Multiple Sclerosis and Brain Tumors, a Challenging Diagnostic case reports

Authors: Sirbu CA*, Plesa CF*, Caloianu I**, Sirbu OM***
*Central Military Emergency University Hospital, Clinic of Neurology, Calea Plevnei street 134,
-Bucharest, Titu Maiorescu University, Dâmbovnicului street, 22, Bucharest, Romania
** Saint Lukas Clinic, Calea Plevnei Street, no 137C, Bucharest,
***,,Bagdasar-Arseni" Emergency Hospital-Neurosurgery Clinic, Bucharest , Berceni street 12, Bucharest 041915

Introduction. If patients with multiple sclerosis (MS) that develop brain tumors over time are not even rare, cases of patients diagnosed with brain tumors who are subsequently diagnosed with multiple sclerosis are exceptionally. We present two such of different cases with difficult diagnosis.

Case report 1: A 26 year old male, with Relapsing Remitting Multiple Sclerosis (RRMS) and clinical onset at 12 years age (vestibular syndrome), was admitted for IFNB-1b treatment in 2007. In 2014, we considered another relapse because the patient presented unsteadiness, vertigo, malaise, ataxia. The lack of clinical remission after Methylprednisolone, determined us to perform a brain MRI. A right cerebellar and vermis desmoplastic nodular medulloblastoma, T3a stage was found (as a result of a biopsy).

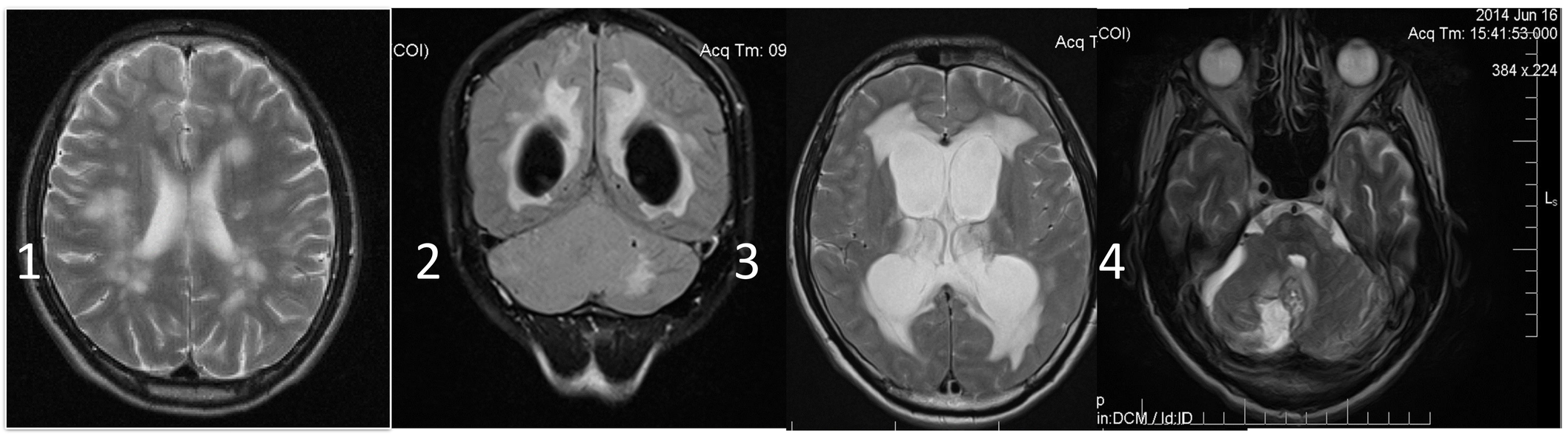

Fig.:Brain MRI one year after initiation of DMT treatment reveals multiple ovoid demyelinating lesions adjacent to the ventricles(1); brain exam 6 years later developed a tumor in the posterior fossa, vermis and right cerebellar hemisphere, which compresses the IV ventricle and determines important mass effect and secondary hydrocephalus(2,3); imagistic control after surgery (4).

It should be noted that at brain MRI in 2008 there were no tumoral lesions in the posterior fossa.So we can indirectly appreciate that the tumor growth rate was accelerated.
Several pathogenic mechanisms could explain these comorbidities: hereditary or acquired factors stimulate the neoplastic transformation of reactive astrocytes; the remyelination process transforms MS lesions into neoplasia; common genetic factors determine both pathologies; common viral infections involved in both pathologies; increased angiogenic factors in MS patients.

