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Brain Abscess Due to Neglected Tetralogy of Fallot: A Case Report

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Abstract

BACKGROUND: Tetralogy of Fallot (TOF) is a type of congenital heart disease accounts for about 10% of all congenital cardiac deformities, and is the most common cyanotic lesion after the 1st year of life. The ideal age for correction of tetralogy of Fallot is still under discussion. Non-cardiac manifestation due to oxygen deficiency has to be aware of in cyanotic patient is brain abscess, because of the right-left shunt in long standing TOF.

AIM: The objectives of the study were to report a case of neglected TOF.

CASE REPORT: A 1-year-old male presented to Murni Teguh Memorial Hospital with the chief complaint of stiffed neck for the past 3 days and got fever for 10 days before admitted, with nausea and vomiting. He was diagnosed with Tetralogy of Fallot through an echocardiography examination when he was 2 months old, but never go through any medical nor surgical treatment. The boy responded to verbal, no eye contact, high grade fever, stiffed neck, Kernig sign, and Brudzinski sign was found, and the right extremities were spastic, clubbing finger. On cardiac examination, there was systolic murmur grade ¾ in the left second intercostal space. Echocardiography evaluation revealed dilated RA-RV, no PDA shunt, large mal alignment ventricular septal defect, overriding aorta > 50%, right ventricular hypertrophy, and severe infundibular pulmonary stenosis, consistent with Tetralogy of Fallot. During hospitalization, there were several episodes of seizure and decreased of consciousness, brain CT investigation was done. The abscess was evacuated and a ventriculoperitoneal shunt was performed. One week after the operation, the patient developed abdominal distention, green bile such as vomiting, decreased bowel movement, and soon muscular defense. From the plain abdominal, X-ray and CT revealed peritonitis and intestinal obstruction. An emergency laparotomy was performed, followed by adhesiolysis and jejunostomy due to jejunal perforation. The boy passed away after several episodes of septic shock.

CONCLUSIONS: We would like to emphasis the consequence of the neglected treatment in infant with TOF.

Introduction

Tetralogy of Fallot (TF) is the most common cyanotic congenital heart lesions. TF consists of four abnormalities such as pulmonary stenosis or obstruction of the right ventricular outflow, ventricular septal defect, overriding aorta, and right ventricular hypertrophy [1], [2], [3]. Cerebral abscess is one of the complication in uncorrected TF and usually seen in patient older than 2 years old [1].

Case Report

A 1-year-old boy was admitted to the Emergency Ward of Murni Teguh Memorial Hospital, Medan. The patient presented with stiffed neck for the past 3 days, fever for 10 days before admission, with nausea and vomiting. He was diagnosed with Tetralogy of Fallot through an echocardiography examination when he was 2 months old (Figure 1), but never go through any medical nor surgical treatment. History of febrile seizure was found, activity intolerance and squatting are unnoticed to the parents. On physical examination, the patient was found response to verbal, no eye contact, body temperature was 38.4°C, pupils were isochoric, normal light reflexes, systolic murmur grade ¾ in the left second intercostal space, and clubbing finger was found. On further examination, stiffed neck, Kernig sign, Brudzinski sign, spastic extremities was found. Right extremities hemiparesis was found. Echocardiography evaluation was done and revealed dilated RA-RV, no PDA shunt, large mal alignment VSD (ventricular septal defect), overriding aorta > 50%, right ventricular hypertrophy, and severe infundibular pulmonary stenosis, consistent with Tetralogy of Fallot (Figure 2). Blood investigation showed hemoglobin 15.2 g/dL, leukocyte 22.330/µl, platelet 336.000/µl, and mild hyponatremia 130 mmol/L. A CT (Computed tomography) brain revealed an abscess cavity in the right frontal region with vasogenic edema and enlargement of the ventricles (Figure 3).

