

## Clinical Study of Intra Cranial Abscesses Managed By Emergency Burr Hole Aspiration and Follow Up.

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**Abstract:** 32 cases of intra cranial Brain Abscess (BA) depending on CT (Computerised Tomography) scan imaging were treated by emergency aspiration by a single burr hole and application of antibiotics into the cavity of abscess, till two consecutive negative aspirations were obtained. A combination of loop diuretics and antibiotics in appropriate doses were also given. The mortality rate with the procedure was nil and the morbidity rate being 12.5%. No role of corticosteroids (CS) in the management of brain abscess. Thus, emergency aspiration was found to be an effective mode of surgical management of brain abscess.

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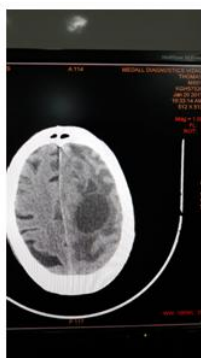
### I. Introduction:

Brain abscess is a challenging clinical condition to both the neurologist and neurosurgeon. Although the diagnosis, treatment and prognosis of patients with brain abscess have improved during the last two decades because of technological advances in medicine like computerised tomographic scanning and refinements in microbiological techniques, the management of brain abscess is still a controversial subject.[1] In this paper, we present the effectiveness of emergency aspiration as the mode of management of brain abscess.

### II. Material and methods

A total of 32 cases of intracranial brain abscesses were admitted and studied from oct 2015 to june 2017. All were admitted in the ward of neurosurgery in King George Hospital, Visakhapatnam. A detailed clinical examination was done in all the cases. Complete set of blood and imaging investigations done for all as emergency. All of the cases were in capsular stage of brain abscess and confirmed by CT scanning of brain.

All the patients were managed as outlined below. Initially furosemide in the dose of 0.75mg/kg/body weight and antibiotics were given intravenously. On the same day the abscess cavity was gently aspirated through a burr hole. It was washed with 1 in 10 diluted solution of gentamicin till clear fluid was aspirated. Then 3 ml of the gentamicin solution was instilled into the cavity.



Aspiration was done on alternate days irrespective of the clinical condition of the patient till two consecutive negative aspirations were obtained. Antibiotics in standard doses were given intravenously for the first two weeks and orally during the next four weeks. Patients were given third generation cephalosporins, Amikacin and metronidazole intravenously till the pus culture report was available. In case of sterile culture, the same antibiotics were continued for 2 weeks, followed by cephalosporins orally. In case of a positive culture, the appropriate antibiotic was given for a six week period.

Anticonvulsants were also given. Corticosteroids were not used during therapy.

In all patients follow up CT scan of brain was performed after 10 days and at the end of 3 months. The patients were discharged after 2 weeks and reviewed at monthly intervals.

### III. Results

A total of 32 cases have been analysed. The highest incidence of abscess (68%) was in the age group of 40-50 years. One case occurred in infant (3.12%) and none over the age of sixty five. 31 cases were between GCS 8-11. Only one case had a GCS score of 6.

Exact source could not be detected in majority of cases. Two cases with chronic suppurative otitis media, 3 cases with congenital heart disease.

5 cases were found to have abscess located in left temporal lobe. 3 cases in frontal lobe. Rest of all cases were found to be located in parietal lobe. None of the abscesses were found in the occipital lobe and cerebellum.

Sterile cultures obtained in 13 cases. *Pseudomonas* species isolated in 7 cases.

*E. coli* isolated in 5 cases. *Staphylococcus* species isolated in 3 cases. *Streptococcus pneumoniae* isolated in one case. *Proteus* species isolated in one case. *Aspergillus* species isolated in one case. *Acinetobacter* isolated in one case. The mortality rate was 3.12%. Only one case was dead due to severe pulmonary oedema on 5th post-operative day, a known case of congenital cardiac anomaly. Rest of all cases improved clinically. All were subjected to CT-Scanning of brain after 2 weeks of aspiration which showed complete collapse of abscess cavity and the capsule found to be fragmented. There was significant decrease in surrounding oedema.

All the cases were followed up for a minimum period of 6 months. The longest follow up being 2 years. All of the cases were underwent CT-imaging of brain at their follow-up in which none of them showed recurrence.

The overall morbidity of the cases in the study was 12.5%. 4 cases showed seizures as the post operative morbidity, even though this being the chief complaint in all these 4 cases at the time of initial presentation. All of them were treated with mono therapy anti-epileptic drugs in the follow-up period.

### IV. Discussion

Various surgical procedures have been mentioned for the treatment of intracranial abscess with variable results.[1],[2],[6],[7],[8] Successful non-surgical management of brain abscess is currently being reported.[3],[4] The mortality rate in our series was only 3.12% as compared to other series where the mortality ranged between 5% to 50%.[2],[7],[9]

Intra ventricular extension of the abscess cavity causing fatal ventriculitis and increase in the surrounding oedema leading herniation were the main cause of death in most series.[2]. The bacterial proliferation in the necrotic central core was the key cause for increasing surrounding oedema. Both the above mentioned clinical scenario and complications have not seen in our study due to serial alternate day aspirations with intra cavity antibiotic administration till two consecutive negative aspirations were found.

Post operative shrinkage of abscess cavity and fragmentation of its capsule have been found in all cases with no added clinical complications. Our study supports the conclusion by Kala et al[10] stating that local application of antibiotics within the cavity of abscess has a beneficial effect in treating the brain abscess.

Hence, this procedure is recommended in patients with capsular stage of pyogenic brain abscess, as the primary operative treatment, because of its low morbidity, mortality and non-requirement of serial CT scans or ultrasound evaluation of abscess cavity.

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