C A S E R E P O R T

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Epileptic seizures due to multiple cerebral cavernomatosis

Multipla cerebralna kavernomatoza i epilepsija

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Abstract

Background. Cavernous angiomas are angiographically occult vascular malformations that are present in 0.4–0.9 % of people, and represent around 5% of all cerebrovascular malformations. They can be single or multiple, and sporadic or familial. The presence of multiple lesions is more frequent in familial cavernomatosis. Ten to 30 % are associated with familial clustering. **Case report.** We presented the case of a 43-year-old man, admitted to the Emergency Department due to unprovoked seizure during the wide awake and everyday activities. Neurological examination was with no focal signs. A 32-channel standard digital EEG was without any significant changes of normal baseline activity. After sleep deprivation EEG showed multifocal, bilateral and asymmetric polyspikes and sharp-waves activity. Hyperventilation induced generalized epileptiform discharges. MRI scan demonstrated multiple small cavernous angiomas. Neuropsychological testing demonstrated a delayed memory impairment. Neurosurgery treatment was not recommended, and the therapy with valproate 1 250 mg/day had an excellent efficacy with no singnificant adverse effects. **Conclusion.** This patient considered as a rare case with multiple cavernomatosis highlights the importance of neuroradiological examination in adult patients with the first epileptic seizure but with no focal neurological signs.

Key words:
hemangioma, cavernous, central nervous system; epilepsy; diagnosis; diagnosis, differential; neurologic examination; electroencephalography; magnetic resonance spectroscopy.

Apstrakt

Uvod. Kavernozni angiomi su angiografski okultne malformacije, koje se javljaju kod 0,4–0,9% populacije i predstavljaju oko 5% svih cerebrovaskularnih malformacija. Mogu biti pojedinačni ili multipli i sporadični ili familijarni. Prisustvo multiplih lezija mnogo je češće kod porodične kavernomatoze. Deset do 30% slučajeva je udruženo sa porodičnim grupisanjem. **Prikaz bolesnika.** Bolesnik, star 43 godine, primljen je u Urgentno odeljenje zbog prvog neprovociranog epileptičkog napada, nastalog tokom budnosti i uobičajenih aktivnosti. Neurološki nalaz bio je bez fokalnih ispada. Urađen je 32-kanalni standardni digitalni elektroencefalogram koji nije ukazao ni na kakvu značajnu promenu normalne osnovne aktivnosti. Elektroencefalografijom nakon deprivacije spavanja registrovani su multifokalni, bilateralni i asimetrični polišiljak i šiljak-talas kompleksi, dok je hiperventilacija indukovala generalizovana specifična izbijanja. Nuklearnom magnetnom rezonancijom mozga otkriveni su multipli mali kavernozni angiomi. Neuropsihološko testiranje ukazalo je na poremećaj odložene memorije. Neurohiruški tretman nije preporučen i terapijom valproatima u dozi od 1 250 mg dnevno postignuta je odlična kontrola epileptičnih napada, bez klinički značajnih neželjenih efekata. **Zaključak.** Ovaj slučaj shvaćen kao retka forma multiple kavernomatoze ukazuje na značaj neuroradiološkog ispitivanja kod adultnih bolesnika sa prvim epileptičnim napadom i neurološkim nalazom bez fokalnih ispada.

Ključne reči:
centralni nervni sistem, hemangiom, kavernozni; epilepsija; dijagnoza; dijagnoza, diferencijalna; neurološko ispitivanje; elektroencefalografija; nuklearna magnetska rezonanca.

Introduction

Cavernous angiomas are angiographically occult vascular malformations that are present in 0.4–0.9 % of the population, and represent around 5% of all cerebrovascular malformations [1]. Male and female patients are equally affected and all ages are represented. They can be single or multiple, and sporadic or familial. The presence of multiple lesions is more frequent in familial cavernomatosis. Ten to 30% are associated with familial clustering [1].

Case report

We presented the case of 43-year-old man, admitted to the Emergency Department due to a sudden loss of consciousness, and generalized tonic-clonic seizure with a pro-

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longed post comitial state. That was the first, unprovoked seizure during the wide awake and everyday activities.

In a previous history there were no health problems except a mild hypertension in the last year that was under good control. During the last summer, he spent his holiday in Egypt enjoying in local food and drinks in spite of epidemiological warnings. His birth, development milestones and school performance (finished high school) were unremarkable and there was no previous neurological illness.

His family history was negative. He was a heavy smoker (up to 40 cigarettes/day), and used to drink every day in "moderate" amounts.

The patient was afebrile with normal vital signs and normal general physical examination. His neurological examination, including mental status examination, was normal.

Laboratory findings were normal except for mild granulocytosis (10^9/l).

A 32-channel standard digital EEG was without any significant changes of the normal baseline activity. After sleep deprivation, EEG showed multifocal, bilateral and asymmetric polispikes and sharp waves activity. Hyperventilation induced generalized epileptiform discharges.

