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INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/19596
DOI URL: http://dx.doi.org/10.21474/IJAR01/19596

RESEARCH ARTICLE

A CASE OF METASTATIC INTRACARDIAC RHABDOMYOSARCOMA

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Manuscript Info

Manuscript History
Received: 30 July 2024
Final Accepted: 31 August 2024
Published: September 2024

Abstract

Intracardiac metastasis of rhabdomyosarcoma (RMS) is a rare occurrence, with only a few cases reported in the literature. RMS is a malignant tumor of skeletal muscle origin, primarily affects children and young adults and rarely adults. It is characterized by an aggressive spread, often metastasizing to the lungs, bone marrow, and lymph nodes. However, cardiac involvement is uncommon and typically presents late in the disease course, complicating management and worsening prognosis. This article explores a rare case of intracardiac metastasis of RMS, discussing the clinical presentation, diagnostic challenges, treatment modalities, and prognosis. We also review relevant literature to provide a comprehensive understanding of this rare phenomenon.

Introduction:-

Case report:

-We illustrate a clinical presentation and imaging of a 74 year old male, with a past medical history of a rhabdomyosarcoma of the left thigh 3 years prior, treated with surgical excision of the mass followed by chemotherapy, has been experiencing worsening exertional dyspnea and fatigue. µ
-the physical examination found a systolic murmur in the left parasternal second intercostal space.
-his vital signs wwere stable and the laboratory results were within normal limits
-Echocardiography was performed and found two intracardiac oval-shaped masses,one very large obstructing the right ventricular infundibulum with a maximum gradient of 38 mmHg at rest, and another one smaller in size located in the apical segment of the interventricular septum.

-Both masses were heterogenous and intramyocardial, the first diagnosis that was considered was an intracardiac metastasis of the rhabdomyosarcoma. -positron emission tomography/computed tomography (PET/SCAN) showed intracardiachypermetabolism, with no other site of involvement. further evaluate the tumor, an endomyocardial biopsy was performed and the histological study confirmed that it was indeed a metastasis of rhabdomyosarcoma. -Surgical removal of the metastasis was planned but unfortunely, the patient experienced sudden cardiac arrest and perished.

Discussion:-

-Intracardiac myxoma, thrombus, metastasis and primary malignant tumors such as angiosarcoma are the main diagnoses to consider upon finding a cardiac mass.

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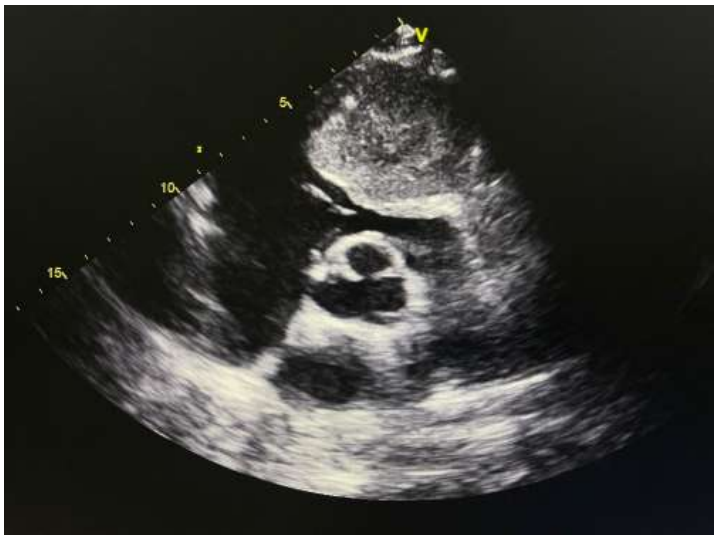
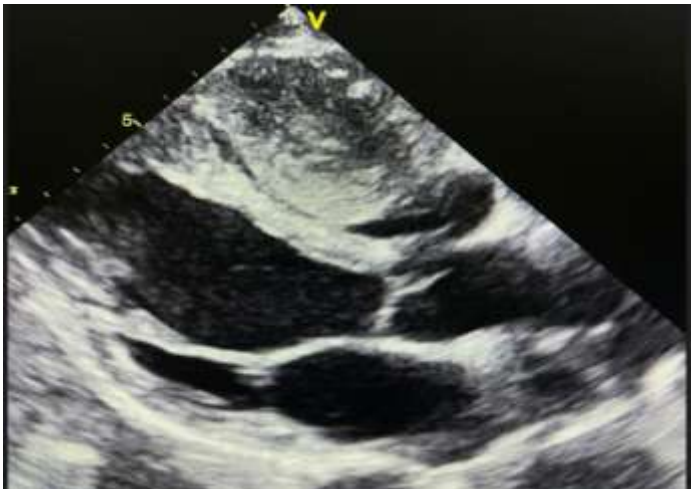
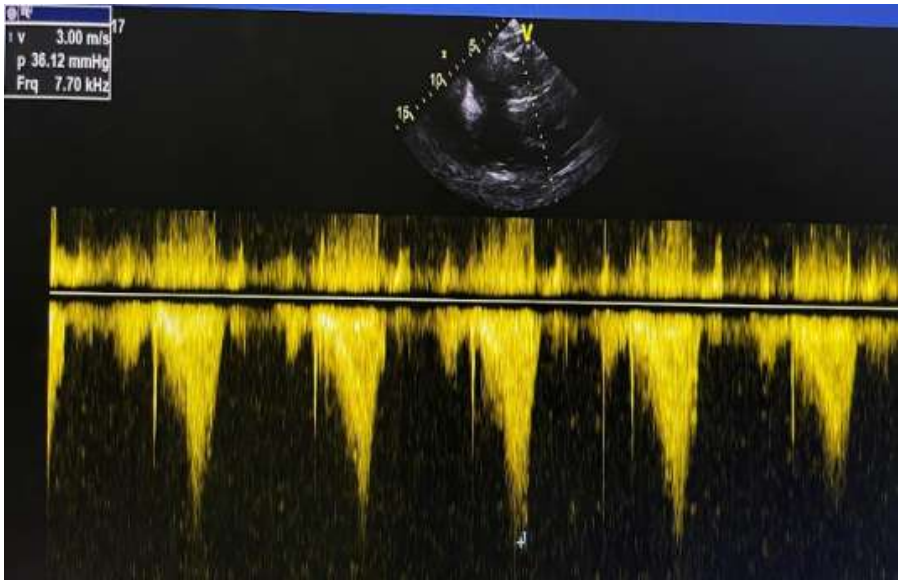
-The heart is an uncommon site for metastasis with primary tumors more likely to be of epithelial origin, such as lung or breast cancer (1)Over the last decades the incidence has increased, this can be attributed to the advances in the diagnostic and management measures available (2).
-The mechanisms of cardiac metastasis include direct extension, hematogenous spread, or lymphatic dissemination. In the case of RMS, hematogenous spread is the most likely route due to the tumor's high vascularity.
-symptoms of cardiac metastasis are very variable, their severity is often proportional to the degree of myocardial infiltration or the site of the infiltration. in our patient one of the tumors was obstructing the RVOT and thus explained the exertional dyspnea. Infiltration of the endocardium and the myocardium is the rarest site of metastasis, with an even rarer extension into the cardiac chambers especially the right side (3).
-echocardiography is the first line imaging technique to use, it evaluates the tumor size, location, shape attachment and mobility (4).
-other imaging modalities such as chest CT and cardiac MRI can be useful in further evaluating cardiac masses, cardiac metastasis are often seen as contrast enhanced masses, they also evaluate adjacent organs for other sites of metastasis (5).
-The management of intracardiac metastasis is challenging due to the limited options available. Surgical resection may be considered in select cases where the tumor is accessible and the patient is a good surgical candidate. However, the prognosis remains poor even with aggressive treatment, with most patients surviving only a few months post-diagnosis (4). Chemotherapy and radiotherapy may offer some palliation but are generally ineffective in controlling cardiac metastasis (6).



