D:\/Nsurg\Vol. 14, No. 2, Jul. - Dec. 2010/Nsurg-8.doc (A) P. 118 – 121

ORIGINAL ARTICLE

Clinical Presentation and Surgical Management of Brain Abscess

SHABIR AHMED LEHRI, SALEH TAREEN, RAZ MUHAMMAD BAZAI
Alamgir Khan, Iqbal Ahmed Lehri
Department of Neurosurgery, Bolan Medical College, Quetta

ABSTRACT

Objectives: *To determine the clinical presentation, surgical management and outcome of patients with Brain Abscess in our locality.*

Study Design*: Descriptive study.*

Place and Duration of Study: *Bolan Medical complex, Sandeman Provincial Hospital and Akram Hospital, Quetta. Duration from January 2003 to July 2004.*

Subject and Methods: *Study conducted on twenty patients with Brain Abscess confirmed on CT Scans. Patients of both gender and all age group were included in the study. Those managed conservatively were excluded from the study.*

Results: *Surgery was performed on all patients with the mortality rate of 20% (4) in this study.*

Conclusion: *Appropriate microbial coverage and surgical management of Brain Abscess reduced the mortality and neurological deficits.*

Key Works: *Brain Abscess, Neurological deficit, Mortality.*

INTRODUCTION

Brain Abscess is the collection of pus in the brain parenchyma when it is infected with microorganisms.[1] It can be single or multiple. The major causes of solitary brain abscess is a contiguous focus of infection usually Otitis media or Sinusitis.[2] They usually cause single, superficial abscess usually affecting the Frontal and Temporal region.[3] While abscesses associated with hemotogenous spread from distant sites are often multiple, deep seated and poorly encapsulated.[3] They are found along the distribution of blood supply of which middle Cerebral artery is the most common.[4]

The Clinical presentation of the patients with Brain Abscess depends on the location, size, number of lesions, host immune status, associated edema and sings of raised Intracranial pressure. The use of CT Scans has led to reduced mortality rate of 15% and one series has reported a mortality of 4%.[5] The use of MRI in Brain Abscess is limited.

The initial success of medical management of Brain Abscess with Antibiotics was limited to lesions, which were small in size and were in the initial stages of Cerebritis.[6] Currently the surgical management is based on two procedures, which are Aspiration and Complete Excision.[7] Aspiration has shown excellent results in deep – seated and multiple Abscesses, while Excision has its advantage in Abscesses, which are solitary and with thickened capsule like post traumatic abscesses with retained foreign body.[8]

In the past, the culture yield from these abscesses was less than 50% but now it has improved significantly.[9] With anaerobes being the most common cause.[10] The most common complication of Cerebral Abscess is brain herniation and ventriculitis, which is due to mass effect or abscess rupture.[11]

Objective

To determine the clinical presentation, surgical management and outcome of patients with Brain Abscess in our locality.

MATERIAL AND METHODS

This is a prospective study conducted in the department of Neurosurgery of Bolan Medical Complex Hospital, Quetta and Akram Hospital, Quetta from January 2003 to July 2004.

Twenty patients of Brain abscess confirmed on CT scan were included in study. Patients of both gender and all age group were included in the study. Those management conservatively were excluded from the study. Base line investigations like Complete Blood Count, Erythrocyte Sedimentation Rate were done in all patients. Patients needing echocardiography were also subjected to it. CT scans with contrast were done in all patients. Empiric antibiotics like aminoglycosides, metronidazole and third generation cephabsporins were given to all patients according to their age and weight. Mannitol and steroids were given to those with raised intracranial pressure and midline shift. Surgery was done in all patients. Immediately after operation, pus sent for gram staining, for Acid fast bacilli and fungi. Antibiotic therapy was then continued for 3 – 4 weeks according to culture and sensitivity. Patients were followed for 3 months after surgery.

RESULTS

Patients belonged to almost every age group in out study (Table 1).

14 (70%) patients were male while 6 (30%) were female.

Table 1: *Age Distribution.*

Age	Male (n)	Female (n)	Total (n)	%
1 – 15 years	4	2	6	30%
15 – 50	5	3	8	40%
> 50 years	5	1	6	30%

Patient presented with various sings and symptoms like headache, vomiting (70%) focal neurological deficit (40%) fits (30%) and fever (30%) (Figure A).

Majority were from ear infection (60%), Post traumatic (20%), Blood borne (10%) and in 10% no source was found (Figure B). The patients in whom source was haematogenous were known cases of ventricular septal defect.

