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Role of MRI in the diagnosis of dysembryoplastic neuroepithelial tumors: a review of two cases

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ABSTRACT

Dysembryoplastic neuroepithelial tumors (DNET) are benign brain tumors clinically revealed by partial seizures occurring in young patients from 20 years of age, with normal neurological examination. Imaging contributes to the diagnosis, it is a supratentorial cortical lesion, without mass effect or peri-lesional edema. The temporal localization is the most frequent followed by the frontal localization more rarely parietal and occipital. generally stable tumor. Surgery is the only treatment for DNET, it allows the control of epilepsy in 85%., But the confirmation remains histological. We report two cases of DNET, in two patients aged 17 and 14, with epilepsy resistant to medical treatment, without neurological deficit on clinical examination, it results in MRI by a temporal cortical lesion in the first case and parietal in the first case. the second, without mass effect or peri-lesional edema.

Keywords : epilepsy, MRI, DNET.

INTRODUCTION

Dysembryoplastic neuroepithelial tumors (DNET) are very rare benign brain tumors, currently classified by the World Health Organization (WHO) as a grade 1 mixed neuronal and neuronoglial tumor, (1,2), seen in children and children. young adolescents under 20 years of age, with a history of drug-resistant epilepsy (3), the typical form results in imaging as a supra-tentorial, cortical, usually temporal lesion without mass effect or peri-lesional edema. (4) The main differential diagnoses of DNET are gangliogliomas and oligodendrogliomas. (1) surgery alone allows the control of epileptic seizures in 85%. (2)

MATERIAL AND METHODS

Observation 1:

This is the case of a 17-year-old patient followed for partial epilepsy. Who presents for a recurrence

of his seizures becoming resistant to treatment. The clinical examination does not indicate a neurological deficit. He was referred by his neurologist for radiological exploration. Brain MRI was performed by a Siemens 1.5 Tesla machine. We performed the following sequences: T1-weighted sagittal sequence, T2-weighted axial sequence, Flair axial sequence, axial gradient echo sequence, axial diffusion sequence with calculation of the Apparent Diffusion Coefficient (ADC) and 3D T1 sequence after injection of Gadolinium . It revealed an intra-axial left temporal, cortico-subcortical lesional process, well limited, in hypo signal T1 (figure 1), in heterogeneous hyper signal T2 (figure 2) and Flair (figure 3), achieving an aspect in "Soap bubbles", in diffusion hypo signal (FIG. 4) with a high (ADC) (FIG. 5), absence of calcifications on the T2 guardian echo sequence (FIG. 6). We note the presence of two fleshy lesions, in hypo signal T1 hyper signal T2 and diffusion with low ADC enhanced annularly after injection of Gadolinium (figure 7). It measures 38x62x45 mm We note the absence of mass and peri-lesional edema, with imprint on the scale of the temporal bone opposite. In front of these radiological images, a DNET was evoked. The patient was operated on, which allowed her seizures to be controlled. Pathological examination confirmed the diagnosis of DNET (Figure 8).

Observation 2:

Our second patient is 14 years old, with no particular pathological history. Who consulted in the emergency room for pharmaco-resistant partial seizures, afebrile. The physical examination was without abnormality. She was referred to us for a brain MRI. . We performed the following sequences: T1-weighted sagittal sequence, T2-weighted axial sequence, Flair coronal sequence, axial gradient echo sequence, axial diffusion sequence with calculation of the Apparent Diffusion Coefficient (ADC) and 3D T1 and axial T1 sequences after Gadolinium injection. She objectified the presence of a left parietal cortical cortical neck area, in hypo signal T1 (figure 9), hyper heterogeneous signal T2 (figure 10), surrounded by a ring in hyper signal flair (figure 11), without effect of mass or peri-lesional edema, and without calcification objectified on the T2 gradient echo sequence (figure 12), This area is in discrete hypo signal diffusion, with an intermediate ADC (figure 13), not enhanced after injection of gadolinium (figure 14) . It measures 35.6x29 x 27 mm. X-ray images were in favor of DNET, which was confirmed histologically after surgical treatment

