomatic worsening of subacute moderate left ear pain associated with ipsilateral hearing loss, without history of ototrauma/otorrhea, vertigo, fever or focal neurological deficits. No familial or personal medical history. On otoscopic examination, there was a severe narrowing of the medial part of the EAM secondary to inflammation. Consequently, it wasn’t possible the evaluation of tympanic membrane. On the CT scan, it was documented heterogenous opacification of the medial third of EAM with predominant soft tissue density, inside of which was a poorly defined hypodensity area with calcified foci. Additionally, there was adjacent bone erosion of manubrium of the malleus and anterior-inferior EAM walls, as well as opacification of middle ear cavity (MEC) and some mastoid cells with soft tissue density. On the MRI scan, there was hyperintense T2/FLAIR opacification of EAM, MEC and mastoid cells with restricted diffusion adjacent to the lateral aspect of the tympanic membrane. The differential diagnosis between abscess collection and cholesteatoma was considered. Inside the medial third of the EAM and lateral to the area of restricted diffusion, there was a oval-shaped hypointense T1 and T2/FLAIR area (concordant to the hypodense area on CT). After antibacterial therapy, on otoscopic examination, there was an improvement of the EAM inflammation, that allowed the observation and extraction of a cotton-like foreign body (due to previous swab usage), followed by complete symptomatic resolution.

**Conclusion:** The present case intends to highlight this uncommon complication of swab usage, which should be taken into account when evaluating an adult patient with hearing loss and ear pain.

**POSTERS RAQUIS**

**P.RAQ1. Grisel syndrome in adulthood: a case report**

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**Introduction:** Grisel syndrome is characterized by non-traumatic atlantoaxial subluxation usually secondary to an inflammatory or infectious process of the head and neck (H&N) region, such as a retropharyngeal abscess. Painful torticollis is the most typical presentation, but it can also be accompanied by neurologic symptoms. It usually occurs after H&N surgery, and it is mainly reported in children.

**Methods:** We describe a case of a patient referred to the neuroradiology department due to headache and right cervicalgia 4 months after a nasal septum surgery.

**Results:** The patient is a 68-year-old male with a history of diabetes mellitus who underwent surgery for a deviated nasal septum. One week later he developed a slight headache and right cervicalgia for which he was prescribed medical treatment. At the time CT scan did not show any abnormalities. Roughly 3 months later, the patient complained of worsening of both headache and right cervicalgia, without a satisfactory response to analgesia. The patient underwent a new CT scan and subsequent MRI which revealed osteomyelitis of the skull base with septic arthritis of C0-C1 and C1-C2 and concomitant atlantoaxial subluxation. An abscess was also present in the retropharyngeal and paravertebral spaces. The patient underwent surgical drainage of the paravertebral abscess and fixation of the occipital-vertebral junction.
in addition to a 6-week antibiotic regimen. Serial imaging showed continued improvement. The last exam, performed around 8 months after the spine surgery, showed complete resolution of the infectious process and adequate alignment of the cervical spine.

**Conclusion:** Though less common than in children, Griesel syndrome can also occur in adults, especially after H&N surgical procedures. In this clinical context, persistent cervicalgia should raise suspicion of Griesel syndrome, especially if patients do not improve significantly after adequate medical treatment and are immunocompromised by conditions such as diabetes, prompting a cervical MRI.

**P.RAQ2. A rare case of Spinal Dural Arteriovenous Fistula without myelopathy, presenting as radiculopathy**

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**Introduction:** Spinal dural arteriovenous fistula (SDAVF) is the most commonly occurring type of spinal vascular malformation, comprising about 70-80% of all spinal vascular malformations. They are generally believed to be acquired lesions affecting mainly middle-aged men. This condition can eventually lead to venous hypertension, venous congestion and intramedullary edema, resulting in myelopathy symptoms such as paraparesis, sphincter and sensory disorder. To the best of our knowledge, only a few cases of SDAVF without myelopathy have been reported in the literature.

**Material/methods:** We describe a rare case of a SDAVF without myelopathy.

**Case report:** A 62-year-old man without any relevant history of significant illness or traumatic injury in the past, presented with long-standing right-sided lumbar and lower limb radicular pain, without any other symptoms. Physical examination did not demonstrate any associated motor weakness or sensory changes. MR of the thoracic spine did not show relevant central canal or foraminal stenoses but revealed, along with MR angiography, prominent dilated vessels, suggestive of venous engorgement, predominantly on the dorsal surface of the spinal cord, without associated spinal cord edema. Spinal digital subtraction angiography was later performed and revealed a SDAVF fed by the right L1 radicular artery, with a perimedullary venous drainage, predominantly posterior, from D11 to L2 levels.

