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(CASE REPORT)

A case study on right ventricular-myxoma: An unusual presentation

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Abstract

Myxomas originating from the right ventricle are even less common in pediatric patients. It's important to note that right ventricular myxomas are rare, and the symptoms and complications can vary from person to person. Prompt diagnosis and treatment are crucial to prevent potentially life-threatening complications. Treatment typically involves surgical removal of the tumor, and in some cases, additional measures may be necessary to address any associated complications or damage caused by the tumor.

Objective: This case study aims to present a rare and noteworthy case of right ventricle myxoma in a 15-year-old boy, emphasizing the challenges in diagnosis, treatment, and the successful outcome achieved.

Methods: Detailed clinical, imaging, and surgical data were collected and analyzed for a 15-year-old male patient presenting with atypical cardiac symptoms. Diagnostic procedures included 2D ECHO, X-RAY, HRCT-Thorax along with pulmonary Angio leading to the identification of a right ventricle myxoma.

Incidences: Primary tumors of the heart are rare with an incidence of 0.02–0.05%. Cardiac MYXOMAS are rare BENIGN TUMORS that account for nearly 50% of all adult primary Cardiac tumors. Approximately 75–80% of myxomas are in the LEFT ATRIUM,10–20% are in the RIGHT ATRIUM, and 5–10% are in both ATRIA or either VENTRICLE. Myxomas arising from the RIGHT-VENTRICLE are extremely rare and characterized by the presence of a gelatinous mass in the right ventricle. The exact incidence of right ventricular myxoma is not well established, as it is a rare condition and limited data is available. The condition is often diagnosed incidentally during investigations for other cardiac conditions or when patients present with symptoms such as chest pain, shortness of breath, palpitations, or heart murmurs.

Results: The patient, initially presenting with palpitation, underwent successful surgical excision of the right ventricle myxoma. Postoperative recovery was uneventful, and the patient demonstrated significant improvement in symptoms.

Conclusion: Right ventricle myxomas are exceptionally rare in pediatric patients, posing unique diagnostic challenges. This case underscores the importance of considering cardiac tumors even in younger populations when presented with unexplained cardiac symptoms. Timely diagnosis and surgical intervention contributed to a favorable outcome, highlighting the successful management of right ventricle myxoma in adolescents.

Keywords: Right ventricle myxoma (RV Myxoma); Cardiac Tumor; Surgical Intervention; Case study; ADL (Activity of Daily Living); OPD (Outpatient Department); PFE (Patient & Family Education)

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1. Introduction

Primary cardiac tumors are uncommon during infancy and childhood. Myxomas originating from the right ventricle are even less common in pediatric patients.

Symptoms might mimic heart disease as well as infectious disease, immunodeficiency, and malignant processes. Myxomas arise from the right ventricle (RV) in 3.7% of cases; however, myxomas originating in the RV-free wall are rare and not a well-defined pathologic process. Due to the complex shape of the RV, is difficult to generate images of its components simultaneously by using two-dimensional transthoracic echocardiography (2D-TTE). Cardiac magnetic resonance (CMR) plays an important role in the evaluation of cardiac masses, especially when echocardiographic findings are suboptimal, or when the localization is atypical.

The evaluation of regional wall motion abnormalities and tissue characterization are only possible with CMR.

2. Case Presentation

In a serene village, there resided a cheerful 15-year-old boy who lived a contented life alongside his loving father, a dedicated farmer, and his two siblings. Their days were filled with laughter, as they cherished the simplicity and tranquillity of their rural surroundings.

However, fate had an unexpected turn in store for the family when his health began to deteriorate. Concerned about their son's well-being, his father promptly arranged for him to be admitted to the nearest hospital, seeking professional medical consultation to understand the cause of his condition. The doctor referred the boy to Apollo Hospitals, Bhubaneswar for the diagnosis & and further treatment. On 23.06.23, he came to visit the OPD, and consultation was done with a heavy heart and great hope of recovery. As per the Doctor's advice, he was admitted to CTICU. He had complained of palpitation and was under treatment with antiarrhythmic drugs for the last 1.5 years & dyspnoea on exertion and breathlessness NYHA Class III for 6 months.