RESULTS AND DISCUSSION

Dysembryoplastic neuroepithelial tumors (DNET) are very rare benign brain tumors that are part of glial tumors, (5) (<1% of all brain tumors, <0.2% of neuroepithelial tumors in patients over 20 years). (6) Recently discovered by Daumas-Duport et al. (2), it occurs before the second decade, and clinically manifests as pharmaco-resistant partial epilepsy, without neurological deficit. (7) Imaging contributes to positive diagnosis It is a cortical tumor, supratentorial, without mass effect or peri-lesional edema. (4) The temporal lobe is the most frequent site (62%), followed by the frontal lobe (31%), then the parietal and occipital lobes which are rarer (7%) (3). Other much rarer localizations have been described in recent years: these are the brainstem, the cerebellum, the caudate nucleus and the thalamis. (1,7) On CT, DNETs are generally cortical lesions, well limited hypodenses, sometimes pseudo-cystic, not enhanced. However, a focal enhancement can be noted (18%), (5). Calcifications may be present, punctate (37%) or nodular (63%), (8) associated with an imprint on the adjacent bone table in 50% of cases. (1.6) as was the case in our first observation. CT can be normal in 10% of cases, when the tumor is iso dense, it becomes difficult to specify its exact location and its extension, hence the interest of MRI which allows better characterization of the tumor. (5) MRI makes it possible to distinguish three types of DNET: a pseudo-cystic or pseudo-poly cystic type, with T1 hypo signal, T2 hyper signal, without contrast uptake after injection of gadolinium and without calcifications, A nodular or multi-nodular type heterogeneous signal with

possibility of calcifications, annular or nodular contrast enhancement. and a dysplastic type in iso or hypo signal T1, poorly limited with a gray matter-fuzzy white matter interface. (9) the MRI data of our patients made it possible to identify the nodular form in the first observation and the pseudo-cystic form in the second.

Histologically, DNETs reform a specific glioneuronal component, glial nodules and cortical dysplasia, the degree of their association allows three forms to be distinguished: the simple form is composed only of the specific glioneuronal component. The complex form formed by the three basic constituents, and the nonspecific form marked by the absence of the glioneuronal component (5) .The simple form and the complex form results in MRI by pseudo-cystic type, the nonspecific form by the nodular or dysplastic type. (9). The main differential diagnoses of DNET are gangliogliomas and oligodendrogliomas. The latter have radiological characteristics similar to that of DNETs. However, they have a few peculiarities that make them different. In particular the frontal preferential localization of the oligodendrogliomas and the frequent calcifications of the gangliogliomas. The association of clinical and radiological signs and especially histology which makes it possible to confirm the diagnosis, which is essential, since the action to be taken is different, comprising only surgery for DNETs, while radiotherapy or adjuvant chemotherapy can be added. may be necessary for other tumors (1,3–5).

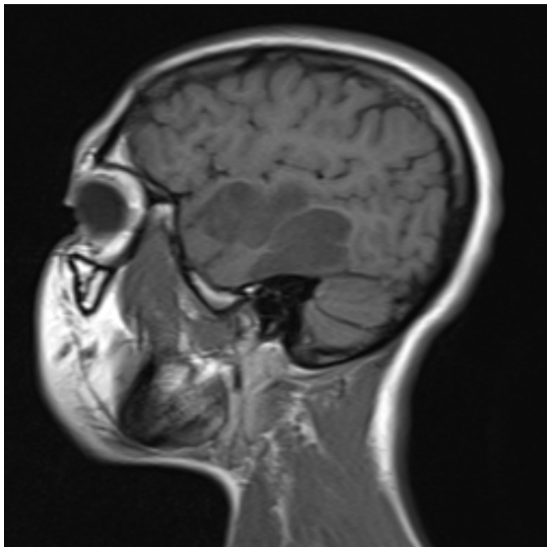

Figure 1: Brain MRI in T1-weighted sagittal section showing a left temporal corticosteroid lesion in hypo signal, seat of a fleshy area in hypo signal