**Discussion:** This case indicates that SDAVFs can manifest exclusively with radiculopathy. Typically, venous hypertension results in spinal cord ischemia or edema and presents as homogenous, longitudinally extensive T2 signal abnormality within the central spinal cord. In addition, an MRI classically shows flow void of the radicular veins and cord enlargement. The pathophysiology related to our case may be similar to that of neurovascular compression syndrome, with compression of a rootlet by an enlarged vascular structure. Our case helps recognize SDAVF as a potential cause of radiculopathy, even in the absence of typical symptoms.

**P.RAQ3. Lytic lesion of the spine: myxoid/round cell liposarcoma – (un)usual site of neoplastic spread**

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**Introduction:** Liposarcomas are rare malignant tumors of the soft tissue which exhibit adipocytic differentiation. Spinal dissemination is rare. Myxoid/round cell liposarcoma (MRCLS) is the second most common subtype of liposarcoma. We present a case of MRCLS presenting as a lytic bone lesion and cord compression, discuss its features and review literature on the topic.

**Clinical Case:** We report a case of a 49-year-old-female who presented with progressive difficulty in ambulation for five days. Physical examination demonstrated motor strength of 4 in 5 on both inferior limbs, hyperreflexia and severe proprioception deficit in the lower extremities. Spine CT and MRI scan were performed and revealed diffuse infiltration of the vertebrae with heterogeneous lesions, predominantly with high SI on T2W and T2W STIR and low SI on T1W. The MRI scan also documented paraspinal lesions with central canal extension at D7 to D12 and L3, causing spinal cord compression at D8. In addition, a mass involving the left kidney was discovered, which turned out to be the primary tumor. Decompressive surgery with partial resection was performed and histopathology revealed a round cell liposarcoma. Despite adjuvant chemotherapy and radiotherapy, disease progressed with pulmonic, lymph nodes and cerebral metastasis. Spine involvement in liposarcomas is not common, specially being the first anatomical place affected. MRCLS is a subtype of liposarcomas that appears to have this metastatic location preference. Being aware of this entity is highly valuable in differential diagnosis of vertebral and paravertebral lesions. We present a summarized literature review on MRCLS, their most common patterns and behaviour, and also important diagnostic imaging clues of this tumor.

**Conclusion:** The purpose of this paper is to add to the current literature on this entity, and raise awareness to the fact that spinal metastasis may be the first presentation, and hence neuroradiologists should be aware of it.

**P.RAQ4. Arachnoiditis Ossificans: an uncommon cause of spinal neuropathy**

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Introduction: “Arachnoiditis ossificans” (AO) is an uncommon entity characterized by chronic fibroblastic proliferative changes leading to extensive arachnoidal ossification. It usually affects the thoracic and/or lumbosacral region of the spine. The pathophysiology of the disease is uncertain although it has been described as a late stage of a chronic inflammatory process, with metaplasia and proliferation of osteoblasts leading to the development of ossification. AO can lead to a wide range of neurological symptoms and signs ranging from progressive paraparesis to a wide range of motor and/or sensitive changes, with or without sphincter incontinence.

Material and methods: We describe two cases of spinal arachnoiditis ossificans (AO) that presented in our institution. Results: A 48-year-old female with a clinical history of chronic Hepatitis C, intravenous drug and alcohol abuse and tobacco use, presented in our institution after she was found on the floor at her house. She denied loss of consciousness or localizing pain. The second patient, an 83-year-old female with a clinical history of stroke, chronic kidney disease, hypothyroidism and chronic heart failure, presented in our institution with complaints of long-standing lumbosacral pain. Both patients were cognitively intact. Neurologically, both showed bilateral lower limb motor weakness with normal sensation and reflexes. Spinal CT scan revealed multiple linear intrathecal calcifications involving the cauda equina roots.

Discussion: Calcified arachnoid and/or dural plaques are relatively frequent findings in surgical and autopsy specimens with an incidence of 43–76%. These asymptomatic calcifications attributed to age-related degeneration have to be distinguished from intrathecal ossification resulting from chronic arachnoiditis and known as AO.