Case report 2: A 21 year old woman has an abrupt onset of right ataxic hemiparesis. Brain CT reveals a periventricular left tumor. Brain MRI showed a large lesion (3,3/2cm) with contrast enhancement, in left periventricular white matter. Blood and CSF analyses were unequivocal. A stereotactic brain biopsy confirmed a grade II Astrocytoma-fibrillary subtipe. She was irradiated six weeks with 64 Gy, followed by chimiotherapy with TMZ for six months. After chimio and radiotheraphy with good evolution, a veritable relapse occured 6 year later. Because of the clinic and new MRI brain lesions she was diagnosed with RRMS.

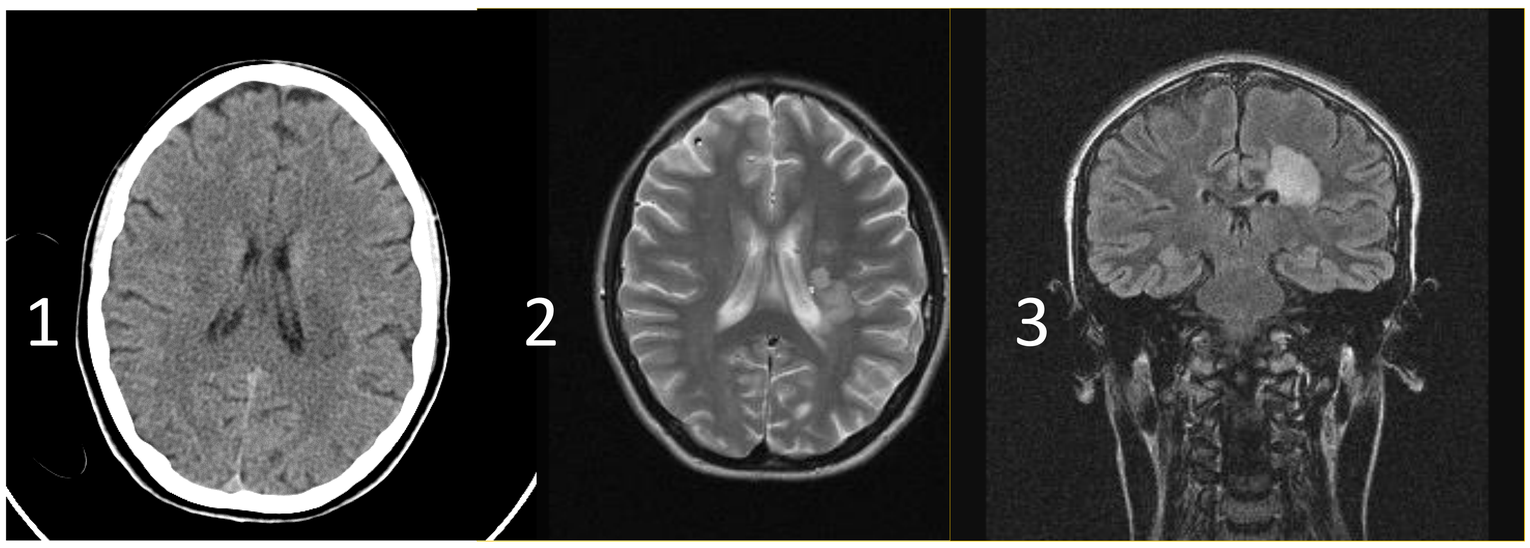

Fig.:Brain CT revealed a large left periventricular lesion, inhomogeneous and irregular (11); MRI showed the same lesion (3,3/2cm) with enhancement.

Discussion: The difficulty of differential diagnosis between a new relapse and another pathology was due to the absence of a MRI examination as a standard practice for every relapse. On the other hand, a patient with brain tumor who develops MS after chimio and radiotherapy is a rare case, raising a lot of questions. This might be due to the effect of radiotherapy on blood brain barrier and immune system. On the other hand, from the morphologic point of view the most difficult distinction, especially on frozen section is between gliosis and low grade astrocytoma. So could it be from the beginning a pseudotumoral form of MS despite the histopathological outcome?

Conclusion: MS and brain tumors, may have a quite variable profile, and for that reason they might simulate or conceal other central nervous system pathologies. Also immunohistochemistry and molecular pathology may be useful in explaining such cases. Follow-up MRIs on yearly basis, represent a good clinical standard at least for RRMS patients.

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