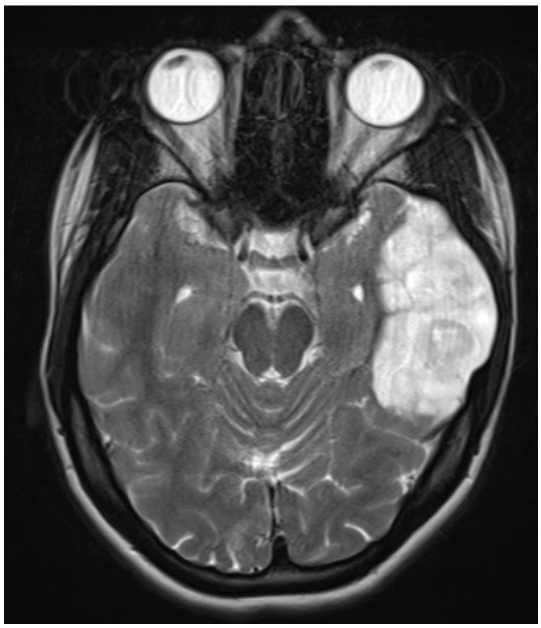

Figure 2: T-weighted axial section 2 showing a microcystic "soap bubble" appearance, of the left temporal corticosteroid-sub-cortical lesion, the fleshy area is hypersignal

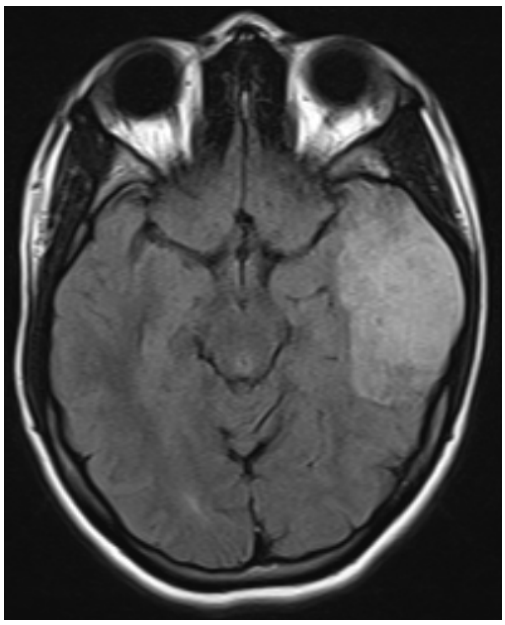

Figure 3: Flair hyper signal appearance, absence of mass effect or peri-lesional edema

