

Perioperative outcomes of patients who underwent open-heart surgery for primary cardiac tumors: brief report

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Primary cardiac tumors are extremely rare, occurring in 0.001% to 0.3% of autopsies.¹ Most cardiac tumors are metastatic, and they are usually diagnosed in approximately 10% of patients with non-cardiac primary tumors at autopsy.^{2,4} About 75% of primary cardiac tumors are benign and are predominantly myxomas.⁵ Only 25% of these tumors are malignant, and the most common types in both children and adults, are sarcomas (75%).^{1,6} In a retrospective study done among 255 patients with cardiac tumors in the Philippine Heart Center from 1976 to 2006, the incidence of benign tumors was 91.8% while malignant tumors were reported in 8.2% of cases. Eighty-nine percent of the patients were adults, and 11% were from the pediatric age group.⁸ As in other similar studies,^{5,9} the most common cardiac tumors in the Philippine study were myxoma among the adult participants and rhabdomyoma among the pediatric participants.¹⁸

Patients with cardiac tumors are often asymptomatic, but when symptoms do appear, the clinical manifestations may mimic other cardiac or systemic diseases, making the diagnosis difficult.¹⁰ The clinical manifestations of primary cardiac tumors depend on the tumor site and infiltration, as well as on tumor morphology.¹¹ Signs and symptoms suggestive of cardiac tumors may manifest clinically as evidence of congestive heart failure due to obstruction, and/or valvular insufficiency, causing shortness of breath, cyanosis, cough, lightheadedness, angina and/or arrhythmias. Systemic embolization due to cardiac tumors may cause cerebral ischemia, coronary obstruction, renal failure, claudication of extremities, or sudden death. Cardiac tumor symptoms may also be constitutional or systemic, which may include fever, rash, cachexia, arthralgia, anemia, and/or Raynaud's phenomenon.¹²⁻¹⁵

Surgical treatment is recommended in patients with resectable tumors to prevent the occurrence of future embolic events. For benign tumors of the cardiac chambers, complete resection is the mainstay of treatment. On the other hand, malignant cardiac masses require a combination of surgical re-

section and chemotherapy to increase the chance of the patient's survival.¹⁶ Adjuvant chemotherapy and/or radiotherapy can reduce the risk of local recurrence.¹⁷ Patients with benign cardiac tumors usually have very good prognosis of illness, with normal life expectancy and low tumor recurrence rate after resection.^{14,18} On the other hand, patients with malignant primary cardiac tumors have a dismal prognosis, with a median survival of 6 to 18 months.^{14,19}

Because cardiac tumors are rare, our knowledge about them is mostly based on a few available literatures, such as case reports and research studies outside the Philippines. One published study from the Philippines describes the 30-year experience of a single center in managing patients with cardiac tumors,⁸ but it did not specifically describe the perioperative outcomes of the subgroup of patients who underwent open-heart surgery. The Mindanao Heart Institute of Southern Philippines Medical Center (SPMC MHI) has been gaining experience in managing patients with primary cardiac tumors for over a decade now. We did this study to describe the perioperative outcomes of patients who underwent open-heart surgery for primary cardiac tumors.

We reviewed the medical records of patients who had open-heart surgery for primary cardiac tumors from 2007 to 2018 at the SPMC MHI, which caters to an average of 110 patients for heart surgery annually. In this study, we included 35 patient charts in the analysis. From each set of patient records, we collected demographic data such as age, sex, and body mass index. We also collected the following clinical data: history of smoking, history of alcoholic beverage drinking, comorbidities (hypertension, diabetes mellitus, heart diseases, and stroke), signs and symptoms (constitutional symptoms, respiratory signs and symptoms, cardiac/vascular manifestations, neurological manifestations, skin and subcutaneous tissue manifestations, pain, and edema), pre-operative New York Heart Association (NYHA) classification, anatomic location of cardiac tumor, histopathologic diagnosis,





