

Fungal Endocarditis in an infant, a case report

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Cardiac fungal infections have become more prevalent and are being diagnosed with increasing frequency. The most common infective organism is *Candida albicans*, followed by *Aspergillus fumigatus* and *Cryptococcus*. Cardiac involvement is usually associated with endocarditis, myocarditis, pericarditis, or intracardiac fungal mass. Early diagnosis is imperative, as these patients have poor outcome once there is cardiac involvement (1).

Cardiac tumors are diverse in clinical presentation but several clinical features including embolisation, obstruction and arrhythmias are seen commonly with many cardiac masses (2).

Case Presentation:

A four month old male infant, with a history of low birth weight and several admissions at different hospitals who had a history of femoral and umbilical catheterization referred to our center.

On examination there was mild cyanosis, normal heart sounds with 2/6 systolic murmur at LSB. Lungs were clear.

Laboratory data showed a normochromic normocytic anemia with other hematologic parameters in the normal range. Blood culture was positive for *Candida albicans*. Chest X-ray was unremarkable.

Echocardiography revealed a large pedunculated RA mass. (Figure 1). Besides, there were a perimembranous VSD (ventricular septal defect), 0.53 cm in diameter and a medium size PDA (patent ductus arteriosus) with subsystemic pulmonary hypertension and global ejection fraction in the ranger of 80%.

In the operating room, under general anesthesia median sternotomy was performed. CPB established in usual manner using bicaval cannulation passing

tape around them. After total bypass right atrium (RA) was opened and the mass (fungal vegetation) which had occupied most of the RA chamber and extended to the right ventricle was removed readily (Figure 2). Using the RA approach VSD, which was small, closed primarily with out using a patch. After re-warming and de-airing, the patient weaned from CPB easily. The CPB time and Aortic cross-clamp time was 53 and 25 minutes, respectively. The specimen is shown in Figure 7. ICU course was uneventful

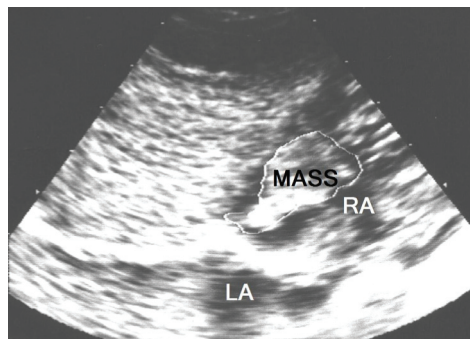


Fig. 1: Transthoracic Echocardiography shows the right atrial mass.

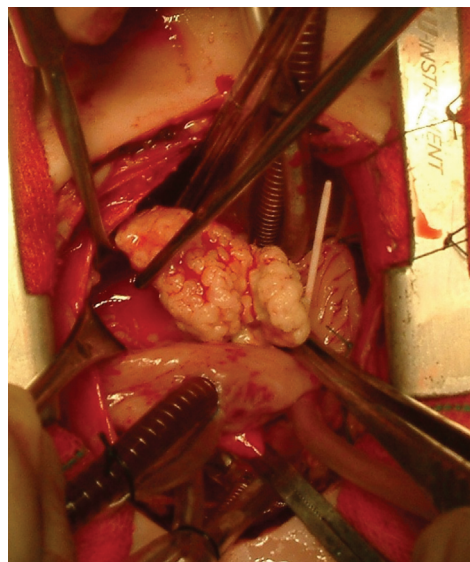


Fig. 2: Large fungal vegetation in the right atrium

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Discussion:

Our patient was a 2-month well baby with right atrial mass due to candida endocarditis documented pathologically and through blood culture. Laboratory examination revealed anemia and thrombocytopenia probably due to cell destruction by mass lesion. Immunologic evaluation showed no kind of immune deficiency.