After admission, he underwent all routine investigations as well as diagnostic procedures to confirm the final diagnosis (2D ECHO, X-RAY, HRCT-Thorax along with PULMONARY ANGIO) and confirmed with Right-Ventricular-myxoma.

The patient had irregular arrhythmia; ventricular tachycardia was also seen in between. The patient was conscious and oriented. Then the sudden onset of ventricular tachycardia, an anti-arrhythmic drug Injection Xylocard STAT 60 mg was administered and an infusion of 40 mg/hr. continued.

2.1. Surgical Management

Right ventricular mass Excision and TV repair were done on 26/06/23.

2.1.1. Procedure

Standard midline sternotomy, vertical pericardiotomy done, heparinized, aorta bicaval cannulation done.

Aorta cross-clamped, RSPV vented. Heart arrested with cold antegrade cardioplegia. RA opened.

Tricuspid valve leaflets retracted findings noted, excision of RV mass done. The tricuspid valve was tested, and De Vegas annuloplasty was done. RA closed. Heart rewarmed, deaired, cross-clamp removed, CPB gradually weaned off with mild inotropic supports. Protamine infused, decannulated, hemostasis achieved, chest closed with 2 MS drains and RV pacing wire, shifted to CTVS-ICU in hemodynamically stable condition.

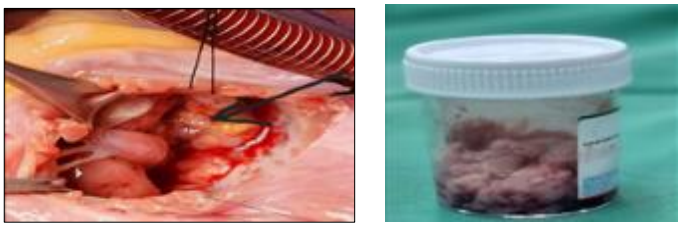

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Figure 1 Right Ventricular Mass (Biopsy)

2.2. Nursing Management

2.2.1. (On the day of surgery)

The patient received from OT on 26.06.23 at 2:05 pm with ventilator support with SIMV mode, ITV-480, peep-5, fio2-50%, Respiration rate-15b/m. Patient with inotropic support Injection Dobutamin 4ml/hr, Inj. Norad 2ml/hr, on sedation, and IV fluid continue 50ml/hr. The patient had multiple lines like- central line, arterial line, Foley's catheter, Ryle's tube, and ICD drain. All lines were fixed well. Monitored vitals and intake output was strictly measured and recorded. ABG done. As per ABG correction is given accordingly. A chest X-ray was done. Antibiotics –Injection Zostum 1.5gm & Injection Levoflox 500mg as advised administered.

PARAMETERS	RECORDED
HEART RATE	88b/m
RESPIRATION RATE	15b/m
BLOOD PRESSURE	130/80 mmHg
TEMPRETURE	98.9'F
SATURATION	100%
URINE OUTPUT	100ML/HR
DRAIN OUTPUT	40 ML/HR

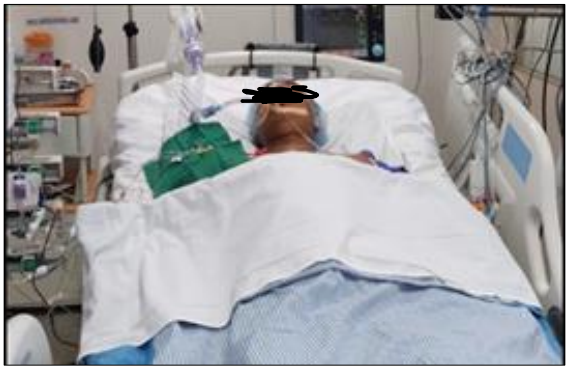

Figure 2 Post-Operative Event

Patient all parameters were good and the patient was conscious, ABG parameters were normal chest X-ray was done and found normal. So as per advice, the patient was extubated at 9:30 am. All vitals were recorded.

The patient is on oxygen support with a 4-liter Fio2. Hb was 8.6g/dL, so as per advice,1 PRBC was transfused.

Blood transfusion started at 10 am and finished at 1:10 am.

Plan for removal of drain after 3-4 hr. observation and drain removed at 3:45 pm.

