Symptomatic Cardiac Fibroma Treated with Tumor Debulking and Right Ventricular Reconstruction

Shelby Harris MD, Morgan Brazelle MD, Shannon Hall MD, Joseph Boyer MD

AdventHealth

Background

- Cardiac fibromas, although primarily a pediatric pathology, are also rarely observed in adults.
- They are the second most common cardiac tumor in children after rhabdomyoma and the most commonly resected tumor.
- Only 15% of cardiac fibromas are diagnosed in adolescents and adults.
- These tumors are composed of fibroblasts and connective tissue within the myocardium.
- It is hypothesized that the tumor size increases with physiological cardiac growth and stops when the heart is fully grown, explaining the rarity of diagnosis in adults.
- Fibromas rarely regress or resolve completely.
- Symptoms of cardiac fibromas vary greatly, with the degree correlating with the size and location of the tumor.
- Fibromas can be asymptomatic or present with arrhythmias, heart murmurs, congestive heart failure, or sudden death.
- The size of the tumor is important, as larger tumors can cause intracavitary, inflow, and outflow obstructions leading to symptoms like fatigue and shortness of breath.
- Tumor location also affects prognosis, with those in the interventricular septum having a higher rate of arrhythmia and death, regardless of size relative to heart size.
- The prognosis of cardiac fibromas in adults is thought to be better compared to children, but more research is needed in this area.
- The treatment of cardiac fibromas is not well defined, but surgical resection is favored as it is curative.
- In pediatrics, medical management with anti-arrhythmic medications like amiodarone and beta-blockers is also supported.
- Surgical resection is viable even for large fibromas, with low operative morbidity and mortality.
- For tumors not amenable to resection, surgical options such as single ventricle palliation or cardiac transplant have been described.
- While these surgical methods extend to the adult population, much of the literature extrapolates from pediatric data, highlighting the need for more research in treating adult cardiac fibromas.

Objective

- The prognosis of cardiac fibromas in adults is thought to be better compared to children, but more research is needed in this area.
- The treatment of cardiac fibromas is not well defined, but surgical resection is favored as it is curative.
- While these surgical methods extend to the adult population, much of the literature extrapolates from pediatric data, highlighting the need for more research in treating adult cardiac fibromas.

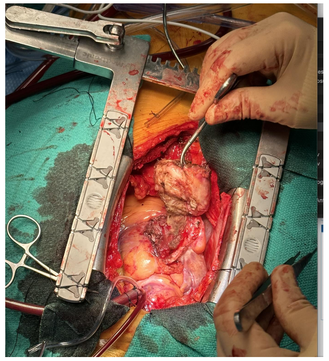
Contact Information

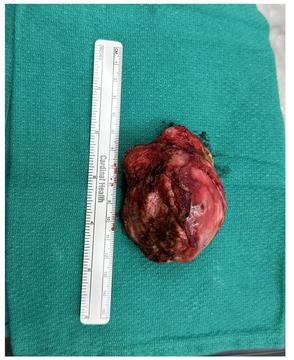
Shelby.Harris.MD@AdventHealth.com

Case Description

- A 54-year-old male, with a history of previous exposure to burn pits in the military, presented to the emergency department with symptoms of fatigue.
- Initial workup included a CT chest, which revealed a well-circumscribed soft tissue mass in the atrioventricular groove measuring 6.8 cm x 6.2 cm x 4.7 cm.
- Subsequent MRI imaging confirmed the mass and suggested invasion into the right ventricular free wall, with possible involvement or displacement of the proximal and mid right coronary artery.
- Right heart catheterization was performed, but a biopsy could not be obtained.
- Due to symptoms, including fatigue from mass effect on the right ventricle, the patient underwent cardiac mass debulking.
- The patient underwent standard median sternotomy and was placed on cardiopulmonary bypass.
- Attempted biopsy using a Tru-Cut needle was unsuccessful due to the mass's density, preventing needle passage in several areas.
- An edge of the mass was raised medially, and the muscle was dissected away laterally and inferiorly.
- A biopsy was successfully obtained from the medial aspect, with pathology consistent with cardiac fibroma.
- The final specimen measured 7.5 x 5.5 x 4.5 cm.
- The right ventricle was reconstructed successfully, and the epicardium was closed.
- The patient tolerated the procedure well and was discharged home after recovery.