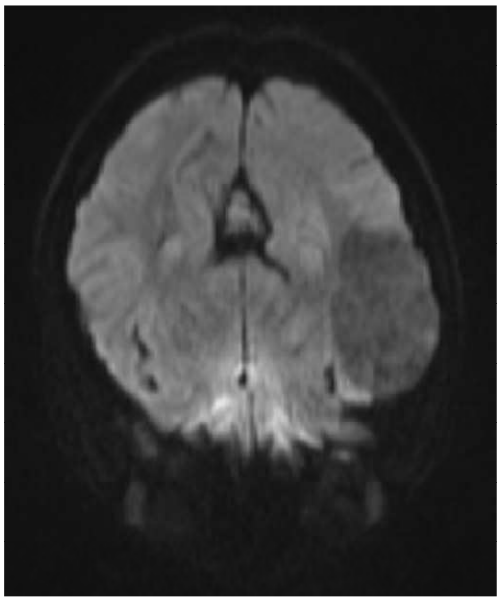

Figure 4 : diffusion hypointense appearance, site of hypersignal areas

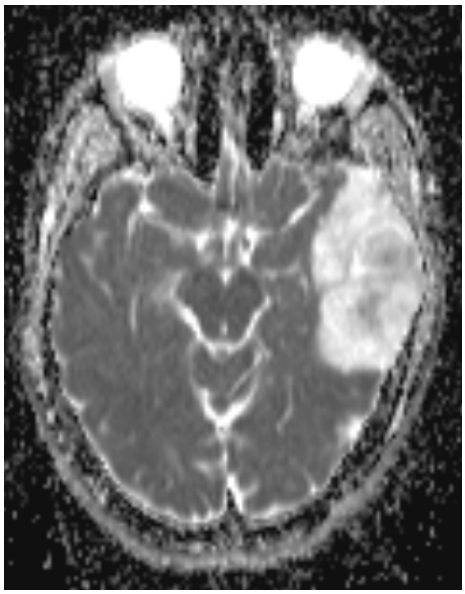

Figure 5 : High ADC is the site of two lesions or there is a restriction in ADC

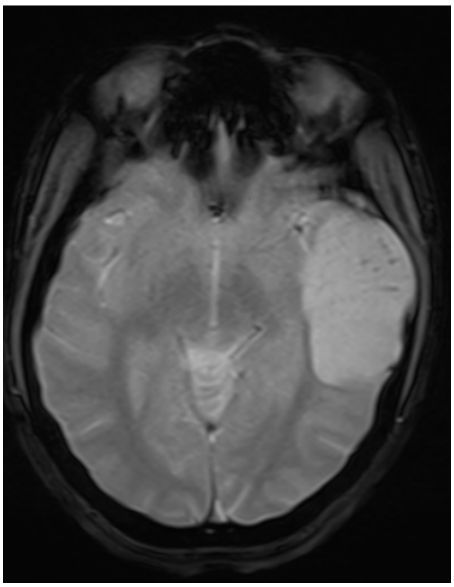

Figure 6 : absence of a signal void zone on the gradient echo sequence testified to calcifications or hemorrhage,

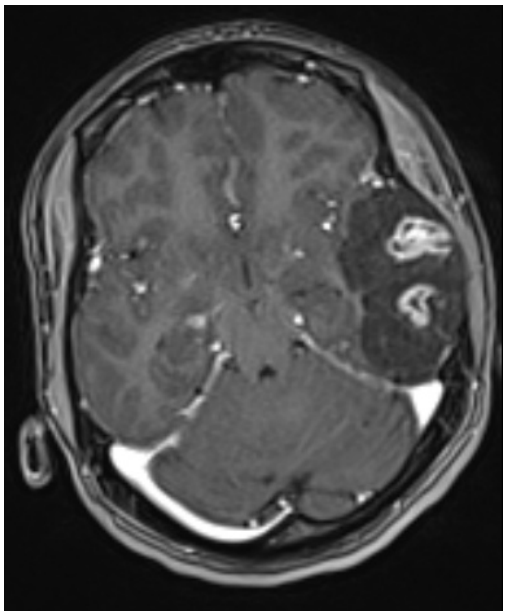

Figure 7: 3D T1 sequence after gadolinium injection shows annular enhancement of the two fleshy lesions,

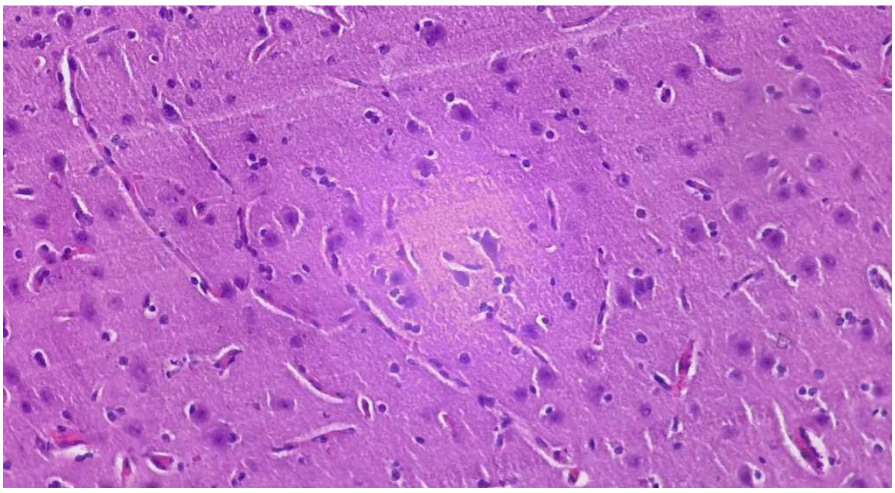

Figure 8 : gliotic glial tissue, comprising a few neurons of regular appearance, placed between the glial fundus which is luxoid, having an aspect of "floating" neurons in places: morphological aspect of DNET