CT scans demonstrated multiple, small round lesions with hyperdensity in both hemispheres infra- and supratentorialy.

Our differential diagnostic considerations had been directed to parasitosis, metastasis and angiomatosis.

Serological tests (cysticercosis, toxoplasmosis, toxocariasis, *echinoccocosis*, *Entaamaeba hystolitica*) were negative. Chest X-ray examination was normal. Ultrasound investigations of abdominal organs were normal.

MRI scan (Figures 1–6) demonstrated multiple small cavernous angiomas: bilaterally by rolandic fissure, in the right centrum semiovale (12×10 mm), left corona radiata (14×12 mm), left temporobasal area (16×14 mm), in the left cerebellar hemisphere and cortical capillary angiomatosis, without any signs of acute or resolving haemorrhage. All of them were angiographically occult.

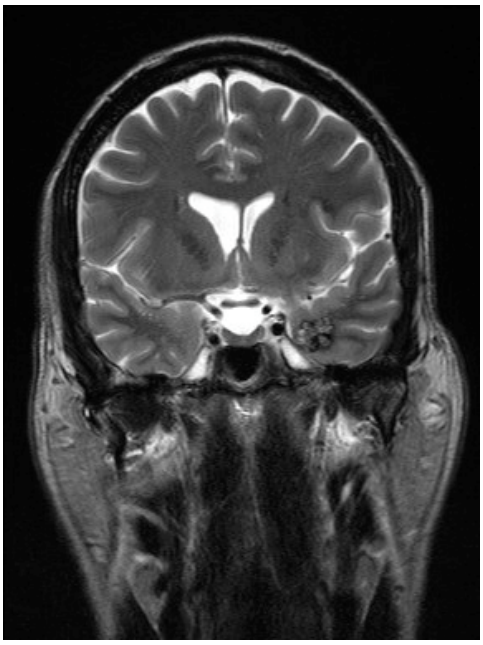

Fig. 1 – T2W coronal plane: unhomogeneous lobular zone in the left temporobasal region

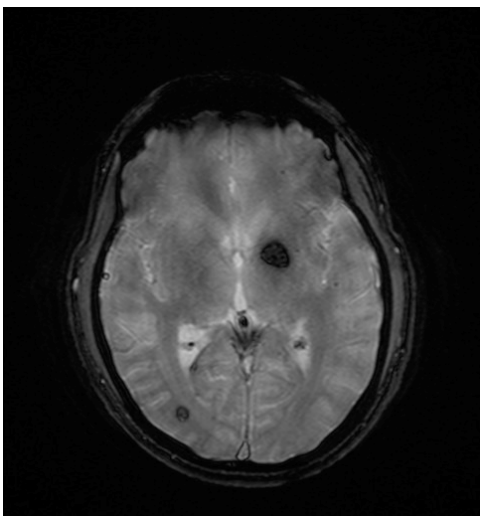

Fig. 2 – GE axial plane: the same lesion defect localized also subcortically in the right occipital region.