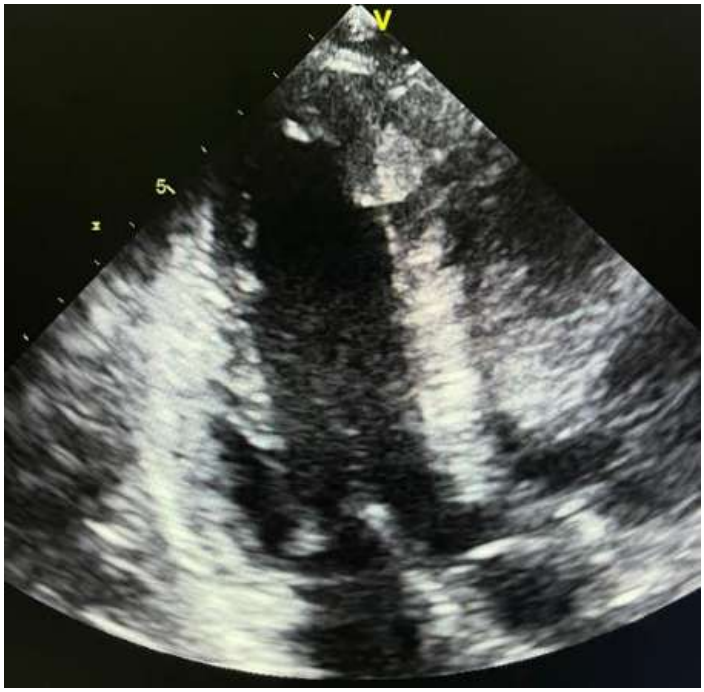
PSSA view showing a large oval shaped mass located in the right ventricular outflow tract.



PSLA view showing the mass obstructing the right ventricular outflow tract.



CW in the RVOT showing the obstruction with a gradient of 38 mmHg at rest



Septo-apical LV metastasis

Conclusion:-

-Intracardiac metastasis of rhabdomyosarcoma is a rare and serious complication that poses significant challenges in diagnosis and management. Due to its rarity, there is limited literature on the optimal approach to treatment. Early detection through advanced imaging techniques and a multidisciplinary approach to care are crucial in managing these patients. Despite aggressive therapy, the prognosis remains poor, underscoring the need for continued research into better therapeutic strategies for this rare manifestation of rhabdomyosarcoma.

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