

Management of Brain Abscess Study of 45 Cases

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ABSTRACT

Objective: To evaluate the signs and symptoms, to diagnose the abscess early and to provide rational treatment and minimize the complications.

Materials and Methods: This prospective study was conducted in the department of neurosurgery PGMI Lady Reading hospital Peshawar from January 2003 to December 2005.

Results: In this study included 45 patients 32 (71.1%) were male and 13 (28.9%) female. In this study analysed the results of different surgical procedures performed in brain abscess and combined therapy. The male and female ratio was 2.5:1 and high incidence was found in young patients mainly in first two decades of life. Otitis media 14 (31.1%) and congenital heart diseases 12 (26.7%) were the commonest causes of cerebral abscesses. Headache (51%), vomiting (51%), fever (53%) and neurological deficits (22.2%) were important signs and symptoms. Computer Tomography Scan (CT) was the common radiological investigation. The most frequently involved sites were temporal lobe in cases 14 (31.1%), frontal in 11 (24.4%) and cerebellum in 10 (22.2%) patients. In 82.2% of cases the volume of pus aspirated was less than 100ml. In 35 (77.8%) cases the first choice of treatment was bur hole aspiration. The excellent outcome was found in 80% of cases.

Conclusions: The cerebritis stage of abscess formation needs rational use of antibiotics, complete abscess with cavity needs bur hole aspiration. Brain abscesses with retained foreign body, CSF leak, containing air and fungal abscess should be excised. Cerebellar abscesses needs early evacuation or excision. Abscesses larger than 3 cm needs drainage and smaller than 1.7cm can be treated conservatively.

Key Words: Brain Abscess, CT brain, Bur hole aspiration.

INTRODUCTION

Brain abscesses had extremely high rates of morbidity and mortality in the past with the development of new techniques of bacteriological identification, high resolution computed, tomography scan (CT) and magnetic resonance imaging (MRI), effective broad spectrum antibiotics, modern antiseptic measures and microneurosurgical skills have significantly changed the prognosis. But with the emergence of autoimmune deficiency syndromes (AIDS), tuberculosis, longevity of congenital heart diseases patients, poverty, regional conflicts and increase in the neurotrauma patients leading to increased incidence of cerebral abscesses and necessitates its effective management.

The French surgeon S.F. Morand performed the first surgery of brain abscess in 1752. The Sir W. Macewen's first case of cerebral abscess operated in

1876-Bucy reported on the first case of brain abscess treated with Sulfanilamide in 1938. Cairns was the first neurosurgeon who used Penicillin for brain abscess in 1943.

MATERIAL AND METHODS

This is a prospective study of 45 cases conducted in the department of neurosurgery PGMI, Lady Reading Hospital, Peshawar. During a period of three years from 1st January 2003 to December 2005. In this study included the patients having brain abscess on brain Computerised Tomography (CT) scans. In this study included children's as well as adults. Excluding criteria was that those patients who had brain abscess due to craniotomy and patients who had not return for follow-up.

RESULTS

The total number of patients included in this study were 45 out of this 32 (71.1%) were male and 13 (28.9%) female. The male and female ratio was 2.5:1. The age of these patients range from 6 months to 55 years. The maximum number of patients were in young age group. Less than one year was only one case and more than 30 years were 3 cases.

Table 1: Shows the ages of the patients.

Ages of Patients in Years	Number of Cases	%
Less than 5 years	12	26.6
5 – 10	6	13.3
10 – 15	13	28.9
15 – 20	7	15.6
More than 20	7	15.6
Total	45	100.00

Table 2: Shows causes of brain abscess.

Causes of Brain Abscess	Number of Cases	%
Otitis Media	14	31.1
Congenital heart Diseases	12	26.7
Shunt related	4	8.9
Post Headinjury	4	8.9
Foreign body	4	8.9
Unknown	7	15.6
Total	45	100.00

Table 3:

Signs & Symptoms	Number of Cases	%
Headache	23	51.1
Vomiting	23	51.1
Fever	24	53
Changes in Sensorium	12	26.7
Hydrocephalus	14	31.1
Neurological Deficit	10	22.2
Seizures	6	13.3
Miscellaneous	11	24.4
Total	45	

INVESTIGATIONS

Routine investigations were performed in all cases, CT brain was the main radiological. There were different causes of cerebral abscess. The Otitis media in 14 (31.1%) and congenital heart diseases in 12 (26%) cases.

The clinical signs and symptoms were mainly of raised intracranial pressure i.e headache, vomiting and changes in sensorium.-In 24 (53%)cases mild fever was noted, 6 (13.3) patients had seizures and in 10 (22.2%) patients neurological deficits were noted. In some patients miscellaneous signs and symptoms were noted like ataxia, dizziness, anorexia, hearing and visual disturbances. Detail is shown in table 3.

The sites of abscesses formation in the brain were different. The most common sites were temporal lobe in 14 (31.1%) cases, frontal lobe in 11 (24.4%) and cerebeller hemispheres in 10 (22.2) patients. In 42 patients noted single abscess, in 2 cases were detected 2 abscesses and in one patients multiple abscesses. The detail is shown in table 4.