Predisposing factors such as trauma, spinal surgery, spinal anesthesia, myelography procedures, meningitis, metabolic factors, vascular anomalies and neoplastic conditions are related to the etiopathogenesis of AO. Currently there is no consensus on either a surgical or conservative treatment for AO.

P.RAQ5. Revisiting intradural spinal cord lipomas with DTI
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Diffusion Tensor Imaging (DTI) is an advanced MR technique which enables visualization and qualitative and quantitative assessment of the integrity of white matter (WM) tracts. New technical advances allowed application of DTI to the spinal cord.

Recent studies have used DTI along with tractography to delineate the displacement and involvement of WM fibers in spinal cord tumors, being of great value for pre-operative planning, predicting resectability. However, only one study described their feasibility in spinal cord lipomas.

There are 4 types of spinal cord lipomas (dorsal, transitional, terminal, and chaotic lipomas), each with distinctive embryological origins and consequently involving different parts of the spinal cord, with distinct lipoma-cord interfaces, some engulfing neural tissue and nerve roots partially.

We present two cases of intradural spinal lipomas who performed DTI.

The first case describes a 46-year-old male who had previously undergone partial resection of a transitional lipoma involving the conus medullaris, from D11 to L1, with clinical improvement. 8 years after the procedure, symptoms recurred. MRI with DTI showed the remnant intradural spinal lipoma with points of anchorage to the posterior dura. Tractography showed ventral compaction of WM fibers.

The second case portrays a 54-year-old female, who performed MRI with DTI due to cervical pain, showing a large upper cervical spinal cord transitional lipoma, extending from the foramen magnum to C3. DTI showed a deformed and anteriorly shifted spinal cord, at the levels involved by the lipoma.

Fiber destruction or disorganization was not observed in both cases, as no significant differences in the mean values of FA and ADC between the level of the lipoma and the levels above and below.

We believe that DTI along with tractography, in the next years, will be further applied and used as additional tool in the pre-operative setting of spinal cord tumoral lesions.

POSTERS PEDIATRICS
P.PED1. Möbius Syndrome: Tertiary Center Experience
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Introduction: Möbius syndrome is a rare disorder characterized by disfunction of multiple cranial nerves, most often the 6th and 7th nerves. Usually it presents at birth and occurs sporadically in most cases.

Methods: Descriptive retrospective study of cases with Möbius Syndrome submitted to a Head MRI in our department between 2003 and 2021.

Results: Six patients diagnosed with Möbius Syndrome were included. There was a female predominance (n=4) and the median age of the first medical appointment was
A 14-year-old girl with ALL-Ph+, undergoing induction-phase polytherapy, including MTX in accordance with the standard of care. One week after the last cycle with intrathecal MTX, she developed severe emotional lability, limited active movements of the jaw, left facial palsy, anarthria, left upper limb paresis that progressed to tetraparesis, extension of the right medial rectus muscle and optic nerve, as well as posterior extension to the lateral wall of cavernous sinus and anterior wall of middle cranial fossa. It was identified the presence of oligoclonal bands on CSF. Corticotherapy was maintained for two months, with clinical relapse after withdrawn. On the follow up MRI, there was resolution of intra-orbital findings with lateral and posterior extension of the pachymeningitis previously documented. The meningeal biopsy showed granulomatous infiltration suggestive of mycobacterial infection; the blood and CSF cultures were negative. Six month after, there was escalation of the imagiological findings. A 6-month antimycobacterial treatment was initiated, without clinical-imagiological response. In the fifth year follow up MRI, there was some mild imagiological fluctuation that motivated the chronic use of immunosuppressant therapy. However, due to erroneous therapy compliance and concurrent symptomatic improvement, the medication was suspended. The CSF evaluation was repeated, and identified the presence of Mucobacterium lentiflavum. Antimycobacterial therapy was restarted and maintained for 1 year, with no signs of progression on the imaging follow up.

**Conclusion:** The present case intends to demonstrate the complexity and difficulty in obtain a definite diagnosis in patients with recurrent hypertrophic pachymeningitis.

**P.PED3. Methotrexate-Induced Leukoencefalopathy:**

**An interesting case of anarthria**

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Acute lymphoblastic leukemia (ALL) is the leading cause of malignancy in childhood. Methotrexate (MTX) is not only vital for the systemic control of the disease, but it also plays a role in the treatment and prophylaxis of central nervous system (CNS) involvement. Nevertheless, it has noteworthy neurotoxicity, being implicated in a wide spectrum of acute and chronic leukoencephalopathies.

