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ABSTRACTS

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Oral Presentatıons

1. CAROTID BLOWOUT IN MODERN RADIOTHERAPY ERA: A REAL NEURO-ONCOLOGICAL EMERGENCY OR A MYTH?

Murat Dökdök[1]
[1]Anadolu Sağlık Merkezi

Introductıon: Rupture of carotid vascular artery was originally defined as a complication of aggressive surgery in patients with head neck cancers. Irradiation is the main predisposing factor that leads to vessel wall weakening (1,2), while tissue necrosis, fistula and infection might accompany (3). Neuroimaging could be utilized for triage, either conservative treatment or intervention (4,5). We aimed to introduce the management of potentially life-threatening carotid blowout syndrome (CBO) cases in our single-centre experience.

Materıals and Methods: Between 2006 and 2022, out of 2496 patients who had head and neck imaging, twelve patients with acute CBO presenting with ear, oral or nasal bleeding referred to our centre for further treatment were included in the study. They presented either with transient haemorrhage that resolves spontaneously or with simple packing (type II) or with profuse haemorrhage that could not be controlled by packing or pressure (type III). All patients had head and neck cancers (five nasopharynx cancer; two maxillary sinus tumour one being cystic adenoid cancer and the other invasion by submandibular gland cancer; one larynx cancer; one tongue root cancer; and one maxillofacial fibrosarcoma). They underwent radiotherapy with 70 Gray or more cumulative radiation doses at least six months before bleeding. CT or MRI was performed in all patients besides non-invasive angiographic imaging and type 1 patients based on only imaging findings were excluded. This retrospective study was approved by the institutional ethical committee (protocol number 22-141).

Results: CT and MRI demonstrated perivascular tumour necrosis and exposed vascular tree in four patients; spontaneous occlusion of abnormalities in ICA in two patients; pseudoaneurysm or vessel lumen irregularities due to tumour invasion in ICA or ECA in seven patients. The findings were confirmed by catheter angiography. One patient was lost just before the transfer from an outside centre. Two patients had spontaneous occlusion in the follow-up confirmed with catheter angiography. Four of the patients were embolized with coils, two in ICA two in a deconstructive manner, and two in ECA. In one patient due to recurrent bleeding, ICA and ECA branch embolization was performed one month apart. In one patient with small pseudo-aneurysm and limited perivascular necrosis, stent-graft was implemented. None of the patients had neurological complications or rebleeding after endovascular treatments.

Dıscussıon and Conclusıon: Vessel wall invasion with endoluminal irregularity, wide-spread necrosis with exposure of vessels, and pseudoaneurysm should alert the physician for a prompt vascular intervention. These findings were described in other studies except for vessel wall invasion extending into the lumen (5,6). We had no recurrent bleeding or neurological complications after embolization. Although endovascular embolization is associated with stroke and patients at high risk of neurological sequelae could be opted for stent- grafts, infarction was still reported up to %30 (7,8). Some authors reported a higher risk of CBO recurrence with stent placement compared to embolization therapy or even surgical ligation (7). We believe that a convenient type of endovascular treatment could be tailored based on the imaging findings and pathology, and timely treatment could save patients.

Keywords: carotid blowout, carotid rupture, embolization

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1-EVALUATION OF DEEP GRAY MATTER IN RELAPSING-REMITTING MULTIPLE SCLEROSIS PATIENTS BY TEXTURE ANALYSIS METHODS COMPARED WITH HEALTHY CONTROLS

Reyhan Yıldız[1], Murat Baykara[1--2]
[1]Haydarpaşa Numune Training And Research Hospital Radiology Clinics
[2]Fırat University Faculty Of Medicine, Department Of Radiology

Introduction and Purpose: Multiple sclerosis (MS) is a chronic, inflammatory and degenerative central nervous system disease that causes physical and psychiatric problems [1, 2].
Magnetic resonance imaging (MRI) is highly effective in detecting intracranial and spinal abnormalities in patients with multiple sclerosis, including white matter damage observed on T2-weighted and T2-FLAIR images [3]. However, changes in deep gray matter (DGM) areas have not been adequately demonstrated [4].
Medical images essentially contain a lot of tissue information relevant to clinical application. For example, MRI images are not capable of providing microscopic information of tissues that can be evaluated visually. However, the histological changes present in some diseases can produce measurable tissue changes on the MRI image with appropriate texture analysis methods [5-7].
In this study, we aimed to investigate various MRI quantitative measures (texture analysis) that may reflect different aspects of microstructural damage in DGM in patients with relapsing-remitting multiple sclerosis.

Materials and Methods: The entire study was conducted in accordance with the 1975 Declaration of Helsinki. Ethics committee approval was not considered necessary because the study was a retrospective and sub-study of another study.
Patients diagnosed with MS in the last five years were scanned from the Hospital Information System (HIS) and 50 cases with brain MRI images in the Hospital PACS were included in the study. As the control group, 50 healthy individuals of the same age and gender as the study group, without psychiatric or neurological disease, who underwent MRI for reasons such as headache, and no pathology was found, were selected using HIS and PACS.
T2-weighted MRI images were obtained with the 1.5T General Electric Optima 450w system installed in the Hospital Radiology Department. Images were transferred to a Windows 10 based computer in DICOM format and processed to obtain the final data. The entire analysis algorithm applied to all selected images was done with an in-house software coded in MATLAB.
All regions of the caudate nucleus, putamen, and thalamus were individually selected on the axial images, with an ROI that best represented the anatomy, without exceeding their borders, as determined by a senior radiologist [8]. Texture values from ROIs have been previously described in the literature [5, 9].
Data are presented as mean ± standard deviation. Statistical analyzes were performed with IBM SPSS for Windows version 26.0. The normality of the distribution of the data was analyzed by Chi-square and Kolmogorov-Smirnov tests. Student's t test was used to compare groups. $p<0.05$ was considered statistically significant.

Results: The mean age of controls (33F/17M) was 38.42±9.48 years and those with MS (35F/15M) were 39.14±9.40 years, and no statistical difference was found in terms of age and gender (respectively, p=0.567 and p=0.544) (Figure 1, 2).
While histogram analysis results showed significant differences between the groups, fractal analysis and first order wavelet analyzes did not detect any significant difference (Figure 3,Table 1-3).

Discussion and Conclusion: Deep gray matter structures are heavily affected during the MS disease process and undergo significant neurodegeneration during the relapsing-remitting phases of MS disease. MRI can play an effective role in demonstrating these changes only when some texture analysis parameters are used.

Keywords: multiple sclerosis, computer aided image processing, deep white matter

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2-CHRONIC OTITIS MEDIA AND MIDDLE EAR VARIANTS: IS THERE A RELATION?

Fatma Dilek Gökharman [1], Özge Özdemir [1], Sonay Aydın [2], Arzu Gülşah Yalçın[1], Pınar Nercis Koşar[1]
[1]S.b.ü Ankara Eğitim Ve Araştırma Hastanesi Radyoloji Bölümü
[2]Erzincan Binali Yıldırım Üniversitesi Radyoloji Ana Bilim Dalı

Objectıve: Chronic inflammation of the middle ear occurs as a result of both genetic factors that create functional and anatomic variations in the middle ear that predispose to chronic otitis media and multiple environmental factors.(1) Middle ear anatomic variations, which are the result of both genetics and environment, have never been associated with chronic otitis media before in the literature.The purpose of this study is to compare the prevalence of anatomic variations between case and control groups, as well as to define and compare the potential erosive effect of chronic otitis media on the anatomic structures of the middle ear and to determine if these variations could be the potential predispositions of chronic inflammation in the middle ear cavity.

Materıals and Methods: Thin-section CT findings of both case and control groups, each has 500 patients, were retrospectively analyzed. We selected patients for our case group if COM was written as a final diagnosis in their electronic records and if there was mucosal thickening and soft tissue densities in middle ear space and mastoid cavity on imaging. Patients who did not meet the chronic otitis media criteria but had an imaging for another reason were included in the control group. Seven

variants were identified to analyze: Koerner's septum, facial canal dehiscence, high jugular bulb, jugular bulb dehiscence, jugular bulb diverticulum, sigmoid sinus anterior location and deep tympanic recesses.

Results: It was observed that the high jugular bulb frequency between the case(91 individuals; 18,2%) and control (23 individual; 4,6%) groups was significantly different. (p< 0,001). The incidence of Jugular Anterior in sick individuals (43 individuals; 8.6%) was significantly higher than control subjects (19 individuals; 3.8%) . (p=0,002). Koerner's septum and facial canal dehiscence and the other three variants were not found statistically significant. (> 0.05)

Conclusıon: Our study concluded that the two most common middle ear variants, Koerner's septum and facial canal dehiscence, are not risk factors for chronic otitis media. At the same time, chronic inflammation's erosive effect does not cause an individual to have these variants. In our case group, anteriorly located sigmoid sinus and high jugular bulb were seen statistically significantly more. Changes caused by chronic inflammation in the mastoid ear cells could be the cause of jugular bulb and sigmoid sinus position changes, or vice versa. More research is needed to understand the link between chronic otitis media and the position of the jugular bulbus and sigmoid sinus. In our study, case series has 13 patients (2.6%) have it, in control series 6 patients (1.2%) have it so there is not a statistically significant relationship. However, it is noteworthy that case series has twice as many people as case series. We have only 4 patients who have jugular bulb diverticulum in case series and don't have any in the control series so there is not a statistically significant relationship. Even though there is no consensus on the reason why and how these variants occur our study contributes to literature a different perspective by associating the variants with chronic otitis media.

Keywords: temporal bone, anatomical variant, chronic otitis media, middle ear, mastoid anatomy, computerized Tomography, juguler bulb, Koerner septum, facial canal dehiscence

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4-EVALUATION OF HIPPOCAMPAL SULCUS REMNANT CYSTS WITH CISS SEQUENCES ON MAGNETIC RESONANCE IMAGING

Beyza Nur Kuzan[1]
[1]Kartal Dr. Lütfi Kırdar City Hospital

Introduction and purpose: Hippocampal sulcus remnant cysts (HSRC) are residual cystic lesions seen after insufficient obliteration of the hippocampal sulcus (1). In our study, we aimed to determine the incidence of HSRC more precisely by using constructive interference in steady-state (CISS) sequences in a large case group and to evaluate its distribution in different age-sex groups.

Materials and Methods: Between January 2022 and October 2022, temporal MRI examinations including CISS sequences obtained with a 1.5T MRI device in adult cases were evaluated retrospectively. A total of 500 cases were included in the study, excluding those with a history of intracranial mass and hemorrhage. Demographic characteristics of the cases were noted. HSRC characteristics (side, configuration, bilateral total number of cysts, and area of the cysts) were recorded on axial CISS images in temporal MRI examinations (Figure 1). In the presence of multiple cysts, the diameter of the largest one (dominant cyst) was measured, and the ratio of the ipsilateral Sylvian fissure diameter was calculated (Figure 2).

Results: The incidence of HSRC was determined in 217 (%43.4) patients with at least one hippocampal sulcus remnant cyst on temporal MRI out of 500 patients included in the study. Of the subjects, 97 were male (mean age ± standard deviation [SD], 51.9 ± 12.7 years; range, 24-77 years) and 120 were female (mean age ± SD, 51.5 ± 14.1 years); range, 18-85 years). The mean number of cysts was 4.55 ± 2.1 and the maximum number of cysts was 10. A statistically significant moderate correlation was found between age and the number of cysts(r= 0.565, p<0.001) (Figure 3). There was no statistically significant relationship between the genders in terms of the number of cysts (p=0.879) (Figure 4). The shapes of the dominant cysts were determined as oval-type cysts in 137 (63.1%) cases, round in 67 (30.9%), and curvilinear in 13 (6%). The area of dominant HSRCs ranged from 0.41 mm^2 to 21.07 mm^2 (mean ± SD = 3.43 ± 2.57 mm^2). A statistically significant low correlation was found between age and dominant cyst area (r= 0.265, p<0.001)(Figure 5). A statistically significant moderate correlation was found between age and temporal sulcus width (r= 0.650, p<0.001). There was no statistically significant correlation between the ratio of cyst diameter to ipsilateral Sylvian fissure diameter and age. (r= -0.106, p<0.119)

Discussion and conclusion: HSRCs are incidentally detected lesions and the mechanism leading to their formation is not fully known(3). HSRCs are detected in healthy individuals on cranial MRI examinations and are considered normal anatomical variations (4,5). It has been reported in the literature that the frequency of HSRC increases with age (6). In another study, it was reported that hypertension may play a role in the etiology of HSRC(7,8). Similarly, in our study, a positive correlation was found between increasing age and the number and area of HSRC. In the literature, HSRCs have been evaluated in detail with high-resolution MRI (3,6), and in our study, HSRC evaluation was performed with thin-slice (1 mm) CISS sequences. In conclusion, HSRC is asymptomatic residual lesions of the hippocampal region. Knowing the incidence of HSRC and distinguishing it from other lesions of the temporal region may contribute to the prevention of unnecessary procedures as well as early and accurate diagnosis.

Keywords: hippocampus, magnetic resonance imaging, anatomy

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5-ARACHNOID GRANULATIONS IN THE PEDIATRIC POPULATION INVESTIGATED WITH CONTRAST-ENHANCED 3D T1-WEIGHTED MAGNETIC RESONANCE IMAGING

Basak Atalay[1], Sabriye Gulcin Bozbeyoglu[1], Mahmut Bilal Dogan[1]
[1]İstanbul Medeniyet University Faculty Of Medicine,department Of Radiology

Background and purpose: AGs originate from arachnoid villi on the visceral surface of the arachnoid membrane probably due to CSF pulsations, the same mechanism that also can force the brain tissue into AG thus resulting in BHAG.[1,2] AGs may resemble thrombosis when larger.[2] AGs increase in number and size with the person's age. Brain herniation into arachnoid granulations of the dural venous sinuses is a recently described finding of uncertain etiology. Most of the BHAGs are asymptomatic incidental findings[2,4]. We aimed to evaluate the frequency, and radiological findings of arachnoid granulation (AG) and brain herniation into arachnoid granulation (BHAG) in the pediatric age group using 3D T1 Weighted (W) post-contrast imaging. Most of the studies reported are in the adult group.[5] In the current study, we aimed to show the frequency and imaging findings of AG and BHAG in the pediatric group.

Methods: The university ethics committee approved this retrospective study (2022/0621). A total of 284 patients under the age of 18 who had brain MRIs with post-contrast 3D T1 CUBE sequences were enrolled. Two observers evaluated the localization of AG, the longest dimension of AG, the contour feature (round/oval and lobulated), the T2W signal feature, and the presence of brain herniation. The presence of a vessel in the AG was evaluated in postcontrast series and recorded in case of its existence.

Results: Forty-nine of the patients (17.3%) had AG. More than one arachnoid granulation was detected in 21 patients, and a total of 77 AG was detected. There was no statistically significant difference in terms of age and gender (p=0.132, p=0.119 respectively) It was found that 53 (68.8%) of 77 lesions were round-oval and 24 (31.2%) were lobulated-shaped. Arachnoid granulation was most common in the transverse sinus (24.7% in the right transverse sinus, and 40.3% in the left transverse sinus, respectively) (Table). Herniation was found in only two of the lesions (2.6%) (Fig.1). The presence of vessel in an AG was observed in 38 (49.4%) of these lesions (Fig.2). T2 hyperintensity was present in 50 (64.9%) of the lesions (Fig.3). The presence of vessel which occurs in approximately 50% of patients, can be attributed to the fact that the granulations are typically close to the entrance to the sinus of the superficial draining cortical vein.[3]
Statistical evaluation was performed using SPSS 22.0. In this study, data were given as mean±Standart deviation (SD) for continuous variables, numbers and percentages for categorical data. Continuous variables with normal distribution were evaluated with Paired Sample's T-test, while those with abnormal distribution were evaluated with one-way Anova. Chi-square test was used to evaluate categorical variables. Statistical significance level was determined as 0.05.

Conclusion: 3D cranial MRI sequences can be safely used in the evaluation of AGs and BHAGs in the pediatric age group. Although studies have reported that the frequency and number of arachnoid granulation will increase with age, AGs can also be seen in the pediatric age group. Especially with isotropic 3D sequences, AGS and BHAGs are easier to demonstrate. It may be due to the difference in section thickness of cases that cannot be seen in T2W sequences but can be detected in series with isotropic 3D contrast. Studies with larger series are needed to conclude the clinical significance of BHAGs, but this may be difficult due to their rarity.

Keywords: arachnoid granulation, brain herniation, magnetic resonance imaging, pediatric

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6-EVALUATION OF EPITYMPANIC RECESS VOLUMES IN PATIENTS WITH CHRONIC OTITIS MEDIA

Fatma Dilek Gökharman[1], Ömer Koçak[1], Sonay Aydın[2], Pınar Nercis Koşar[1]
[1]Sbü Ankara Eğitim Ve Araştırma Hastanesi
[2]Erzincan Binali Yıldırım Üniversitesi Radyoloji Ana Bilim Dalı

Introduction and Purpose: Chronic otitis media is a recurrent infection of the middle ear and mastoid air cells in the presence of perforation of the eardrum. Predisposing factors such as history of acute otitis media, upper respiratory tract infections, gender, allergies, eustachian tube dysfunction are risk factors for chronic otitis media. [1] [2]In the tomographic imaging findings, nonspecific soft tissue values at the middle ear and mastoid level, thickening of the tympanic membrane, calcification or retraction appearance, erosion of middle ear ossicular structures and wall structures can be observed. [3]In recent studies, anatomical variables such as middle ear cavity volume, aditus ad antrum diameter or Eustachian tube diameter are stated to be risk factors for chronic otitis media formation. [4] [5][6] In this study, we aim to evaluate the volume of epitympanic reses, another anatomical variable, in the formation of chronic otitis media.

