Intra-cardiac Tumor in Newborn: An Echo Presentation

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Abstract
Cardiac tumors represent a relatively rare, yet challenging diagnosis. Echocardiography is the main diagnostic tool for the detection of a cardiac tumor. We report a case of congenital giant intra-cardiac tumor, in which echocardiography revealed a large well-defined hyperechoic homogenous intracardiac mass involving interventricular septum which mimicked like asymmetrical septal hypertrophic pattern and another two small masses attached to right ventricular part of interventricular septum.

Introduction
Cardiac tumors make a challenging diagnosis and represent a relatively rare condition across all age groups, with a reported prevalence of 0.001% to 0.03% in autopsy series.¹² With the advent of 2D transthoracic echocardiography, the ability to identify cardiac tumors antemortem has steadily increased. This has been brought about by improvements in imaging technology that include higher frequency transthoracic imaging transducers, harmonic imaging and refinements in transesophageal echocardiography (TEE) including multiplane TEE and three-dimensional (3D) imaging. Computed tomographic (CT) scan and magnetic resonance imaging (MRI) provide additional diagnostic information and should be seen as ancillary complimentary techniques.

Case Report
A preterm male of one day was brought to our hospital with respiratory distress. There was maternal history of premature rupture of membrane and oligohydramnios. Mother had regular antenatal check-ups; baby was diagnosed to have hypertrophic cardiomyopathy during last antenatal check-up. Baby delivered via naturalis, not cried soon after birth, APGAR score 5/10 at 1 min, 7/10 at 5 min. Admitted in NICU for respiratory distress syndrome. Chest X-ray showed enlarged cardiac shadow (Figure 1). Baby was given oxygen therapy by the hood, oxygen saturation was maintained, and tolerated feeds well. An echocardiography done on second day revealed large well-defined hyperechoic homogenous intracardiac mass involving interventricular septum which mimic like asymmetrical septal hypertrophic pattern and another two small masses attached to right ventricular part of interventricular septum. No atrioventricular valve insufficiency, pulmonary hypertension, left or right ventricular outlet tract obstruction was noted and was in regular rhythm during the study (Figures 2 and 3). On 6th day of hospital stay, baby developed apnea with seizures and drop in oxygen saturation. Baby was intubated, antibiotic prophylaxis and inotropes were given; baby developed profuse bleeding through endotracheal tube suggesting pulmonary haemorrhage, and died because of cardiorespiratory arrest.

Discussion
Benign neoplasms occur more often than malignant tumors in pediatric age group. The most common type of tumors reported in children and adolescents is rhabdomyoma followed by fibroma, myxoma, and teratoma. Sarcoma is the largest group of primary cardiac malignant neoplasms.⁴

Signs and symptoms of these tumors at presentation are generalized, nonspecific, and mimic several other systemic diseases. The clinical presentation of a patient with a cardiac tumor is determined more by the tumor’s location and by its histologic type.¹³ Benign tumors, depending on their location, can present with more symptoms than malignant tumors if they critically obstruct a valve or outflow tract.⁷

Benign Tumors
Rhabdomyomas are hamartomas which are the most frequently found tumors in infants and children. Nearly 60% of the reported cases of cardiac rhabdomyomas occur in patients less than one year.¹² There is a well described and common association with tuberous sclerosis.⁷ These tumors are frequently multiple, involving ventricular free and septal walls, 30% of cases can involve either atrium.⁷ They vary from small to extremely large.
In an echocardiogram, they appear well-circumscribed and slightly brighter than the surrounding normal myocardium.\textsuperscript{2,5} They are rarely excised because they tend to regress over time.

Fibromas, usually single and large, are most commonly found in the left ventricular free wall, interventricular septum, the RV, and rarely in atria.\textsuperscript{7} 30% of fibromas are diagnosed in infants younger than 1 year.\textsuperscript{1,4} In an echocardiogram, a discrete often obstructive, echogenic, non-contractile mass ranging from 1 to 10 cm in diameter in a ventricular wall is seen.\textsuperscript{2,5}

Myxomas are usually seen in adults, rarely seen in children, accounting for only 9-15% of all cardiac tumors.\textsuperscript{1,4} They are often found attached to the atrial septum.\textsuperscript{7} Myxomas may embolize; this may be their first clinical presentation. In an echocardiogram, characteristic narrow stalk, tumor mobility, and distensibility should arise high degree of suspicion.\textsuperscript{2,4,5}

Teratomas are large basal tumors, seen most often in the pericardium. Teratomas develop in the right atrium, right ventricle, and septum of the heart.\textsuperscript{7}

Hemangiomas are a benign proliferation of endothelial cells, also known as vascular tumors 2.8%-10% of primary cardiac tumors. They can occur in any part of the heart (with a preference for right-sided chambers). They can infiltrate the intraventricular septum near the conduction system where they may cause heart block. Hemangiomas vary from small to large and occasionally have been associated with hemorrhagic cardiac tamponade. Localisation approximately 30% in RV, 30% in LV and 25% in RA.\textsuperscript{1,2,5,7}

Other types of tumors that have been less frequently reported in children include lipomas, papillary tumors, accessory cardiac cushion tissue, leiomyomas, mesotheliomas, fibroelastomas, fibroelastic papillomas, and benign cystic tumors.

Malignant Tumors

Sarcomas originate from mesenchyme and, therefore, display a wide variety of morphologic types. These tumors are rare in children, with angiosarcoma being the most common type of sarcoma for all ages.\textsuperscript{1,2,9}

Cardiac angiosarcomas are characteristically lobulated variegated masses that are necrotic or hemorrhagic and are composed of anastomosing vascular channels lined by malignant cells that may contain areas of spindle cells. They tend to be aggressive malignancies, either infiltrative or polyloid, with most arising from the right atrium. Metastases are common.\textsuperscript{1,3,9}

Rhabdomyosarcomas grow invasively, metastasize, and can recur. These tumors are rare and are more common in children because...
they may arise from embryonic cell rests in the septum.\textsuperscript{1,3,9}

Fibrosarcomas, often involving more than one chamber of the heart, contain areas of hemorrhage and necrosis.

Other reported malignant cardiac tumors are lymphoma, histiocytoma, leiomyosarcoma, choriocarcinoma, liposarcoma, and osteogenic sarcoma.\textsuperscript{1,3}

In conclusion, intracardiac tumors are relatively rare. Echocardiography is very useful in diagnosing cardiac tumors. Benign neoplasms occur more often than malignant tumors in pediatric age group. The most common type of tumors reported in children and adolescents is rhabdomyoma followed by fibroma, myxoma, and teratoma. Sarcoma is the largest group of primary cardiac malignant neoplasms.

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