A 14-year-old girl with ALL-Ph+, undergoing induction-phase polytherapy, including MTX in accordance with the standard of care. One week after the last cycle with intrathecal MTX, she developed severe emotional lability, limited active movements of the jaw, left facial palsy, anarthria, left upper limb paresis that progressed to tetraparesis, extensor plantar reflexes and bilateral dysmetria. CSF analysis...
was normal, highlighting the absence of leukaemic cells. Although the head CT and CT angiography were unremarkable, brain MRI depicted findings consistent with acute MTX-induced leukoencephalopathy, namely symmetrical bilateral areas of restricted diffusion in the semiovale centrum, with subtle subcortical T2/FLAIR hyperintensity sparing U-fibers and no abnormal enhancement. She was admitted for neurological monitoring and achieved complete clinical recovery within 48 hours, even in the absence of targeted therapy. An MRI performed 22 days after symptom onset showed subtotal resolution of aforementioned findings.

Acute MTX-related leukoencephalopathy usually occurs 2 to 14 days after administration and its prevalence is increased with high-dose or intrathecal use, as is the case. The changes appreciated in the diffusion-weighted imaging are the characteristic radiological marker of this entity and are believed to be reliable early signs for the diagnosis of acute MTX-related leukoencephalopathy. Beside other types of MTX toxicity, damage to the CNS is particularly worrying due to its potential for significant morbidity. In conclusion, acute MTX-induced leukoencephalopathy should be considered in the differential diagnosis of patients that presents with early-onset of neurologic symptoms and known exposure to this drug.

**P.PED4. Fusobacterium necrophorum as causative agent of complicated middle ear infections in children – clínico-radiologic report of 2 cases**

**Methods:**

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**Background:** Anaerobic bacteria are uncommon etiologic agents of acute mastoiditis in children. However, recent studies suggest an increase in the incidence of Fusobacterium necrophorum middle ear infections, often associated with exuberant destructive processes of the structures of the outer and middle ear and otic capsule, with possible intracranial complications. The purpose of this presentation is to review the imaging findings of two pediatric patients with exuberant middle ear otitis due to Fusobacterium necrophorum.

**Methods:** We present two pediatric clinical cases of complicated acute otitis media caused by Fusobacterium necrophorum with special focus on imaging characteristics.

**Results:** We describe the cases of two children, aged 2-3 years, who presented to the emergency room with otalgia and otorrhea, highlighting the presence of meningeal signs in the observation. The two patients had elevated levels of inflammatory markers and cerebral spinal fluid analysis compatible with meningitis. In the imaging evaluation, exuberant infectious/inflammatory processes of the middle ear were visualized, extending to the external canal and labyrinthine structures, emphasizing optic capsule bone erosion in the first case and of the petrous bone in the second case. Nodular dural masses were identified in both cases in the internal auditory canal, probably reactive. Ear exsudates cultures were positive for bacterial DNA PCR Fusobacterium necrophorum. Both children underwent ENT surgical intervention and prolonged antibiotic therapy with favorable outcome.

**Conclusion:** Acute otitis media due to Fusobacterium necrophorum is often associated with a complicated course and warrants particular attention by pediatricians. The presence of extensive inflammatory changes in the middle ear and adjacent structures, with destruction/erosion of osseous components and associated intracranial complications, should alert the neuroradiologist to infection by this anaerobic agent. In such cases the empiric antibiotic treatment must include agents to treat Fusobacterium necrophorum.

**P.PED5. Pediatric glioblastomas: Review of 6 cases**

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**Introduction:** Glioblastomas are the most frequent primary malignant brain tumors in adults, albeit relatively rare in the pediatric age group. On imaging studies these tumors usually show thick and irregular contrast-enhancing margins surrounding a non-enhancing necrotic core, often with significant perilesional edema. Hemorrhagic foci may also be present and the solid components of the tumor may show restricted diffusion. The aim of this work is to review the imaging features of pediatric glioblastomas based on different cases from our institution.

**Methods:** Our prospective database of pediatric brain tumors was screened from January 2010 to June 2021. Pediatric patients (< 18 years old) with histologically proven glioblastomas were selected.