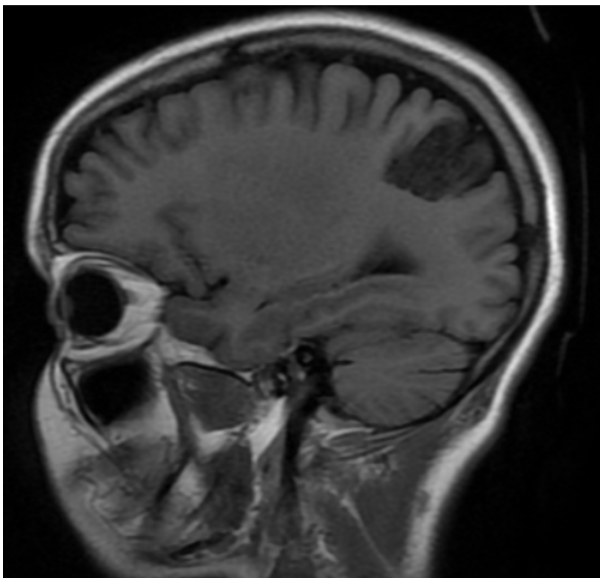

Figure 9: sagittal T1 sequence showing a cortico-subcortical area, left parietal hypo-signal

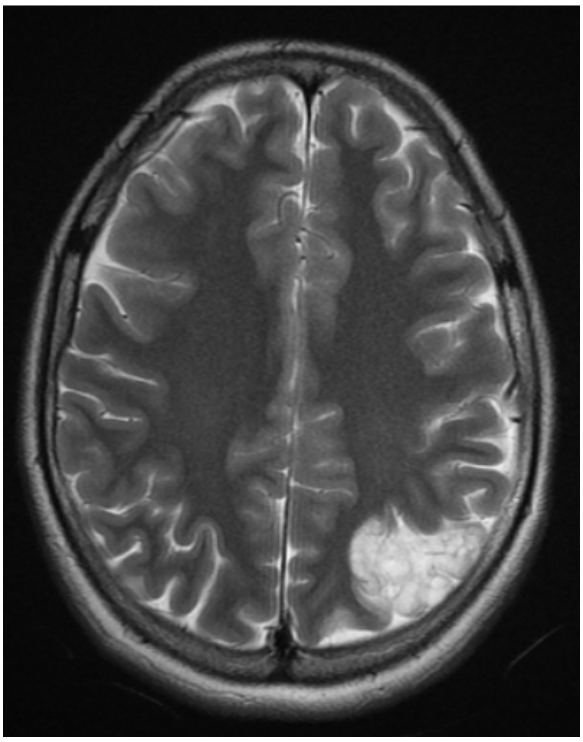

Figure 10 : T2 axial sequence: the area is in T2 hyper signal, without peri-lesional edema effect, nor mass effect