Material and Method: This cross-sectional study included patients who were followed up on with the diagnosis of chronic otitis media between 01.06.2021 and 31.08.2021 and had soft tissue value in the epitympanum in the paranasal CT examination, as well as healthy individuals without any pathological diagnosis. In the cross-sectional examination, CT and PACS systems with 64 sections were used.The tomography examination parameters were 100 kVp, 1.375 mm pitch, 0.4 s rotation time, and 0.625 mm slice thickness.The epitympanic volume was measured using the PACS system's 3D volumetric measurement function in the segment from the malleus head-incus body section at the caudal level in the axial sections to the level from the cranial to the tegmen tympanum. Coronal sections were used to evaluate and confirm defined levels. In addition,variables such as unilateral/bilateral involvement, aditus ad antrum involvement, mastoid cellular involvement and degree of mastoid cellular involvement and history of surgery were also examined in the patient individuals.

Statistical Analysis: The normality of numerical variables was tested by the Shapiro Wilk test.Student's t-test will be applied to compare normal distributed values with Mann-Whitney U test. Chi-square test and Fisher definitive test were used to perform categorical analyses.Descriptive statistics for numerical variables mean±sd, median [min-max]and numbers and percentages (%) for categorical variables.SPSS Windows 23.0 package program was used for statistical analysis and $p<0.05$ values were considered statistically significant.

Results and Conclusion: It was observed that the median value of the epitympanic recess volume in individuals with unilateral chronic otitis media was 72.30 mm3, while it was 75.00 mm3 in patients with bilateral involvement. The epitympanic recess median value of the healthy control group was 74.73 mm3. There was no significant difference between epitympanic volume values in patients with chronic otitis media and healthy individuals, and epitympanic volume was not considered as a predisposing feature. ($p=0.686$)

Keywords: epitympanic recess, middle ear,chronic otitis media,anterior epitympanic recess, Temporal bone, computed Tomography, ear/middle pathology

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7-MACHINE LEARNING BASED ON TEXTURE ANALYSIS TO EVALUATE THE RELATIONSHIP BETWEEN VITAMIN D LEVEL AND BRAIN STRUCTURES

Esat Kaba[1], Nur Hürsoy[1], Fatma Beyazal Çeliker[1], Mehmet Beyazal[1], Hüseyin Er[1], Gülen Burakgazi[1]
[1]Recep Tayyip Erdogan University Department Of Radiology

Objective: Vitamin D is very important for brain functions. It has been found that its deficiency causes changes such as atrophy in brain structures and is associated with cognitive and movement disorders (1). We aimed to perform texture analysis on magnetic resonance imaging (MRI) to understand the relationship between some brain structures and vitamin D in young individuals.

Materials and methods: Patients who underwent brain MRI in 3 T MRI scanners in our hospital between 2020-2022 and who had vitamin D measurements in the last 3 months were included. After the exclusion of patients with mass, stroke, and significant motion artifact, 40 patients aged 18-50 years were included. Vitamin D was low in 28 of these patients and normal in 12 patients. Of the MRI images, only T1 images without contrast were used. Sections passing through the basal ganglia level were downloaded in DICOM format and transferred to the LIFEx (version 7.3.2) texture analysis program. Here, an appropriate ROI was placed in the nucleus caudate, putamen, thalamus, and corpus callosum splenium with the consensus of 2 radiologists. For image standardization, +-3 sd was used for all images and the number of gray levels 128 was chosen. The results obtained from the texture analysis were transferred to the Orange Data mining (version 3.33.0) machine learning application. Here, the features of 40 patients were classified using the 10-fold cross-validation method. A total of 10 machine learning algorithms were used for each anatomical structure.

Results: The mean age is 35.5 in those with normal vitamin D, 30.7 in those with low vitamin D, and 32.15 in all patients. Significant relationships were observed between the texture analysis results and the vitamin D level. The most significant texture analysis parameter was NGLDM_Coarseness. The highest classification accuracy (CA) ratios for the nucleus caudate, putamen, thalamus, and splenium were 0.77, 0.70, 0.70, and 0.70, respectively to predict vitamin D level. The AUC is 0.66, 0.59, 0.67, and 0.71, respectively. The most successful machine learning algorithms for nucleus caudate, putamen, thalamus, and splenium are Tree, SVM, kNN, and SVM respectively. Considering the confusion matrix values for the nucleus caudate, which is the most successful structure, the Tree model correctly predicted 24 of 28 patients with vitamin D deficiency and 7 of 12 patients with normal values.

Conclusion: Vitamin D is of great importance for brain function and its deficiency is known to cause volumetric decreases in some brain structures such as cerebral cortex, hippocampus, and amygdala (2). In addition, it has been shown that vitamin D deficiency is associated with many neuropathological conditions such as cerebrovascular disease, dementia, Parkinson's disease, and multiple sclerosis (3,4,5).
Machine learning algorithms based on texture analysis show promise in determining the relationship between brain anatomical structures and Vitamin D levels.

Keywords: Brain, MRI, Vitamin D, Machine Learning

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8-A TISSUE IGNORED IN CERVICAL ULTRASOUND: RELATIONSHIP OF PALATINE TONSIL SIZE WITH AGE, GENDER, BODY MASS INDEX, AND BODY SURFACE AREA IN THE PEDIATRIC POPULATION

Sabriye Gülçin Bozbeyoğlu[1], Mahmut Bilal Doğan[1]
[1]Istanbul Medeniyet University Göztepe Prof Dr Suleyman Yalcin City Hospital

Background and Purpose: Palatine tonsils serve as an immunocompetent tissue located in the palatopharyngeal space in the oropharynx. Evaluation of the palatine tonsils is an important issue both in cases of acute infection and in diseases such as obstructive sleep apnea, and it is quite common especially in children.[1] Ultrasound is a safe, easily accessible, and inexpensive test for the demonstration of tonsillar pathologies and pre-surgical evaluation.[2] Therefore, it is necessary to know the normal sonographic dimensions of the tonsils. The aim of this study is to measure the palatine tonsil size by ultrasonography in healthy children and to determine whether it is associated with gender, age, body mass index and body surface area.

Material and Method: The measurement of tonsil size was made with a 5-12-MHz linear array transducer (Aplio 500; Toshiba, Otawara, Japan) by a radiologist with 10 years of pediatric radiology experience. Patients with clinically tonsillitis and cervical lymphadenopathy during examination were excluded from the analysis. Two hundred patients aged 3-15 years were included in the study. The patients were divided into 4 groups, three years apart. Measurements were made in the supine position, with the neck slightly extended and externally rotated. The hypoechoic tonsils were visualized in the transverse and longitudinal planes (Fig 1). Tonsil volume was calculated in mm using the formula "0.52 x length x width x height" (Fig 2). Statistical evaluation was done with SPSS 22.0. Pearson and Spearman rho tests were used for correlation.

Results: Of the patients, 101 (50.5%) were male and 99 (49.5%) were female. The mean age of the patients was 8.5±3.4 years. When the patients' ages and right and left palatine volumes were evaluated; a significant but very weak correlation was observed (r:0.167, p=0.018; r:0.161, p=0.023, right and left, respectively). When the palatine volumes of the patients were evaluated according to their BMI; the result was similar (r:0.253, p<0.01; r:0.282, p<0.01). When evaluation is made according to body surface areas; a statistically significant but very weak correlation was observed between volume and BSA (r:0.207, p=0.003; r:0.242, p=0.001). Tests were also carried out for groups formed at three years apart (Table). In the PostHoc evaluation, it was observed that statistical significance observed the 3-6 age group and the 9-12 age group (p=0.028).

Conclusions: In this study, it has been observed that tonsil size increases with variables such as age, BMI and BSA. Determining the normal value of tonsil size in healthy children in the Turkish population will be useful in the diagnosis of diseases with tonsil enlargement. Therefore, the evaluation of tonsil size in children is an important issue, especially in cases such as tonsillitis and obstructive sleep apnea.[3]
There are different findings about whether tonsil dimensions change with age, BMI and BSA in studies. As expected, increase in size with age is a common finding. While Hong et al. did not detect a correlation with BMI, Ozturk did.[1,2] In our study, the palatine tonsil volume increased with the increase in BMI. The relationship between BSA and palatine tonsil was also examined for the first time. In conclusion, US is an easily applicable and noninvasive technique for tonsil evaluation in the pediatric population. Tonsil size measurements can be used to diagnose tonsil infections, lesions and diseases related to tonsil size.

Keywords: head and neck; pediatrics; tonsil; ultrasonography

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9-DOUBLE STENT RETRIEVER FOR REFRACTORY MIDDLE CEREBRAL ARTERY OCCLUSION

Bekir Sıtkı Said Ulusoy[1]
[1]Dr Ersin Arslan Training And Research Hospital

Aim: This study is aimed to present the results of the double stent retriever for middle cerebral artery (MCA) occlusion in patients with acute stroke.

Methods: Between September 2018-September 2022, patients who underwent endovascular mechanical thrombectomy (MT) with double stent retriever for MCA occlusion were reviewed, retrospectively. The modified thrombolysis in cerebral infarction (mTICI) score was used to determine reperfusion. Patients' status were determined according to the National Institutes of Health Stroke Scale (NIHSS) score.

Results: There were 9 patients (4 female, 5 male) with a median age of 70-year-old (min.-max: 63-83 year-old). All patients had refractory MCA occlusion. The median NIHSS score was 14 (min.-max.:10- 20). Y-stent configuration was performed in 55.5% (n=5) of the patients and parallel stent configuration was performed in 44.5% (n=4) of the patients. The technical success rate was 100%. There was no procedure-related complication. mTICI 3 was achieved in 33.3% (n=3), mTICI 2b in 55.5% (n=5), and mTICI 2a in 11.1% (n=1) of patients. There was no mTICI 0. There was no procedure-related arterial rupture or mortality.

Conclusion: The double stent retriever technique was a feasible, safe and effective approach for refractory MCA occlusion.

Keywords: Stroke, double stent retriever, refractory MCA occlusion, mechanical thrombectomy

10-REGENERATIVE EFFECT OF DYNAMIC STABILIZATION ON THE INTERVERTEBRAL DISC

Berrin Erok[1], Kenan Kıbıcı[2]
[1]Prof Dr Cemil Tascıoglu City Hospital
[2]Altınbaş University Bahçelievler Medical Park Hospital

Spondylolysis, unilateral or bilateral anatomical defects involving the pars interarticularis, is commonly known as pars interarticularis defect.It can involve one or both sides of one or more vertebral bodies.These defects are observed almost exclusively in the lower lumbar spine, most frequently at the L5 level (1).The incidence is much higher among individuals engaged in atheletic activities (2).Patients may be asymptomatic; symptomatic presentation is generally with progressive low back pain that is aggravated by hyperextension Both CT scans and MR imaging are more sensitive than radiographs for diagnosis.CT is the gold standard modality, especially for detecting unilateral and nondisplaced defects (3,4).For evaluating more progressive disease, CT is excellent; however, MR imaging is better for diagnosing early stage disease in which cortical disruption has not yet occurred (5).Disc degeneration at the level of the pars defect (surgical segment disc) is generally an accompanying disorder.Loss of bone integrity in the pars interarticularis can increase the load on the disc at the level of spondylolysis and may cause degeneration (5,6).Conservative approaches are first-line treatments.However, some patients may require surgical treatment for persistent low back pain or neurological findings that do not respond to conservative treatments (7).Segmental fusion has been used for years.However, there is an increased risk of pseudoarthrosis.Moreover, degenerative changes adjacent to the fused segment, most commonly disc degeneration, is an important concern in fusion surgeries (8).We would like to present the rehydration observed in the surgical segment disc in addition to absence of adjacent senet disc degeneration during one year follow up.

A 24-year-old male patient was presented with a complaint of low back pain that progressively worsened.He was engaged in bodybuilding. He had received all conservative treatments, including drugs, corset application, and physical treatments, but there was no benefit. Lumbar CT scans revealed bilateral pars interarticularis defect at the L5 vertebra (Figure 1A,B). Lumbar MR imaging performed at another institution showed a mild degeneration and bulging in the L5–S1 disc (Figure 1C).After dynamic stabilization the follow-up radiological imagings revealed pars fusion on serial CT scans.Lumbosacral MR imaging revealed some rehydration in the surgical segment disc and no degeneration in the adjacent segment disc performed at postoperative 12th month (Figure 2).

Several studies have demonstrated improvements in disc hydration at the treated level on follow-up MR imaging scans (9,10).We think that it is better to restore the normal anatomy having mobile segments in physiological limits, especially in young patients.Radiological imaging plays a vital role not only in the postoperative evaluation of the position and unity of the instrumentation and establishment of complications, but also in the evaluation of the surgical and adjacent disc status along with the developing fusion of pars interarticularis.However, careful patient selection is essential.We believe this procedure should be limited to patients with spondylolysis without significant spondylolisthesis to achieve satisfactory clinical outcomes

Keywords: Intervertebral disc, degeneration, rehydration

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11-PREVALENCE OF TEMPORAL BONE VARIATIONS ON COMPUTED TOMOGRAPHY EXAMINATIONS

Atiye Cenay Karabörk Kılıç[1], Zeynep Sezgi Erdal[1], Sevcihan Kesen Özbek[1]
[1]Gazi University Medical School

PREVALENCE OF TEMPORAL BONE VARIATIONS ON COMPUTED TOMOGRAPHY EXAMINATIONS

Objective: Computed tomography is widely used for diagnosis of middle and inner ear pathologies like cholesteatoma, tumors and anomalies of the temporal bone. Still there are limited studies about the prevalence of temporal bone variations (1,2). Focusing on anatomical variations will increase awareness about their presence and clinical importance. In this study our aim is to find out the prevalence of temporal bone variations on computed tomography examinations.

Materials and methods: In this retrospective study we reviewed examinations of patients with temporal bone CT scans at our department from January 2021 to October 2022. All temporal CT examinations were obtained using a 192-slice dual-source CT scanner (Somatom Force, Siemens Healthineers) with a standard protocol without contrast administration. The scanning parameters included: detector collimation widths 64x0.6 mm, tube voltage of 130 kV. Patients were scanned in the caudal to cranial direction with a scan revolution time of 1 second and pitch of 0.4. Tube current was regulated by an automatic exposure control system (CARE Dose 4D;Siemens, Erlangen, Germany). All scans covered an area from 1 cm inferior to the mastoid tip to 1 cm superior to the petrous temporal bone. Images were reconstructed in axial and coronal planes with a slice thickness of 0.6 mm. The images were transmitted to the picture archiving and communication system (PACS). Images were reviewed by 2 radiologists fort the presence of temporal bone variants.

Results: There were 741 patients with temporal bone CT scans examined at our department from January 2021 to October 2022. Patients

who had a history of choleastatoma, chronic otitis media and mastoid, skull base, or posterior fossa surgery, patients with poor technique or motion artifacts were excluded. We also excluded patients younger than five years old, since the jugulary bulbus may not be completely developed. Consequently, 126 examinations were excluded, and 741 patients were included the study. The variants diagnosed were: high juguler bulb, high dehiscent juguler bulb, juguler bulb diverticulum, superior semicircular canal dehiscence and posterior semicircular canal dehiscence. High juguler bulb was the most observed variant (31/615, 5,04 %)(figure1). Three (0,48 %) patients had high dehiscent jugular bulb (figure2). Superior semicircular canal dehiscence was diagnosed in 28 patients (4,55 %), (figure3). Jugular bulb diverticulum was observed in 1 patient (0,48 %) (figure3). Posterior semicircular canal dehiscence was diagnosed in 4 patients (0,65 %) (figure 4a, 4b).
Results are summarized in table 1

Conclusion: Sixty-seven (67) patients among 615 patients (10,89 %) had temporal bone variations in our study. Anatomical variations in the temporal computed tomography examinations are common [3-5]. Awareness of these variations and informing the clinician prior to surgery can prevent several complications and can have vital importance.

Keywords: Temporal bone variations, Computed Tomography, Radiology

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12-EFFECT OF LUMBOSACRAL TRANSITIONAL VERTEBRA ON SPONDYLOLISTHESIS

MUSA ATAY[1]
[1]Department Of Radiology, Bagcilar Training And Research Hospital, University Of Health Sciences, Istanbul, Turkey

Purpose: The aim of this study was to evaluate the effect of lumbosacral transitional vertebra (LTSV) on spondylolisthesis (SL).