**Results:** Six patients were included, of which 4 were male and 2 female, aged 11 to 17 years. Three patients presented the usual imaging features of glioblastomas, showing both solid and necrotic components and displaying irregular contrast enhancement of the solid component. One case showed a large infiltrative T2-hyperintense lesion without contrast enhancement, resembling the gliomatosis cerebri imaging pattern. Another case displayed a regular and smooth ring-enhancing lesion with a small mural nodule, mimicking a pilocytic astrocytoma, although peritumoral edema was seen. The last case showed a large T2-hyperintense lesion with a small area of restricted diffusion and mild smooth ring enhancement after gadolinium injection, without a clear necrotic core or surrounding vasogenic edema.
Conclusion: Glioblastomas are malignant tumors which may occur in all age groups, including the pediatric population. The presence of a diffuse infiltrating or focal space-occupying lesion with diverse imaging features in a pediatric patient should address the possibility of glioblastoma in its differential diagnosis.

POSTERS INFECTION/INFLAMMATION

P.INF1. Focal pseudosubarachnoid haemorrhage as a presentation form of meningeal tuberculosis
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Introduction: Tuberculous meningitis (TM) is the most common presentation of central nervous involvement by mycobacterium tuberculosis. The hematogenous dissemination towards the meninges can also extend to the subarachnoid space and adjacent parenchyma. Multifactorial stroke is a common complication, including vasculitis, more often in middle cerebral arteries and its branches.

Clinical Case: A 41-year-old man was admitted following complaints of nausea, vomiting and refractory paroxysmal headache with acute onset. Neurological examination was unremarkable and head CT depicted an apparent subarachnoid hemorrhage (SAH). CSF was notable for pleocytosis (strongly predominance of mononuclear cells), reduced glucose and increased proteins, that prompted the start of large-spectrum antibiotic regime. Brain MRI revealed punctiform foci of restricted diffusion in the right striatum and temporal pole, suggestive of acute ischemic lesions; and no subarachnoid hemorrhage – focal parietal sulcus T2 FLAIR hyperintensity was noted, with slight enhancement, suggestive of exudate. Following a sudden impairment of consciousness, allied with a lack of response to the current regime and the aforementioned imagiological findings, the possibility of TM was considered. Antituberculosisotics and corticosteroids were started, and the hypothesis was confirmed by CSF culture. Two weeks later, follow-up MRI showed an acute ischemic lesion in the left hemisproterubance, outlining nodularities and exuberant leptomeningeal enhancement. Diffuse vessel irregularities were evident on MR Angiography, with vessel- wall enhancement in perforating branches of the basilar artery, congruent with the area of recent ischemia.

Conclusion: Although the association between TM, vasculitis and subsequent stroke is well established, the causative mechanism remains obscure. In this case, there was a mislabeling of sulcal hyperdensity SAH in the setting of purulent exudate in the subarachnoid space, later confirmed by the absence of blood on MRI. Thus, familiarity with the relationship between TM, vasculitis and stroke can prompt early treatment and significantly reduce stroke-related morbidity, especially in young adults.

P.INF2. Cerebral trojan virus: a case of post-herpetic autoimmune encephalitis
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Introduction: Herpes simplex virus-1 (HSV-1) encephalitis is one of the most common causes of severe infectious encephalitis. It usually has a monophasic course but some of the patients may develop relapsing neurologic symptoms a few days to months after treatment is completed, related to autoimmune anti-N-methy-D-aspartate receptor (anti-NMDAR) encephalitis.

Case presentation: A 28-year-old woman presented to the hospital with a 6-day history of fever and headache, followed by seizures on that day. CT and then MRI were performed, showing expansion and T2 hyperintensity of the right anterior and mesial temporal lobe, extending to the insula, with meningeal and focal contrast enhancement. Lumbar puncture (LP) revealed HSV-1 positivity in the CSF. Treatment with acyclovir for 21 days was completed. After discharge from hospital, she started feeling anxious and depressed, but this was initially attributable to the antiepileptic medications. Control MRI was performed 4 months after the infection, showing an area of encephalomalacia involving part of the right anterior and mesial temporal lobe, but there was an overall increase of the T2 hyperintensity of the temporal lobe, and a new area of T2 hyperintensity in the anterior cingulate gyrus, both with patchy contrast enhancement. CSF analysis revealed anti-NMDAR positivity. Treatment with methylprednisolone for 5 days was completed and the patient improved in neuropsychiatric evaluation. Follow-up MRI showed partial regression of the changes.