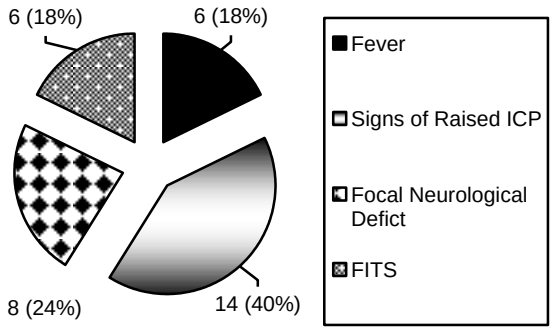

Figure A: *Clinical Features.*

Temporal region (50%) was the most frequently affected area on CT scan followed by posterior fossa and frontal lobe. (Figure C).

Surgery was done in all cases. Burr hole Aspiration was done in 30% of the cases and they were those in which the abscess were multiple and deep seated, standard Craniotomy with excision of capsule was done in 15% and Aspiration alongwith excision of capsule was done in 30% o the cases. The latter was done on patients who did not respond to early Aspiration.

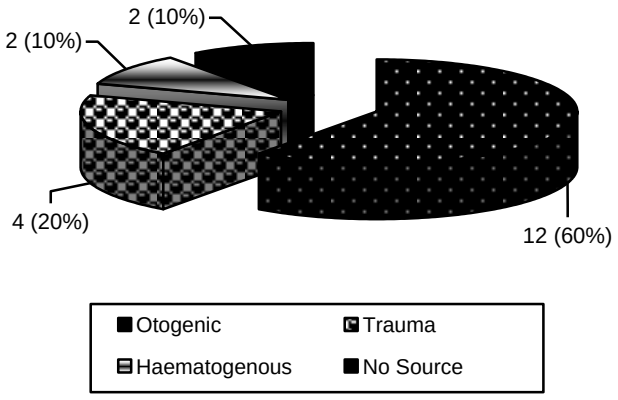

Figure B: *Source of Infection.*

The organisms isolated were Streptococcus intermedias in 40%, Bacteroidsfragilis in 30%, Staphylococcus aureus in 15% and 15 showed mixed colonies of Gram positive and gram Negative organisms.

In our study 80% of the cases improved while the mortality was 20% (4 cases).

DISCUSSION

Brain Abscess has proven to be one of the disease entities that Neurosurgeons can treat more successfully. This success depends on early clinical diagnosis. The advent of CT Scan and MRI has a significant impact on the course of Brain Abscess. It is also sometimes useful to hold the antibiotic therapy until the purulent material has been collected for culture.

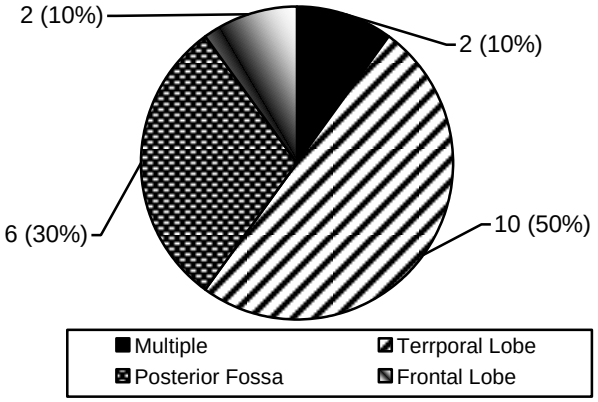

Figure C: *CT Scan Findings.*

Most patients with brain abscess present in the first five decades of life[12] and this is also suggested by our study in which 70% of the cases belong to this age category. This is also possible because the four important predisposing factors which are congenital Heart Diseases, open head injury, sinusitis and Otitis median occur in this age group.[13]

In our study the male to female ratio is 70% and 30% respectively which is same as in other studies[14].

Headache was the most predominant symptom (70%) as also reported in most studies.[15] Seizure is reported as 10% in most studies[16] but in our study it was upto 30%, which may be due to a delay in treatment.

Fever occurs in 35% to 50% and is more common in children.[17] The source of infection was otogenic in 60% and post-traumatic in 20% of the cases. Dental abscess has been found to be the third most common cause in some studies[18] but in our study no case was reported.

CT scan remained the investigation of choice and was done in all cases. It showed that 50% of the lesions were located in the temporal lobe and 30% in posterior fossa and again this is with accordance to International students.[19]

Blood culture was done in 6 cases only and only 4 cases (20%) showed positive results. While in some studies it has been reported as high as 60 – 70%.[20] This difference could be due to early antibiotic treatment.
The Organisms isolated in our study were:

40% Streptococcus intermedias.
30% Bacteroids fragilis.
15% Staphylococcus aureus
and 15% showed mixed colonies of Gram positive and Gram negative organisms.