Materials and Methods: Lumbosacral MRI of 100 patients with LTSV were included in the retrospective study. MRI of 100 patients without LTSV were analyzed as a control. Presence of SL at all lumbar levels was examined. The amount of vertebral listhesis was measured using the Meyerding grade and Taillard technique [1, 2] . LTSV was classified (lumbarized, sacralized). Patients with a history of lumbosacral surgery, rheumatological spinal involvement and congenital pathologies were excluded.

Results: *T*here were 100 patients with LTSV (51.2 ± 7.6 years) and 100 patients without LTSV (52.3 ± 7.8 years) with same age range (40-65 years). 81 of the patients with LTSV (81%) were sacralized, 19 (19%) were lumbarized (Fig. 1). SL was observed in 43% of patients with LTSV and it was found to be significantly higher than the control group (21%) (p=0.001) (Table 1) (Fig. 2). The relative risk was 2,048 (95% CI 1,316-3,186). A total of 49 levels of listhesis were detected in patients with LTSV and in terms of the level, listesis was found to be significantly more common in patients with LTSV at the L4-5 compared to the controls (p=0.002) (Table 2). No significant difference was found at other levels.No statistically significant difference was found between the LTSV and control groups and lumbarized and sacralized groups in terms of the grade and percentage of SL (Table 3). SL was observed significantly more common in the lumbarized group compared to the sacralized group only at the L5-S1 (p=0.001) (Table 4) (Fig. 3).

Discussion: LSTV is a congenital anomaly at the L5-S1 level and is characterized by fusion of the transverse processes to the sacrum [3]. SL refers to the slippage of one vertebra relative to the one below [4, 5]. The relationship of LTSV with pathologies such as spinal stenosis and scoliosis has been investigated [6, 7]. There are two studies in the literature on the LTSV-SL relationship. In study of Kim et al. [9], only L4 and L5 vertebrae were evaluated in 33 patients with LTSV, and the degree of listhesis was found to be higher in patients with LTSV only at the L4 level compared to patients without LTSV. In study of Yao et al. [9], only the L4 level was evaluated, and reported that the frequency and degree of listhesis in this level were higher in patients with sacralized LTSV than the control. In our study, unlike these studies, all lumbar levels were examined with a larger patient group, and lumbarized and sacralized patients were compared. We found a significantly higher incidence of listesis in patients with LTSV (43%). In terms of level, the risk of listesis increases in patients with LTSV only at the L4-5. These findings are consistent with the findings of literature. However, we did not detect a correlation between LTSV and the degree of listesis. This may be related to the small number of patients in the above studies. At L5-S1, listesis was detected more frequently in lumbarized patients than in sacralized patients. This may be related to degeneration caused by lumbarisation more prominent than sacralisation in this level.
As conclusion; the risk of SL increases in patients with LTSV, especially at the L4-5. Lumbarization is more prominent in the listhesis of L5-S1. The presence of LTSV and lumbarization may be factors affecting treatment, especially in patients with SL at these levels.

Keywords: Transitional, Spondylolisthesis, Sacralisation, Lumbarisation

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13-THE RELATION BETWEEN BOVINE ARCH AND LATERALITY IN STROKE PATIENTS: A PRELIMINARY STUDY

Begümhan Baysal[1], Didem Darıcı[2], Merve Gezgin[1], Sıla Elif Can[1], Mehmet Bilgin Eser[1], Hasan Hüseyin Karadeli[2]
[1]Department Of Radiology, Istanbul Medeniyet University, Goztepe Prof. Dr. Suleyman Yalçın City Hospital
[2]Department Of Neurology, Istanbul Medeniyet University, Goztepe Prof. Dr. Suleyman Yalcin City Hospital

Purpose: Stroke is currently a life-threatening acute condition. Although many etiological causes have been identified, not all etiological causes have been revealed. In this study, we aimed to investigate the lateralization of stroke with Bovine arch variation of aortic arch.

Material and Methods: This retrospective observational study was conducted in a tertiary university hospital between March 2020 and July 2021. Inclusion criteria were acute ischemic infarct and availability of brain diffusion imaging magnetic resonance imaging (MRI) and computed tomography angiography (CTA). Patients with hemorrhagic stroke and other causes were excluded from the study. If the brachiocephalic trunk and left common carotid artery originates from common origin, that called Bovine arch. Strokes were classified as right, left or bilateral. Univariate analysis was performed using chi-square tests.

Results: A total of 295 patients, 137 (46.4%) women, who met the inclusion and exclusion criteria were included in the study. The mean age was 68.40 (SD: 14.15) years. Anatomic arch (n = 225) stroke distribution was left 49.33% (111), right 40.0% (90), and bilateral 10.66% (24). Bovine arch (n = 70) stroke distribution was left 47.14% (33), right 34.28% (24), and bilateral 18.57% (13). Although the frequency of bilateral stroke in Bovine arch patients was not statistically significant, it was twice as common (p = 0.20).

Conclusions: The preliminary findings of this study indicated that there may be an association between Bovine arch variation and the likelihood of developing bilateral stroke. Considering the worse clinical course of these patients, it may be useful to screen these and other variations in a larger population.

Keywords: Stroke, Aorta, Thoracic, Computed Tomography Angiography, Diffusion Magnetic Resonance Imaging

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14-RADIOMICS ANALYZE OF MAGNETIC RESONANCE IMAGING IN CASE OF NASOPHARYNGEAL CARCINOMA

Orkun Cıvan [1], Gökçen Yıldız[1], Ahmet Öz[1], Sevda Kanat[2], Ömer Erol Uzel[2], Osman Kızılkılıç[1]
[1]Cerrahpasa Medical School, Department Of Radiology
[2]Cerrahpasa Medical School, Department Of Radiation Oncology

Introduction: There has been increased interest in radiomics analysis, a potentially useful biomarker that allows assessment and quantification of tumor heterogeneity. In the last review article of the Lancet journal [1] on nasopharyngeal carcinoma, which is the most common type of head and neck cancer, eighteen research questions regarding nasopharyngeal carcinoma were identified. Among there, models to be developed using radiomics data in the field of radiology and the inclusion of artificial intelligence in clinical decision-making systems have been proposed. As a matter of fact, radiomics researches on nasopharyngeal carcinoma have increased in recent years.

Aim: The purpose of our study is to investigate the texture features of the tumor and develop a radiomics model based on MRI in order to discriminate recurrent from non-recurrent nasopharyngeal carcinoma.

Materials and Methods: The records of 110 patients with nasopharyngeal carcinoma who were followed up in the CTF Radiation Oncology Department between 2010 and 2016 are reviewed retrospectively. Forty patients who met the inclusion criteria were included in the study. The cases were divided into two groups as cases with local recurrence or metastasis (n=14) and cases without disease (n=26) during the 5-year follow-up period. From T2-weighted and post-contrast T1-weighted MR images obtained from different devices, lesions were manually segmented in each section over the entire tumor volume in three dimensions(Figure a), and radiomics parameters were calculated(Figure b). Radiomics features obtained from different devices are harmonized. Feature selection is performed by univariate chi-square test and correlation analysis methods. Machine learning models are trained and tested with radiomics features that can discriminate between two lesion classes ($p < .01$). The classification algorithm with the highest lesion classification performance metrics is determined.

Results: Three parameters from T2-weighted images: tumor volume, contrast metric of Grey Level Cooccurence Matrix (GLCM), LRLGLM metric of GLRLM (Grey Level Run Length Matrix), and one parameter from post-contrast T1-weighted images: mean of the histogram distribution, are four texture parameters included in the radiomics model. By using these features linear SVM (support vector machine) classification algorithm classified lesions with 92.5% accuracy and 92.3% specificity rate. (Figure c)

Discussion: In our country, which is a nonendemic region, no radiomics study has been reported on nasophraryngeal carcinoma. Among the studies reported on this subject in the literature, only the study by Bologna et al. In Italy included the nonendemic patient group [2], while other studies did not go beyond the endemic patient group in the Far East [3]. The limited number of cases in our patient gruop and the asymmetry between the patient groups (relapsed, non-relapsed) were approached by limiting the tested algortihms to workable models with a relatively small training set and resampling the patient group at each validation. Calculated radiomics parameters were selected only from IBSI (Image Biomarker Standard Initiative) recommended metrics.[4]

Conclusion: The texture analysis of pre-treatment MR images can predict recurrent and non-recurrent lesions of nasopharenygeal carcinoma with high accuracy and specificity.

Keywords: Nasopharyngeal Carcinoma, Magnetic Resonance Imaging, Texture Analysis, Radiomics Analysis

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15-EVALUATION OF INTRATUMORAL VASCULAR HETEROGENEITY OF GLIAL TUMORS WITH ARTIFICIAL INTELLIGENCE

Hüseyin Kasap[1], Mehmet Öztürk[1], Halil Özer[1], Hakan Cebeci[1], Abdussamet Batur[1], Yahya Paksoy[2]
[1]Selcuk University Faculty Of Medicine, Konya, Turkey
[2]Qatar University, Doha, Qatar

Introductıon: In this study, the importance of tumor vascular heterogeneity to determine the differentiation of low and high-grade glial tumors was assessed, and an unsupervised deep learning method and conventional MRI and perfusion images were used to distinguish these vascular heterogeneities.

Materıals and Methods: Cases with histopathological diagnosis defined according to the 2016 WHO Classification of Central Nervous System Tumors, that were scanned prior to surgery or biopsy, were included in the study.
MRI images of all patients uploaded to an application called Hemodynamic Tissue Signature, which allows online, free tumor evaluation in DICOM format, works with deep learning and convolutional neural network method, via their web address.
Hemodynamic Tissue Signature (HTS): HTS consist on an automated unsupervised method able to describe the vascular heterogeneity of the enhancing tumor and edema tissues in terms of the angiogenic process located at these regions. The HTS provides 4 vascular sub-compartments the high angiogenic enhancing tumor region (HAT), the low angiogenic enhancing tumor region (LAT), the potentially tumor infiltrated peripheral edema (IPE) and the pure vasogenic edema (VPE). The HTS is able to capture the local heterogeneity of the tumor, hence providing relevant information about its behavior.

Results: In this study, low-grade glial tumors were represented by 19 cases, and high-grade glial tumors were represented by 33 cases. In the enhanced tumor area, the mean rCBV values of high- and low-grade tumors were 3.16 ± 0.89 and 2.12 ± 0.72, respectively. The cut-off point for rCBV was set to be >2.78. The mean rCBV values in the region coded as HAT for high- and low-grade glial tumors were 4.58 ± 1.32 and 3.00 ± 1.16, respectively. In addition, high- and low-grade tumors were found as 2.82 ± 0.57; 1.93 ± 0.60 in LAT, 1.66 ± 0.45; 1.00 ± 0.39 in IPE, and 0.80 ± 0.25; 0.51 ± 0.20 in VPE, respectively. In the differentiation of low- and high-grade glial tumors, the cut-off point for the rCBV values measured in the HAT, LAT, IPE and VPE fields was taken as >3.33, >2.32, >1.11 and >0.61, respectively. These data show that in the enhanced tumor, in the areas coded as HAT, LAT, IPE and VPE; rCBV values were higher in high-grade tumors than low-grade tumors, and the difference between them was statistically significant.

Dıscussıon and Conclusıon: This study aimed to preoperative characterization of the vascular heterogeneity of central nervous system glial tumors through a multi-parameter habitat survey. In the study, all procedures from tumor detection to tissue segmentation and identification of vascular heterogeneity were performed unsupervised
The importance of using perfusion MRI data obtained from the highest angiogenic area to determine the most precise grade of the tumor is remarkable and will be very useful and helpful in decision-making in daily practice. It has been shown that perfusion parameters differ both in different areas of the tumor in the same patient and in different grades of glial tumors .Considering that the data from IPE area are significantly different and higher than VPE, it is thought that it is very likely to be responsible for the recurrence or residual tumor tissue, especially in high-grade glial tumors. Furthermore, the measurement of ROI, which is the main limitation and low reproducibility of perfusion MRI studies, was also performed in a highly sensitive manner using artificial intelligence.

Keywords: Deep Learning; Glial Tumors; Perfusion MRI; rCBV; Artificial Intelligence

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16-DO HIPPOCAMPAL VOLUMES INCREASE IN NEUROFIBROMATOSIS TYPE 1 CASES?

Merve YAZOL[1], Halil OZER[2], Oznur Leman BOYUNAGA[1]
[1]Gazi University Faculty Of Medicine Department Of Radiology Ankara-turkey
[2]Selcuk University Faculty Of Medicine Department Of Radiology Konya-turkey

Introduction: Neurofibromatosis type 1 (NF1) is characterized by focal T2 hyperintense brain lesions that are predominantly located in the deep gray nuclei, brainstem, and cerebellar white matter. This study explored the existence of volume differences in the hippocampus of the NF1 subjects without a history of epilepsy.

Materials and Methods: In this retrospective study, by using three-dimensional T1-weighted MR images, 16 patients with NF1 and 14 age and gender-matched healthy control subjects were quantitatively

assessed. According to age and sex, measurements and evaluations of the hippocampus were performed with volBrain software (Fig 1).

Results: The study included 16 (%53.3) NF1 patients, with 31.3% males and 68.8% females, with a mean age of 12.56 ± 4.76 years (range, 4- 19 years). The control group included 14 age- and gender-matched healthy people with 35.7% males and 64.3% females, a mean age of 11.86 ± 4.17 years (range, 5- 17 years). Tables 1 show the demographic and clinical characteristics of NF1 patients and the healthy control group. The groups did not differ significantly in terms of age, or gender (p>0.05).
The total hippocampal volume was found to be significantly higher in the NF1 patient group than in the healthy control group (Table 1) (p=0.001). In addition, right and left hippocampal volumes were significantly higher in the NF1 patient group than in the healthy control group (p<0.001 and p=0.017, respectively).
Table 2 shows the results of the ROC analysis. Total hippocampus volume showed good diagnostic performance in differentiating NF1 patients. The AUC value for total hippocampal volume was 0.830 (P=0.001), with a sensitivity of 81.3% and a specificity of 78.6% at a cutoff value of 96.95.

Conclusion: Neuroanatomic abnormalities in specific brain regions have previously been observed in NF1(1,2). Quantitative measurements by MRI may be biomarkers for longitudinal investigation in morphology and volume in selected cortical and subcortical structures in NF1 patients. We have identified that volumes of hippocampi both in right and left hemispheres are significantly larger in patients with NF1 in comparison to healthy controls.

Keywords: Neurofibromatosis type 1, Hippocampus volume, Subcortical analysis

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17-WHITE MATTER ALTERATION IN GLIOBLASTOMA PATIENTS - DTI, DKI AND NODDI BASED TBSS STUDY

Barış Genç[1], Kerim Aslan[2], Ali Özçağlayan[2], Lütfi İncesu[2]
[1]Samsun Education And Research Hospital, Department Of Radiology
[2]Ondokuz Mayis University Faculty Of Medicine, Department Of Radiology

Introduction: Insular gliomas are a common tumour of limbic system. Tumours in the insular lobe cause changes in the fibers in the brain compared to tumours in the other intracranial region because of a lot of tract[1]. Neurite Orientation Dispersion and Density Imaging(NODDI) and Diffusion Kurtosis Imaging(DKI), which have been developed in recent years, increase the sensitivity and specifity of Diffusion Tensor Imaging in detecting microstructural changes by using multi-shell diffusion techniques[2,3].
Our aim in this study is to investigate whole brain white matter microstructural changes in DTI, DKI and NODDI parameters in insular Glioblastoma (GBM) patients by using Tract Based Spatial Statistics(TBSS).

Methods: 7 right insular GBM and 6 left insular GBM patients who did not operated, not receive chemotherapy and without extension to the contralateral hemisphere in conventional MR sequences and 11 age-sex matched healthy controls were included in the study. In addition to conventional MRI sequences, multi-shell b (using 1 b=0.32 directional b=1000 32 directional b=2500) diffusion tensor images were obtained for these patients. Distortion corrections and eddy current corrections were applied using FSL 6.0.5[4]. Diffusion tensor parameters (FA, MD, RD, AD) parameter obtained using dti_fit in FSL package program. NODDI parameters (ICVF: Inracellular volume fraction, Fwe: Free Water, ODI: Orientation dispersion index) obtained with AMICO toolbox, kurtosis parameters obtained with diffusion imaging in phyton (DIPY)[5].Similar to previous studies, TBSS analysis was performed on FA images [6].Then other diffusion tensor parameters using TBSS_non_FA, NODDI and kurtosis parameters were compared with the control group for all glial tumor patients using "randomise" for the whole brain. p<0.05 family wise error (FWE) was considered significant[7].

Results: Global FA reduction (voxel size: 91333) and increased RD (voxel size: 78507) were detected in white matter areas in insular glioblastoma patients. There was no difference between the groups in MD and AD. Among the kurtosis parameters, RK showed a global decrease (voxel size: 61591), while MC showed a decrease in the right half of the brain (voxel size: 17374). AK did not differ significantly between the two groups. Among the NODDI parameters, only ODI showed an increase in bilateral centrum semiovale plane and bilateral inferior frontooccipital fasciculus fibers in glioblastoma patients (voxel size:14639)(Figure-1). In the literature, there are various DTI studies investigating DTI changes in insular glioma patients, and changes such as local edema and infiltration caused by gliomas, there was a decrease in FA due to fiber infiltration[8]. In the only study investigating DTI changes in the whole brain with TBSS in insular gliomas, global FA decrease was found[1]. However, DKG and NODDI parameters were not investigated in this study, and some of these patients have a history of operation and radiotherapy. Although FA is a parameter with high sensitivity, its specificity is low. Low FA may be caused by loss of myelination, loss of axon, or increased fiber orientation[9]. In this study, we showed the global FA decrease in insular glioblastoma patients in a similar way to that study, in addition, we showed for the first time that the possible reason for this is the deterioration in fiber orientation. In conclusion, microstructural changes in the brain occur globally, not locally, in insular glioblastoma patients.

