

INTRACRANIAL ABSCESS; A STUDY OF 20 CASES AT THE DEPARTMENT OF NEUROSURGERY IN CHITTAGONG MEDICAL COLLEGE HOSPITAL

NATH HD¹, KAMAL UDDIN MD², ZILLUR RAHMAN MD³, MAINUDDIN MD⁴

Abstract

This is a descriptive cross sectional study which was carried out from April 2006 to November 2009 in the department of neurosurgery of Chittagong Medical College Hospital. We have studied 20 cases after collecting patient admission data a brief history and clinical examination was done. After surgical & medical treatment close follow up was done. It was evident that the most of the sufferer had age group <20 years 9(45%). It was documented that male 12(60%) predominate than female. The commonest symptoms has headache 12(60%). The other symptoms were vomiting 3(15%), convulsion 3(15%), fever 2(10%). It was evident that the most sufferer had temporal lesion 10(50%). The other had cerebellar 3(15%), frontal 3(15%) and parietal 3(15%). The most of the patient were treated by burr hole aspiration 14(70%). The other were treated by craniotomy and excision of capsule. it was evident that pus culture shows. no growth of bacteria 14(70%) probably due to antibiotic therapy & lacking of anaerobic culture. The other had streptococcus 3(15%) staphylococcus 2(10%) & enrobacteriaceae 1(5%) and 1(5%) had candida. Complete recovery occurred 14(70%) of cases and 2(10%) died during treatment. So the surgery with antibiotic therapy is the best option of treatment in intracerebral abscess.

Bang. J Neurosurgery 2011; 1(2) : 49-53

Introduction:

Prior to 1980, the most common source of cerebral abscess was from contiguous spread. Now, hematogenous dissemination is the most common vector.

Abscesses arising by this means are multiple in 10-50% of cases. No source can be found in up to 25% cases. The chest is the most common origin, in adult, lung abscess, in children, congenital cyanotic heart disease especially tetralogy of Fallot the common origin of abscess. The increased Hct and low PO2 provides an hypoxic environment suitable for abscess proliferation. Those with right-to-left (veno-atrial) shunts additionally lose the filtering effects of the lungs (the brain seems to be a preferential target for these infections over other the organs). Streptococcal oral flora is frequent, and may follow dental procedures. Coexisting coagulation defects often further complicate management².

Pulmonary arteriovenous fistulas, 50% of these patients have Osler-Weber-Rendu syndrome (AKA hereditary hemorrhagic telangiectasia), and in up to 5% of these patients a cerebral abscess will eventually develop.

Bacterial endocarditis, only rarely gives rise to brain abscess. More likely to be associated with acute endocarditis than with subacute form, dental abscess, infections, pelvic infections may gain access to the brain via Batson's plexus

In patients with septic embolization, the risk of cerebral abscess formation is elevated in areas of previous infarction or ischemia.

From purulent sinusitis, spreads by local osteomyelitis or by phlebitis of emissary veins. Virtually always singular. Rare in infants because they lack aerated paranasal and mastoid air cells. This route has become less common due to improved treatment of sinus disease. Middle-ear and mastoid air sinus infections-temporal lobe and cerebellar abscess. The risk of developing a cerebral abscess in an adult with active chronic otitis media is=1/10,000 per year⁴. Nasal sinusitis causes frontal lobe abscess. Sphenoid sinusitis, the least common location for sinusitis, but with a high incidence of intracranial complications due to venous extension to the adjacent cavernous sinus. Odontogenic, rare Associated with a dental procedure in the past 4 weeks in most cases. May also spread hematogenously.

1. Assistant Professor, Department of Neurosurgery, Bangabandhu Sheikh Mujib Medical University, Dhaka
2. Associate Professor, Department of Neurosurgery, Chittagong Medical College, Chittagong.
3. Professor, Department of Neurosurgery, Suhrawardi Medical College, Dhaka.
4. Associate Professor, Department of Neurosurgery, Rangpur Medical College, Rangpur.

