

Brain abscess in an adult with uncorrected TOF - A case report

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ABSTRACT

Brain Abscess is an uncommon but serious complication of congenital heart diseases. The incidence of brain abscess in patients with Tetralogy of Fallot is reported to be 13.7%.¹ Hemiparesis and seizures in a 28-year-old male with uncorrected Tetralogy of Fallot is reported which was diagnosed as brain abscess and managed conservatively with antibiotics. The aim is to emphasize the importance of recognizing cerebral abscess in patient with Tetralogy of Fallot and initiating timely appropriate management for this potentially fatal complication.

Keywords:

Tetralogy of Fallot, Cerebral Abscess, Seizures, Hemiparesis.

INTRODUCTION

One of the most common cyanotic congenital heart diseases in children is Tetralogy of Fallot (ToF). It occurs in 3 out of every 10,000 live births and accounts for up to one-tenth of all congenital cardiac lesions.² The patients with cyanotic congenital heart disease are prone to develop cerebral abscess incidence being 4-6%.³ Tetralogy of Fallot is the most common cyanotic congenital heart disease accounting for 13-70% of all brain abscess cases.^{1,4} Most of them are located in the supratentorial compartment and are most common in 4 to 7 years of age.⁵ The incidence of cerebral abscess in patients with Tetralogy of Fallot is due to the fact that microorganisms in blood, instead of passing through pulmonary circulation and undergoing phagocytosis, passes from right to left heart through the shunt and gains access to cerebral circulation. The prognosis of a cardiogenic abscess is worse than that of other brain abscesses, and mortality rates have ranged from 27.5% to 71%.⁶ Management options include antibiotics for 6-8 weeks, aspiration under local anesthesia and excision of abscess under general anesthesia. Aspiration of abscess under local anesthesia is the most common because of greater risks associated with general anaesthesia.⁷

CASE REPORT

A 28-year-old male presented to Cardiology

Department with complaints of headache, high grade fever and right hemiparesis followed by generalized tonic clonic seizures. He was diagnosed to have Tetralogy of Fallot at 8 years of age and had not undergone corrective surgery. On examination, he had Pulse rate of 126/minute, blood pressure of 110/70 mmHg and fever of 103°F. Patient had central and peripheral cyanosis, grade 4 digital clubbing and bilateral pedal edema. His GCS was 10/15, pupils were dilated, and plantars were upgoing. He regained consciousness with a GCS of 15/15 after 2 hours. Power was 4/5 in right upper and lower limbs with brisk reflexes and upgoing right plantar. Jugular venous distension and left parasternal heave were present. A pansystolic murmur at lower left sternal border and an ejection systolic murmur at upper left sternal border were audible on auscultation. His laboratory tests showed a hemoglobin of 23gm/dl and hematocrit of 67 percent suggesting a secondary polycythemia. Total leucocyte count was 15000/cmm and Platelets were 80 x 10⁹/L. His AST was 66 U/L and LDH level was 600 U/L, with negative viral markers of hepatitis B and C indicating liver congestion. Echocardiography showed large ventricular septal defect (VSD) with overriding of aorta, severe right ventricular outflow obstruction with tricuspid valve pressure gradient of 76 mmHg along with right ventricular hypertrophy. Left ventricular ejection fraction was 64%. Blood culture revealed no growth. An MRI brain with gadolinium contrast showed ring enhancing lesion (3 cm x 2.8 cm x 2 cm) in

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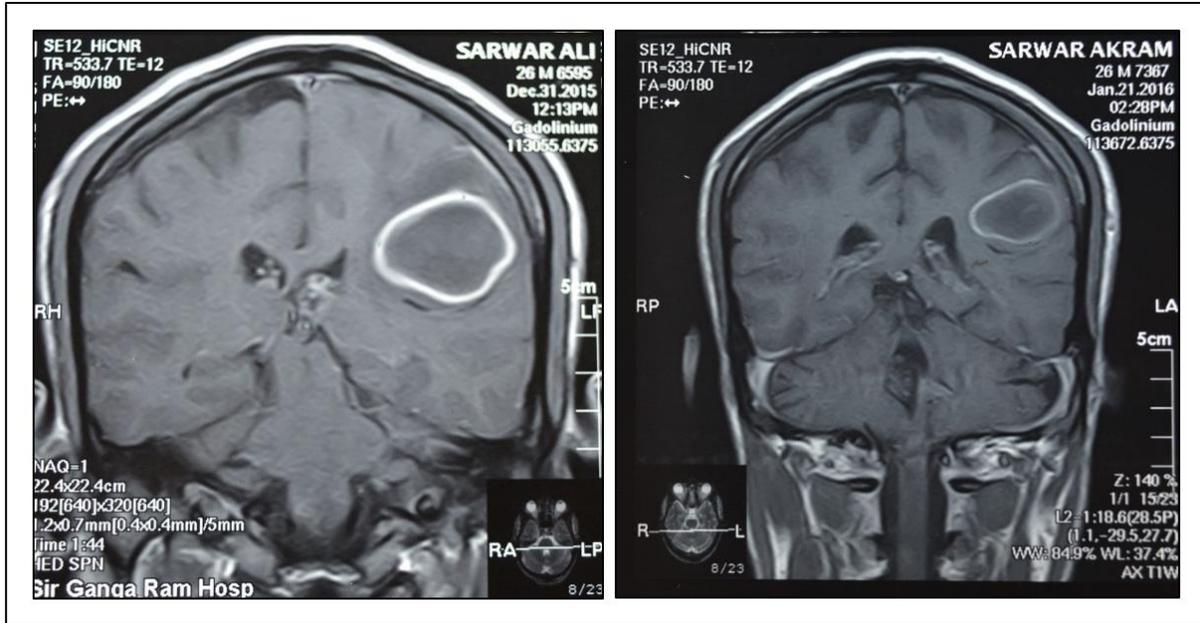