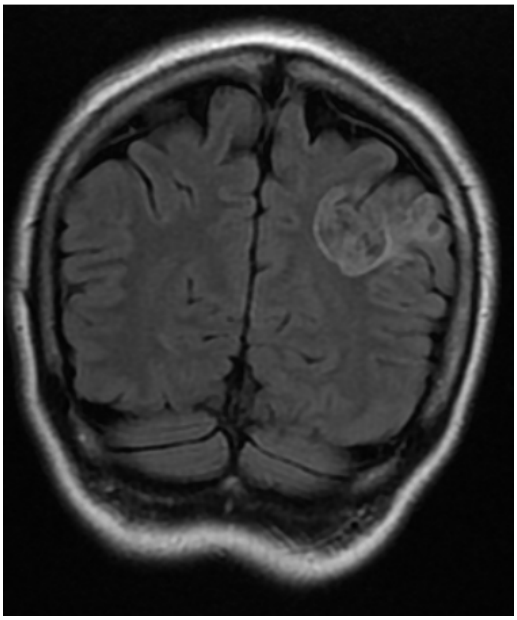

Figure 11: Flair coronal sequence: presence of a hyper signal ring

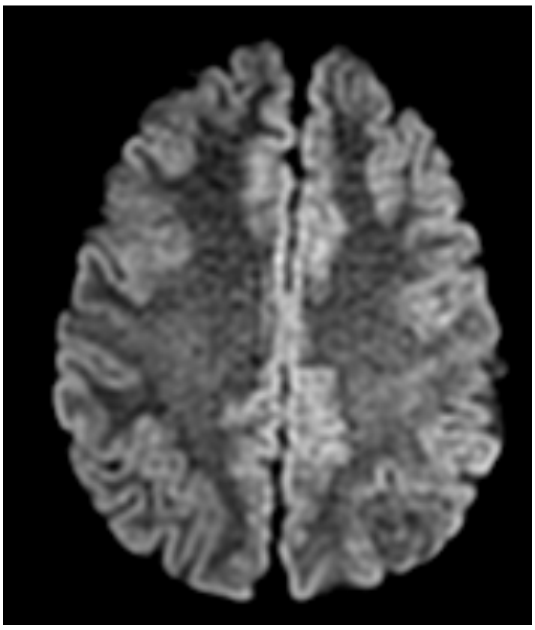

Figure 12: diffusion sequence: diffusion hyposignal

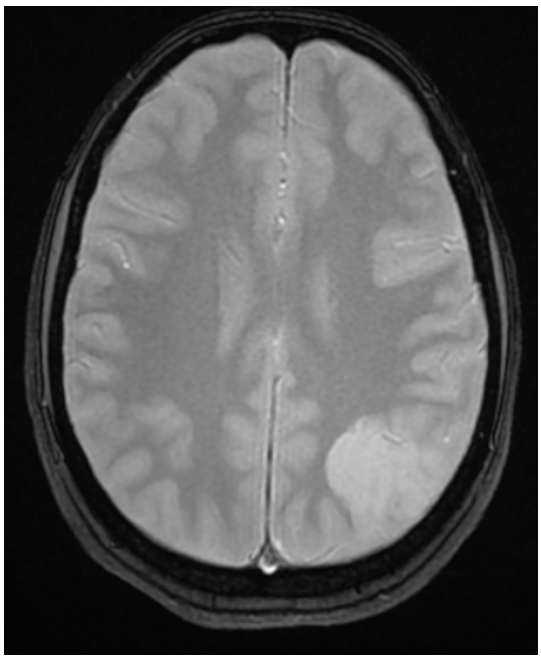

Figure 13: T2 gradient echo sequence: absence of calcification or hemorrhage stigma

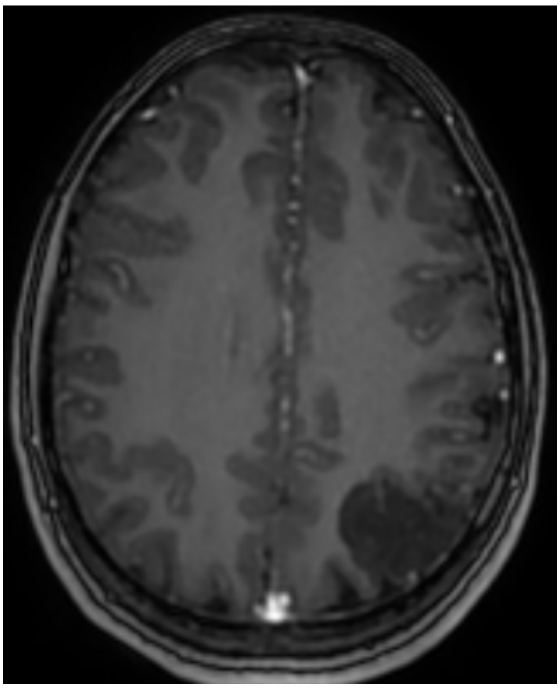

Figure 14 ; 3D T1 sequence after gadolinium injection: absence of contrast enhancement

CONCLUSION

Modern imaging, including MRI, plays a key role in the preoperative diagnosis of DNET. The combination of clinico-radiological criteria in children and young adults, particularly in their typical form, should allow early diagnosis as well as better management.