Keywords: Glioblastoma, Diffusion kurtosis imaging, Diffusion tensor imaging, NODDI

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18-DIFFERENTIATION OF HIGH GRADE GLIAL TUMORS AND SOLITARY BRAIN METASTASES USING MULTIPARAMETRIC MRI RADIOMICS DATA

Basak Atalay[1], Mahmut Bilal Dogan[1], Mehmet Bilgin Eser[1], Umut Percem Orhan Soylemez[1], Nesrin Gunduz[1]
[1]Istanbul Medeniyet University Faculty Of Medicine, Department Of Radiology

Background and purpose: This study aims to develop and validate neural networks to differentiate high grade glial tumors from solitary metastasis in the supratentorial area based on FLAIR, ADC and T1W contrast enhanced MRI radiomics.[1]

Materials and Methods: The university ethics committee approved this study (2021/0306). This retrospective model development study included a cohort of patients (n = 104) with high grade glial tumors and solitary brain metastasis (lung, breast, and others) from January 2015 to May 2021 in one tertiary center. The mean patient age was 59,11±14,47 years, and 37 (36%) were women. One experienced observer segmented lesions on axial FLAIR, ADC and T1W contrast enhanced series and extracted radiomics features (n = 851) as predictor variables.[2] Feature selection was made with least absolute shrinkage and selection operator (LASSO) regression analysis with 10-fold cross validation.[3] The model outcome was to differentiate glial tumors from metastasis in the supratentorial area. A multivariable diagnostic prediction model was developed with artificial neural networks for outcome. Neural network performance was presented as an area under the receiver operating characteristic curve (AUC) and accepted as successful if the AUC >0.85 and p-value <0.01.

Results: The neural network based on ADC radiomics have limited success to differentiate glial tumor from metastasis with 0.79 (95%CI: 0.65 – 0.93) AUC in the ROC analysis ($p < 0.001$) and the model accuracy was 76%. FLAIR sequence based neural networks had higher AUC (0.86, 95%CI: 0.75 – 0.98, $p < 0.001$) and similar accuracy (76%). The neural network based on T1W contrast enhanced was successful to differentiate gliomas from metastasis with high sensitivity (90%), specificity (90%) and accuracy (90%), the model AUC was the highest 0.97 (95%CI: 0.92 – 0.99, $p < 0.001$).

Conclusion: Differentiation of high-grade glial tumors and metastases, which are the most common brain tumors in adults, is important for determining appropriate treatment strategies. While the diagnosis can be made easily in cases with a history of primary malignancy and more than one lesion, approximately 25-30% of them appear as a single lesion. In addition, high-grade tumors and solitary brain metastases have similar MR imaging features, including perilesional T2W hyperintensity and peripheral contrast enhancement, and can therefore be difficult to distinguish. Recently, radiomics has been used to analyze features to differentiate these tumors through imaging that is beyond the perception of the human naked eye. [3]
In this study, a comprehensive evaluation including FLAIR, ADC and T1W contrast enhanced series was made. As stated in previous studies, the data obtained from the T1W contrast-enhanced sequence was found to be the most successful, but it was seen that the FLAIR sequence could also contribute to the combined models. [1,4] Also, unlike some studies in the literature, we used 3D-based segmentation instead of 2D-based analysis. This increased the success of the trained neural networks.[3,5]
The neural network based on T1W contrast-enhanced radiomics features was successful to differentiate glial tumors from metastasis. Overall, artificial neural networks can be used as a second observer to differentiate high grade glial tumors from solitary brain metastasis or as a decision support tool in complicated cases.

Keywords: Gliomas, Metastasis, Magnetic Resonance Imaging, Computer-Assisted Image Processing, Machine Learning, Artificial Intelligence

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Notlar : Best Regards

19-THE ROLE OF MAGNETIC RESONANCE IMAGING ON THE DIAGNOSIS OF PLEOMORPHIC ADENOMAS OF THE SALIVARY GLANDS

Ayşe Özlem Balık[1], Selçuk Yıldız[2]
[1]Health Science University, Haydarpaşa Numune Training And Research Hospital, Department Of Radiology
[2]Health Science University, Haydarpaşa Numune Training And Research Hospital, Department Of Ent

Objective: Pleomorphic adenoma (PA) is the most common salivary gland tumor and is often seen as well-circumscribed lesions on Magnetic Resonance Imaging (MRI). On T2-weighted images, a typical PA appears markedly hyperintense, representing abundant myxochondroid stroma, with a hypointense capsule showing the fibrous capsule. However, intratumoral signal intensity varies according to cell density and the ratio of epithelial and stromal components. In this study, we aimed to evaluate the compatibility of the preliminary diagnosis of PA on MRI with the histopathologic results.

Materials and Methods: The study was approved by our Institutional Review Board (771/11/2022). The medical records of patients who applied to the ENT outpatient clinic with the complaint of facial swelling between January 2019 and November 2022 and who underwent contrast-enhanced facial or neck MRI with the preliminary diagnosis of a mass in the parotid and submandibular gland in the Radiology clinic were scanned. The MRIs of the patients were evaluated retrospectively by the same radiologist who has neuroradiology experience. Intraglandular localizations, dimensions, contour, sequence features, and contrast enhancement patterns of the masses were recorded. Then, radiological preliminary diagnoses and histopathologic diagnoses were compared.

Results: Thirty patients with preliminary radiological diagnoses of PA were included in the study. Of the patients, 16 (54%) were female and 14 (46%) were male. The mean age was 51.2 ± 14.4 years. 84% of the lesions were located in the superficial lobe, 1% in the deep lobe, and 15% in both lobes. The mean lesion size (craniocaudal diameter x transverse diameter /2) was 24.6 ± 3.4 mm. 78% of the lesions were observed with regular contours and 22% with lobulated shapes. Almost all of the lesions were hypointense in T1 and hyperintense in T2 series. Three lesions showed heterogeneous signal features in both series. Of the lesions, 23 were homogeneous, 6 were weakly heterogeneous, and 1 had a peripheral contrast enhancement pattern. According to the final histopathologic results, 18 of the masses were diagnosed as PA, 5 of them Warthin tumor, 2 of them lymphoma, 2 of them basaloid adenoma, and 3 of them squamous cell carcinoma. The agreement between those who were preliminarily diagnosed as PA according to MRI and the final histopathologic results was 60% ($p > 0.05$).

Conclusion: Although preoperative MRI guides, histopathological sampling is of great importance. In addition, non-PA primary benign and malignant salivary gland tumors and metastatic tumors should also be considered in the radiological differentiation of salivary gland masses, in the presence of signal differences and weak contrasting patterns on MRI series.

Keywords: Adenoma, Pleomorphic; Diffusion Magnetic Resonance Imaging; Biopsy, Needle

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20-COMPARISON OF RESTING STATE CONNECTIVITY FINDINGS IN COVID-19-ASSOCIATED ANOSMIA AND PAROSMIA CASES VIA FUNCTIONAL MAGNETIC RESONANCE IMAGING

DÜZGÜN YILDIRIM[1], BERNİS SÜTÇÜBAŞI[2], DENİZ ESİN TEKCAN ŞANLI[3], AYTUĞ ALTUNDAG[4], EREN YILMAZ[5], AMALYA ZEYNALOVA[1]
[1]Acıbadem Taksim Hospital, Radiology Department
[2]Acıbadem University, Psychology Department
[3]Gaziantep University Medical Faculty, Radiology Department
[4]Biruni University, Ear Nose Throat Department
[5]Acıbadem Taksim Hospital, Ear Nose Throat Department

Abstract

Objective: It was aimed to compare the resting functional brain images of patients with COVID-19-associated anosmia and parosmia to investigate the connectivity changes associated with olfactory dysfunction.

Method: The patients included in the study were divided into two groups anosmic (A) and parosmic (P) cases after COVID-19 infection according to the results of anamnesis, clinical examination, and symptomatology. Functional magnetic resonance imaging (fMRI) images at rest obtained with multiparametric protocol and magnetic resonance imaging (MRI) which were taken previously and recorded in the PACS system, of these patients were evaluated. MRI recordings were performed with a 3T device (Siemens-Skyra 3T, 32-channel head coil). Anatomical images were collected with high-resolution T1-weighted 3D TFE sequence (TR/TE=2/2.99ms; flip angle: 9; the number of sagittal slices: 160; slice thickness: 1 mm; voxel: 0.98 × 0.98 × 1 mm3; FOV: 256 mm; data acquisition matrix: 216x256, recording time 5 minutes 12 seconds). In resting state fMRI recordings, functional images were recorded in the axial plane with T2* weighted gradient-echo echo-planar (GE-EPI) sequence aligned with the Anterior Commisure-Posterior Commissure (AC-PC) (TR=2 s; TE=25 ms; flip angle: 90 degrees; the number of axial slices: 35; slice thickness: 4 mm; voxel size: 3.8 x 3.8 x 4 mm3; FOV: 240 mm; data summation matrix: 64x64, recording time 8 minutes). No task was given to the participants in the resting state recordings, they were asked to lie in the MR device with their eyes closed without thinking about anything as much as possible. Obtained images were evaluated with seed-to-voxel analysis, which is one of the traditional and standard resting state analyses. The connectivity changes of all cases with all network seeds were analyzed separately. Odor parameters (T-D-I measurements) of all cases were evaluated with the Sniffin' Sticks test. Parosmia was quantified with a parosmia assessment scale only in parosmia patients in 3 degrees (0-1 point) using these factors; frequency of occurrence, intensity, and social effects. Patients with previously diagnosed psychiatric-neurological-genetic disease, cases with neurological involvement associated with COVID-19 other than olfactory loss, cases contraindicated for MRI, and cases with poor image quality due to motion artifact during the shooting were not included in the study. All data were evaluated statistically.

Results: A total of 47 cases aged 14-55 years were included in the study (30A; 17P). There was no significant difference between the two groups in terms of gender and age (A: 13 males; 17 females, P: 8 males; 9 females, mean age A: 21.7 years; P: 28.06 years, $p>0.05$) (Figure 1). However, there were also cases under the age of 18 in the parosmia group. There was no significant difference between the two groups in terms of smell tests (TDI- A: 11.16; P: 11.96, $p>0.05$). The most affected seeds in both groups were the default mode network (DMN) and somatosensory network (SMN). In addition, significant changes were detected in subcortical regions such as the thalamus, hippocampus, and amygdala. Higher connectivity was observed in parosmic cases compared to anosmic cases (Figure 2).

Conclusion: The characteristic of olfactory loss that develops after COVID-19 correlates with connectivity found on fMRI. It is possible to say that connectivity networks decrease significantly more in anosmic cases.

Keywords: functional MRI, parosmia, anosmia, connectivity, network, COVID-19

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21-DIFFUSION RESTRICTION ASSOCIATED WITH BEVACIZUMAB TREATMENT IN RECURRENT GLIAL TUMORS, EVALUATION OF SURVIVAL WITH ADC MEASUREMENT ANALYSIS

Burcu Savran[1], Fatih Göç[1], Özkan Ünal[1]
[1]Sbu Dr. Abdurrahman Yurtaslan Ankara Oncology Training And Research Hospital

Introductıon: Recurrent glial tumors treated with bevacizumab often develop diffusion restriction (1). Some patients develop prominent and large regions of diffusion restriction that did not seem to correlate with tumor recurrence (1,2). In this study, we investigated the diffusion restriction pattern after bevacizumab treatment along with the relationship between ADC values and overall survival.

Materıals and Methods: We retrospectively identified 24 patients treated with bevacizumab for recurrent glial tumor who had low ADC values after the onset of the treatment. The study was conducted with the approval of the Hospital Ethics Committee (Decision number: 2021-06/1220). Serial MR scans were obtained at 3-month intervals lasting maximum for 27 months. MRI findings were analyzed for the presence of restricted diffusion, time to onset, location, duration of restriction, and persistence of restriction after cessation of bevacizumab treatment. We also investigated the relationship between the mean ADC values and overall survival.

Results: The most common location for diffusion restriction was periventricular area (%50). Diffusion restriction appeared 1 to 6 months after the onset of BEV therapy and persisted up to 18 months while on Bevacizumab. The restricted diffusion persisted up to 7 months after cessation of Bevacizumab. The mean ADC value was 683×10^{-6} mm2/s for areas of restricted diffusion (range: 364 to 1127 x 10^{-6} mm2/s). It was previously reported that the ADC threshold that best differentiated necrosis from hypercellulerity was 736.10^{-6} mm^2/s (6). In our study, we found that the mean survival of 15 patients with an ADC value less than 736.10^{-6} mm^2/s was 9.6 months, and the mean survival of 9 patients with an ADC value higher than 736.10^{-6} mm^2/s was 13.6 months. Patients with lower ADC values after the initiation of bevacizumab treatment, are found to have decreased overall survival. (p=0.04).

Dıscussıon: In patients with recurrent glial tumor treated with bevacizumab, we found that the ADC values obtained from diffusion restricted areas correlate with overall survival with the worst survival seen in the patients with the lower ADC values. There are conflicting publications in the literature regarding the relationship between Bevacizumab-induced diffusion restriction and survival. Some studies have suggested that these lesions may reflect aggressive infiltrative tumor whereas others have suggested that these areas may correspond to necrosis induced by bevacizumab treatment (3, 4). The diffusion restriction observed in these patients that is thought to be due to necrosis, is associated with lower diffusion values (2, 5). Most of our patients with lower ADC values had hypoperfusion in areas of diffusion restriction on MRI scans. Besides, the periventricular distribution of the diffusion restricted areas would be less typical of growing tumor than of bevacizumab-induced necrosis. Additionally, the mean ADC values were much lower than what would be expected from actively growing tumor. Therefore we hypothesized that these regions would be due to bevacizumab induced coagulative necrosis and the reason for decreased overall survival might be due to the powerful stimulant role of bevacizumab induced hypoxia on tumor growth and invasiveness. As a result, the lower ADC values found in these patients can be considered as an imaging marker that can predict the prognosis.

Keywords: Angiogenesis Inhibitors, Bevacizumab, Magnetic Resonance Imaging, Brain Neoplasms, Diffusion

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22-NEURORADIOLOGIC MANIFESTATIONS OF COVID-19: THINGS TO KNOW FOR RADIOLOGISTS

Banu Yağmurlu[1], Numan İlteriş Çevik[1], Erdem Özkan[1]
[1]Ankara City Hospital

Aim: Pulmonary disease is the most common source of morbidity and mortality in severely affected COVID-19 patients, but there is a substantial body of literature indicating that a variety of neurologic manifestations also characterize this disease. Here the neurological manifestations and neuroradiological findings of 117 cases among 477 patients with laboratory or radiology-confirmed diagnosis of COVID-19 is described. Correlation of neuroradiologic findings with neurological comorbidities and laboratory data was analysed. In this study, it was aimed to take the attention of radiologists and other health care providers regarding the awareness of the spectrum of neurologic findings associated with COVID-19.

Materials and Methods: A retrospective chart review was performed after receiving ethical consent form the local institution (E1-21-1770). In addition to the demographic data (age and sex), neurologic comorbidities, serum markers (D-dimer, IL-6, Ferritin, Neutrophil/Lymposit ratio) of 477 patients with the diagnosis of COVID-19, who had a radiological imaging, either brain CT or MRI, due to presenting neurological symptoms were collected from the hospital database. Patients complaining of neurological symptoms were evaluated by means of standard neurological examinations, Brain Computerized Tomography (CT) and/or Magnetic Resonance Imaging (MRI). Risk factors were analyzed by logistic regression analysis forward method.

Results: From March 2021 to December 2021, 477 patients with the diagnosis of COVID-19 infection developed neurologic manifestations. Neurologic manifestations were the first presenting sign of COVID-19 infection In 142 (29.8%) (Table 1). Neurologic comorbidities were present in 373 (78.2%) of the patients (Table 2). Brain CT demonstrated acute ischemic lesions (7.7%), hemorrhage (6.0%) and some other pathologic findings (2.6%). MRI demonstrated multifocal acute ischemic lesions in 35 patients (13.6%),

unifocal acute ischemic lesion in 29 cases (11.2%), dural sinus thrombosis in 14 (5.4%), hemorrhage in 13 (5.0%), and encephalitis in 5 patients (2%) (Table 3). Neurologic manifestations as the presenting COVID-19 symptoms demonstrated a higher possibility of having a neuroradiological pathology ($p<0.001$). Altered mental status, focal central neurologic defects, peripheral neuropathies, movement disorders and higher values of serum D-Dimer displayed a higher incidence of having a neuroradiological pathology ($p<0.001$). Serum markers (D-dimer, IL-6, Ferritin, Neutrophil/Lymposit ratio) for patients having a neuroradiological pathology were also analysed. D-Dimer values were significantly higher in patients having a neuroradilogical pathology compared to the patients having normal brain CT or MRI findings ($p<0.001$). Other laboratory values did not differ among groups. When all the parameters were investigated for neuroradiological pathologies with Logistic Regression Analysis; focal central neurological findings, peripheral extremity weakness and movement disorders were the most significant factors ($p<0.001$, $p<0.001$, $p=0.017$) in patients with COVID-19.

