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Clinical Presentation of Cardiac Myxoma at Tertiary Referral Hospital in East Indonesia

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SOUHRN

Úvod: Srdeční myxom je nejčastější benigní srdeční nádor. Přes celosvětovou dostupnost údajů panuje nedostatek publikované literatury na téma této klinické entity v Indonésii. Cílem této studie je popsat klinické projevy a výsledky chirurgické léčby srdečního myxomu v terciární referenční nemocnici v provincii Východní Indonésie.

Metody: Byl proveden retrospektivní přehled výsledků chirurgické resekce srdečních myxomů v období mezi lednem 2020 a srpnem 2024. Mezi sledované klinické údaje patřily demografické parametry, symptomy, charakteristiky nádoru, diagnostické metody a výsledky chirurgické léčby hodnocené formou deskriptivní analýzy.

Výsledky: Do studie byly zařazeny údaje 20 pacientů, převážně žen (70 %) průměrného věku 47,0 ± 13,66 roku. Nejčastějšími symptomy byla dyspnoe (90 %), následovaná letargií (50 %), kašlem (30 %) a bolestí na hrudi (20 %). Všechny tumory byly v oblasti síní; 95 % z nich v levé síni. Transtorakální echokardiografie byla jedinou předoperačně použitou zobrazovací metodou. Chirurgická resekce byla spojena s 10% mortalitou do čtyř let.

Závěr: Se srdečními myxomy se lze setkat převážně u žen středního věku a nejčastěji se vyskytují v levé síni. Echokardiografie je i nadále primárním a účinným diagnostickým nástrojem. S chirurgickou resekcí jsou spojeny příznivé výsledky, i když je zapotřebí provést ještě větší multicentrické studie, které by přinesly komplexnější údaje, a napomohly tak k formulování národních doporučených postupů pro klinickou praxi.

ABSTRACT

Introduction: Cardiac myxoma is the most common benign cardiac tumor. Despite global data availability, there is a lack of published literature on its clinical characteristics in Indonesia. This study aims to describe the clinical presentation and surgical outcomes of cardiac myxoma cases treated at a tertiary referral hospital in East Indonesia.

Methods: A retrospective review was conducted on patients who underwent surgical resection for cardiac myxoma between January 2020 and August 2024. Clinical data including demographics, symptoms, tumor characteristics, diagnostic methods, and surgical outcomes were analyzed descriptively.

Results: Twenty patients were included, predominantly female (70%) with a mean age of 47.0 ± 13.66 years. The most common symptom was dyspnea (90%), followed by lethargy (50%), cough (30%), and chest pain (20%). All tumors were located in the atria, with 95% in the left atrium. Transthoracic echocardiography was the sole imaging modality used preoperatively. Surgical outcomes showed a 10% mortality rate over the four-year period.

Conclusion: Cardiac myxoma predominantly affects middle-aged women and is most frequently located in the left atrium. Echocardiography remains the primary and effective diagnostic tool. Surgical resection offers good outcomes, although larger multicenter studies are necessary to provide more comprehensive data and inform national clinical practice guidelines.

Keywords:
Cardiac myxoma
Cardiac surgery
Cardiac tumor
Clinical presentation
Indonesia

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Introduction

Cardiac tumors, though rare, have a substantial impact on affected individuals. The prevalence of benign primary cardiac tumors is estimated to range between 75% and 90% of all primary cardiac tumors.[1,2] Cardiac myxoma (CM) is the most prevalent cardiac tumor, accounting for 50–85% of all primary cardiac tumors with an estimated incidence of 0.03% in the general population.[3,4] It is classified as a benign primary cardiac tumor and can affect both children and adults.[5,6]

The symptoms reported by patients with cardiac tumors are often nonspecific. Commonly reported symptoms include shortness of breath, arrhythmia, and fatigue.[2,7] Diagnosis is frequently incidental during cardiac imaging, particularly via echocardiography.[8] Echocardiography is the simplest diagnostic approach, while advanced imaging techniques such as CT scans and MRI can provide additional information for a more accurate diagnosis. Due to the high risks associated with intracardiac biopsy, tumor resection is typically performed first, followed by histological examination.[9]

The previous meta-analysis analyzed the clinical characteristics and surgical outcomes of 8150 cardiac myxoma patients from 1120 data reports.[4] However, the clinical characteristic of cardiac myxoma in Indonesia is unclear as there is no publication regarding this issue. This study aims to provide the first report of clinical characteristic and surgical outcomes of cardiac myxoma.