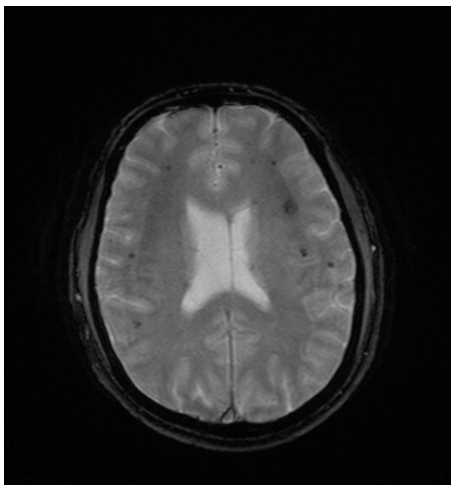

Fig. 3 – GE axial plane: multiply cavernous angiomas bilaterally

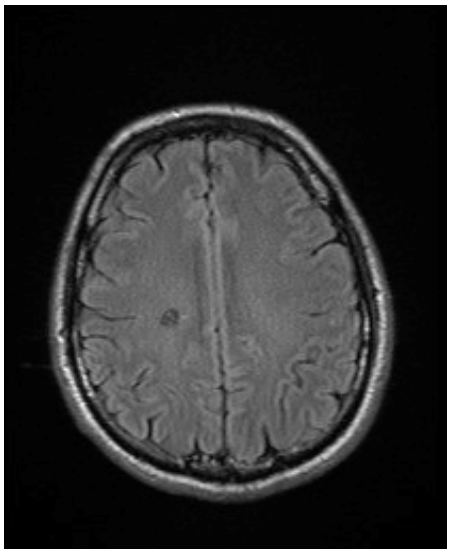

Fig. 4 – FLAIR-axial plane: hypodense lesion in the right parietal lobe

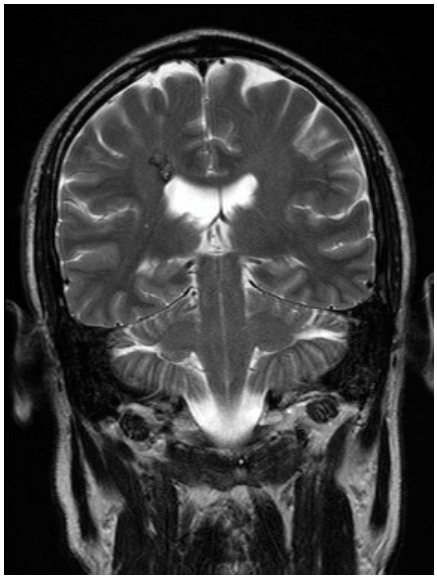

Fig. 5 – T2W-coronal plane: inhomogeneous lobular lesion close to the right side of lateral ventricle

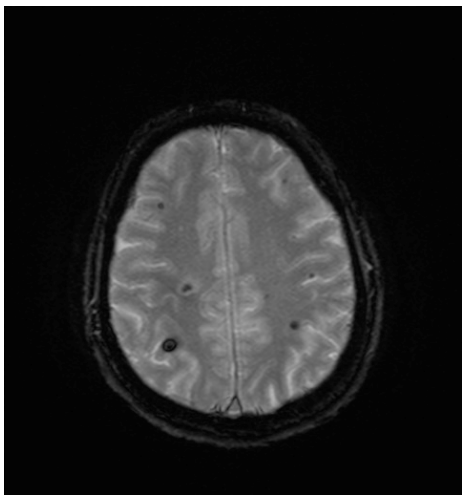

Fig. 6 – GE- axial plane: low intensity signal multiply intraaxial lesions in both sides of *centrum semiovale*

Neuropsychological testing demonstrated a delayed memory impairment.

We established the diagnosis of multiple cerebral cavernomatosis and symptomatic epilepsy.

Neurosurgery treatment was not recommended. The patient was started on valproate with the gradually increasing dosage. Currently he is on valproate 1250 mg/day and has had no generalized tonic-clonic or focal seizures since valproate was started. He has no adverse effects. His hypertension is still under control with small doses of beta blockers. He is suffering from mild memory difficulties that were discovered before medication started.

Discussion

This was our first patient with multiple cerebral cavernomatosis, with seizure as the first clinical manifestation, without haemorrhage and clinical, neurological deficits.

Cavernous angiomas are commonly manifested as seizures, gross intracranial haemorrhage and focal neurological deficits [1]. Haemorrhagic risk and neurological disability seem to be related to multiple factors, including lesion location, age, gender, the state of reproductive cycle and previous haemorrhage [2]. Lesions may behave aggressively with repetitive haemorrhages and cumulative disability or may remain quiescent for many years.

The first unprovoked seizure in adults is often symptomatic. Our patient represents a case with rare etiological factor.

Although our patient has multiple cavernomatosis, his familial history is negative (no seizures or haemorrhage), so we considered him a rare sporadic case. However, definite conclusion could not be made since neuroimaging penetrance of familial cavernomatosis is much higher than clinical penetrance, and a great majority of sporadic cases with multiple lesions are, in fact, familial ones [3].

A decision about surgery treatment of cavernous malformations is controversial [4]. Several reports have documented a dynamic clinical-radiological lesion behavior with *de novo* lesion genesis, intralesional and perilesional hemorrhage, and corresponding fluctuations in lesion size [5]. Hence, no surgical patients should be followed up with yearly MRI examination.

Conclusion

This patient considered as a rare case with multiple cavernomatosis highlights the importance of neuroradiological examination in adult patients with the first epileptic seizure and with no focal neurological signs.

R E F E R E N C E S

1. *Maraire JN, Awad IA.* Intracranial cavernous malformations: lesion behavior and management strategies. Neurosurgery 1995; 37(4): 591–605.
2. *Zabramski JM, Wascher TM, Spetzler RF, Johnson B, Golfinos J, Drayer BP,* et al. The natural history of familial cavernous malformations: results of an ongoing study. J Neurosurg 1994; 80(3): 422–32.
3. *Labauge P, Laberge S, Brunereau L, Levy C, Tournier-Lasserve E.* Hereditary cerebral cavernous angiomas: clinical and genetic features in 57 French families. Societe Francaise de Neurochirurgie. Lancet 1998; 352(9144): 1892–7.
4. *Kim DS, Park YG, Choi JU, Chung SS, Lee KC.* An analysis of the natural history of cavernous malformations. Surg Neurol 1997; 48(1): 9–17.
5. *Labauge P, Brunereau L, Levy C, Laberge S, Houtteville JP.* The natural history of familial cerebral cavernomas: a retrospective MRI study of 40 patients. Neuroradiology 2000; 42(5): 327–32.

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