Conclusion: COVID-19 patients may present with a wide variety of neuroradiological findings. Radiologists and other health care providers have to be watchful regarding the awareness of the spectrum of neurologic findings associated with COVID-19.

Keywords : COVID-19, Neuroimaging, Brain, MRI, CT

23-SHORT AND MID-TERM RESULTS OF DERIVO EMBOLIZATION DEVICE FOR THE TREATMENT OF INTRACRANIAL ANEURYSMS

BERKAY YILMAZ[1], BORA KORKMAZER[1], EREN ERTEK[1], OSMAN KIZILKILIÇ[1]
[1]Cerrahpasa Faculty Of Medicine, Department Of Radiology

Abstract

Purpose: Endovascular techniques are frequently used for the treatment of intracranial aneurysms and flow diverter stents are important devices in this field. The aim of our study is to report short and mid-term follow-up results of flow diversion with Derivo Embolization Device.

Methods: We retrospectively examined angiographic images and clinical reports of 10 patients (10 females, mean age 56.1 years [range, 43–76 years]) who were treated with Derivo Embolization Device in 2022 and were followed up radiologically at least 6 months. The aneurysms treated with flow diverters were assessed according to technical problems, stent patency, residual filling, regrowth, and occlusion status, and the patients were assessed according to morbidity and mortality.

Results: Except for three patients, one aneurysm was treated per patient. Derivo Embolization Device placement was technically successful in all patients. All aneurysms were located at the internal carotid artery, and the mean diameter was 11.5 mm. Median duration of the follow-up was 187 days. In the first-month flat detector CT angiographic control, no residual filling was detected in 46.1% (n=6) of the treated aneurysms. Total occlusion rates in angiographic follow-up were found 69.2% (n=9) for the sixth-month. No mortality or ischemic complication were observed in the follow-up period.

Conclusion: Derivo Embolization Device is an effective tool for the treatment of challenging wide-necked aneurysms. Nonetheless, long-term results of treatment must be evaluated hemodynamically and clinically in multicenter studies.

Keywords: Aneurysm, Stents, Endovascular Procedures, Cerebral Aneurysm

Poster Presentations

1-ORBITAL EMPHYSEMA AS A CONSEQUENCE OF FORCEFUL SNEEZING AFTER MEDIAL ORBITAL WALL FRACTURE

Berrin Erok[1]
[1]Prof Dr Cemil Tascıoglu City Hospital

Orbital emphysema was first described by Heerfordt in 1904.He defined three types of orbital emphysema including isolated palpebral, true orbital, and orbitopalpebral emphysema **(1).**True orbital emphysema is the abnormal presence of air within the orbital soft tissue posterior to the intact orbital septum.If the intraorbital pressure increase up to a certain value due to the excess accumulation of the air, the orbital septum may rupture and result in the air entry into the eyelids resulting in the development of orbitopalpebral emphysema.The most frequent cause is traumatic orbital wall fractures allowing communication between paranasal sinuses and the orbit.The passage is usually from the ethmoid air cells through the fractures of the medial orbital wall. However, orbital emphysema may also occur in various nontraunatic clinical conditios including gas producing infections, orbital or dental surgeries, pulmonary barotrauma, air travel and spontaneously after forceful sneezing, coughing and nose blowing **(2-7).**We present report an intraorbital emphysema following sneezing preceded by traumatic medial orbital wall fracture.

38 year old female patient applied to an outer center emergency department with swelling around the right orbit and bloody nasal discharge. On computed tomography(CT) of head&orbit right lamina papyrecea fractures were established without air either in the preseptal soft tissue or in the orbit **(fig.1).**Ophhtalmological examination revealed no abnormality and she was discharged from the emergency department with symptomatic treatment.One day later she presented with a rapid increase in her periorbital swelling with feeling like the skin around her eye suddenly puffed out following a forceful sneezing and again a small amount of bloody nasal discharge. She denied any visual deterioration.On repeated CT both preseptal and intraorbital emphysema was revealed.Orbital air was present both in the extraconal and intraconal compartments.The extraconal air was located between the medial rectus muscle & medial orbital wall and was extending anteriorly to the preseptal soft tissue and superiorly to the supraorbital fat**(fig.2).**The intraconal air was located around the optic nerve.The optic nerve and the globe were unremarkable.There were multiple lamina papyracea fractures depressed approximately 6 mm, associated with heterogenous hyperdense opasification in the right ethmoidal air cells and nasal cavity.The right retroorbital extraconal fat was herniated through these fractures into the right ethmoidal area.The right medial rectus muscle was increased in thickness and was entrapped along with the orbital fat**(fig.3).**Since the CT scan before the sneezing had been obtained, we could be able to show that the orbital emphysema did not occur due to orbital wall fracture but rather occured due to the sneeze.She was suggested to avoid forceful nose blowing and sneezing and referred to otorhinolaryngy for the follow up and surgical repair of the lamina papyracea.In most of the cases orbital emphysema resolves spontaneously with the absorption of the air and symptomatic treatment with prophylactic oral antibiotics and nasal decongestants are sufficient. However, in complicated cases urgent decompression may be needed to avoid acute orbital compartment syndrome **(8).**In addition, in patients with large orbital wall fractures, entrapped periorbital tissue like muscles surgical repair of the orbital fractures is indicated **(9,10).**

Keywords: orbital emphysema, sneezing, CT

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2-POST-OPERATIVE INTRACRANIAL HYPOTENSION IN A PEDIATRIC PATIENT WITH PILOCYTIC ASTROCYTOMA CAUSING OBSTRUCTIVE HYDROCEPHALUS

Büşra Nur Bay[1], Hediye Pınar Günbey[1], Emine Çalışkan Güden[1], Naz Paytoncu[1], Hanife Gülden Düzkalır[1], Evren Aydoğmuş[2]
[1]Kartal Dr. Lutfi Kirdar City Hospital, Department Of Radiology
[2]Kartal Dr. Lutfi Kirdar City Hospital, Department Of Neurosurgery

Introduction: Intracranial hypotension is suspected in a patient with positional headaches, vomiting, and nausea. Imaging features are helpful for diagnosing ICH. Due a decreased pressure in the CSF space; dural venous sinuses are enlarged. Subdural effusions may accompany. Since CSF volume is decreased the cerebellar tonsils may herniate from the foramen magnum, and the splenium of the corpus callosum may show drooping. Also, mamillopontine distance which is measured between the roof of the pons and mammillae less than 5.5 millimeters, and ponto mesencephalic angle less than 50 degrees suspects diagnosis. Continuous CSF loss under relatively high negative pressures might be potentially life-threatening in intracranial hypotension after intracranial and spinal surgery with the dural opening. (1) In this case, we present a child with worsening symptoms of nausea, vomiting, and headache post-operatively in which imaging showed intracranial hypotension complicated with hydrocephalus.

Case Presentation: A 5-year-old female presented to the clinic with headaches and at initial imaging, she was diagnosed with a ventricular mass. In magnetic resonance imaging: a slightly hyperintense mass located in the third ventricle, enlargement of the lateral ventricles, and periventricular T2 signal hyperintensity due to trans ependymal CSF migration can be observed in axial T2 image (Image 1).
The sagittal T2 image shows the mass lying over mamillar bodies and the enlargement of the ventricular system. Also, a cystic structure in the supracerebellar region is distinguished. (Image 2).
A gross total excision of the mass and a third ventriculostomy were performed during surgery. Six months after the surgery the patient was admitted to the outpatient clinic with symptoms of worsening nausea and vomiting. Also, she experienced gait difficulties.
In the postoperative images, a millimetric residual tumoral tissue was seen in the region of the septum pellucidum showing diffuse enhancement. Also coronal T1 image after intravenous contrast injection showed diffuse dural enhancement (Image 3). The sagittal T2 image showed a residual tumor in septum pellucidum, tonsillar herniation in foramen magnum, drooping of the corpus callosum splenium, and decreased mamillopontine distance measuring 3.7 millimeters.(Image 4).
In image 5, bilateral subdural effusions prominent on the left side (pointed with an arrow), and the residual tumor are seen in axial T2 scans.

Discussion: Several cases present intracranial hypotension complicated with hydrocephalus. Whose symptoms are nausea, vomiting, and blurred consciousness.(2)
The term negative pressure hydrocephalus is used for an increase in ventricular size with symptoms such as headache, nausea, cranial neuropathies. Despite ventriculomegaly, the CSF pressure is measured low in this rare clinical entity. (3)
In hydrocephalus, ventricular dilatation is believed to be due to increased intraventricular pressure. In communicating hydrocephalus increased pressure is equal throughout the central nervous system, while in non-communicating hydrocephalus this does not seem to be the case. There is pressure differences between the different compartments of the central nervous system. (4)
The cause is unknown but there are two possibilities first are iatrogenic, and the second is spontaneous CSF leaks. (5) Although diagnosis and treatment of this rare clinical entity are challenging, early diagnosis and management are crucial for patient outcomes.

Keywords: hydrocephalus, intracranial hypotension, pilocytic astrocytoma

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3-AN UNUSUAL PRESENTATION OF ADULT L-2-HYDROXYGLUTARIC ACIDURIA

Beyza Nur Kuzan[1], Hediye Pınar Günbey[1]
[1]Kartal Dr. Lütfi Kırdar City Hospital

Introduction and purpose: L-2-Hydroxyglutaric aciduria is a rare autosomal recessive organic aciduria with the L2HGDH gene mutation defined in 2004. Although the diagnosis may be delayed due to its slow progression, early diagnosis may be possible with the recognition of characteristic MRI findings in the early stages. In MR examinations, it

shows an involvement pattern that starts from the subcortical U fibers and progresses to the periventricular white matter. Even in advanced stages, the corpus callosum and internal capsule are preserved. It can be diagnosed with high levels of L-2-hydroxyglutarate in cerebrospinal fluid, plasma, and urine. The most common presentation is psychomotor retardation and epilepsy in early childhood. Although cerebellar findings and motor loss increase in the later stages of the disease, most patients can survive into adulthood (1,2,3).
Here, a case who refer to the outpatient clinic with the complaints of epilepsy and mental motor retardation in adulthood is presented.

Case report: A 36-year-old female patient referred to the outpatient clinic of our hospital with a complaint of seizures. Mental-motor retardation was also noticed in the patient who was described as having generalized tonic-clonic seizures. First degree consanguineous marriage was defined between the parents. Cerebellar findings such as dysarthric speech, lack of eye tracking, and dystonia in the extremities were also defined in the neurological examination, and macrocephaly was not detected. The cranial MRI of the patient showed diffuse symmetrical centripedal white matter involvement. Periventricular deep white matter, corpus callosum and internal capsule are preserved (Figure 1,2). The basal ganglia are partially preserved, and a slight increase in T2 signal is observed in the bilateral globus pallidus(Figure 3). In the cerebellum, there is a slight increase in T2 signal in the bilateral dentate nucleus (Figure 4). No significant signal changes were detected in other sequences. As a result of laboratory tests, the patient was diagnosed with L-2 hydroxyglutaric aciduria.

Discussion and conclusion: L2 hydroxyglutaric aciduria is a rare organic aciduria that can be diagnosed late due to its slow progression and therefore MRI findings play an important role in early diagnosis. It can be used to differentiate late-onset mental motor retardation and later cerebellar findings from other neurometabolic diseases. It should be the first in the differential diagnosis list with bilateral symmetrical leukoencephalopathy pattern on MRI and preservation of deep white matter and basal ganglia. In previous studies with case series, it has been reported that central nervous system malignancies increase in patients with L-2 hydroxyglutaric aciduria (4). In this respect, it has been recommended to re-evaluate the cases in terms of possible tumor presence with contrast-enhanced examination in case of sudden clinical worsening(5).

Keywords : L -2-hydroxyglutaric aciduria, organic aciduria, magnetic resonance imaging

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4-GOMEZ-LOPEZ-HERNANDEZ SYNDROME: A DISEASE WITH A DISTINCTIVE MRI FEATURE

Yunus Emre Çakmaklı[1], Seda Çakmaklı[2]
[1]Bagcilar Training And Research Hospital
[2]Bakirkoy Dr. Sadi Konuk Training And Research Hospital

Two-year old girl was referred to medical genetics department because of macrocephaly. She was born at term to non-consanguineous parents of Turkish origin. During physical examination, head circumference was measured 48 centimeters. She had neurodevelopmental delay, she could not walk and was using only single words. On physical examination bitemporal alopecia and strabismus were noted. We did not detected any copy number variation on microarray analiysis. Whole exome analysis could not be performed. On brain MRI absence of cerebellar vermis and fusion of the cerebellar hemispheres, which was compatible with rhombencephalosynapsis, were observed.
Gómez-López-Hernández syndrome is rare syndrome believed to be caused by a sporadic mutation without any identified gene yet. It is characterized by rhombencephalosynapsis, ataxia and bitemporal alopecia[1]. Although trigeminal anaesthesia is also commonly reported our patient was too young to be evaluated[1]. Rhombencephalosynapsis can cause aquaductal stenosis and hydrocephalus therefore care should be taken when examining the images[2].
We present this case to increase awareness to this rare entity.

Keywords: Gomez-Lopez-Hernandez Syndrome, cerebellar malformation, alopecia

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5-A CASE WITH SUPERIOR OPHTHALMIC VEIN THROMBOSIS

Hatice Kaplanoğlu[1], Veysel Kaplanoğlu[2], Aynur Turan[1]
[1]Health Sciences University Etlik City Hospital, Department Of Radiology, Ankara, Turkiye
[2]Health Sciences University, Ankara Ataturk Sanatory Educatıon And Research Hospıtal, Department Of Radiology, Turkiye

Introduction: Superior ophthalmic vein thrombosis (SOVT) is a rare clinical condition that causes acute painful proptosis, chemosis, and vision problems. It most commonly develops secondary to cavernous sinus pathologies and has many septic or aseptic causes (1,2). In addition, SOVT is associated with many systemic diseases that cause hypercoagulability and is also seen in malignancies.

Case Report: A 60-year-old female patient presented with swelling and redness in the right eye. On examination, there was edema of the eyelid, conjunctival hyperemia, and chemosis in the right eye, and the left eye was normal. Proptosis is observed in the right bulbus oculi on magnetic resonance imaging of the orbit. Asymmetric enlargement of the right superior ophthalmic vein and hyperintense appearance in

T2WI is remarkable (Figure 1). Heterogeneous increases in intensity and edematous signal changes are observed in the retroconal fat tissue posterior of the right orbit (Figure 2). The cavernous sinus was normal(Figure 3).

Discussion: Although superior ophthalmic vein thrombosis is rare, it should be considered in the etiology of sudden unilateral proptosis, conjunctival hyperemia, and chemosis, especially in elderly patients. In some cases, it may also be accompanied by findings such as eye pain, decreased visual acuity, diplopia, and ophthalmoplegia. It can cause severe and permanent complications if not intervened early. In etiology, infection, trauma, inflammation, hypercoagulability, and neoplasms should be considered.CT Angio / MR Angio / DSA can be used for diagnosis. Anticoagulants, antimicrobial therapy, steroids, and specific treatments for etiology are used in the treatment.

Conclusion: Isolated SOVT is a rare and most common differential diagnosis in the exclusion of cavernous sinus pathology. SOVT should be considered in all cases of sudden onset of painful proptosis, and careful evaluation should be performed to prevent life-threatening thromboembolic events and to find the underlying cause.

Keywords : Keywords: Chemosis, superior ophthalmic vein, thrombosis, MRI

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6-A CASE OF SECONDARY INTRACRANIAL HYPOTENSION FOLLOWED WITH MISDIAGNOSIS

Berat Demirel[1], Hatice Kaplanoğlu[1], Veysel Kaplanoğlu[2], Aynur Turan[1]
[1]Health Sciences University Etlik City Hospital, Department Of Radiology, Ankara, Turkiye
[2]Health Sciences University, Ankara Ataturk Sanatory Educatıon And Research Hospıtal, Department Of Radiology, Ankara, Turkiye

Introductıon and Purpose: Intracranial Hypotension Syndrome (IHS) is an entity that occurs secondary to cerebrospinal fluid (CSF) leakage and usually presents with orthostatic headache.[1] There are two types, primary (spontaneous) and secondary.[1,2] Secondary causes include previous surgery or lumbar puncture.[2] In this article, we purposed to present a case of secondary intracranial hypotension, which was operated for Chiari Malformation(CM) 5 years ago and was confused with recurrent CM in the postoperative follow-up.