Methods

This is a single-center, retrospective, observational study conducted at a tertiary referral center of East Indonesia. This study included all patients who underwent surgical resection at Dr. Soetomo General Hospital, Surabaya. Our study was reviewed and approved by the local institutional review board. Patients were identified using ICD-10 code for benign neoplasm of the heart (D15.1) between January 2020 and August 2024. Patients with lack of information in the medical record were excluded. The study primarily aimed to describe patient characteristics and clinical features of cardiac myxoma.

The diagnosis of cardiac myxoma in all cases was confirmed through histopathological examination. Medical records were reviewed to collect data on clinical presentation, tumor location and size, diagnostic methods, laboratory findings, and postoperative outcomes. The collected data will be analyzed descriptively based on the predetermined variables. The categorized data will be presented for all variables. Descriptive statistics including mean with standard deviations and median with range were used to describe the variables.

Results

During the study period, 20 patients were diagnosed with cardiac myxoma, comprising 6 males (30%) and 14 females (70%). The average age of the patients was 47.0 ± 13.66 years, ranging from 9 to 65 years. The mean weight of the patients was 56.68 ± 11.32 kg, while the mean height was 157.7 ± 7.28 cm, resulting in an average BMI of 22.76 ± 4.57 kg/m². Among the 20 myxomas identified, 95% (19) were in the left atrium and 5% (1) in the right atrium. No myxomas were observed in other cardiac chambers beyond the atria. In our study, the median vo-

Table 1 – Clinical Characteristic of Cardiac Myxoma

Variable	No. (%)
Age of resection (year)	47.0 ± 13.66
Male gender	6 (30%)
Location of myxoma	
Left atrium	19 (95%)
Right atrium	1 (5%)
Weight (kg)	56.68 ± 11.32
Height (cm)	157.7 ± 7.28
Body mass index (kg/m^2)	22.76 ± 4.57
Size of myxoma (cm^3)	61.88 (0.60–343.0)
Weight of myxoma (gram)	35 (6.2–98)

Data presented as mean ± SD, median (range), and n (%).

Table 2 – Symptoms in patients with cardiac myxoma

Symptoms (n = 20)	No. (%)
Asymptomatic patient	1 (5%)
Cardiac symptoms	
Breathlessness/Dyspnea	18 (90%)
Palpitation	2 (10%)
Chest pain	4 (20%)
Cough	6 (30%)
Syncope	0 (0%)
Systemic symptoms	
Letargy	10 (50%)
Weight loss	1 (5%)
Others	10 (50%)
Embolic symptoms	5 (25%)

Data presented as mean ± SD or n (%). Patients may have multiple symptoms.

Table 3 – Postoperative complications in patients with cardic myxoma

Postoperative complications (n = 20)	No. (%)
Arrhythmia	9 (45%)
Wound infection	3 (15%)
Pleural effusion	5 (25%)
Pericardial effusion	4 (20%)
Length of stay (days)	13.60 ± 9.54
Mortality	2 (10%)

Data presented as mean ± SD or n (%). Patients may have multiple complications.

lume of the myxomas was 61.88 cm³ (0.60–343.0), and the median weight was 35 grams (6.2–98). Patient characteristics and detailed demographic are described in **Table 1**.

The most common symptom experienced by patients with cardiac myxoma was breathlessness or dyspnea, reported by 18 patients (90%). This was followed by systemic symptoms such as lethargy, observed in 10 patients (50%). Other symptoms included cough (30%), chest pain (20%), palpitations (10%), and weight loss (5%). Embolic symptoms, such as stroke, were observed in five patients at our center. These patients presented with stroke symptoms despite having no risk factors. Following echocardiographic evaluation, they were diagnosed with cardiac myxoma, which was identified as the underlying cause of their stroke. Detailed symptoms of patient with cardiac myxoma are described in **Table 2**. In this study, all patients in this study were using echocardiography as the diagnostic modality for cardiac myxoma.

Among the 20 patients with cardiac myxoma, the mortality rate was 10% (2/20 patients). The most common postoperative complication was arrhythmia, occurring in 9 patients (45%), followed by pleural effusions in 5 patients (20%). The average length of hospital stay was 13.60 ± 9.54 days. Notably, 6 patients (30%) experienced no postoperative complications. Detailed postoperative complications in patients with cardiac myxoma are described in **Table 3**.

