

A Thirteen-Year-Old Boy with Undiagnosed Congenital Heart Disease Presented with Brain Abscess

Raafat Hammad Seroor Jadah, MBBCh, BAO (NUI), LRCP&SI*

Tetralogy of Fallot is the most common form of cyanotic heart disease and it is associated with intracerebral abscess in childhood.

We report a thirteen-year-old boy with undiagnosed cyanotic heart disease who presented to the emergency department with history of fever, vomiting, headache and left sided body weakness.

The neuroradiological images were suggestive of brain abscess and echocardiogram confirmed the diagnosis of Tetralogy of Fallot.

An emergency craniotomy and brain abscess drainage was done and the patient showed a complete recovery of his clinical symptoms.

Bahrain Med Bull 2013; 35(3):

Intracerebral abscess is an uncommon finding in children, but it can be associated with high rates of permanent neurologic impairment and death if not detected and treated early^{1,2}.

Tetralogy of Fallot is the most common form of cyanotic congenital heart disease which is associated with intracerebral abscess in children³.

Brain abscess associated with cyanotic congenital heart disease typically present with symptoms of fever, headache and vomiting along with focal neurological deficit^{4,5}.

Early and aggressive surgery of brain abscess in children is associated with excellent prognosis and minimal morbidity and mortality⁶.

The aim of reporting this case is to stress the early surgical intervention in brain abscess associated with neurological manifestations to avoid high rates of permanent neurological impairment and death.

* Chief Resident
Pediatrics Department
Bahrain Defense Force Hospital
Kingdom of Bahrain
Email: nader212@hotmail.com

THE CASE

A thirteen-year-old boy presented to the emergency department with two days history of fever, headache, vomiting and left sided body weakness involving the upper and lower limbs. There was no history of trauma or abnormal movement.

The patient was found to have cardiac murmurs in the neonatal period based on clinical examination but the family did not follow-up with a cardiologist.

Physical examination showed normal vital signs. Glasgow coma scale was 15/15. The patient had central cyanosis with grade two ejection systolic murmurs and clubbing of the fingers.

The neurological examination revealed reduced power and brisk reflexes over the left side of the body with intact cranial nerves examination and no cerebellar signs.

The initial brain CT with contrast showed a well defined rounded shaped hypodense lesion at the right cerebral hemisphere with ring enhancement and midline shift, see figure 1.

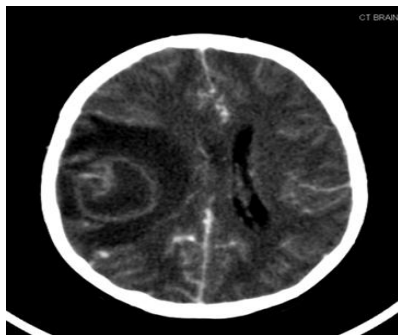


Figure 1: Brain CT with Contrast Showing Right Cerebral Hemisphere Lesion with Ring Enhancement, Edema and Midline Shift

MRI brain T1 showed a ring enhancing mass in the right cerebral hemisphere with extensive surrounding edema and midline shift highly suggestive of intracerebral abscess, see figure 2 (a, b, c)

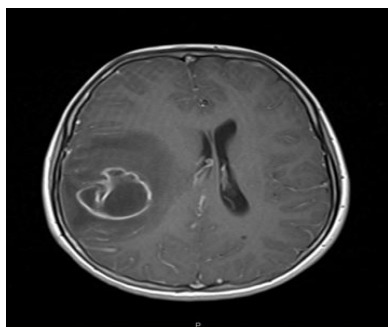


Figure 2 (a): MRI of the Brain T1 Sequence Axial View Showing Right Cerebral Hemisphere Abscess

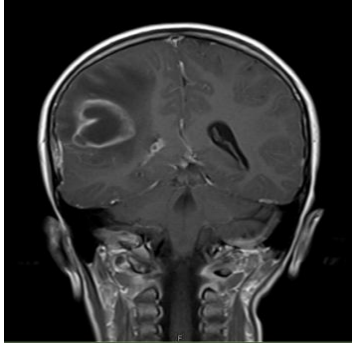


Figure 2(b): MRI of the Brain T1 Sequence Coronal View Showing Right Cerebral Hemisphere Abscess

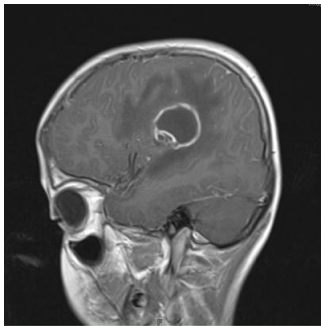


Figure 2(c): MRI of the Brain T1 Sequence Sagittal View Showing Right Cerebral Hemisphere Abscess

An urgent echocardiogram was done which confirmed the diagnosis of Tetralogy of Fallot. The patient started on intravenous antibiotics and had urgent craniotomy and brain abscess drainage with complete resolution of his neurological manifestations.