This pattern has also been reported in some International studies.[21]

In our study 80% of the cases improved while the mortality was 20% (4 cases). Of the four patients who expired, one was a diabetic with age above 50, second was with a congenital heart disease and was referred to Cardiac unit for further management. While two patients on whom standard craniotomy with aspiration was done died due to Ventriculitis. The mortality rate has decreased dramatically in recent years due to sophisticated investigations like CT Scan. Improved bacteriological isolation techniques, availability of versatile antibiotics and introduction of stereotactic guided surgery.

Address for Correspondence
Dr. Shabir Ahmed Lehri
Associate Professor Neurosurgery
Bolan Medical College, Consultant Neuro Surgeon
Akram Hospital, Zarghoon Road Quetta
Ph: - Cell 0300-8388108
Res: - 081-2853192
Email: - shabir_lehri@hotmail.com
Contribution of Co- Authors:
Dr. Salheh Tareen
Dr. Alamgir Khan are orthopedic surgeons and
Dr. Iqbal Ahmed Lehri is Oromaxillofacial Surgeon,
they Contribute to this Paper Regarding those
Patients who have Ostemylitis of Bones

REFERENCES

1. Alderson D, Strong AJ, Ingham HR, Selkon JB Fifteen-year review of bran abscess. Neurosurgery 1981; 8: 1-6.
2. BrittRH Brain abscess in : Wilkins RH, Rengachary SS, eds. Neurosurgery. New york : MeGraw – hill, 1985: 1928-1956.
3. Britt RH, Enzelmann Dr, Remington JS. Intracranial infections in cardiac transplant, recipients Ann neurol 1981; 19: 107-119.
4. Garfield J, management of supratentiorial intracranial abscess: a review of 200 cases. BMJ 1969; 2: 7-11.

5. Milles ES, Dias PS Uttley D.CT scanning in the management of intracranial abscesses; a review of 100 cases. Br J Neurosurgery 1988; 2 (4): 439-446.
6. Rousseaus M. Lesion F, Destee A et al. Developments in the treatment and prognosis of multiple cerebral abscess. Neurosurgery 1985; 16: 304-308.
7. Kartimenos G, Crockard HA multiple brain abscess: a review of fourteen cases. Br J Neurosurgery 1991; 5 (2): 153-161.
8. Osenbach RK, Loftus CM. Diagnosis and management of brain abscess. Neurosurgery Clin N Am 1992; 3 (2): 403-420.
9. Kaplan K; Brian Abscess med-clin North AM 1985; 69: 345-360.
10. Haines SJ, Mampalam T, Rosenblum ML, Nagib G Cranial and intracranial bacterial infections. In : Youmans JR, ed. Neurological surgery. Philadelphia : WB Saunders, 1990: 3707-3735.
11. Shaw mdm, Russell JA. Cerebellar Abscess. A review of 47 cases. J Neurol Neuro Surgery Psychiatry 1975; 38: 429-439.
12. Obana WG, Rosenblum ML. Nonoperative treatment of neurosurgical infections. Neurosurgery Clin N Am 1992; 3 (2): 359-373.
13. Yang SY. Brain abscess : a review of 400 cases, J Neurosurgery 1981; 55: 794-799.
14. Seydoux C, Francioli P. Bacterial brain abscess: factors influencing mortality and sequelae Clin infect Dis 1992; 15: 394-401.
15. Darowiche RO : Review Article current accept treatment of infection associated with Implutionts. NE ng J MD. 2004; 350: 1420-1429.
16. Kanew P. JM : Reflection of sshunt infection pediatr Neurosurgery 2003; 39: 285-290.
17. Hargrave IG, Kothori M. Neurological Sequelae of infections endoleriting e Medicine S[Serial online April 2002/cited 20023 Jun 1] : 3 (4). Available from URL htt/www co e-medicine.com / Neurology Neurological sequale of infections endocrditis.
18. Britt RH, Enzelmann DR.clinical stages of human brain abscess on serial CT scans after contrast infusions: computerized tomographic, neuropathological, and clinical correlations. J Neurosurgery 1983; 59: 972-989.
19. kammin M, Biddle D. Conservative management of focal intracerebral infections. Neurology 1981; 31: 103-106.
20. Itakura T. Yokote H, Ozaki, et al. Stereotaxic operation for brain abscess. Surg Neurol 1987; 28: 196-200.
21. Wispelwey B, Scheld M, Brain Abscess In : Mandell CL, Douglas RG, Bennett JE. Eds. Principles and practice of infectious disease. New Your. Churchill livingstone. 1990: 778.