Case Report: A 31-year-old female patient was admitted to our hospital with the headache recurring at intervals for about 5 years. She said that had an operation for CM 5 years ago and is currently followed up with the same diagnosis. She explained that the headache first appeared at night, but lately it was also during the day, and it started from the neck and spread to the occipital region. Pain intensity did not change with standing or lying down, but increased with straining, sneezing and laughing. MRI was performed on suspicion of IHS. In MRI, significant migration to the inferior in both cerebellar tonsils, effacement in the cerebral sulci and cisterns, narrowing in the 3rd and 4th ventricles, sagging of the corpus callosum and brainstem structures and enlarged pituitary gland were detected (Figures 1-2). Decreased mamillopontine distance and narrowing of the pontomesencephalic angle were other findings that caught our attention in the case (Figure 3). In addition, rounding in the dominant transverse sinus compatible with venous distension was observed (Figure 4). When the findings were evaluated together, the case was considered to be secondary IHS.

Keywords: Intracranial Hypotension, Cerebrospinal Fluid Leak, Headache, Magnetic Resonance Imaging

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7-TONGUE HEMANGİOMA LEADİNG TO SPEECH DİFFİCULTY

Hatice Kaplanoğlu[1], Veysel Kaplanoğlu[2], Aynur Turan[1]
[1]Health Sciences University Etlik City Hospital, Department Of Radiology, Ankara, Turkiye
[2]Health Sciences University, Ankara Ataturk Sanatory Educatıon And Research Hospıtal, Department Of Radiology, Ankara, Turkiye

Introduction: Hemangioma is a localized benign vascular tumor most commonly seen in the head and neck region. Clinically, hemangiomas enlarge rapidly with endothelial cell hyperplasia in the first year of life and shrink spontaneously. It is six times more common in girls than boys. Although hemangiomas are the most common soft tissue tumors in the head and neck region, they are rarely seen in the oral cavity. Localized hemangiomas in the tongue may cause recurrent bleeding, pain, difficulty in breathing due to an enlarged tongue, and difficulties in chewing, swallowing, and speaking. Many treatment options, including pharmacological and surgical treatment, have been described in the treatment of hemangiomas.

Case Report: A 30-year-old female patient presented with pink-red swelling on the superior lateral aspect of the tongue, impaired speech, and difficulty in eating solid foods. This swelling, which has existed since the age of 3, progresses with growth and shrinkage in between, but it does not go away. In the first examination, a pink-red colored soft mass with unclear borders, holding the free superior edge of the tongue along its long axis, was encountered (Figure 1). Magnetic resonance imaging (MRI) revealed a 28x25x20 mm lesion with lobulated contours on the upper surface of the tongue, located on the left lateral-midline, heterogeneous hyperintense on fat-suppressed T2AG, and heterogeneous contrast enhancement after IVGad injection (Figure 2). Since the mass did not regress spontaneously, impair speech function and cause difficulty in eating solid foods, surgical excision was planned with the preliminary diagnosis of hemangioma.

Keywords: Tongue; hemangioma; MRI, surgery

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8-UNILATERAL HYPERTROPHIC OLIVARY DEGENERATION

Hatice Kaplanoğlu[1], Cansu Öztürk[1], Veysel Kaplanoğlu[2], Aynur Turan[1]
[1]Health Sciences University Etlik City Hospital, Department Of Radiology, Ankara, Turkiye
[2]Health Sciences University, Ankara Ataturk Sanatory Educatıon And Research Hospıtal, Department Of Radiology,ankara, Turkiye

Introduction: Hypertrophic olivary degeneration (HOD) is a transsynaptic degeneration caused by damage dentato-rubro-olivary (DROP) pathway of the inferior olivary nucleus. Although the response to degeneration in the central nervous system is usually secondary neuronal loss and proliferation of glial cells, hypertrophy develops in the olivary nucleus due to DROP transneuronal degeneration. HOD is a rare condition and mimic tumor, demyelinating disease, etc. In addition, ischemia, hemorrhage, trauma, and cavernous hemangioma may play a role in etiology.

Case Report:A 60-year-old male patient applied to the emergency service because of falling at home. The patient had symptoms of confusion, tremor, and ataxia. Cranial MRI showed encephalomalacia at the left anterolateral cerebellar hemisphere (Figure 1). There were signs of gliosis and chronic infarcts like volüme loss and T2W hyperintensities on the left mesencephalon, pons, and left cerebral peduncle (Figure 2). The left olivary nucleus level on medulla oblongata was hyperintense on T2W and hypointense on T1W. There was no enhancement or diffusion restriction (Figure 3). Findings were evaluated hypertrophic olivary degeneration. It was learned that the patient had a previous ischemic event.

Discussion: HOD is a degenerative disease of the inferior olivary nucleus (ION) that occurs after any injury to DROP (also called the Guillain-Mollaret triangle or GMT). Injury of DROP causes hypertrophy and enlargement of the ION, unlike atrophy observed in other parts of the central nervous system. Vacuolization of neurons and increase of astrocytes are seen. Patients may show specific findings such as palatal myoclonus, nystagmus, tremor, or ataxia. Radiologic findings of HOD are enlargement and T2 hyperintensities of ION. Contrast enhancement and diffusion restriction are not observed in the ION. Damage of the triangular dentate nucleus, dentatorubral tract (Superior cerebellar peduncle, SCP), or central tegmental tract causes this pathology. If the primary lesion is limited to the tegmentum, olivary hypertrophy is ipsilateral. If the primary lesion is on the tegmentum, olivary hypertrophy is ipsilateral. If the primary lesion is located on the dentate nucleus or superior cerebellar peduncle, olivary hypertrophy is contralateral. Lesions involving both of dentate nucleus and tegmentum cause bilateral olivary degeneration.

Keywords: Hypertrophic olivary degeneration, GuillianMollaret triangle, dentato-rubro-olivary pathway, MRI

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9-INTRALABYRINTHINE SCHWANNOMA: CASE REPORT

Hatice Kaplanoğlu[1], Veysel Kaplanoğlu[2], Cansu Öztürk[1], Aynur Turan[1]
[1]Health Sciences University Etlik City Hospital, Department Of Radiology, Ankara, Turkiye
[2]Health Sciences University, Ankara Ataturk Sanatory Educatıon And Research Hospıtal, Department Of Radiology, Ankara, Turkiye

Introductıon: Vestibular schwannoma is a common benign tumor of vestibulocochlear nerve. Tumor is called intralabyrinthine schwannoma (ILS), if it originates of schwann cells of terminal branch of vestibulocochlear nerve in membranous labyrinth (1, 2). ILS may mimic, Meniere's disease (MD) or inflammatory disorders and present with recurrent dizziness/vertigo and fluctuating or progressive tinnitus, ear fullness, and hearing loss (3, 4). Slow growing cause late diagnosis of the tumor. In addition, routine brain magnetic resonance imaging (MRI), even with contrast, often fails to show ILS (4).

Case Presentation: A 44-year-old female patient presented with vertigo that had persisted for about six months and hearing loss that had occurred in the last month. Mild sensorineural hearing loss was detected on audiometry. Computed tomography of the temporal bone was standard. T2 SPACE MRI demonstrated 3x2 mm area caused a filling defect at the proper vestibule and nodular contrast enhancement after IV Gad injection (Figure 1,2). Differential diagnosis was thought of as intralabyrinthine schwannoma. Medical treatment was started, and the patient followed up.

Discussion: Intralabyrinthine schwannoma is a rare form of acoustic neuroma. Acoustic neuromas, also called vestibular schwannoma, are benign tumors of VIII, the cranial nerve. The most common origin is Schwann cells of the vestibular nerve. ILS arises in the labyrinth. There are three types according to which part of the eighth nerve is related. The first variant, ILS, is limited to the vestibule. The second variant, intracochlear schwannoma, is limited to the cochlear nerve. The third variant, the tumor, arises out of the labyrinth but spreads toward the labyrinth as it grows(4).
İLS is a rare cause of unilateral hearing loss and vertigo. These tumors slow growing or nongrowing (about 1 mm/year). The best diagnostic tests for ILS are audiometry and MRI with IV Gad. The key finding for diagnosis is filling the defect with contrast enhancement after IVGad injection in labirynth. Treatment options are careful follow-up, surgery, and radiotherapy. No matter what treatment method is used, hearing loss on the side of the tumor is highly likely(5).

Keywords : Acoustic neuroma; Inner ear; Intralabyrinthine schwannoma; MRI

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10-DYKE-DAVIDOFF-MASSON SYNDROME: A CASE REPORT

Hatice Kaplanoğlu[1], Veysel Kaplanoğlu[2], Berna Keskin[1], Aynur Turan[1]
[1]Health Sciences University Etlik City Hospital, Department Of Radiology, Ankara, Turkiye
[2]Health Sciences University, Ankara Ataturk Sanatory Educatıon And Research Hospıtal, Department Of Radiology, Ankara, turkiye,

Introduction: Dyke-Davidoff-Masson syndrome is a condition characterized by facial asymmetry, contralateral hemiplegia or hemiparesis, mental retardation, sensorineural hearing loss, psychiatric disorders, epilepsy and in neuroimaging cerebral hemiatrophy, unilateral calvarial thickening, excessive enlargement and hyperaeration of paranasal sinuses (1). Trauma, infection, vascular anomalies, ischemic and hemorrhagic conditions (2), aortic coarctation, subependymal germinal matrix hemorrhage, amniotic band, premature infantile hemorrhages have been implicated in the etiology of this syndrome (3). The gold standard for the diagnosis are cranial computed tomography (CT) and magnetic resonance imaging (MRI), which can give information about the stage of the pathology (4).

Case Report: 23-year-old male patient admitted to the neurology department with seizure and contraction of right upper and lower limb. The birth history of the patient revealed a hypoxic trauma. He was diagnosed with epilepsy and he was being treated with anticonvulsant drugs. Mental retardation and right hemiparesis were determined in the patient's neurological examination. Cranial MRI was planned and it revealed hemiatrophy and volume loss of the left cerebral hemisphere, significant grey matter atrophy and white matter hyperintensities. Bilateral lateral ventricles, significant on the left, were dilated. Third ventricle was narrowed and extended. Volume loss is observed in the left half of the mesencephalon and pons. Focal encephalomalacia areas were seen in bilateral frontal lobe, in the localization of olfactory gyrus and orbital gyrus, which are prominent on the left (Figure 1). Left basal ganglia couldn't be visualized (Figure 2). There was corpus callosum disgenesis (Figure 3). With all these findings including right hemiplegia, Dyke-Davidoff-Masson syndrome was diagnosed.

Discussion: Dyke-Davidoff-Masson syndrome, which is first described in 1933 by Dyke et al., is a condition characterized by hemiplegia or hemiparesis, epilepsy, cerebral hemiatrophy, ipsilateral facial atrophy, enlargement and hyperaeration of paranasal sinuses, unilateral calvarial thickening, mental retardation, sensorineural hearing loss, psychiatric disorders (5). Hemisphere hypoplasia or acquired atrophy is resulting from infarction caused by congenital or acquired causes (6). It's been reported that Dyke-Davidoff-Masson syndrome occurs as a result of brain damage in intrauterine life or in the first 3 years of life, that calvarial maturation is not yet completed (5,6). Different degrees of cranio-facial asymmetry, epilepsy, sinusitis, hemiparesis/hemiplegia and mental retardation can be present as clinical symptoms. Mental retardation may be absent in some cases (7,8). Although seizures in Dyke-Davidoff-Masson syndrome are absence-like seizures that occur mostly in adolescent period, any type of seizure may be present (7, 9).General imaging differential considerations include; hemimegalencephaly, Sturge-Weber syndrome, Rasmussen encephalitis, Fishman syndrome, Silver-Russell syndrome(10) .As a result, the patient with childhood onset epilepsy, mental retardation, slowly developing hemiparesis was diagnosed with Dyke-Davidoff-Masson syndrome supported by neuroimaging.

Keywords: Dyke-Davidoff-Masson syndrome, Cerebral hemiatrophy, hemiplegia, MRI,

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11-MRI FINDINGS IN WALKER-WARBURG SYNDROME; A DEMONSTRATIVE CASE

Naz Paytoncu[1], Büşra Nur Bay[1], Hediye Pınar Günbey[1], Emine Çalışkan Güden[1], Safiye Güneş Sağer[1], Ufuk Yükselmiş[1]
[1]Kartal Dr. Lütfi Kırdar Şehir Hastanesi

Introduction and Purpose: Walker-Warburg Syndrome (WWS) is clinically the most severe form of congenital muscular dystrophies (CMDs) associated with brain and eye anomalies. It is an autosomal recessive disease with an incidence rate of 1.2 per 100,000 live births (1). The etiology has been attributed to defects in dystrophin glycoprotein complex which is a group of proteins spanning the sarcolemma of skeletal muscle (2). Patients diagnosed with WWS die within few months of life; maximum survival age is usually three (3). The disease is characterized by generalized hypotonia and a spectrum of eye and brain anomalies. In this report we aim to demonstrate typical brain MRI findings of WWS through an informative case.

Case Report: Our patient was a five-year-old male diagnosed with WWS in an outpatient clinic. His parents were first degree cousins. He had been diagnosed with hydrocephalus in utero and had ventriculoperitoneal shunt operation when he was 7 months old. He had started to have seizures after the operation and took antiepileptic medication for some time. He had not been using medication for two years when he was

admitted to our emergency department with status epilepticus. He was hypotonic and unconscious. Laboratory tests revealed a high creatine kinase level of 7124 U/L. A contrast enhanced brain MRI-diffusion weighted MRI was performed soon after he was admitted. There was cortical irregularity and thickening and shallowness of sulci especially prominent in frontoparietal and parietooccipital lobes (Image a). Lateral ventricles, third ventricle and the fourth ventricle were dilated with moderate hydrocephalus (Image b). In T2 weighted (T2W) images, periventricular white matter was hyperintense which may be indicative of a hypomyelinization process (Image b). On coronal FLAIR images, absence of septum pellucidum and subacute subdural hematoma reaching 4 mm in width at left frontoparietal convexity were noted (Image c). On T2W sagittal images, corpus callosum was visible only in anterior parts yet posterior portion (posterior body, splenium) was not distinguishable; this was considered accordant with corpus callosum hypogenesis (Image d). Pons appeared hypoplastic and a kink was present in pontomesencephalic junction (Image d). Cerebellar hemispheres demonstrated cortical polymicrogyri. There were subcortical cysts millimetric in size (Image e). There was bilateral macroophthalmia, prominent in the right eye. There was minimal protrusion of posterior contour of right eye which may be interpreted as early posterior staphyloma (Image f).

Discussion and Conclusion: Lissencephaly is classified as type I and type II. In type II brain has a coarse surface due to absence of normal sulcation similar to type I but the appearance is pebbly; thus, giving it its name 'cobblestone lissencephaly' (4). The term 'lissencephaly type II' was originated to describe the malformation; which included irregularly convoluted brain surface, flat brainstem and cerebellar hypoplasia and to distinguish it from classic lissencephaly. Lissencephaly type II is a heterogenous group of disorders characterized by morphological changes in cerebral and cerebellar cortex and CMD. The CMDs associated with lissencephaly type II are WWS, muscle-eye-brain (MEB) disease and Fukuyama congenital muscular dystrophy (FCMD) (5). In conclusion; our patient's laboratory tests, physical examination notes and MRI findings were all consistent with the diagnosis of WWS.

Keywords : Walker-Warburg Syndrome, Chemke Syndrome, Warburg Syndrome, HARD Syndrome, Pagon Syndrome, Cerebroocular Dysplasia-Muscular Dystrophy Syndrome, COD-MD Syndrome, Fukuyama Type Congenital Muscular Dystrophy, Muscle-Eye-Brain Disease

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12-MILD ENCEPHALITIS/ENCEPHALOPATHY WITH REVERSIBLE SPLENIAL LESION (MERS)

Esat Kaba[1], Fatma Beyazal Çeliker[1]
[1]Recep Tayyip Erdogan University Department Of Radiology

Introduction: Mild encephalitis/encephalopathy with reversible splenial lesion (MERS) is a benign clinic-radiological diagnosis presenting with findings of encephalitis characterized by reversible corpus callosum splenial lesion. It has been reported that it is usually seen due to viral infections. Reversible magnetic resonance imaging (MRİ) findings are observed in the splenium of the corpus callosum. This condition, which is more common in children, has rarely been reported in adults (1).
We aimed to present an adult patient diagnosed with MERS clinically and radiologically.

Case Report: A 35-year-old male patient presented to the emergency department with complaints of confusion, nausea, vomiting, and urinary incontinence. He had no known disease or medication use other than asthma. The patient's clinic progressed and delirium was added. In the cerebrospinal fluid examination performed with the preliminary diagnosis of encephalitis, protein and glucose were high and 170 erythrocyte cells were detected per mm^3. In the brain MRİ obtained afterward, a slightly hyperintense T2-weighted - FLAIR lesion in the splenium of the corpus callosum, isointense in the T1-weighted image and did not show contrast increase, and restricted in the diffusion-weighted image was detected. (Fig. 1,2,3) No bleeding was observed in the Susceptibility Weighted Imaging (SWI) sequence and the magnetic resonance venography was completely normal. (Fig. 4) When the clinical and radiological images of the patient were evaluated together, MERS was diagnosed and treatment was started. In the control imaging obtained 4 days later, the diffusion restriction in the splenium of the corpus callosum had almost completely regressed. (Fig. 5) The patient was discharged with full recovery after a total of 14 days.