12 Males 23 Females

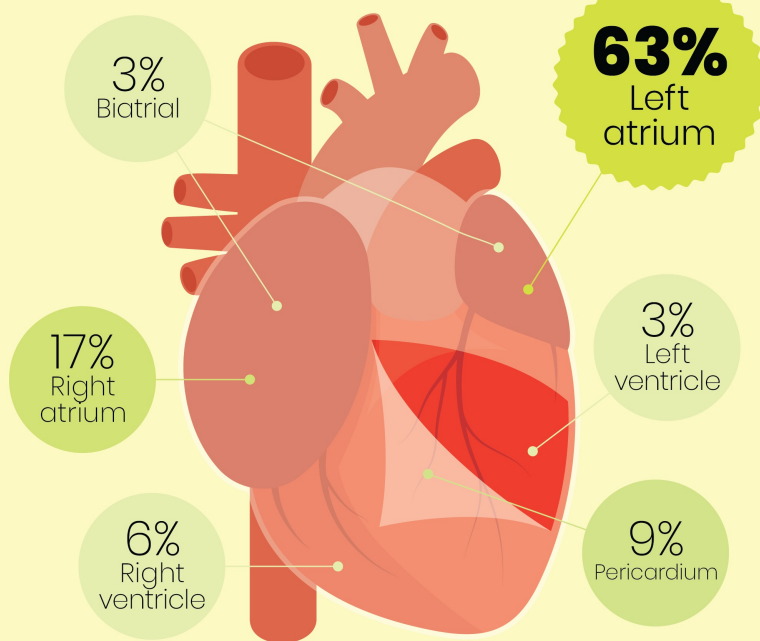
32 Mean age in years
21 Mean BMI

8/35 are pediatric patients

6/27 of adult patients are smoking any tobacco products

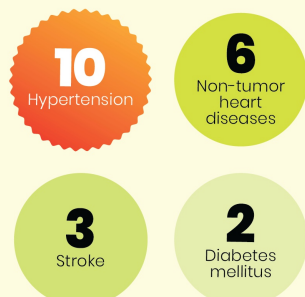
8/27 of adult patients are alcoholic beverage drinkers

TUMOR LOCATION

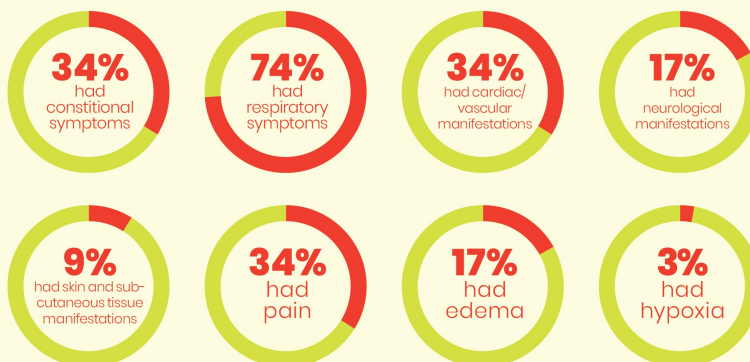


COMORBIDITIES

n=35

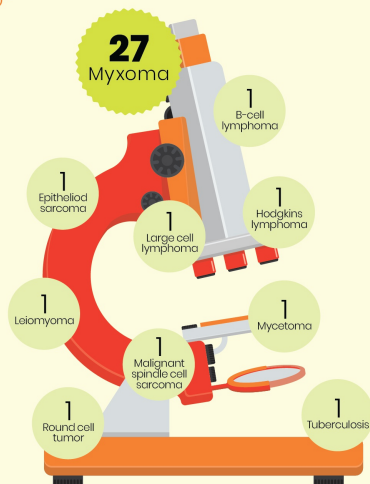


SIGNS AND SYMPTOMS



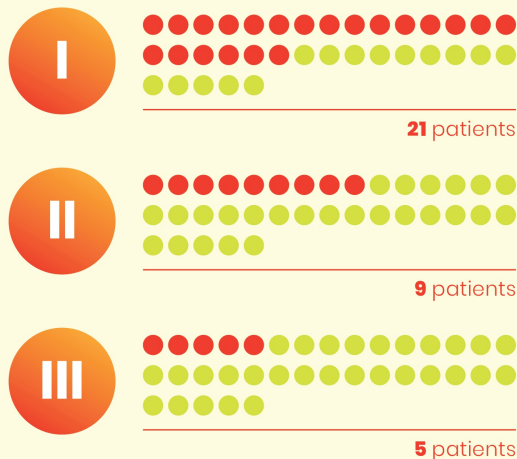
HISTOPATHOLOGY RESULTS

n=36*



*One patient had two histopathologic results

NEW YORK HEART ASSOCIATION CLASSIFICATION



3 patients expired

81 Mean cardiopulmonary bypass time in minutes

52 Mean clamp time in minutes

4 Mean length of ICU stay in days

32 Mean length of hospital stay

cardiopulmonary bypass (CPB) time, cross-clamp time, use of mechanical ventilator, blood transfusion, length of stay in the intensive care unit (ICU), total length of stay in the hospital, and death

We analyzed the data of 35 patients, 12 males and 23 females, who were admitted at the SPMC MHI from 2007 to 2018. The overall average age of the patients was 32.43 ± 18.21 years old. Eight (22.86%) of the 35 patients were within the pediatric age group (range: 5 days to 16 years; mean age: 8.26 ± 5.95 years), while 27/35 (77.14%) were adults (range: 19 to 70 years; mean age: 39.59 ± 13.82 years). Among the adult patients, 6/27 were smokers, and 8/27 were alcoholic beverage drinkers. None of the pediatric patients smoked or drank alcoholic beverages.

The two most common comorbidities were hypertension and non-tumor heart diseases (including patent ductus arteriosus, postpartum cardiomyopathy, and rheumatic heart disease). The most common NYHA classification among the patients was Class I, while the most common location of the cardiac tumors was the left atrium. The most common histopathologic diagnosis of car-

diac tumor was myxoma. One patient had epithelioid sarcoma and malignant spindle cell sarcoma, both located in the left atrium. Among the 29 patients who underwent CPB, the mean CPB time was 52.31 ± 76.07 minutes, and the mean cross-clamp time was 52.31 ± 48.20 minutes. Only 27/35 (77.14%) required the use of mechanical ventilators postoperatively, and 24/35 (68.57%) had blood transfusion during their admission. Of the 35 patients in this study, three (8.57%) died immediately postoperatively. The remaining 32 patients had a mean ICU stay of 3.50 ± 1.59 days and a mean total hospital stay of 31.78 ± 25.47 days.