Conclusion: This case highlights the importance of careful clinical and imaging follow-up of patients with previous herpetic encephalitis, knowing autoimmune encephalitis is a possible complication. Early detection and treatment may avoid permanent deficits.

P.INF3. HIV-associated and immune-mediated mononeuropathy multiplex – a case report
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Mononeuropathy multiplex (MNM) is an uncommon HIV-associated condition, defined as an anatomical pattern of peripheral neuropathy in which two or more individual nerves, nerve roots or plexus are affected, typically asymmetrical and asynchronously. Since vasculitis is thought to
be its most common cause, the possibility for MNM to have an immune-mediated basis in some HIV patients has risen.

Patients are commonly divided into two groups: patients early after HIV infection, with maintained CD4-lymphocyte (CD4) count and patients in an immunosuppressed state, with very low CD4 count, occasionally associated with CMV opportunistic infection.

We describe a case of a 43-year-old male with the onset of symptoms suggestive of MNM, 3-years after the diagnosis of HIV-1. Symptoms began with gait imbalance, followed by dysphagia, left peripheral facial palsy, dysarthria, loss of taste and bilateral hearing loss.

At the time of hospital admission, CD4 count remained normal and serum HIV-1 PCR non-detectable. Further serological and CSF tests, including PCR for CMV and presence of malignant cell in CSF, were all negative.

MRI demonstrated bilateral gadolinium enhancement of the V, VII and VIII cranial nerves and areas of T2-hyper-signal in the anterior and posterolateral aspects of the medulla oblongata and bulbo-medullary transition, suggesting demyelination.

Therefore, MNM was assumed as secondary to HIV infection, with an immune-mediated mechanism. Intravenous immunoglobulins were administered with stabilization of neurological deficits. Later, PCR HIV-1 on CSF revealed 23 copies/mL, from a spared tube of frozen CSF collected at the time of hospitalization. This led to a switch of the antiretroviral medication, to include substances with greater blood-brain barrier penetration and subsequent HIV viral load suppression on CFS was achieved.

Since there are numerous causes associated with MNM, MRI can be a helpful additional tool for accessing/excluding some etiologies.

P.INF4. Posterior Reversible Encephalopathy Syndrome after SARS-CoV2 infection in a vaccinated patient
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Posterior Reversible Encephalopathy Syndrome (PRES) is one of several neurological presentations of SARS-CoV-2. The proposed mechanism behind dysfunction of cerebral autoregulatory pathways is the binding of the virus to angiotensin converting enzyme 2 (ACE2) receptors, which leads to fragility of the endothelial layer and subsequent disruption of the blood-brain barrier.

A 52-year-old female, was diagnosed with asymptomatic COVID-19 one month after being fully immunized with the second dose of the AstraZeneca® vaccine against SARS-CoV-2. One week later, she developed generalized seizures that were preceded by headaches. The physical examination was unremarkable with normal blood pressure. CSF analysis was negative for SARS-CoV-2, only revealing subtle pleocytosis, and the electroencephalogram (EEG) showed no abnormalities with paroxysmal significance. Although head CT was normal on admission, brain MRI depicted features of vasogenic edema, namely bilateral T2/FLAIR hyperintensity in the fronto-parietal, tempo-ro-occipital and posterior cerebellar subcortical white matter, that extended to the adjacent cortex. There were no signs of hemorrhage nor abnormal enhancing areas. Angiographic studies (CT and MR angiography) were normal. Empiric treatment with nimodipine (60mg 4/4h) was started and brain MRI performed 7 days later showed clear improvement. The medical history, combined with imaging findings and evolution of the event were consistent with a diagnosis of PRES. Other possible etiologies were ruled out. On discharge, the patient was asymptomatic with normal vital signs. The case of PRES after SARS-CoV2 infection we report is, as far as we know, the first in a previously vaccinated patient. In line with other reports, the absence of hypertension supports the hypothesis that endothelial dysfunction in the setting of COVID-19 contributes to the development of PRES. In conclusion, PRES should be considered in the differential diagnosis of COVID-19 patients that show clinical findings consistent with this entity in order to ensure prompt treatment.