Chest wound dressing was done, and no oozing from the surgical site, the surgical wound was closed with proper infection control practices. Post drain removal, chest X-ray done and found normal.

Orally diet started- normal liquid and gradual tapper of IV fluid. Analgesics were also administered as per the doctor's advice.

Encouraged the patient to do spirometry exercises and steam inhalation.

Day-1

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- Plan for removal of drain after 3-4 hr observation and drain removed at 3:45 pm.
- Chest wound dressing was done, and no oozing from the surgical site, the surgical wound was closed with proper infection control practices.
- Post drain removal, chest X-ray done and found normal.
- Orally diet started- normal liquid and gradual tapper of IV fluid. Analgesics were also administered as per the doctor's advice.
- Encouraged the patient to do spirometry exercises and steam inhalation.

PARAMETERS	RECORDED
HEART RATE	80b/m
RESPIRATION RATE	24 b/m
BLOOD PRESSURE	130/60 mmHg
TEMPRETURE	98.2'F
SATURATION	95-100%
URINE OUTPUT	60 ML/HR
DRAIN OUTPUT	10 ML/HR

Figure 3 First Feed

Day-2

- He was active and able to do mild ADL. The patient's arrhythmia settled, and the infusion stopped.
- His blood pressure was maintained & Urine output was monitored hourly, and vitals were found stable.
- He was advised to normal semi-solid diet.

ABG analysis was done, and parameters were normal, with 2 liters of Fio2 SpO2 being 95-98%. Spirometry and steam inhalation continued. Hemoglobin report collected- 9.7mg/dl advised to transfuse 1 unit of PRBC, arranged, consent taken, vitals, temperature checked before transfusion. One more PRBC was transfused. As per the Doctor's advice arterial line, Foley's catheter, and CVP line were removed.

(Day-3)

- The patient's vitals are stable. Oxygen disconnected and spo2 96-98% in room air.
- The first step is done.
- Collected lab investigation of Hb and TLC
- Hemoglobin-10.1mg/dl
- TLC-11.69
- The pacing wire was removed and planned for discharge.
- All injectables stopped and changed into Tablets.

2.3. Nurses' Role in RV Myxoma

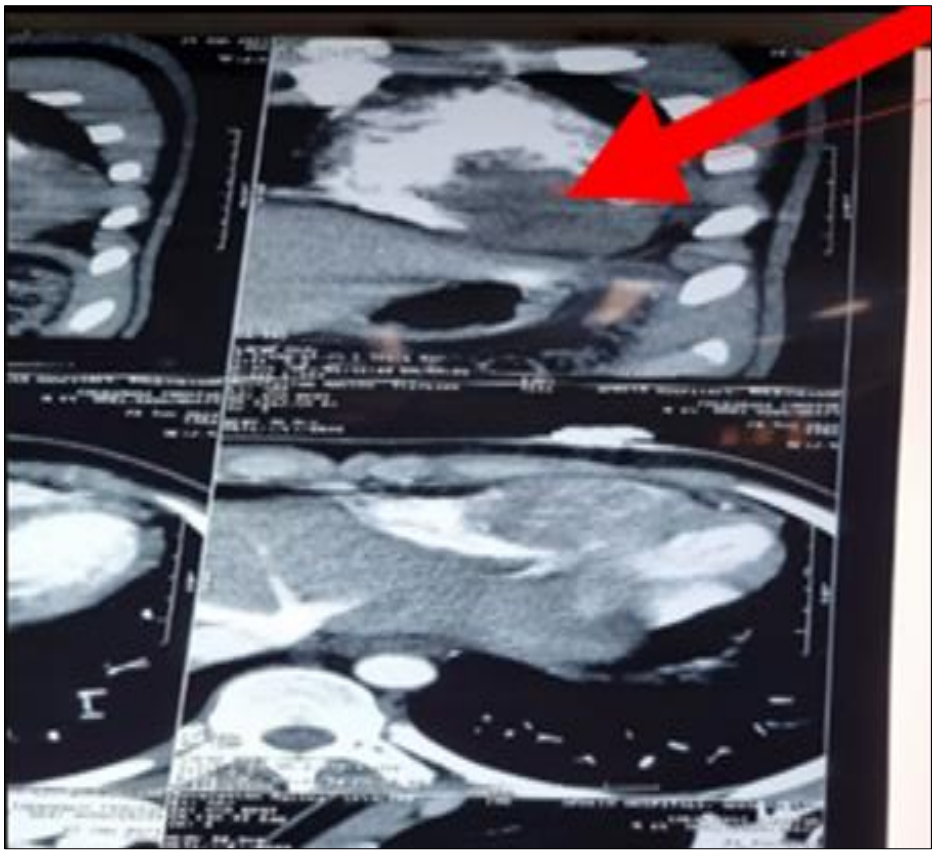
- **Assessment:** Nurses are responsible for assessing the patient's vital signs, including heart rate, blood pressure, oxygen saturation, and respiratory rate. They also monitor the patient's cardiac status, such as any abnormal heart sounds or irregular rhythms.
- **Monitoring**: Cardiac output, such as shortness of breath, fatigue, or decreased peripheral perfusion. They may also monitor the patient's fluid balance.
- **Medication administration**: Nurses administer medications as prescribed by the healthcare team, including medications to manage symptoms such as diuretics to reduce fluid overload or beta-blockers to control heart rate and rhythm.
- **Preoperative preparation**: including explaining the procedure, ensuring necessary preoperative tests are completed, and providing emotional support. Post-operatively, nurses monitor the patient's vital signs, manage pain, assess for complications, and assist with early ambulation and recovery.
- **Patient Education**: provides information on lifestyle modifications, such as dietary changes and regular exercise, as well as signs of complications to watch for.
- **Collaboration and communication**: Nurses collaborate with the healthcare team, including physicians, surgeons, and other specialists, to ensure the patient receives comprehensive care.
- **Emotional support**: listen to their concerns, offer reassurance, and provide information to alleviate anxiety or fear associated with the diagnosis, treatment, or recovery.
- **Follow-up care**: Provide ongoing support and education to promote long-term management and prevention of further complications.