Discussion: MERS is a rare entity diagnosed with clinical and radiological images for the first time in 2004. Clinically, it progresses with changes in consciousness, headache, seizures, nausea, vomiting, urinary incontinence, and delirium. The most frequently accused infectious agents are viruses such as influenza, rotavirus, mumps, herpes, varicella, and legionella. However, it can also be seen after bacterial infections and the use of epileptic drugs. In addition, a few cases developing after COVID have been reported in the literature in recent years (2). T2-FLAIR mild hyperintensity and reversible diffusion restriction are observed in the splenium of the corpus callosum on imaging. The reason for this diffusion restriction is thought to be transient intramyelinic edema. Its differential diagnosis includes diseases such as ischemia, posterior reversible encephalopathy syndrome (PRES), HIV-associated encephalopathy, diffuse axonal damage, multiple sclerosis, lymphoma, and epilepsy (3).
It is divided into two types: MERS, type 1 with limited diffusion only in the splenium of the corpus callosum, and type 2 MERS with periventricular white matter lesions in addition to the splenium. Type 1 is the most common. The prognosis of both types is very good, and almost all of the patients reported in the literature were discharged with full recovery (3).

Conclusion: MERS is an entity that should be evaluated clinically and radiologically, causing reversible imaging findings in the splenium of the corpus callosum. Although the prognosis is good, it is important for radiologists to recognize this entity.

Keywords : reversible,corpus callosum,splenium,encephalopathy,mri

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13-SECOND BRANCHIAL KLEFT FISTULA DETECTED AT ADVANCED AGE: CASE REPORT

Veysel Kaplanoğlu[1], Hatice Kaplanoğlu[2], Aynur Turan[1]
[1]Health Sciences University, Ankara Ataturk Sanatory Educatıon And Research Hospıtal, Department Of Radiology, Ankara, Turkiye
[2]Health Sciences University Etlik City Hospital, Department Of Radiology, Ankara, Turkiye

Introduction: Branchial anomalies are the developmental anomalies of the branchial apparatus which consist of six mesodermal arches seperated by invaginations of the ectoderm called as clefts. Branchial anomalies are named according to their origin. Branchial cleft anomalies are divided into four types(1). Second branchial arches anomalies are the most common branchial anomalies. The second branchial cleft anomaly is observed with a rate of 95% (1). At least 75% of second branchial cleft anomalies are cysts. About 25% are sinuses and fistulas (1).
Second branchial cleft fistulae can be diagnosed as a result of typical clinical presentation, seen as a small opening just infront of the anterior border of the sternocleidomastoid muscle, at the level of the middle and lower third muscle juction(2). They are rare and comprise only 2% of all branchial anomalies. They are almost always present at birth, however the small pinpoint external opening may go unnoticed. These individuals, commonly present in the first and second decade of life. There is a slight male predilection(2).
Only 39% are complete fistulae, linking the skin to the pharynx, with the majority (50%) only having a draining sinus; 11% have internal opening alone(2). Bilateral fistulae found in 2-10% of cases. In patients with unilateral fistulae, 70% occurs on the right side(2). We aimed to present a case with a second branchial cleft fistula diagnosed at an advanced age with clinical and imaging findings.

Case Report: A 41-year-old female patient was admitted to the otolaryngology outpatient clinic of our hospital with punctual redness, swelling, discharge, and pain on touch on the skin in the lower left part of the neck. On physical examination, it was observed that there was a fistula mouth on the lower left side of his neck (Figüre 1). In the anamnesis taken from the patient, it was learned that there was spontaneous discharge from the mouth of the fistula from time to time, cough, and swallowing sensation on touch and it had been present since childhood. Light palpation of the fistula tract revealed a transparent white discharge at the mouth of the fistula. In the neck ultrasonography examination performed on the patient; a linear fistula tract, which was starting from the submandibular region on the left, and extending to the anteromedial of the sternocleidomastoideus (SCM) muscle, containing dense echogenic materials, opening to the skin at the level of the thyroid gland was noted (Figüre 2). In the neck computed tomography examination of the patient; On the left, a fistula tract starting from the level of the piriform sinus, running anteromedially to the SCM muscle, and opening under the skin at the level of the thyroid gland was observed. The fistula wall shows contrast enhancement (Figüre 3). The appearance was evaluated in favor of a Type 2 branchial cleft fistula. The fistula was removed by making a wide incision into the tract.

Keywords : Branchial arch, fistula, imaging

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14-INFUNDIBULAR RATHKE CLEFT CYST

Hatice Kaplanoğlu[1], Cansu Öztürk[1], Veysel Kaplanoğlu[2], Aynur Turan[1]
[1]Health Sciences University Etlik City Hospital, Department Of Radiology, Ankara, Turkiye
[2]Health Sciences University, Ankara Ataturk Sanatory Educatıon And Research Hospıtal, Department Of Radiology, Ankara

Introduction: Rathke cleft cysts (RCC) are benign lesions typically located between the anterior and posterior lobes of the hypophysis gland in sella (1). RCCs are cystic lesions that develop from the remnant of Rathke's pouch in the pars intermedia region. Its incidence ranges from 4 to 33% in the autopsy series. Its typically located intrasellar but has a suprasellar extension (3). However, they can be only intrasellar or only suprasellar (4). Therefore, we aimed to present the radiological findings of infundibular RCC, a rare localization.

Case Report: A 46-year-old female patient presented with a headache that persisted for about one year and increased for three months. Laboratory tests were standard. Hypophysis MRI showed a 15x8 mm cystic lesion originating from the level of the infundibulum, extending to the chiasma, with peripheral and septal contrast enhancement and hyperintense on T2 AG (Figure 1, 2). Firstly, it was thought that craniopharyngioma was on differential diagnosis. The patient was under transnasal-transsphenoidal surgery. Patient symptoms were recovery after the surgery. The histopathologic diagnosis was Rathke's cleft cyst.

Discussion: RCCs are usually asymptomatic, but they can rarely cause compression effects to the hypophysis gland and optic chiasma, which various clinical consequences such as headache, hypophysis dysfunction, or visual impairment. RCCs are usually asymptomatic, but they can rarely cause compression effects to the hypophysis gland and optic chiasma, which can have various clinical consequences, such as headache, hypophysis dysfunction, or visual impairment (2). Also, rarely, they can cause aseptic meningitis, abscess formation, and empty sella syndrome.
It has been reported that 46% of the patients had one or more hormonal disorders in the preoperative period. The most common hormonal disorder is hyperprolactinemia, followed by gonadotropin deficiency, panhypopituitarism, hypothyroidism, and hypocortisolism (6).
Craniopharyngioma is the first lesion to be considered in the differential diagnosis of RCC. Craniopharyngioma and RCC have similar origins and localization. Craniopharyngioma is usually seen in the child and young adult populations. RCC usually does not have calcification of the wall (2). RCC rarely has septa in the cyst. The hypointense nodule in the cyst on the T2WI sequence is characteristic (5). Differential diagnosis is not ready between these lesions with only imaging. We give the first diagnosis was craniopharyngioma, because of localization, with septa and enhancement.
If RCC is asymptomatic, we may follow up with safety, but symptomatic RCCs should be done decompression with surgery (2). In surgery, simple transsphenoidal partial removal of the cyst wall and cyst drainage is recommended for intrasellar cysts. It is reported that the risk of pituitary, hypothalamic or visual complications and aseptic meningitis will be reduced (7).

In conclusion, less than 10% of Rathke's sac cyst cases are symptomatic. The morphology of Rathke sac cysts is apparent, but it should be kept in mind that they may be encountered in rare localizations such as infundibulum and rarely contain septa.

Keywords : Pituitary, Rathke cleft cyst, Suprasellar, MRI

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15-DURAL SINUS THROMBOSIS AND VENOUS INFARCTION

Hatice Kaplanoğlu[1], Veysel Kaplanoğlu[2], Erdi Tangobay[1], Aynur Turan[1]
[1]Health Sciences University Etlik City Hospital, Department Of Radiology, Ankara, Turkiye
[2]Health Sciences University, Ankara Ataturk Sanatory Educatıon And Research Hospıtal, Department Of Radiology, Ankara, Turkiye

Introduction: Cerebral vein thrombosis (CVT) is a rare clinical condition compared to arterial occlusive diseases of the brain. CVT is responsible for 1-2% of cerebrovascular diseases. Although it can be seen at any age, it is more common in young people, especially in women between the ages of 20-40 (1). Pregnancy, puerperium, use of oral contraceptives (OCS), coagulopathies, intracranial infections, and brain tumors are among the most common etiologies (2). The superior sagittal sinus (70-80%) is most commonly affected; later transverse, sigmoid, and to a lesser extent, cavernous sinus involvement is observed (3). Clinical findings may indicate acute, subacute, and chronic processes. The most common clinical symptoms and findings are partial or generalized epileptic seizures and focal neurological deficits that indicate the brain parenchyma is affected; headache, nausea, vomiting, papilla edema, and changes in consciousness indicate increased intracranial pressure(1, 2).

Case report: A 36-year-old male patient is admitted to the emergency department with a severe and progressive headache. Thin linear areas of hemorrhage are observed between hypodense areas in the bilateral frontoparietal region In unenhanced axial CT images(Figure 1a, b). Contrast-enhanced cranial MR examination showed an area with thin linear hyperintensity and vasogenic edema around it, affecting both the gray and white matter, which causes effacement in the sulci of bilateral frontal lobes (figure 2). The gradient echo sequence shows bleeding foci that tend to coalesce within the lesion (figure 3). In the contrast-enhanced series, a filling defect was noted at the sigmoid and transverse sinuses on the right side (thrombosis)(figure 4). The MR venography examination observed a filling defect at the right sigmoid and transverse sinuses. In addition, a filling defect was observed in the bilateral frontal cortical veins. (Figure 5). Findings were consistent with sinus vein thrombosis in the right sigmoid and transverse sinus, superior sagittal sinus anterior section, and bifrontal venous infarction in cortical veins.

Discussion: Cerebral venous thrombus occurs due to occlusion of the cerebral venous sinus or cortical vein due to thrombus or compression. The most common is superior sagittal sinus (SSS) thrombosis. Predisposing factors such as infection, head trauma, surgical interventions, and tumors increase the frequency of thrombosis(4). It can be seen in all ages. It is more common in women due to oral contraceptives, pregnancy, and puerperium(4). The most common symptoms are acute, subacute, and chronic headaches (4). Convulsions are present in 1/3 of the patients (4). The most frequently affected dural sinuses are the superior sagittal sinus, transverse and sigmoid sinus, cavernous sinus, and sinus rectus (4).
MRI is more advantageous because it can detect thrombosis and show parenchymal lesions that cannot be observed in CCT. Therefore, cranial MRI (with pre-post contrast) and MR venography are performed, which can show dural sinuses with higher sensitivity and are noninvasive(5). Thrombosis in MRI is isointense in T1WI and hypointense in T2WI in the early stages. It is hyperintense is observed in T1WI and T2WI a few days later(5).

Keywords : Thrombosis, venous sinus, cortical vein, venous infarct

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16-RAMSAY-HUNT SYNDROME

Hatice Kaplanoğlu[1], Veysel Kaplanoğlu[2], Aynur Turan[1]
[1]Health Sciences University Etlik City Hospital, Department Of Radiology, Ankara, Turkiye
[2]Health Sciences University, Ankara Ataturk Sanatory Educatıon And Research Hospıtal, Department Of Radiology, Ankara, Turkiye

Introduction: Acute infection with the varicella-zoster virus (VZV) causes a series of neurological syndromes, including Ramsay Hunt syndrome (RHS). RHS is a rare affection characterized by peripheral facial paralysis, skin eruption in the auricular canal, and cochleovestibular symptoms. It is produced by varicella zoster virus (VZV) reactivation in the geniculate ganglia. In elderly and immunocompromised individuals, the virus may reactivate to produce shingles (zoster). After the zoster resolves, many elderly patients experience postherpetic neuralgia. Uncommonly, VZV can spread to large cerebral arteries to cause a spectrum of large-vessel vascular damage, ranging from vasculopathy to vasculitis, with stroke. Brain magnetic resonance imaging (MRI) usually shows no abnormalities. Conversely, an MRI of the internal auditory canal (IAC) was seldom applied, which was helpful in the diagnosis and differential diagnosis.

Case Report: A 66-year-old male presented to the hospital with a 7-day history of left-sided otalgia. Left facial paralysis started after four days, accompanied by hearing loss and tinnitus. Vesicular rash manifested in the left side of the face, left ear auricle, and behind the ear. Routine laboratory examinations, including retroviral screening, were regular. In the temporal MRI examination of the patient, there is a thickening of the facial and vestibulocochlear nerves on the left in the CISS sequence (figure 1, white arrow). Contrast-enhanced axial and coronal T1WI shows abnormal enhancement of the vestibular nerve, geniculate ganglion, and facial nerve (figure 2, white arrow). A clinical diagnosis of Ramsay Hunt syndrome (RHS) was considered. He was started with oral valaciclovir and prednisolone.

Discussion: Although the VZV remains latent in CN and dorsal root ganglia, it may reactivate, causing a diverse spectrum of neurological syndromes, including the well-known RHS(1). RHS consists of a unilateral otalgia associated with a vesicular eruption in the external auditory canal and sometimes in the pharynx and other parts of the cranial integument, accompanied by severe peripheral facial palsy, sometimes as well as hearing loss and disequilibrium involving the facial and the vestibulocochlear nerve (2). Multiple CN involvement is rare in RHS, which was reported only in some cases(3). The diagnosis of cranial polyneuropathy in RHS is difficult since it can be associated with neurological symptoms mimicking other diseases such as Bell's palsy, Guillain-Barré spectrum disorders, vestibular neuritis, acute labyrinthitis of various causes, and so on. In most cases, brain MRI showed no abnormalities. Conversely, IAC MRI was seldom applied(4).
This case indicated that early diagnosis of RHS with atypical clinical manifestations could be prompted by IAC MRI findings which can show enhancement in the affected CN (CN VII, VIII, IX, X). It has been attributed to the swelling of CN caused by edema and inflammatory cells, the breakdown of the blood-peripheral nerve barrier, and so on(3). In addition, a combination of systemic antiviral and steroid therapy has a beneficial response in patients with RHS(1).

Keywords : Ramsay Hunt Syndrome, vesicle, facial palsy, MRI

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17-AN UNCOMMON FORM OF MENENGIOMA: CYSTIC MENENGIOMA

Muhammet İkbal IŞIK[1], Ferhat CUCE[1]
[1]Gulhane Training And Research Hospital

Introduction: Meningiomas are a common intracranial tumor with a frequency of 15% and are the most common of the extraaxially located tumors. While most of them tend to have a benign course, there are also forms with atypical appearance and malignant features. Cystic meningiomas constitute approximately 3-7% of all meningiomas in adults (1). In this case, we aimed to share the imaging features of cystic meningioma.

Case Report: A 70-year-old female patient with known chronic liver and kidney disease was admitted to the emergency department with complaints of headache and numbness in her hands and legs. In the MRI, a dura-based extraaxial lesion located at the level of the left parietooccipital border zone with a homogeneous internal structure and surrounded by an area of FLAIR hypointensity was observed. It was seen the lesion was isointense with gray matter in all sequences, contained a T2 hyperintense cystic area around it, and millimetric calcifications were found in the CT examination. The follow-up in 2 years, its size and imaging findings did not differ significantly. The lesion was evaluated as a cystic meningioma.

Discussion: Meningiomas are the most common non-glial intracranial tumors from originating meningoendothelial cells. They typically have a solid structure and are classified as WHO Grade I. However, there are also forms with atypical features and the forms classified as WHO Grade II (2). In both CT and MRI, they appear as extraaxially located, well-circumscribed solid lesions with a homogeneous internal structure. Cystic meningiomas are an atypical form and the mechanism of formation has not been fully explained. Nauta et al., in 1979, classified meningiomas (According to this classification, the case we presented was classified as Type 3). Differential diagnosis varies due to the localization of the tumor (supratentorial / infratentorial) and additional imaging findings (Diffusion MRI, Perfusion MRI, etc.). Prognosis and treatment options depend on several factors including histological subtype, tumor location, patient's age, and associated comorbidities. It is important for radiologists to know the presence of atypical forms as well as typical imaging findings of meningiomas and to keep them in mind in the differential diagnosis.

Keywords: Meningioma, Neoplasms, Central Nervous System Neoplasms

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*18-R*UPTURED INTRACRANIAL DERMOID CYST

Hatice Kaplanoğlu[1], Veysel Kaplanoğlu[2], Cansu Öztürk[1], Aynur Turan[1]
[1]Health Sciences University Etlik City Hospital, Department Of Radiology, Ankara, Turkiye
[2]Health Sciences University, Ankara Ataturk Sanatory Educatıon And Research Hospıtal, Department Of Radiology, Ankara, Turkiye

Introduction: Intracranial dermoid cysts (IDC) are rare, slow-growing lesions that can reach a large size. Symptoms usually depend on compression of the adjacent parenchyma. Although spontaneous cyst rupture is rare, serious complications, such as aseptic meningitis, hydrocephalus, vasospasm, cerebral ischemia, etc. may occur. The rupture could detect with computed tomography (CT) or magnetic resonance imaging (MRI). We aimed to present a case of a ruptured intracranial dermoid cyst with CT and MRI findings.