Address of Correspondence: Dr. Haradhan Debnath, Assistant Professor, Department of Neurosurgery, Bangabandhu Sheikh Mujib Medical University, Dhaka

Following Penetrating cranial Trauma or Neurosurgical procedure

Post neurosurgical, especially with traversal of an air sinus. The risk of abscess formation following civilian gunshot wounds to the brain is probably very low with the use of prophylactic antibiotics, except in cases with CSF leak not repaired surgically following traversal of an air sinus. An abscess following penetrating trauma cannot be treated by simple aspiration as with other abscesses, open surgical debridement to remove foreign matter and devitalized tissue is required. Abscess has been reported following use of intracranial pressure monitors and halo traction.

Materials & Methods:

The study was conducted during the period from April 2006 to November 2009. 20 Consecutive patients were admitted in the Department of Neurosurgery, CMCH with CT scan finding suggestive of intracranial abscess. This was a descriptive cross sectional study. Data were collected after history, clinical examination CT scan findings, Surgical finding & Pus culture.

Inclusion Criteria:

Those patients who were treated both surgically & by medicine.

Exclusion Criteria:

Those who were taken only antibiotic treatment.

Result:

Table-I

Age distribution of the patients (N=20)

Age of the patients (years)	No.	Percentage
<20	09	45.00
21-30	05	25.00
31-40	03	15.00
41-50	02	10.00
>50	01	05.00

Total 20 100.00 It was documented that the commonest age groups were <20 years 9(45.00%).

Table-II

Sex distribution of patient (N=20)

Sex	Number	Percentage
1. Male	12	60.00
2. Female	08	40.00
Total	20	100.00

It was evident that the male 12(60.00%) were predominant than female.

Table-III

Distribution of the patients by occupation (N=20)

Occupation	Number	Percentage
1. Schoolboy	06	30.00
2. Infant & Children	05	25.00
3. Housewives	03	15.00
4. Service holder	03	05.00
5. Farmer	01	05.00
6. Professional	01	05.00
7. Day Laborer.	01	05.00
Total	20	100.00

The most of the sufferer were school boy 6(30.00%)

Table-IV

Distribution of patients by causes of brain Abscess

Causes of Abscess	Number	Percentage
1. Chronic Suppurative otitis Media (CSOM)	08	40.00
2. Penetrating head trauma	04	20.00
3. Congenital cyanotic heart disease	04	20.00
4. Sinusitis	01	05.00
5. Dental Infection	01	05.00
6. Infective endocarditis	01	05.00
7. Unknown.	01	05.00
Total	20	100.00

It was evident that the commonest causes of brain abscesses were CSOM 8(40.00%)

Table-V

Distribution of Patients by presenting symptoms (N=20)

Presenting Symptoms	Number	Percentage
1. Headache	12	60.00
2. Vomiting	03	15.00
3. Convulsion	03	15.00
4. Fever	02	10.00
5. Altered consciousness	01	05.00
6. Visual blurring	01	05.00
7. Limb weakness	03	15.00
Total	20	100.00

It was documented that the most sufferer had headache 12(60.00%).

Table-VI

Distribution of patient by Site of lesion (N=20).

Site of lesion	Number	Percentage
1. Temporal	10	50.00
2. Cerebellar	03	15.00
3. Frontal	03	15.00
4. Parietal	02	10.00
5. Occipital	02	10.00
Total	20	100.00

It was evident that most of the sufferer had temporal lesion 10(50.00%)

Table-VII

Distribution of Patient by procedure of operation.

Treatment procedure	Number	Percentage
1. Burr hole Aspiration	14	70.00
2. Craniotomy & excision of capsule.	06	30.00
Total	20	100.00

The most of patents were treated by burr hole Aspiration 14(70%).