Table 4:

Site of Brain	Number of Cases	%
Temporal Lobe	14	31.1
Frontal Lobe	11	24.4
Parietal Lobe	6	13.3
Occipital Lobe	1	2.2
Cerebellum	10	22.2
Basal Ganglia	3	6.7
Total	45	100.00

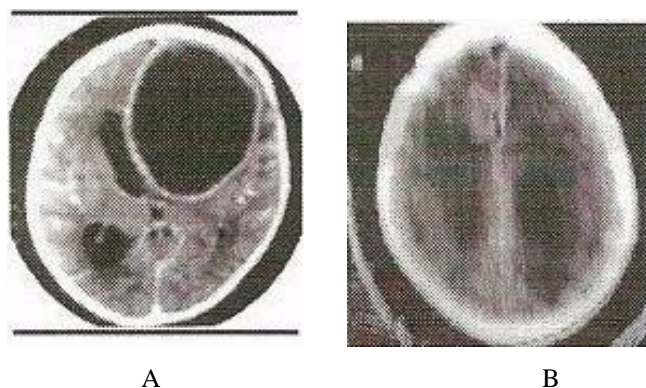


Fig. 1: A male child 8 years old having congenital heart disease and frontal case brain abscess pie. a before surgery and b after bur hole aspiration.

Burr hole aspirations were performed in 35 (77.8%) cases, craniotomy in 6 (13.3%) patients, 4 were treated conservatively. In 4 cases were done two aspirations and in 2 patients were performed three aspirations. Ventriculoperitoneal shunt was put in 3 cases. The volume of pus aspirated ranged from 30ml to 250ml. In 37 (82.2%) cases it was less than 100ml. The culture of pus was positive in 45% of cases and mainly Gram positive bacteria were isolated. In all cases antibiotics were given for 4-8 weeks. The outcome in 36 (80%) stable cases were excellent, 6 (13.3%) patients had residual neurological deficits and 3 (6.7%) cases had bad outcome.

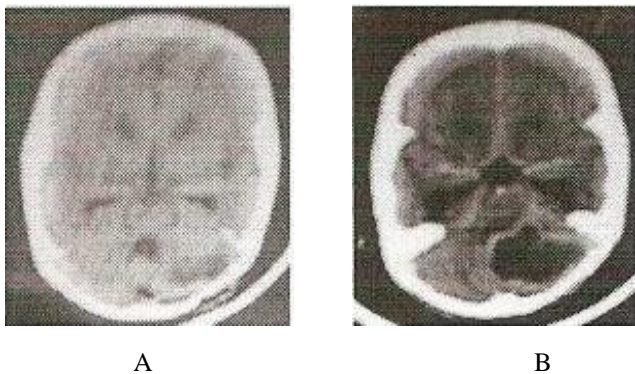


Fig. 2: Female patient 7 years old having cerebellar abscess of otogenic origin. Pie. A before surgery and pie. B after burr hole aspiration.

DISCUSSION

Bhatia and associates from India have reported that 8% of all intracranial mass lesions are brain abscesses while in developed countries this rate is 2-5%. According to literature most cerebral abscesses presents in the first four decades of life while in our study it is mainly in first three decades. The male to female ratio ranges from 2:1 to 3:1 while in our study it is 2.5:1. This is logically explained by the fact that otitis media, congenital heart diseases and head injury are common in these age groups. In our study Otitis media is 31% and congenital heart diseases 26.7%. The general clinical signs and symptoms are related to the raised intracranial pressure like headache, nausea and vomiting and the specific signs like neurological deficits are related to the location of the brain abscess. Preoperative seizures are 13.3% in our study and in literature it is mentioned 30-50%. It is less in our study because that our 31% of brain abscesses were located in occipital lobe, basal ganglia and cerebellum which are not

prone to seizures. Similarly foreign body were found only in 4 cases. Low grade fever was present in 53% cases while

literature mentioned 50%. The CT scan is the first choice of investigation in brain abscess and in the stage cerebritis CT scan with contrast and MRI will be preferred. The pus culture is positive in 100% cases and in our study it was positive only in 40% cases. Small abscess mean diameter 1.7cm can be treated conservatively and large abscess diameter more than 3cm needs drainage (Rosenblum). In our study we have not measured the size of the abscesses but they were generally of large sizes and clinical conditions of the patients were serious. The focal neurological deficits occurs in 4-27% of cases while in our study initially it was 22.2% which improved to 13.3%. The mortality ranges from 0-89%, in alert patients 0-21%, in signs of herniation 60% and in comatose patients 89% and we observed in 6.7% cases.

CONCLUSIONS

1. Fever, persistent headache, nausea, vomiting and neurological deficits are important signs of brain abscess.
2. The stage of cerebritis in brain abscess should be treated withy proper antibiotics, in proper dosage and duration.
3. Brain abscesses in majority of cases can be drained with brain cannula under local or general anesthesia which is manimally invasive procedure.
4. Brain abscesses with retained foreign body, CSF leak, containing air and fungal abscess should be excised.
5. Cerebellar abscesses needs early evacuation or excision.
6. Communication of abscess with the ventricular system and loss of sensorium have bad prognosis.
7. PCR should be the choice of investigation along with the culture and sensitivity for the pus aspirated.
8. Abscesses larger than 3 cm needs drainage and smaller than 1,7cm can be treated conservatively.

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