Intraoperative Images

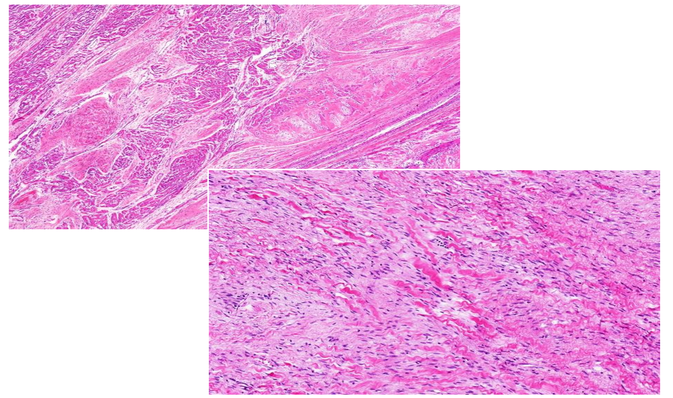




References

- Harriet Nwachukwu, Alice Li, Vidhya Nair, Elsie Nguyen, Tirone E. David, Jagdish Butany, Cardiac fibroma in adults, Cardiovascular Pathology, Volume 20, Issue 4, 2011, Pages e146-e152, ISSN 1054-8807, https://doi.org/10.1016/j.carpath.2010.08.006.
- Cho SH, Fritz T, Cronin LJ, Cohle SD. Primary Cardiac Fibroma in an Adult. Case Rep Cardiol. 2015;2015:713702. doi: 10.1155/2015/713702. Epub 2015 Sep 20. PMID: 26457206; PMCID: PMC4592704.
- Torimitsu S, Nemoto T, Wakayama M, Okubo Y, Yokose T, Kitahara K, Ozawa T, Nakayama H, Shinozaki M, Sasai D, Ishiwatari T, Takuma K, Shibuya K. Literature survey on epidemiology and pathology of cardiac fibroma. Eur J Med Res. 2012 Mar 27;17(1):5. doi: 10.1186/2047-783X-17-5. PMID: 22472419; PMCID: PMC3351722.
- Rajput FA, Bishop MA, Limaiem F. Cardiac Fibroma. [Updated 2023 Aug 8]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK537081/
- Liu Y, Zhang L, Li Y, Song Y, Gong W. Primary cardiac fibroma of the right ventricle in an adult: report of one case. Int J Clin Exp Pathol. 2021 Dec 15;14(12):1167-1171. PMID: 35027998; PMCID: PMC8748009.

Pathology



Representative pathology demonstrating fibroblastic cells in a dense collagenous stroma, without cytologic atypia or increased mitotic activity.

Conclusions

- Cardiac fibromas are increasingly rare in adults, likely due to the tumor's growth during heart development and cessation of growth once the heart is fully grown.
- Symptoms of cardiac fibromas are typically related to arrhythmias or obstruction and can sometimes lead to sudden death.
- Surgical resection is curative for these benign tumors, although other surgical options exist for cases where resection is not feasible.
- We presented a case of a right ventricular cardiac fibroma in a patient who initially presented with fatigue.
- Imaging showed a cardiac mass involving the right ventricular free wall, leading to successful resection of a 7.5 x 5.5 x 4.5 cm specimen and right ventricle reconstruction.
- The favorable tumor location, not in the interventricular septum, contributed to the patient's uneventful recovery.
- There is limited literature on cardiac fibromas in adults, highlighting the need for guidelines on resection.
- Efforts should be made to create guidelines considering factors such as tumor size, location, and involvement of cardiac structures to guide treatment decisions.