POSTERS VASCULAR
P.VASC1. Twig-like middle cerebral artery: a rare congenital anomaly presenting as ischemic stroke
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Introduction: During embryologic development, the middle cerebral artery (MCA) is believed to be composed of arterial twigs that will coalesce to form a single trunk. It is hypothesized that an insult during this period, like an occlusion, results in a plexiform arterial network instead of the MCA main trunk. This variation was named unfused or twig-like MCA. It may be found incidentally or present with acute symptoms, mainly due to intracranial hemorrhage (flow related aneurysms), or, less often, ischemic stroke.

Case presentation: A 66-year-old woman, with cardiovascular risk factors, presented with sudden right hemiparesis and hypoesthesia. A brain CT and CT angiography were performed. No signs of hemorrhage or ischemic stroke were seen. CT angiography showed irregularity of the left terminal internal carotid artery (ICA) and no main trunk of the
MCA, but prominent vessels resembling a moyamoya pattern were seen. The patient was treated conservatively and recovered, maintaining right hypoesthesia. Digital Subtraction Angiography was performed. It revealed a dysmorphic/dysplastic aspect of the right terminal internal carotid artery (ICA) and the proximal anterior cerebral artery, and no main trunk of the MCA arising from the ICA; instead, prominent lenticulostrate arteries and an arterial network with prominent vessels were seen; a larger vessel in the middle of this network corresponding to MCA originated the M2 branches and anterior temporal artery. These findings were suggestive of an anomaly of the MCA, resulting from an arrestment in its embryonal development (unfused/twig-like MCA).

**Conclusion:** Unfused/twig-like MCA is a rare vascular anomaly and its etiology is still not completely understood. Knowledge of its existence may prevent misdiagnosis like moyamoya disease/pattern or arteriovenous malformation.

P.VASC2. Wyburn Mason Syndrome – a unique triad

**Methods:** We describe the case of a 24-year-old male

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**Introduction and Purpose:** Wyburn-Mason syndrome (WMS) is a rare congenital nonhereditary neurocutaneous syndrome (phakomatoses) characterized by multiple arteriovenous malformations (AVMs) predominantly affecting visual pathways, the orbit and face are common and tend to be ipsilateral to the affected vessels. These findings were suggestive of an anomaly of the MCA, resulting from an arrestment in its embryonal development (unfused/twig-like MCA).

**Conclusion:** Unfused/twig-like MCA is a rare vascular anomaly and its etiology is still not completely understood. Knowledge of its existence may prevent misdiagnosis like moyamoya disease/pattern or arteriovenous malformation.

P.VASC2. Wyburn Mason Syndrome – a unique triad

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**Methods:** We describe the case of a 24-year-old male referred to the Ophthalmology Clinic to investigate abnormal conjunctival vascular changes, in the context of multiple facial and oral mucosal AVMs.

**Results:** On slit-lamp observation an extensive conjunctival vascular malformation of the left eye (LE) was present. LE fundoscopy revealed multiple dilated and tortuous arterioles and veins with arteriovenous communications with a racemose distribution from the optic disc to the retinal periphery. Brain MRI revealed AVMs around the left midbrain, in the left orbit (both intraconal and extraconal), left buccal space and superior lip. The case was discussed between a multidisciplinary team of ophthalmologists, neuroradiologists and neurologists to establish an optimal follow-up and treatment strategy.

**Conclusions:** In patients presenting with facial vascular malformations, phakomatoses should always be considered. Ophthalmologic evaluation and CNS imaging are mandatory due to phenotypic variability. WMS is a rare phakomatosis with an uncertain prognosis. Therefore, multidisciplinary approach and case-to-case discussion are paramount to achieve an optimal management.

P.VASC3. Classical Brainstem Stroke Syndromes

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**Objectives:** Clinical-imaging characterization of the main brainstem stroke syndromes.

**Background:** Brainstem stroke syndromes have characteristic clinical pictures related to the involved anatomical area, leading to crossed brainstem syndromes (ipsilateral cranial nerve palsy and contralateral signs of long tract involvement, such as hemiparesis or hemisensory deficit). Knowing the anatomy and functions of brainstem structures is helpful to understand the neurological symptoms and locate the lesion. MR imaging has high sensitivity and specificity for the diagnosis of these lesions and DWI is especially useful in the acute phase of brainstem stroke. Methods: A pictorial review of the main brainstem syndromes was performed, illustrating the affected anatomical structures in each syndrome through a schematic representation of axial sections of the brainstem, matched with magnetic resonance images from the Neurological Imaging Department of Centro Hospitalar Universitário Lisboa Norte.