2.4. Diagnostic Evaluation

- Chest X-Ray
- ECG
- Echocardiography
- CT-Thorax
- Cardiac MRI
- Trans Esophageal Echocardiogram (TEE)

CT Pulmonary Angio was done after injecting 100ml/IV contrast & and found – that the right ventricle shows a solid nodular circumscribed moderately enhancing lesion attached to the interventricular septum projecting into the right ventricular lumen presenting as a filling defect measuring 36*33 mm in cross section and 40mm in craniocaudal extent.

The main pulmonary artery, both right and left pulmonary arteries, and lobar segmental arteries were normal in the course, caliber, and contrast opacification. No filling detects were seen.



Mildly dilated RA, RV; No RWMA; Mild PH/TR; No MR/AR/PR; Large RV mass attached to the free wall (37*35 MM); (ECHO REPORT)

Figure 4 ECHO Report

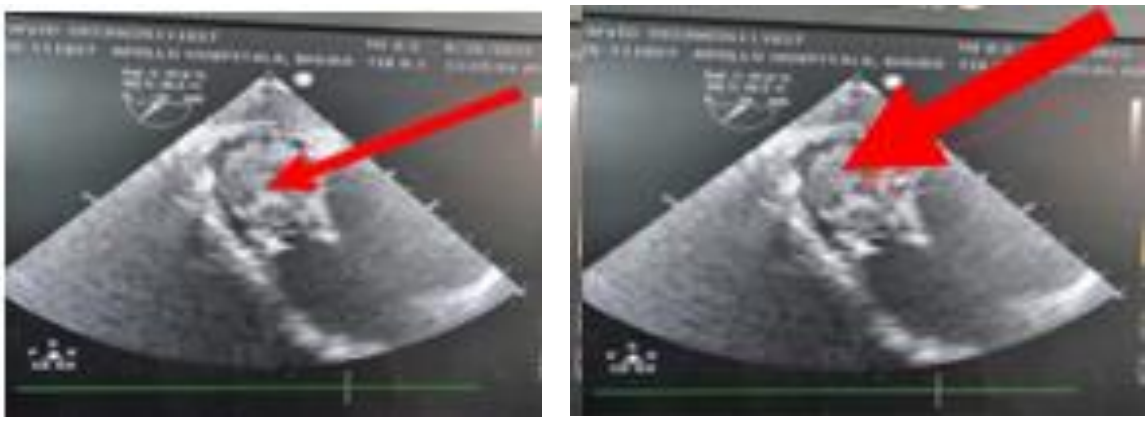


Figure 5 Transoesophageal Echocardiogram (TEE)