Declaration of interests:

The authors declare that they have no conflicts of interest in connection with this article. According to the international standard or the university standard, the consent of the patient has been collected and retained by the authors.

Authors' contribution:

All authors have contributed equitably to the conduct of this work. They also declare that they have read and approved the final version of the manuscript.

REFERENCE

[1] Thanvi S, Jangid H, Joshi YR. Dysembryoplastic neuropithelial tumor: a rare case report. Int J Res Med Sci [Internet]. 26 avr **2017** [cité 9 janv 2021];5(5):2270. Disponible sur: http://www.msjonline.org/index.php/ijrms/article/view/2941

[2] Burneo JG, Tellez-Zenteno J, Steven DA, Niaz N, Hader W, Pillay N, et al. Adult-onset epilepsy associated with dysembryoplastic neuroepithelial tumors. Seizure - Eur J Epilepsy [Internet]. 1 sept 2008 [cité 9 janv **2021**];17(6):498‑504. Disponible sur:

https://www.seizure-journal.com/article/S1059-1311(08)00032-0/abstract

[3] Paudel K, Borofsky S, Jones RV, Levy LM. Dysembryoplastic Neuroepithelial Tumor with Atypical Presentation: MRI and Diffusion Tensor Characteristics. J Radiol Case Rep [Internet]. 1 nov 2013 [cité 9 janv **2021**];7(11):7‑14. Disponible sur:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3888338/

[4] Guduru H, Shen JK, Lokannavar HS. A Rare Case of Dysembryoplastic Neuroepithelial Tumor. J Clin Imaging Sci [Internet]. 6 oct **2012** [cité 9 janv 2021];2. Disponible sur: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3515966/

[5] El Kettani N, Sqalli-Houssaïni N, Sbihi S, El Quessar A, Amarti A, El Hassani MR, et al. Tumeur neuroépithéliale dysembryoplasique. Feuill Radiol [Internet]. févr 2007 [cité 9 janv **2021**];47(1):46‑51. Disponible

sur: https://linkinghub.elsevier.com/retrieve/pii/S0181980107888336

[6] Chassoux F, Rodrigo S, Mellerio C, Landre E, Miquel C, Turak B, et al. Dysembryoplastic neuroepithelial tumors: An MRI-based scheme for epilepsy surgery. Neurology [Internet]. 16 oct 2012 [cité 10 janv **2021**];79(16):1699‑707. Disponible

sur: http://www.neurology.org/cgi/doi/10.1212/WNL.0b013e31826e9aa9

[7] Hoehn D, Konoplev S, Yin CC. Unusual Presentation of a Dysembryoplastic Neuroepithelial Tumor Mimicking a Pontomesencephalic Cavernous Hemangioma. J Med Cases [Internet]. 20 sept 2012 [cité 9 janv **2021**];3(6):375‑8. Disponible

sur: https://journalmc.org/index.php/JMC/article/view/718

[8]Devaux B, Chassoux F, Guenot M, Haegelen C, Bartolomei F, Rougier A, et al. [Epilepsy surgery in France]. Neurochirurgie. mai **2008**;54(3):453‑65.

[9] Cervera-Pierot P, Varlet P, Chodkiewicz J-P, Daumas-Duport J-P, Catherine. Dysembryoplastic Neuroepithelial Tumors Located in the Caudate Nucleus Area: Report of Four Cases. Neurosurgery [Internet]. 1 mai 1997 [cité 11 janv **2021**];40(5):1065‑70. Disponible

sur: https://doi.org/10.1097/0006123-199705000-00035