With the advent of the latest advancements in cardiac imaging over the recent years, antemortem diagnosis of cardiac tumors became more plausible. This development has greatly helped clinicians in SPMC MHI in the early diagnosis and thorough preoperative planning for the therapeutic management of patients with primary cardiac tumors. These timely interventions, in turn, have led to favorable perioperative outcomes of patients with the condition.

Contributors

DPM and MEAMM both had substantial contributions to the study design, and to the acquisition, analysis and interpretation of data. DPM and MEAMM wrote the original draft and subsequent revisions, and both authors reviewed, edited, and approved the final version of the manuscript. DPM and MEAMM both agreed to be accountable for all aspects of the work.

Ethics approval

This study was reviewed and approved by the Department of Health XI Cluster Ethics Review Committee (DOH XI CERC reference P18052802).

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None declared

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REFERENCES

1. Reardon MJ, DeFelice CA, Sheinbaum R, Baldwin JC. Cardiac autotransplant for surgical treatment of a malignant neoplasm. *Ann*

Thorac Surg. 1999;67:1793-5.

2. Shapiro LM. Cardiac tumors: diagnosis and management. *Heart.* 2001; 85: 218-22.

3. McAllister H, Fenoglio J. Tumors of the cardiovascular system. In: Hartmann W, Cowan W, editors. *Atlas of tumor pathology*. Washington, DC: Armed Forces Institute of Pathology; 1978. pp. 1–20.

4. Reynen K. Frequency of primary tumors of the heart. *Am J Cardiol.* 1996;77.

5. Hoffmeier A, Sindermann JR, Scheld HH, Martens S. Cardiac Tumors—Diagnosis and Surgical Treatment. *Dtsch Arztebl Int.* 2014 Mar; 111(12): 205–11.

6. Riberi A, Gariboldi V, Grisoli D, Collart F. Cardiac tumors. *Rev Pneumol Clin.* 2010; 66: 95-103.

7. Tao TY, Yahyavi-Firouz-Abadi N, Singh GK, Bhalla S. Pediatric cardiac tumors: clinical and imaging features. *Radiographics.* 2014 Jul-Aug;34(4):1031-46.

8. Asuncion BR, Lasaca RP, Templo FS. 30 years of experience in the Philippine Heart Center: P1-158: Thoracocardiovascular surgery and pathology of 255 patients with cardiac tumors. *J Thorac Oncol.* 2007;2(8):S798.

9. Uzun O, Wilson DG, Vujanic GM, Parsons JM, De Giovanni JV. Cardiac tumours in children. *Orphanet J Rare Dis.* 2007 Mar 1;2:11.

10. Silverman NA. Primary cardiac tumors. *Ann Surg.* 1980;191(2):127–138.

11. Strotmann J. Kardiale Tumoren - Klinik, Diagnostik und Therapie. [Cardiac tumors—clinical symptoms, diagnostic approaches, and therapeutic aspects] *Med Klin.* 2008;103:175–180.

12. Armstrong WF, Ryan T. Feigenbaum's Echocardiography. 7th

edition. Philadelphia, PA:Lippincott Williams and Wilkins;2009.

13. Dias RR, Fernandes F, Ramires FJ, Mady C, Albuquerque CP, Jatene FB. Mortality and embolic potential of cardiac tumors. *Arq Bras Cardiol.* 2014;103(1):13-8.

14. Bethea BT, Richter A. 48: Primary Cardiac Tumors. In: Yuh DD, Vricella LA, Yang SC, Doty JR. *John Hopkins Textbook of Cardiothoracic Surgery.* New York: McGraw-Hill; 2014.

15. Gupta R, Meghrajani V, Desai R, Gupta N. Primary Malignant Cardiac Tumors: A Rare Disease With an Adventurous Journey. *J Am Heart Assoc.* 2020 May 18;9(10):e016032. [doi:10.1177/2049996220938888](https://doi.org/10.1177/2049996220938888)

16. Barreiro M, Renilla A, Jimenez JM, et al. Primary cardiac tumors: 32 years of experience from a Spanish tertiary surgical center. *Cardiovasc Pathol* 2013;22:424-7.

17. Wendling P. Primary Cardiac Tumors: A Clarion Call for Cardio-Oncology. *Medscape.* 2020 May 22 [cited 2020 December 2]. Available from: https://www.medscape.com/viewarticle/931033#vp_2.

18. Steger CM, Hager T, Ruttman E. Primary Cardiac Tumours: A Single-Center 41-Year Experience. *ISRN Cardiol.* 2012;2012.

19. Leja MJ, Shah DJ, Reardon MJ. Primary cardiac tumors. *Tex Heart Inst J.* 2011;38(3):261-2.

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