Case Report: A male patient of sixty years old, who has had headaches and dizziness for three months, was admitted to the neurology clinic. The patient said he had intermittent headaches for one year, but they intensified and added dizziness in the last ten days. The headache and dizziness were unresponsive to treatment. Cranial CT without contrast

showed a well-circumscribed mass with fat density (mean -65 HU density) and linear wall calcifications in the right frontotemporal. Fat densities were observed in the right frontotemporal between the cortical sulci and in the Sylvian fissure, and in the left temporal subdural area (yellow arrow) (Figure 1). Contrast-enhanced cranial MRI showed a mass with 64x35 mm size, fat–fluid leveling that T1W and T2W hyperintense, and caused slight displacement to the left in midline structures (Figure 2). Also, MRI showed fat intensity same localizations as CT (Figure 3). Mass and scattered fat intensities did not show contrast enhancement (Figure 4). CT and MRI findings evaluated the lesion in favor of a ruptured IDC.

Discussion: IDCs are benign congenital tumors and cause less than 1% of all intracranial tumors (1). Because they are origin than the epidermis and dermis, they could contain hair, fat, and tooth. Although they develop during the embryonic period because of the slow growth rate, they reach the asymptomatically adult period with a considerable size. They are usually located in the parasellar region and cerebellopontine angle. However, they rarely could be in the spinal canal and syrinx cavity (2).
Rupture of IDCs is rare and usually occurs spontaneously. Clinical consequences usually depend on localization and compression of brain parenchyma. Spontaneous rupture of IDK causes subarachnoid dissemination of cyst contents. It may cause severe conditions such as aseptic chemical meningitis, transient cerebral ischemia due to vasospasm, hemiparesis, and rarely rapidly developing hydrocephalus (3, 4). Due to the rupture of IDC fat, contained particles pass subarachnoid space and create typical MRI and CT findings (3). As a result of IDC rupture fat contained particles are passed to subarachnoid space, and these fat particles constitute the typical findings of ruptured IDC on MRI and CT (3).

Keywords: Intracranial dermoid cyst, rupture, computed tomography, magnetic resonance

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19-CEREBRAL AIR EMBOLISM ASSOCIATED WITH CENTRAL VENOUS CATHETERIZATION: AN UNUSUAL CAUSE OF ISCHEMIC STROKE

Selahattin Durmaz[1], Bilgin Nabi Coskun[1], Sinan Seyrek[1], Mehmet Barburoglu[1]
[1]Department Of Radiology, Istanbul University, Istanbul School Of Medicine

Introduction and Purpose: Cerebral air embolism(CAE) is defined as the introduction of air into cerebral arteries or venous structures. It is a rare and avoidable condition that can lead to severe neurological deficits and possible death[1]. Iatrogenic causes include central venous catheter placement, manipulation or removal, cardiac surgery, endoscopy, laparoscopy, etc. comprise the majority of etiologies[2,3]. CAE can present with a variety of clinical symptoms including altered consciousness, seizures, and acute stroke findings. Early diagnosis and prompt specific treatment are important to avoid severe morbidities and mortality. However, due to nonspecific clinical manifestations, it can easily be underdiagnosed[1-3]. An immediate brain computed tomography(CT) is the first-line imaging modality of choice. Being familiar with the imaging findings of CAE is essential for early diagnosis[2]. In this report, we aim to review CT and magnetic resonance imaging(MRI) findings of CAE.

Case: A 76-year-old man who was operated due to acute mesenteric ischemia 10 days ago suddenly developed altered consciousness with Glasgow Coma Scale (GCS) 6. The brain CT(figure 1) performed right after the onset of symptoms showed bilateral air bubbles in the high convexity distributing subarachnoid space along cortical grooves. The subsequent brain MRI performed a couple of hours revealed bilateral extensive cortical ischemic lesions on both cerebral and cerebellar hemispheres suggestive of acute ischemic stroke. The brain MR angiography(figure 3) was unremarkable. Clinical and radiological findings were interpreted as acute ischemic stroke associated with CAE. The origin of the air embolism was considered the central venous catheter(CVC) placed during the surgery 10 days ago and it was immediately replaced. On control brain CT(figure 4) acquired around 10 hours after the first brain CT, diffuse brain edema predominantly affecting the right hemisphere was observed. The air bubbles observed in the previous CT were almost completely resorbed. The patient died a week after the onset of symptoms.

Discussion and Conclusion: Although CAE has been reported as an infrequent condition, the number of reported cases has increased due to the increased number of diagnostic and therapeutic interventions[2,3]. CAE occurs due to the pressure gradient and direct communication between the blood vessels and atmospheric air. Both venous and arterial vessels can be involved in CAE[1,2,4]. The air got logged into the capillaries acts like a foreign body and causes not only ischemia due to microcirculation blockage but also inflammatory response and complement activation[1,4,5].
CT scan is the first-line imaging modality of choice in patients suspected of CAE. The presence of intracranial air can easily be detected by CT as small round or curvilinear hypodensities(gyriform pattern). However owing to the rapid resorption of intracranial air, CT should be performed within the first hour from the onset of symptoms. The diagnosis of CAE by MRI is challenging. Susceptibility artifacts on gradient echo sequences can be used to detect intracranial air(figure 3). On DWI, CAE can manifest as multifocal cortical diffusion restrictions. Vasogenic edema may also be present in the ischemic areas[2].
In conclusion, radiologists should be aware of CAE and its imaging findings to be able to make an early diagnosis that is significantly important for patients' management and outcome.

Keywords: Air embolism, central venous catheter, acute ischemic stroke, computed tomography, magnetic resonance imaging

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20-ORBITAL INFLAMMATORY PSEUDOTUMOR; A RARE CASE REPORT

ismail dilek[1], Abdussamet batur[2]
[1]Iğdır Dr. Nevruz Erez Devlet Hastanesi, Radyoloji Kliniği
[2]Selçuk Üniversitesi Tıp Fakültesi Hastanesi, Radyoloji Kliniği

Introduction: Orbital pseudotumor or idiopathic orbital inflammation is a rare idiopathic, non-specific, non-neoplastic, non-granulomatous chronic inflammation of the orbit. Although the clinic is often a sudden onset of pain, proptosis, eyelid edema and redness, and pain with eye movements may accompany. The diagnosis is made using clinical findings, laboratory tests and radiological imaging methods.

Case presentation: He was diagnosed with orbital cellulitis 20 days ago in an external center and admitted to our hospital with the complaints of sudden onset of pain and ongoing redness in the left eye despite the use of systemic and topical antibiotics during this period. On examination of the patient, proptosis in his left eye; edema, redness and ptosis of the upper eyelid, there was limitation of outward gaze. In laboratory tests, complete blood count, liver function tests, thyroid function tests, acute phase reactants, c-ANCA, p-ANCA, ANA were normal. In the contrast-enhanced magnetic resonance(MRI) evaluation of the orbit, an unbounded increase in thickness in the left lateral rectus muscle and a slightly edematous appearance in the retrobulbar area were observed (Fig.1,2).
With these clinical and radiological findings, the patient was diagnosed with orbital pseudotumor. Antibiotic treatment was discontinued and intravenous methyl-prednisolone treatment was started for 2 days, and then oral steroid treatment and artificial tear treatment were started.
In the control examination performed 2 weeks later, it was found that the visual level was complete in both eyes, the redness and edema of the eyelid disappeared, proptosis regressed, and the complaint of double vision disappeared. In the contrast-enhanced MRI of the orbit performed 2 months later, it was observed that the left lateral rectus muscle thickness decreased significantly (Fig.3).

Discussion: Orbital pseudotumor is an idiopathic, rare disease that can involve any structure in the orbit. Infectious agents and autoimmune disorders are blamed in its etiology. It is commonly seen in women under 50 years of age. It usually occurs following a viral upper respiratory tract infection in children(1). Unilateral involvement is more common than bilateral involvement (2). Bilateral involvement is mostly seen in pediatric patients (3).
Clinical findings are often in the form of sudden onset of eye pain, proptosis, eyelid edema, and limitation of eye movements(4,5). Thyroid orbitopathy, sarcoidosis, infections, vasculitis, foreign body reaction, dermoid cyst, neoplasms should be considered in the differential diagnosis(2,6). The diagnosis of the disease is made by clinical findings, laboratory tests, imaging methods, rapid response to steroids, and biopsy in some difficult cases that do not respond to steroids. In addition to the extraocular muscles, the surrounding adipose tissue, sclera, optic nerve and lacrimal gland involvement can also be observed in radiological imaging. In classical treatment, systemic steroids are used (7). Orbital pseudotumor is a disease that should be kept in mind in the differential diagnosis together with orbital lesions in patients presenting with ocular pain, proptosis, and diplopia, and imaging plays an important role in elucidating any underlying etiology behind orbital inflammation and is critical for ruling out other conditions prior to a definitive diagnosis of orbital pseudotumor.

Keywords : Orbita, Pseudotumor, Inflammatory

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21-NON-ANEURYSMAL PERIMESENCEPHALIC SUBARACHNOID HEMORRHAGE

Esat Kaba[1], Mehmet Beyazal[1], Fatma Beyazal Çeliker[1], Lütfullah Sağır[1]
[1]Recep Tayyip Erdogan University Department Of Radiology

Introduction: Non-aneurysmal perimesencephalic subarachnoid hemorrhage (NAPH) is defined as bleeding predominantly in the perimesencephalic cisterns and without aneurysm detected in digital subtraction angiography (DSA). It constitutes 10-15% of all spontaneous subarachnoid hemorrhages. Its prognosis is better than aneurysmal subarachnoid hemorrhage (aSAH) (1).

Case report: A 51-year-old woman patient presented to the emergency department with a headache complaint. He had no known disease. In the brain computed tomography (CT) was obtained, and bleeding was observed in the prepontine cistern, interpeduncular, and ambient cisterns. (Fig 1,2) Subsequent magnetic resonance imaging (MRİ) confirmed that there was no bleeding anywhere other than the perimesencephalic area. (Fig 3,4) No aneurysm was detected in DSA performed to rule out aneurysmal bleeding and a diagnosis of NAPH was made. (Fig. 5.6)

Discussion-conclusion: Subarachnoid hemorrhage is an important cause of mortality and morbidity, accounting for approximately 5% of all cerebrovascular diseases. Most spontaneous subarachnoid hemorrhages are due to aneurysms. Non-aneurysmal perimesencephalic subarachnoid hemorrhage is rare. It is defined as bleeding predominantly in the perimesencephalic cisterns without an aneurysm in DSA. The center of bleeding should be the periphery of the mesencephalon and the front of the pons and the ambient and quadrigeminal cisterns, but it is acceptable for a small amount of bleeding to extend to the following areas; basal part of the sylvian fissure, lateral ventricle occipital horn, fourth ventricle and cisterna magna. (2)
Its etiology is not yet clear. It is discussed that it may be due to many reasons, such as microangioma, rupture of the pons pefroran arteries, rupture of the deep internal vein and bacillary trunk dissections. In addition, some studies suggest that it is caused by abnormal drainage of the basal vein of Rosenthal. The prognosis is quite good compared to aneurysmal SAH, and the risk of rebleeding and vasospasm is very low (3).

Keywords: Perimesencephalic, non-aneurysmal subarachnoid hemorrhage, DSA

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22-HYPOTHALAMIC LANGERHANS CELL HISTIOCYTOSIS: A RARE MANIFESTATION IN THE CENTRAL NERVOUS SYSTEM

Mehmet Hamdi Şahan[1], Ahmet Mete[1]
[1]Gaziantep University Faculty Of Medicine, Department Of Radiology

Introduction-Aim: Langerhans cell histiocytosis (LCH) represents a rare disease spectrum with local or systemic effects, characterized by idiopathic infiltration in various tissues and accumulation of abnormal histiocytes (1-3). We aimed to present a case of central nervous system LCH, which is a rare localized intracranial mass lesion, extending along the hypothalamo-pituitary axis at the hypothalamic level, with imaging features.

Case: Twenty-year-old woman applied with hearing loss complaint. After clinical examination, a preliminary diagnosis of otitis media was considered. Temporal bone Computed Tomography (CT) was planned. Widespread soft tissue density areas causing multiple lytic erosive destructive changes and local expansion in the calvarial bones, especially in the temporal bones, were observed in the CT examination. (Figure 1 a,b). In addition, the appearance of a mass in the suprasellar area was note (Figure 2). Magnetic resonance imaging (MRI) was planned. Intense homogeneous contrast enhancement causing enlargement in calvarial bones, especially temporal bones, was observed on MRI (Figure 3). Mass lesion in the suprasellar area, starting from the immediate neighborhood of the stalk and extending to the level of the interpeduncular cisterna, 22x15x18 mm in size, with smooth lobulated contours, iso-intense on T1-weighted images, heterogeneous iso-hypointense on T2-weighted images, without diffusion restriction, with intense homogeneous contrast enhancement in contrast-enhanced series observed on MRI (Figure 4 a,b,c,d,e). In addition, slight signal loss was observed in the neurohypophysis on T1-weighted images (Figure 4 a). Laboratory examinations did not reveal any distinctive features in hormonal and biochemical findings. LCH was considered among the differential diagnoses due to calvarial lytic lesions. Postauricular skin-soft tissue biopsy was performed for tissue diagnosis. As a result of the pathology, Langerhans cell histiocytosis was diagnosed.

Discussion and Conclusion: LCH can affect any organ or system, but skeletal, skin and central nervous system are more frequent

Keywords : Langerhans cell histiocytosis, hypothalamus, intracranial, MRI

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23-GIANT CELL TUMOR OF THE TEMPORAL BONE: A CASE REPORT

Hatice Kaplanoğlu[1], Aynur Turan[1], Veysel Kaplanoğlu[2]
[1]Health Sciences University Etlik City Hospital, Department Of Radiology, Ankara, Turkiye
[2]Health Sciences University, Ankara Ataturk Sanatory Educatıon And Research Hospıtal, Department Of Radiology, Ankara, Turkiye

Introduction: Giant cell tumor (GCT) arises from undifferentiated mesenchymal cells of the bone marrow(1). GCT, a benign and locally aggressive tumor, is more commonly seen in the metaphysis of long bones (2). It may cause local bone destruction, recurrence, and pulmonary metastases (~1%) (3). They are rarely found in the skull and temporal bone and present with different symptoms depending on location. GCT of the temporal bone may cause otalgia, ear fullness, conductive or sensorineural hearing loss, tinnitus, localized swelling in the temporal or preauricular region, temporomandibular joint dysfunction, and facial paralysis (4). This article presents a case of temporal bone GCT in light of the literature.

Case: A 15-year-old male patient was admitted with complaints of swelling on the right face, a headache that has persisted for one year and progressively worsened in the last three months, and hearing loss. There were no features in his self-history and family history. On physical examination, immobile, poorly circumscribed 4x5 cm swelling in the right temporal region was not sensitive. The otoscopic review of the patient was normal. However, on audiometric examination, conductive hearing loss was observed on the right side.
Computed tomography (CT) imaging depicted a mass lesion arising from the squamous part of the temporal bone, caused erosion and scalloping in the greater wing of the sphenoid bone and extends under the skin by eroding the temporal bone, including hyperdense levels and calcified septas (Figure 1).
Magnetic resonance imaging (MRI) revealed a lobulated contoured, 52x50 mm sized mass that originates from the right temporal bone squamous part, arches the adjacent dura, extends to the middle temporal fossa, subcutaneous fat tissue, temporal muscle, and the temporomandibular joint. The lesion was hyperintense in T1 WI and hypointense in T2 WI, revealing fluid-fluid levels, diffusion restriction (Figure 2), and heterogeneous peripheral and septal enhancement (Figure 3).
As a result of the imaging findings, surgical excision was recommended as a treatment option. Craniotomy and total tumor excision were performed. It was observed that the tumor invaded the infratemporal fossa and extended to the anterior of the right temporomandibular joint and the inferior of the greater wing of the sphenoid bone. Histopathological examination revealed a giant cell tumor of the bone. Radiological follow-up was recommended at close intervals in the postoperative period.

Discussion: GCT originates from non-osteogenic stromal cells of the bone marrow (5). It constitutes approximately 3-7% of all primary bone tumors (6). It is common in the fourth or fifth decades and in women (4.7). It usually occurs in long bones such as the distal radius and femur, proximal tibia, and fibula (6). It is infrequent in the skull, accounting for 1–2% of the GCTs of the bone. It occurs most frequently in the sphenoid and the temporal bone due to their endochondral ossification, like long bones (8,9).
The histopathological differential diagnosis of GCT includes giant cell granuloma, aneurysmal bone cyst, non-ossifying fibroma, osteogenic sarcoma, benign fibrous histiocytoma, and Brown tumor associated with hyperparathyroidism (9). In addition, it should be considered in the differential diagnosis of cholesteatomas, paragangliomas, and Langerhans cell histiocytosis in middle ear lesions (8).

Keywords : Giant cell, temporal bone, Tumor, CT, MRI

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