Table-VIII

Distribution of patients by causes of micro-organism:

Causes of Micro Organism	Number	Percentage
1. No growth	14	70.00
2. Streptococcus	03	15.00
3. Staphylococcus	01	05.00
4. Enterobacteriaceae	01	05.00
5. Candida	01	05.00
Total	20	100.00

The majority of patient 14(70.00%) had no growth of bacteria probably due to antibiotic therapy. 3(15.00%) of the had streptococcus infaction and 1(0.5%) had Candida infection.

Table-IX

Distribution of patient by Site of lesion (N=20).

Site of lesion	Number	Percentage
1. Temporal	10	50.00
2. Cerebellar	03	15.00
3. Frontal	03	15.00
4. Parietal	02	10.00
5. Occipital	02	10.00
Total	20	100.00

It was evident that most of the sufferer had temporal lesion 10(50.00%)

Table-VII

Distribution of Patient by procedure of operation.

Treatment procedure	Number	Percentage
1. Burr hole Aspiration	14	70.00
2. Craniotomy & excision of capsule.	06	30.00
Total	20	100.00

The most of patents were treated by burr hole Aspiration 14(70%).

Table-VIII

Distribution of patients by causes of micro-organism:

Causes of Micro Organism	Number	Percentage
1. No growth	14	70.00
2. Streptococcus	03	15.00
3. Staphylococcus	01	05.00
4. Enterobacteriaceae	01	05.00
5. Candida	01	05.00
Total	20	100.00

The majority of patient 14(70.00%) had no growth of bacteria probably due to antibiotic therapy. 3(15.00%) of the patients had Streptococcus infection and 1(05%) had Candida infection.

Table-IX

Distribution of patients by outcome after treatment.

Outcomes	Number	Percentage
1. Complete recovery	14	70.00
2. Improvement with	04	20.00 defecit
3. Death	02	10.00
Total	20	100.00

It was revealed that 18(90.00%) of patient improved after treatment, 2(10.00%) died after treatment. One was due to Candida & one was due to multiple cerebellar abscesses with recurrent surgery.



Fig.-1: Intracranial abscess

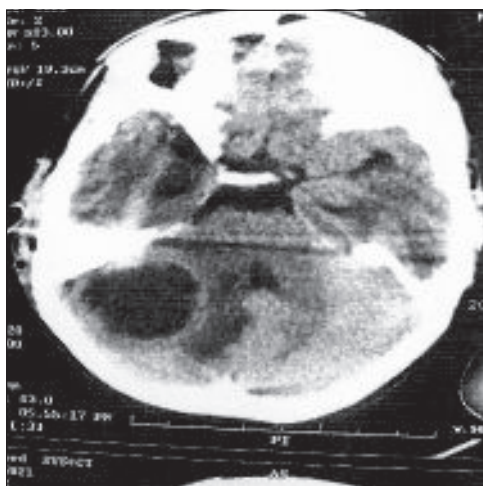


Fig.-2: Cerebellar abscess

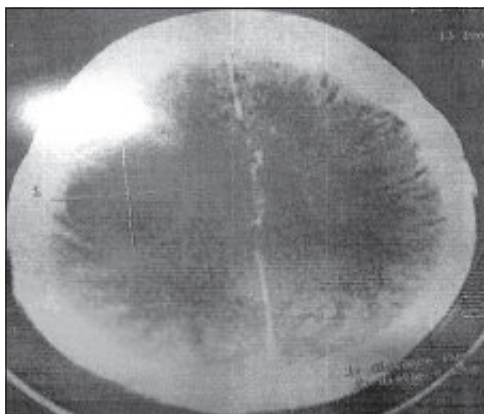


Fig.-3: Parietal abscess

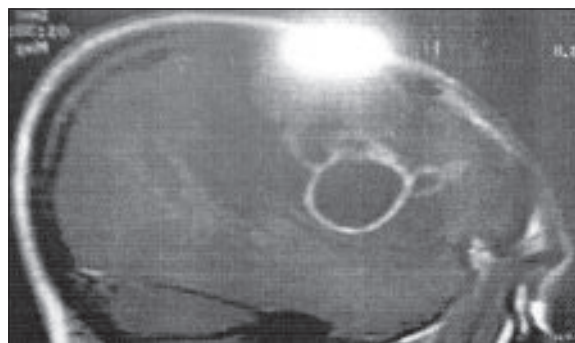


Fig.-4: Candidal abscess

Discussion:

This is a descriptive cross sectional study. In this study male female ratio was 60:40. In U.S male and female ration was 1.5:3. It was 1.5 documented that the commonest causes of pathogenesis was chronic supportive otitis media 8(40.00%). In a 30 years old with active chronic otitis media the life time risk becomes=1 in 200 of cases. In previous authors showed in cases of children congenital cyanotic heart disease, estimated risk of abscess is 47%⁹. In our study it was revealed that congenital cyanotic heart disease causes of intracerebral abscess was 4(20.00%) other causes of abscess were penetrating head trauma 4(20.00%) sinusitis 01(05.00%) Dental infection 1(05.00%) and infective endocarditis 1(05.00%) presenting symptoms of this study.

This study showed headache 12(60.00%), vomiting 3(15.00%), convulsions 3(15.00%) and other had fever, altered consciousness, visual blurring and limb weakness.

In previous study, most had headache, lethargy, hemiparesis, seizures and papilloedema¹⁰. The commonest site of lesion were temporal region 10(50.00%) followed by cerebellar & frontal region 3(15.00%).

The most group of patient were treated by Burr here aspiration on 14(70.00%), followed by craniotomy 6(30.00%).

In previous study revealed that there was no growth in 25% cases.

Streptococcus causes 33-50% of infection in was revealed that the most of culture showed no growth probably due to antibiotic therapy. 3(15.00%) had showed streptococcus growth, 2(10.00%) had staphylococcus and 01(05.00%) had enterobacteriaceae, candida.

References:

1. Mamelak A N, Mampalam T J, Obana W G, et al.: Improved management of multiple brain abscesses: a combined surgical and medical approach. *Neurosurgery* 1995;36:76-86.
2. Takeshita M, Kagawa M, Yato S, et al: Current treatment of brain abscess in patients with congenital cyanotic heart disease. *Neurosurgery* 1997; 41:1270-9.
3. Kanter MC, Hart RG: Neurologic complications of infective endocarditis. *Neurology* 1991;41:1015-20.
4. Garvey G: Current concepts of bacterial infections of the central nervous system: Bacterial meningitis and bacterial brain abscess. *J Neurosurg* 1983;59:735-44.
5. Nunez DA, Browning G G: Risks of developing an otogenic intracranial abscess. *J Laryngol Otol* 1990;104:468-72.
6. Hollin Sa, Hayashi H, Gross SW: Intracranial abscesses of odontogenic origin. *Oral Surg* 1967; 23:277-93.
7. Mamelak A N, Mampalam T J, Obana W G, et al: Improved management of multiple brain abscesses: A combined surgical and medical approach. *Neurosurgery* 36: 1995, 76-86.
8. Hollin SA, Hayashi H, Gross S W: Intracranial abscesses of odontogenic origin. *Oral Surg* 23: 1967, 277-93
9. Takeshita M, Kagawa M, Yato S, et al: Current treatment of brain abscess in patients with congenital cyanotic heart diseases. *Neurosurgery* 41: 1997, 1270-9.
10. Grimstad J A, Hirschberg H, Rootwelt K: 99m Tc hexamethylpropyleneamine oxime leukocyte scintigraphy and C-reactive protein levels in the differential diagnosis of brain abscesses. *J Neurosurg* 77: 1992, 732-6
- 1 L Williams F H, Nelms D K, McGaharan K M: Brain abscess: A rare complication of halo usage. *Arch Phys Med Rehabil* 73: 1992, 790-2.