

Cognitive Neuroscience 2020: Brain abscess in Cyanotic Heart Disease - Ramchandran Muthaih - Zion Hospital

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Brain abscess (BA) is an intraparenchymal infection of brain parenchyma and begins with a localized area of inflammatory change stated as cerebritis, attain immature capsule stage and so to abscess, containing pus encapsulated by a vascularized membrane. The capsule serves to stop the infective process from becoming generalized and it also create within it an inflammatory soup which will impede resolution of the infection. The incidence of brain abscess is about 8% of intracranial masses in developing countries and in cyanotic cardiopathy its incidence varies from 5 to 18.7%. In patients with right-to-left shunts, absence of pulmonary phagocytic clearance of pathogens can occur and therefore the ischemic injury from hypoxaemia and polycythaemia, produce low perfusion areas within the brain which can act as a nidus for infection and anaerobic streptococci are the foremost common agents isolated in cyanotic cardiopathy with brain abscess. All abscesses that are greater than (>) 1 cm produce positive scans and CT brain appears to be adequate in most cases of brain abscess. Third generation cephalosporins combined with metronidazole for two weeks followed by 4 weeks of oral therapy is that the medical treatment of choice for cyanotic brain abscess. Surgical techniques like drainage via burr-hole, complete excision after craniotomy, migration technique and neuroendoscopic technique with freehand stereotaxy have also been practiced within the treatment of brain abscess (BA).

Introduction:

A brain abscess is a collection of pus that develops in response to an infection or the trauma. It remains serious and potentially life-threatening condition. Brain abscess is an intraparenchymal infection of brain parenchyma and begins with a localized area of inflammatory change that are referred as cerebritis. The effect varies depending on the size of the abscess and where it forms in the brain. There are some typical complications in patients with cyanotic congenital heart disease they are right-to-left shunts, cerebral bacterial spreading and an altered blood-brain-barrier permeability, brain abscesses (BA). The risk of Brain abscess (BA) complicating cyanotic heart disease is inconstant and it continuously increasing up to approximately age of 12.

The CT brain appears to be adequate in most cases of brain abscess. The Third generation cephalosporins combined with metronidazole for 2 weeks followed by 4 weeks of oral therapy is the medical treatment of choice for cyanotic brain abscess (BA). Surgical techniques such as drainage via burr-hole, complete excision after craniotomy, migration technique and neuroendoscopic technique with freehand stereotaxy have also been practiced in the treatment of brain abscess.

The person may need surgery if he has Pressure in the brain continues to build, The Brain abscess does not respond to medication, There is gas in the Brain abscess (BA), There is a risk that the abscess might burst.

Age groups affected by Brain Abscesses:

Brain abscesses (BA) are most likely to affect adult men aged less than 30 years, whereas in children's they most commonly develop in the age of 4-7 years and it is risk for newborns also. For young children the vaccination program for Brain Abscess (BA) has been reduced. A seizure can be the first sign of an abscess, whereas Nausea and vomiting tend to occur as pressure builds inside the brain. Pain usually starts on the side of abscess and it may begin slowly or suddenly. The symptoms of a brain abscess (BA) may result from a combination of infection, brain tissue damage, and it can also because of pressure on the brain. Sometimes the headache may suddenly become worse it may means that the abscess has burst. The symptoms will start from day 8. With respect to etiology the infectious endocarditis, infections per continuitatem, bacterial meningitis, bacterial lung diseases with intrapulmonary shunts, and also thromboembolic complications of systemic infections have to be differentiated. Other symptoms may include Stiff neck/back, Blurred/double. There will be a stepwise diagnosis that includes CCT to demonstrate the typical contrast enhancement and a lumbar puncture which shows the granulocytic pleocytosis.

The common sign and symptoms include headache, fever, chill, seizures, nausea, vomiting, altered sensorium, nuchal rigidity, and localizing neurologic signs. The incidence of brain abscess (BA) is about of 8% intracranial masses in developing countries and in cyanotic heart disease the incidence varies from 5 to 18.7%. In patients with right-to-left shunts, absence of pulmonary phagocytic clearance of pathogens can occur and the ischemic injury from hypoxaemia and polycythaemia, produce low perfusion areas in the brain which may act as a nidus for infection. The Anaerobic streptococci are the most common agents isolated in cyanotic heart disease with brain abscess. All Brain abscesses (BA) are (> 1 cm) and produce positive scans.

Causes:

- A Brain abscess (BA) is most likely caused due to bacterial or fungal infection in some part of the brain.
- Parasites can also cause a Brain abscess (BA).
- When the bacteria, fungi, or parasites infect part of the brain it causes inflammation and swelling.
- A Brain abscess (BA) consists of infected brain cells, active and dead white blood cells, and also contains organisms that cause the problem.

- When Brain abscess (BA) swells it puts increasing pressure on surrounding brain tissue.
- The skull is not flexible and it cannot expand.
- The pressure from the abscess will block the blood vessels which lead in preventing oxygen from reaching the brain, and these results in damage or destruction of delicate brain tissue.

Tests may include:

- Blood test to check for high levels of white blood cells which can indicate an infection
- Imaging scans, such as an MRI or a CT scan in which an abscess will show up as one or more spots
- CT-guided aspiration a type of needle biopsy which involves taking a sample of pus for analysis

The effectiveness of the treatment will depend on:

- The size of the Brain abscess (BA)
- How many abscesses there are?
- The cause of the abscess
- The general state of the person's health

Medication:

- A short course of high-dosage corticosteroids may help if there is increased intracranial pressure and a risk of complications such as meningitis.
- However doctors do not prescribe corticosteroids as a routine measure.
- A doctor may prescribe anticonvulsants to prevent seizures and a person who has had a brain abscess (BA) may need to take anticonvulsants for up to 5 years.

Conclusion:

If the cerebral spinal fluid fails to demonstrate the typical findings then the cerebral angiography may be necessary to remove a malignant vascularized neoplasma. In case of doubts we can perform stereotactic cerebral biopsy. The Optimal antibiotic therapy can be performed after determining the minimal bactericidal concentration and combination of antibiotics is one of the utmost prognostic significance. The Cranial computed tomography should be repeated after 6, 14, and 24 days. The number of patients diagnosed yearly has increased since the CT scanning became available. The capsule serves to prevent the infective process from becoming generalized and it also create within it an inflammatory soup that may impede resolution of the infection. There are some of the most common known infections that causes Brain abscess (BA) that are Endocarditis, pneumonia, bronchiectasis, lung infections, abdominal infections, such as peritonitis, an inflammation of the inner wall of the abdomen and pelvis, cystitis, or inflammation of the bladder, and other pelvic infections.