

A Case of a Large Frontal Cerebral Abscess, as a Complication of Purulent Sinusitis and Bacterial Meningoencephalitis

Vesselin Karabinov^{1,*}, Boyko Milkov¹, Lyubomir Haralanov¹

¹ Clinic of Neurology, National Cardiology Hospital, Sofia, Bulgaria



* Corresponding author: Dr. Vesselin Karabinov, Clinic of Neurology, National Cardiology Hospital, 65 Konyovitsa Str., 1000 Sofia, Bulgaria, Tel: 359899232342; Email: karabinov@hotmail.com

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Abstract

Brain abscess is a relatively rare disease. Despite advances in its diagnosis through the use of neuro-imaging methods and the comparatively better prognosis in the antibiotic age, this disease is still a challenge for medical specialists. We present a case of a 58-year-old woman developing a large brain abscess in the left frontal and parietal lobe, after a poorly treated respiratory infection. The case is characterized by the size of the abscess. After the diagnostic procedures, conservative and surgical treatment, a very good recovery was achieved. The patient was discharged without neurological deficit.

Key words: Brain Abscess; Sinusitis; Etiology; Treatment

Introduction

Brain abscess is a relatively rare complication of purulent sinusitis with a frequency of less than 1/100 000 and is a life-threatening disease with a high mortality rate of up to 32% [1,2]. The most common causes of a brain abscess are: traumatic brain injury, neurosurgical interventions, neighbor infections - otitis, mastoiditis, sinusitis, dental infections, congenital or acquired immune deficiency, hematogenous dissemination of infectious material - endocarditis. Brain abscess occurs at any age, but most often between 24 and 57 years, significantly more affected are men, according to various studies from 1.3:1 to 3:1 versus women [1, 3-5]. More frequent are infections, caused by different groups of streptococci - *Bacteroides fragilis*, *Peptostreptococcus* spp. Otologenic abscesses are more commonly associated with *Proteus*, *Streptococcus milleri* and *Streptococcus pneumoniae*. Sinusitis is commonly associated with *Streptococcus* sp, *Staphylococcus* sp, *Enterobacter*. In abscesses due to traumatic brain injury, *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Pseudomonas aeruginosa* are most commonly found [2]. Most common is localization in the frontal lobe of the brain [6]. Othogenic abscesses engage temporal fragments and cerebellum while those in sinusitis - frontal partitions.

Case

We present a 58 years old woman. The patient was ill 23 days before hospitalization in the Clinic of Neurology. Antibiotic

treatment was performed for 10 days due to a respiratory infection, after which she felt good. After some days, she suddenly became sleepy and confused. She was presented in emergency department with disturbance of consciousness - 18 in Glasgow-Liege Coma Scale, elevated body temperature of 39 degrees Celsius, pronounced rigidity of the neck and bilateral positive Kernig sign, diffuse headache, phono- and photophobia, with right-sided latent hemiparesis with Babinski's signs. Laboratory tests showed leukocytosis with leucosis /GRA 95.3%/ and very high CRP 157.2 mmol/l. A lumbar puncture was made and demonstrated hypoglycorahia and elevated protein - 2.67 g/l. The microbiological examination of the liquid remained without growth. Computed tomography revealed (Figure 1) heterogeneous, relatively well-formed capsule formation in the deep white brain substance on the left frontal lobe with dimensions 34/51.5/41mm, accompanied by pronounced perifocal brain edema, compression on the frontal cortex, left lateral ventricle and discrete shift of the midline. Following contrast application, the lesion showed post contrast amplification only on the periphery without absorbing contrast material in depth (Figure 2). The left anterior frontal and maxillary sinus mucosal thickening was observed as in chronic frontal and maxillary sinusitis. The formation was interpreted as a brain abscess. Immediate antibiotic treatment with the combination of Ceftriaxone, Metronidazole and Vancomycin was started. Anti-edema therapy and anticonvulsants were initiated. After a consultation with

a neurosurgeon a high risk of abscess rupture was assessed and the patient was urgently transferred for surgical treatment. The patient was operated under general anesthesia. A small dural incision has been made. A tense brain parenchyma with a tendency to prolapse through the dural defect was visualized. The content of the cavity was evacuated and a partial excision of the capsule was performed. Postoperatively the patient was with improvement of neurological symptoms and toxo-infectious syndrome. Microbiological study of abscess reveal a *Staphylococcus epidermidis*. Post-operative head CT is without sings of lesion in left frontal lobe, good brain parenchyma development and edema in the intervention area. Afterwards the patient was discharged in good condition and without neurological deficits.