Figure 1: MRI brain showing a ring enhancing lesion left parietal lobe

the left parietal lobe with significant surrounding edema suggesting brain abscess (Figure 1). Neurosurgical consultation was obtained who suggested conservative management because of a high cardiopulmonary risk associated with general anaesthesia and a low platelet count. He was given a combination of intravenous antibiotics including Injection Meropenem 1gm x i.v. x 12 hourly, and Injection Metronidazole 500 mg x i.v x 8 hourly for 6 weeks. Seizure after admission was controlled with injectable diazepam i.v. followed by oral Carbamazepine. 200mg x 8 hourly. Fever settled in the following week and the power deficit improved within the second week. He was discharged after 6 weeks with no residual focal neurological deficit with an advice for surgical correction of ToF and regular outpatient follow up every 3 months. His follow up MRI of brain showed complete resolution of brain abscess (Figure 2). He underwent surgical correction of Tetralogy of Fallot after 6 months and is doing well.

DISCUSSION

Tetralogy of Fallot is one of the most common cyanotic congenital heart disease (CHD) in children. This report describes an adult male with Tetralogy of Fallot who presented in emergency with neurological manifestations of cerebral abscess and was identified to have brain abscess. The brain abscess is a known serious complication in uncorrected cyanotic CHD, although it may occur in uncorrected acyanotic CHD as well.⁴ It is

frequently reported in developing countries due to delay in the diagnosis and correction because of paucity of pediatric cardiologists and cardiac surgeons. Without corrective surgery, survival rate of adults with Tetralogy of Fallot ranges from 10 to 12 years and only up to 10% of the population live to their 30s, only 3% reaching to their 40s or beyond.⁸ Hypoxia and hyperviscosity are the two main factors that predispose patients with ToF to brain abscess.^{1,4,5} Hyperviscosity reduces the flow of blood in microvasculature and causes infarctions which get infected and develop focal cerebritis and then abscess.⁴ Thirdly microorganisms in the blood evade the pulmonary circulation and hence phagocytosis due to shunting of blood from right to left heart and gain entry to cerebral circulation. This fact is further supported as most of the reports on brain abscess in ToF describe anaerobic bacterial growth on cultures.^{1,4,5} Management of brain abscess among cyanotic CHD patients poses special problems. These patients have coagulation defects in addition to the cardiopulmonary risks. Both the factors increase the risk of anaesthesia and surgery. There is considerable controversy regarding the choice of medical versus surgical therapy in patients with cardiogenic brain abscess.⁶ Surgical options for brain abscess include drainage through osteoplastic craniotomy and removal of abscess capsule, or aspiration and drainage of the abscess under stereotaxic guidance. This procedure can be performed under general or scalp block anaesthesia with good result but



Figure 2: Follow up MRI showing complete resolution of brain abscess

require expensive apparatus and expertise.⁴ The reported patient had thrombocytopenia and so a decision was made to manage him conservatively with a combination of triple antibiotics which proved successful. Conservative management with intravenous broad-spectrum antibiotics may be recommended as initial management option in patients of ToF presenting with brain abscess in high risk surgical patients.

CONCLUSION

In patients of Tetralogy of Fallot presenting with fever and acute neurological features including headache,

limb weakness or seizures, a high index of suspicion of brain abscess must be kept, as early detection and prompt antibiotic treatment reduce morbidity and mortality with complete resolution of lesion, especially in high surgical risk patients. Patients should also be encouraged to undergo corrective surgery as early as possible for a nearly normal life and prevention of further potentially fatal complications.

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