3. Transoesophageal Echocardiogram (TEE)

3.1. Prognosis

The prognosis for a right ventricle myxoma depends on several factors, including the size of the tumor, the success of surgical intervention, and any potential complications. Generally, if the tumor is completely removed and there are no complications, the prognosis can be favorable. However, individual cases vary, and patients need to discuss their specific situation with their healthcare team for more accuracy.

The prognosis is favorable. Regular follow-ups are recommended to monitor.

Discharge Instructions:

- PFE on routine care at home was well explained by the Doctor.
- The diet plan was given by the Dietician.
- Surgical wound dressing was done.
- Discharged medication was explained to the patient.
- 2D ECHO done & as per doctor's advice, he got discharged on 30/6/23.

This prognosis note is based on the patient's status and may be subject to adjustments during follow-up assessments.

4. Discussion

Right ventricular myxomas are rare cardiac tumors that pose both diagnostic and therapeutic challenges. In this case study, the successful management of a patient with a right ventricle myxoma is discussed, shedding light on key aspects of diagnosis, treatment, and prognosis.

4.1. Diagnostic Challenges

Diagnosing right ventricular myxomas can be challenging due to their nonspecific symptoms. In this case, after and highlighting the importance of a comprehensive diagnostic approach, including imaging modalities such as all routine investigations as well as diagnostic procedures to confirm the final diagnosis (2D ECHO, X-RAY, HRCT-Thorax along with PULMONARY ANGIO) and confirmed with Right-Ventricular-myxoma.

4.2. Treatment Modalities

Surgical intervention remains the primary treatment for right ventricular myxomas. The procedure involves Right ventricular mass Excision and TV repair, emphasizing the need for a multidisciplinary team to ensure a comprehensive and successful outcome.

4.3. Prognostic Factors

The prognosis in right ventricle myxomas is generally favorable, as observed in this case. Factors contributing to a positive prognosis include normal ADL, Vitals stable and good cardiac output, underscoring the significance of timely intervention and postoperative care.

4.4. Postoperative Management

Meticulous postoperative care ensures a smooth recovery. Timely interventions and reassessment of the patient's status during the post-operative period by the expert team of doctors and nurses made the successful recovery of the patient.

4.5. Future Directions and Research Implications

Given the rarity of right ventricular myxomas, further research is warranted to enhance our understanding of their etiology, diagnostic strategies, and optimal treatment approaches. This case adds to the limited body of literature on this topic and underscores the need for collaborative efforts in investigating rare cardiac pathologies.

5. Conclusion

This case study contributes valuable insights into the diagnosis, treatment, and prognosis of right ventricular myxomas. As we continue to encounter such cases infrequently, collaboration among healthcare professionals and ongoing research efforts are crucial for refining our approach to managing these rare cardiac tumors.

This discussion provides a comprehensive overview of the unique considerations surrounding right ventricular myxomas, serving as a foundation for future studies and advancements in the field.

Compliance with ethical standards

Acknowledgments

We extend our sincere gratitude to the patient and their family for their unwavering cooperation and consent in sharing the details of this right ventricular myxoma case scenario. Their willingness to contribute to medical literature is commendable and has played a pivotal role in advancing our understanding of this rare cardiac condition.

We also express our appreciation to the healthcare team involved in the comprehensive care of the patient. The dedication and expertise of the physicians, surgeons, nurses, and supporting staff have been instrumental in the successful diagnosis, treatment, and recovery of the patient.

Once again, our heartfelt appreciation goes to everyone who played a role in bringing this case study to fruition.

This case study contributes valuable insights into the clinical course and management of right ventricle myxoma in the pediatric population, providing a basis for further research and understanding of cardiac tumors in adolescents.

Disclosure of conflict of interest

No conflict of interest is to be disclosed.

Statement of ethical approval

With the prior permission of the parents and after the informed consent, the case study was ready for presentation.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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