The differential diagnosis of intra-cardiac mass may include cardiac tumors, as well as, thrombus. Before 12 months age, the most common tumors are rhabdomyomas, teratomas, and fibromas, while atrial myxoma are extremely rare (3). However, the present case seems to be a rarer cause of cardiac mass, but should be considered as possible cause of primary cardiac masses. All echocardiographic features of our patient's cardiac mass are similar to many primary heart masses especially myxoma and some kinds of rhabdomyoma.

Although our patient is a rare presentation of endocarditis, however through our research, similar cases have been reported in other centers. For instance, according to a retrospective study, echocardiography revealed a mass or vegetation in nine infants younger than 3 months of age (4) and through another report a premature neonate with right atrial mass due to candida infection has been introduced (5). Additionally, Candida may be the superimposed infection in some cardiac tumors instead of their primary etiology (13). Finally, cardiac mass due to candida endocarditis has reported in adults (6, 7).

What can be the core question in this patient is the suspected predisposing factor for this infective cardiac mass. As previously explained, the patient had history of fetal distress, birth asphyxia and meconium aspiration followed by respiratory distress and there was history of umbilical vein cannulation in her first admission which all might be considered as probable predisposing factors for cardiac mass formation.

One research has shown that, prenatal and postnatal factors such as hypoxia, haemodynamic and coagulation disturbances may have contributed to the formation of the vegetations (8). According to this study, mass lesions were observed on the tricuspid valve by cross-sectional echocardiography in 5 neonates, 4 of whom presented with fetal distress (8). In another report, the main risk factors for neonatal infectious endocarditis were central venous catheters and congenital heart disease, including PDA and the main causative microorganisms were staphylococci and

Candida sp (4). Similarly, other reports noted that candida septicemia and right atrial mass can happen secondary to umbilical vein catheterization (9, 10). These results, harmonically, demonstrating that all formerly mentioned factors, should be considered as the probable predisposing factors of candida albicans endocarditis including those with mass formation.

The second issue is early diagnosis and appropriate management of these patients. There are many other causes of cardiac masses during infantile period including; benign and malignant tumors which may be primary or secondary, atrial thrombus and different kinds of vegetations. In our case, at the first step, echocardiographic evaluation demonstrated the mass lesion, its size and relationship to atrial septum as well as its protrusion into tricuspid valve and obstructive hazard. Although, these findings could not display the exact inherent of this cardiac mass, however it visualized a relatively large pedunculated mass which could potentially cause tricuspid valve occlusion. Performing blood culture for aerobic and anaerobic bacteria and fungal agents were other our strategies which helped us to be suspicious about candida endocarditis in spite of absence of especial clinical manifestation of a generalized infection. We documented our diagnosis by means of pathologic evaluation.

In this regard, a study demonstrated that, the main investigations of diagnostic value in infective endocarditis due to staphylococci and Candida sp have been blood and urine cultures and echocardiography (4).

Although identification of cardiac mass is one of the most important uses of two dimensional transthoracic and transoesophageal echocardiography, however, not all echogenic structures in the heart are pathologic. Erroneous diagnosis can lead to serious mismanagement, and overlooking a potentially lethal condition can be disastrous (11). For example in one situation, the mass lesion seen in the right atrium represented the clot formed within the bulbous end of the fistula a few days after the deployment of the coil (11). In another patient with endocarditis due to Candida tropicalis echocardiograms from mitral valve vegetations were found to mimic the typical pattern of a left atrial myxoma (12).

Management of cardiac masses depends on their frequency of complications and progressive or regressive characteristic. For instance, myxoma is one which may give rise to severe problems such as arrhythmia or

obstruction and its urgent excision is recommended (2). In comparison rhabdomyoma, is less disastrous and may have self regression which can be allowed for clinical follow up (2). In our case, although there was no significant cardiac manifestation otherwise tachycardia and cardiac murmur and pallor, however, since embolisation, obstruction, and arrhythmias could be potentially a disaster in this large pedunculated cardiac masse with frequent protrusion and obstruction of the tricuspid valve. Therefore surgical strategy in this patient or similar cases seems to be a reasonable consideration.

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