During hospitalization, there were several episodes of seizure and decreased of consciousness, the patient was quickly consulted to the neurosurgery

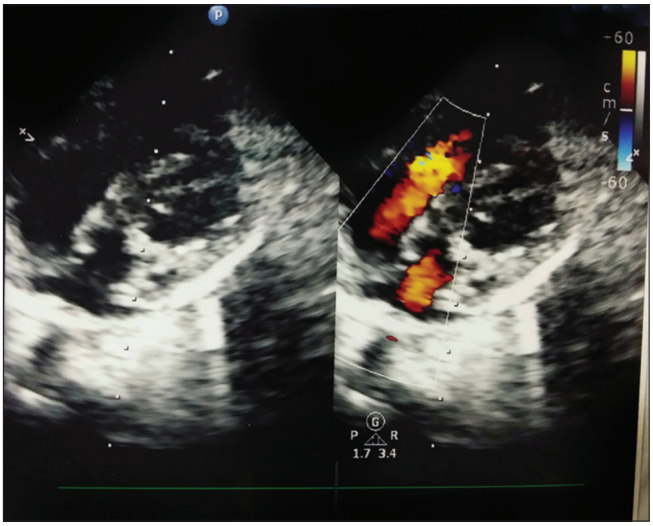

Figure 1: Echocardiography: Tetralogy of Fallot, Small pulmonary artery, small RVOT

department. The abscess was evacuated and cultures were found to be negative, a ventriculoperitoneal shunt was performed. Postoperatively, patient still responded to verbal, no eye contact and shows little neurological improvement, remittent fever was found, the patient goes through several episodes of cyanotic spell that resolved with knee-chest position, morphine injection was given once and given propranolol 2 mg 3 times daily. He was given Ceftriaxone 500 mg IV twice daily,

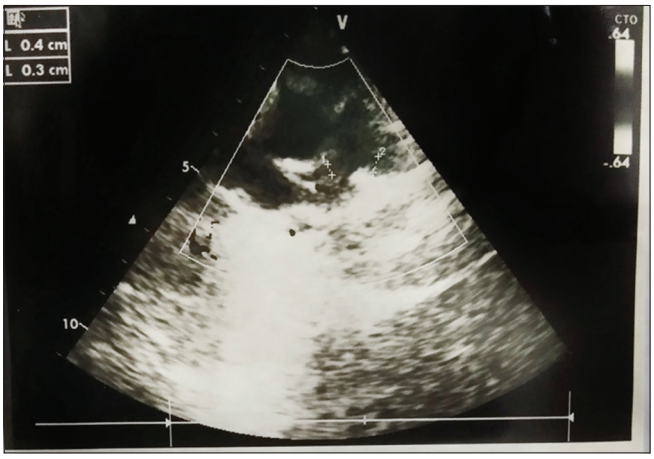

Figure 2: Echocardiography: Tetralogy of Fallot, severe infundibular pulmonary stenosis

Metronidazole 150 mg IV 3 times daily, Amikacin 50 mg twice daily, and Phenytoin 35 mg IV twice daily. Fever begins to resolve. One week after the operation, the patient developed abdominal distention, green bile like vomiting, decreased bowel movement, and soon muscular defense. A three position abdominal X-ray and abdominal computed tomography were performed and revealed peritonitis and intestinal obstruction. An emergency laparotomy was performed, followed by adhesiolysis and jejunostomy, during surgery jejunal perforation was found. Postoperatively, the boy was on total parenteral nutrition (TPN), intravenous antibiotics were given continuously. Four weeks after laparotomy and jejunostomy, an surgical anastomosis was performed, the patient was given parenteral nutrition, trophic feeding, and enteral nutrition.

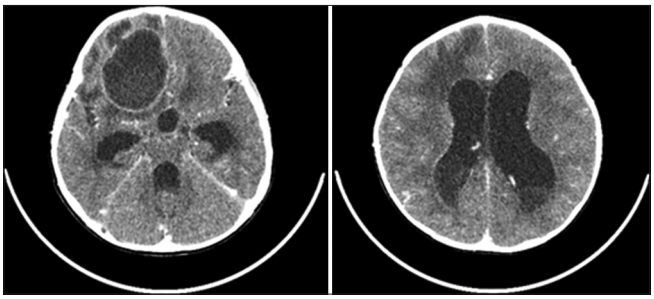

Figure 3: First head CT scan: Abscess cavity in the right frontal region, vasogenic edema, ventricular enlargement

Further evaluation was done; blood cultures found to be negative, blood investigation revealed Hb 17.8 g/dl, leukocyte 18.520/µl, platelets 39.000/µl, sodium 133 mmol/L, and potassium 2.40 mmol/L, *Klebsiella pneumonia* sp. was identified in sputum cultures. The patient developed fever and generalized seizures, a computed tomography was performed for further evaluation and revealed hydrocephalus communicans, ventriculoperitoneal tube is intact, a suspected lesion in the cerebellum (Figure 4). Although there was a suggestion of a recurrent cerebral abscess, no further evaluation or intervention can be performed due to continuing deterioration of the patient condition. Sadly, the patient passed away after several episodes of septic shock.