**Results:** We illustrate with MR images eight brainstem stroke syndromes.

**Conclusion:** Brainstem infarcts are associated with classic clinical presentations that should raise suspicion of specific infarcted anatomical areas. Understanding the correlation between anatomical involvement and symptomatology is of extreme relevance in the identification of these lesions, for which MRI has a crucial role.

**POSTERS TUMORS**

P.TUM1. Involvement of the Cavernous Sinus and Meckel’s Cave by a Squamous Cell Carcinoma of Unknown Origin: A Case Report

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Ruben Maia; Ana Isabel Almeida; Duarte Vieira
It is often difficult to discriminate cavernous sinus (CS) lesions, whose differentials include neoplastic, inflammatory and vascular aetiologies.

A 71-year-old woman with a history of cervical squamous cell carcinoma (SSC), in full remission for the last 7 years, was admitted following insidious complaints of right hemifacial dysesthesia, dysgeusia of the right hemitongue and horizontal binocular diplopia. Neurological examination confirmed right trigeminal, abducens and facial nerves palsy. During the following months, her neurological status worsened, including the development of complete right-sided ptosis in the setting of oculomotor nerve palsy.

Initial brain MRI revealed an expansile enhancing lesion filling Meckel’s cave and the CS and additional enhancement of the cisternal segment of the right trigeminal nerve, projecting through its second and third divisions towards the pterygopalatine fossa and masticator space. Extensive full body workup was unremarkable and a corticosteroid trial was ineffective. Follow-up MRIs described growing of the aforementioned lesion and a more extensive involvement of the right oculomotor, trigeminal, abducens and facial nerves. In light of these findings, a neoplastic aetiology was proposed and a biopsy was performed, revealing a well-differentiated SCC. Multidisciplinary discussion decided on best supportive care, haltering further investigation.

As far as we know, there have been no reports of primary SCC of the cavernous sinus. Although the bulk of metastasis involving the CS are originated from head and neck primary neoplasms, some more distant tumours have also been implicated. Nevertheless, there was reluctance in the assumption of cervical cancer metastasis in this case, since there is only one anecdotal report of secondary involvement of Meckel’s cave in such setting. In accordance with the literature, mass lesions of the CS in the absence of conclusive findings should be considered metastatic until proven otherwise. Awareness of such neoplasms is essential to avoid unnecessary delays in the appropriate management.

**Discussion**: Glioblastoma should be kept in mind in the differential diagnosis of heterogeneous intraventricular tumour lesions, particularly in the lateral ventricles, as illustrated in our case. Other differential diagnosis in our patient’s age group includes central neurocytoma, ependymoma and oligodendroglioma. Although a definite diagnosis warrants histological examination, key demographic and imaging findings such as irregular borders, peripheral post-contrast enhancement, an extensive surrounding edema and central hypointensity suggestive of necrosis may help narrow the differential diagnosis.

**Materials**: A typical case of MBD is presented, showcasing the characteristic clinical, etiological, imaging features and outcome.

**Discussion**: A 52-year-old man is brought to the emergency department by firefighters after being found unconscious at home. Described as previously autonomous and cognitively intact, he had not been seen for 3 days. The patient was a heavy drinker and was cachectic and dehydrated. On neurological examination, he was alert, without verbal response, demonstrating withdrawal to painful stimuli. No focal deficits were detectable. The analytical study was in accordance with malnutrition. CT scan showed generalized hypodensity of the corpus callosum. One week later, on MRI, hyperintensity of the corpus callosum was
visualized on T2-weighted sequences, with slight thickening of its splenium. Areas of T2 hyperintensity were also present on the coronae radiatae and centra semiovale’s white matter, probably with the same etiology. During the etiological study, a supraglottic neoplasm was detected which had led to dysphagia, dyspnea and malnutrition. Tracheostomy was performed. The patient was given thiamine and high-dose methylprednisolone as soon as CT was obtained and the diagnosis of BMD was considered probable.

**Discussion:** In this patient, the two classical etiological factors for MBD were present, the clinical picture was the one described as the most frequent - altered state of consciousness - and the imaging features were characteristic. At the time of MR study, the patient was no longer in the acute phase, with a FLAIR lesion being observed throughout the corpus callosum, with no evidence of restriction on DWI. The patient developed appendicular spasticity and ended up dying on the 19th day of hospitalization.

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