Follow-up MRI of the brain after craniotomy and abscess drainage showed complete resolution of brain abscess with no evidence of recurrence, see figure 3.

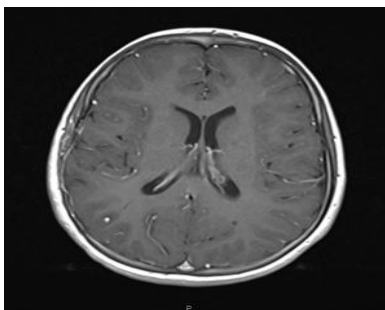


Figure 3: MRI of the Brain T1 Sequence with Contrast Axial View Following Abscess Drainage. Complete Resolution of the Intracerebral Abscess and No Evidence of Recurrence

DISCUSSION

Intracerebral abscess is rare in children. Shachor-Meyouhas et al stated that twenty-five percent of all brain abscess occur in children¹. Our patient was the first case of pediatric brain abscess to be reported from our hospital, similar to what has been reported by Shachor-Meyouhas et al that intracerebral abscess is uncommon in pediatric population¹.

Cyanotic congenital heart disease complicated with brain abscess occurs commonly in children. Our patient presented at the age of thirteen years and according to Chakraborty et al the average age of clinical presentation of affected children was 9.1+/- 5.5 years⁷.

Several predisposing factors have been associated with brain abscess in children. Yang et al have reported that Tetralogy of Fallot is the most common form of cyanotic congenital heart disease to be associated with intracerebral abscess in pediatric age group³.

The typical clinical presentations of brain abscess include fever, headache and vomiting; according to Ozsurekci et al, fever and headache were the most common presenting symptoms and an associated focal neurological deficits which has been reported by Kao et al^{4,5}. Our patient presented with fever, headache and vomiting with focal neurological deficit in the form of left sided body weakness.

Neurological images including brain CT and MRI are the diagnostic tests for intracerebral abscess. Our patient had brain CT and MRI which were highly suggestive of brain abscess. Kalinowska et al proposed that brain CT and MRI are the tests of choice for diagnosis of brain abscess⁸.

Early identification, antibiotic therapy and emergency surgical management of brain abscess in children have been associated with excellent prognosis. Madhugiri et al reported that antibiotic treatment with early and aggressive surgical intervention lead to good outcome and reduce the recurrence rate of brain abscess⁶.

CONCLUSION

Intracerebral abscess in children is an emergency condition. Early aggressive management including antibiotic therapy and surgical intervention is associated with excellent outcome and significantly reduce morbidity and mortality rates.

Potential conflicts of interest: None.

Competing interest: None. **Sponsorship:** None.

Submission date: 16 April 2013. **Acceptance date:** 12 June 2013.

Ethical approval: Approved by the Research Committee, BDF Hospital, Bahrain.

REFERENCES

1. Shachor-Meyouhas Y, Bar-Joseph G, Guilburd JN, et al. Brain Abscess in Children-Epidemiology, Predisposing Factors and Management in the Modern Era. *Acta Paediatr* 2010; 99(8): 1163-7.
2. Goodkin HP, Harper MB, Pomeroy SL. Intracerebral Abscess in Children Historical Trends at Children Hospital Boston. *Pediatrics* 2004; 113(6): 1765-70.
3. Yang SY. Brain Abscess Associated with Congenital Heart Disease. *Surgical Neurol* 1989; 31(2): 129-32.
4. Ozsurekci Y, Kara A, Cengiz AB, et al. Brain Abscess in Childhood: A 28-year Experience. *Turk J Pediatr* 2012; 54(2): 144-9.
5. Kao KL, Wu KG, Chen CJ, et al. Brain Abscess in Children: Analysis of 20 Cases Presenting at a Medical Center. *J Microbiol Immunol Infect* 2008; 41(5): 403-7.
6. Madhugiri VS, Sastri BV, Srikantha U, et al. Focal Intradural Brain Infections in Children: An Analysis of Management and Outcome. *Pediatr Neurosurg* 2011; 47(2): 113-24.
7. Chakraborty RN, Bidwai PS, Kak VK, et al. Brain Abscess in Cyanotic Congenital Heart Disease. *Indian Heart J* 1989; 41(3): 190-3.
8. Kalinowska-Nowak A, Garlicki A, Bociaga-Jasik M. Brain Abscess-Modern Diagnostics and Therapeutic Treatment. *Przegl Epidemiol* 2009; 63(1): 89-95.