Figure 1

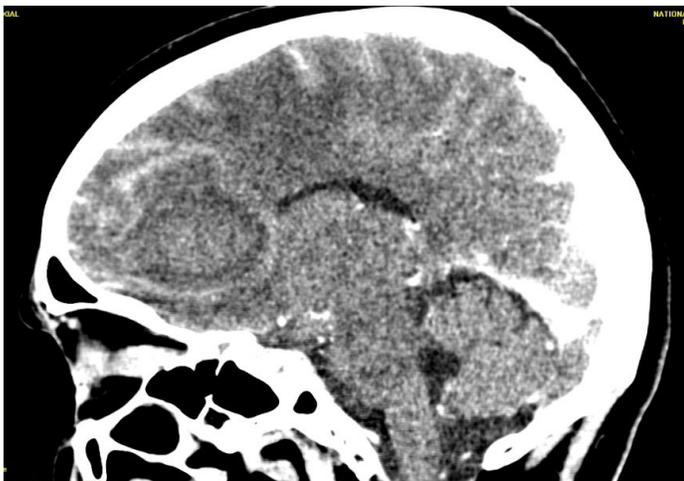


Figure 2

Discussion

Pyogenic infection of brain parenchyma begins with local inflammatory changes, defined as cerebritis. At this early stage of infection there is an increased vascular permeability without angiogenesis. In case of early-stage misdiagnosis, the process progresses with capsule formation and cerebral abscess formation, which is described as an infection of the brain parenchyma with purulent contents encapsulated in a vascularized membrane. The clinical manifestation of the disease includes the following main signs: fever, headache, consciousness disturbance, focal neurologic deficit, nausea and vomiting. Seizures are often manifested - generalized and partial, rarely - status epilepticus [4, 1-2]. In about 40% of cases, there is a neck stiffness. To establish the diagnosis in a timely manner, in addition to laboratory and clinical studies, early imaging of the brain is necessary - CT with contrast enhancement, or MRT testing [7, 4, 2, 8]. The treatment is generally surgical, with stereotaxic surgical drainage of the purulent material, but the capsule extirpation is also widely used [7]. It is appropriate to immediately begin an empirical antibiotic therapy, with the classic combination of Penicillin G and Chloramphenicol, or with the latest protocols of Cefotaxime, Metronidazole and Vancomycin, until the results of the antibiograms are obtained. Antibiotic treatment should last for 6 to 8 weeks. Corticosteroids are not recommended in the brain abscess treatment as they delay capsule formation, reduce the penetration of an antibiotic into the abscess, increase necrosis, and alter the CT pattern [4, 1]. The treatment of brain edema and the prevention of partial and generalized epileptic seizures is needed in some patients. The most common complication of the cerebral abscess is intraventricular rupture, which is clinically manifested by suddenly onset of severe headache, meningeal signs and loss of consciousness. This condition requires immediate surgical intervention with craniotomy, lavage and ventriculostomy for drainage of the ventricular system, as well as antibiotic administration locally. Another common complication of the cerebral abscess is obstructive hydrocephalus. It is due to occlusion of the ventricular system and resulting in a sharp increase in mortality.

Conclusion

This case describes characteristics of an adjacent abscess in a poorly treated bacterial sinusitis in a woman without a history of cranial-brain injuries and operations. The specific case is interesting due to the large size of the abscess cavity - 3.4/5.2/4.1 cm, located deeply basal and frontal. The relatively long "bright" period and the onset of the disease with the sudden appearance of qualitative and quantitative disturbances of consciousness, fever and headache is noticeable.

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