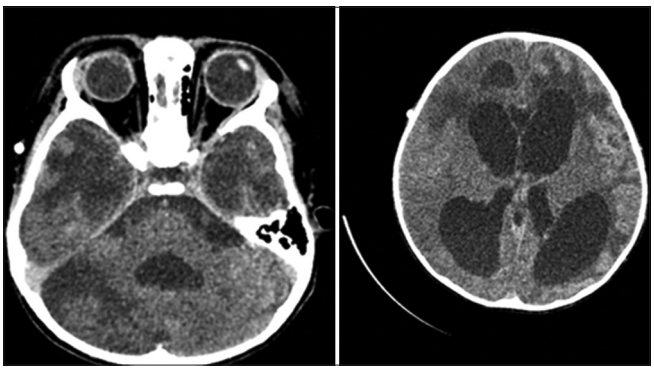

Figure 4: Second Head CT scan: Suspected lesion on the cerebellum

Discussion

Non-cardiac manifestation due to oxygen deficiency that has to be aware of in cyanotic patient is brain abscess because of right-left shunt in long standing TOF. The severity of the shunt is determined by the degree of pulmonary stenosis [1]. The degree of right-to-left shunt is responsible for the hypoxia of cerebral tissue which could lead to cerebral infarction that is considered as a precursor of cerebral abscess [3], [4]. An early TF repair is preferred to

avoid prolonged hypoxemia and the risk of cyanotic spells, preserves myocardial function and to minimize secondary damage to the heart and other organs [5]. TF in this patient was diagnosed early since he was 2 months old and advised for corrective surgery, but never go through any medical nor surgical treatment, because the child appear normal to the parents. TF symptoms may be vary depending on the severity of the obstruction, some infants may look normal due to less obstruction, but the obstruction generally gets worse over time and the child may developed blue lips at several months age [2]. An echocardiography was done during hospitalization and revealed dilated RA-RV, large malalignment VSD (ventricular septal defect), overriding aorta > 50%, right ventricular hypertrophy, and severe infundibular pulmonary stenosis. During hospitalization, the patient developed several cyanotic spell. Definitive repair in patients aged older than 12 months has been shown to be associated with increased mortality [6]. Most infants have surgical repair at 3–6 months of age [2]. An multivariate analysis showed that the risk of post-operative complications was 40% lower in infants ≥ 91 days old compared to those ≤30 days old [7].

In this case, the patient has a severe infundibular pulmonary stenosis and repeated occurrence of cyanotic spell that is an indication for surgical repair. Unrepaired TF in this patient resulted in cerebral abscess. The treatment in cerebral abscess is surgical intervention; in this case, a surgery was performed to evacuate abscess and a ventriculoperitoneal shunt was performed. The patient still go through several cyanotic spell. One week after surgery, an intestinal obstruction was found and was treated through an emergency laparotomy surgery, during surgery jejunal perforation was found, jejunostomy was formed. Guney *et al*. conducted a study on abdominal problems in congenital cardiac disease, concluded that gastrointestinal system complication and mortality rates were higher in cyanotic congenital cardiovascular abnormalities patients [8].

Wanty, 2004, reported a case of recurrent cerebral abscess in tetralogy of Fallot that resolved and no further complaint were seen after TF total correction [4]. In this case, the patient was treated for cerebral abscess, but in the meantime, TF was not repaired, in further evaluation, a new suspected lesion for cerebral abscess was found in the cerebellar region as shown in Figure 4. As long as the TF is not repaired, there were no guarantee that no other complication will arise that would eventually lead to morbidity and mortality. We have lost this patient after he had failed to survive after suffered several episodes of septic shock.

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