Discussion

This study presents our experience with cardiac myxoma cases at a Tertiary Referral Hospital in East Indonesia. Myxoma, the most common type of cardiac tumor, is classified as a benign primary cardiac tumor and can affect both children and adults. Although myxoma predominantly occurs in middle age,[5,10] our study found that the mean age of patients undergoing surgery for myxoma was 47.0 ± 13.66 years, with an age range of 9 to 65 years. These findings are consistent with other studies.[11–13] Additionally, a systematic review and meta-analysis of cardiac myxoma reported a mean age of 51 years, with a range of 9 to 67 years.[4] All patients underwent urgent surgical resection of the tumor using the median sternotomy approach, due to the unavailability of minimally invasive surgical tools at our institution. One patient underwent tumor excision along with surgical mitral valve repair due to valve damage caused by the tumor. Histopathological examination confirmed the diagnosis of myxoma in 100% of the resected specimens.

Cardiac myxoma occurs more frequently in women than in men. Our data showed that cardiac myxoma is twice as common in women as in men, consistent with findings from previous studies.[10,11] Regarding the location of myxomas in the heart, the left atrium is the most commonly affected chamber. In our study, 19 out of 20 patients (95%) had myxomas in the left atrium, while 1 patient (5%) had a myxoma in the right atrium. These findings align with prior research, which reported that the left atrium is the most common site of cardiac myxoma, accounting for 85% of cases, followed by the right atrium (9%).[4] However, a large variation in the size of cardiac myxomas has been reported in the literature. In our study, we evaluated myxoma size based on histopathological tissue obtained during surgical resection. The median volume of cardiac myxomas in our series was 61.88 cm³ (0.60–343.0), which appears larger compared to previous studies, possibly reflecting delays in diagnosis and treatment.[10,11]

The most common symptom observed in this study was breathlessness or dyspnea. This finding aligns with a prior systematic review and meta-analysis, which identified dyspnea as the primary symptom in 64 out of 91 studies.[4] Other symptoms, such as systemic and embolic symptoms, cough, palpitations, chest pain, lethargy, and weight loss, were also reported in previous studies.[4,10,11] Additionally, this study identified patients with asymptomatic cardiac myxoma, a condition that has also been documented in other studies.[10,11] Embolic symptoms, particularly cerebrovascular accidents (CVA), are critical to recognize, as they can be recurrent and life-threatening. Prompt surgical removal of the myxoma is essential to prevent further embolic events events. However, in patients who recently experienced a CVA, careful consideration of the timing of surgery is necessary due to anesthetic risks related to cerebral autoregulation and hemorrhagic transformation. Typically, a waiting period of at least 3 months is considered to allow for stabilization in elective surgery, though urgent surgery may still be required in high-risk cases.[17–19]

All patients in this study were diagnosed using echocardiography. Echocardiography was the primary diagnostic modality, utilized in the majority of cases (98.1%).[4] Additionally, a smaller number of cases were identified through computed tomography (CT) scans, angiography, and other abnormal examinations. Echocardiography remains the cornerstone of diagnosis due to its wide availability, non-invasive nature, and ability to provide detailed structural and functional cardiac information. In stable patients, coronary artery disease was excluded using MSCT, as invasive coronary angiography was reserved for cases with high suspicion or unstable clinical presentation.

The mortality rate in our series was 10%, whereas other studies have documented rates ranging from 1% to 5%.[10,11,13] A prior systematic review also found that the early post-surgical mortality rate for cardiac myxoma was 1%, while the late post-surgical mortality rate was 2 cases per 1,000 person-years.[4] Other study showed that the early mortality rate was 2.0%, while the late mortality rate reached 6.1%.[20] Arrhythmia was the most common postoperative complication observed in our study, a finding that remains consistent with previous research.[10,11] Notably, no cerebrovascular accident (CVA) or other embolic complications occurred after surgery.

Although this study revealed a higher mortality rate, it remains generally comparable to previous research. One possible explanation for the higher mortality in our cohort is the delay in diagnosis, where patients often presented at an advanced stage with severe clinical conditions. This is particularly relevant in developing countries, where left atrial myxomas often remain silent and asymptomatic for a long time. By the time symptoms emerge, they are usually severe due to the lack of routine cardiovascular screening and limited access to early diag-

nostic tools. Additionally, the relatively small number of patients included may have contributed to the appearance of a higher mortality rate. Nevertheless, the findings support that surgery still provides a favorable prognosis for cardiac myxoma.

Limitations

There were several limitations to this research. As a single-centre study, the findings may not be generalizable to other institutions. Small number of patients in this study also become the limitation in our study. Additionally, the retrospective observational design introduces potential biases in data collection. Therefore, multicenter studies across the country are recommended to enhance data analysis and contribute to the development of clinical guidelines.

Conclusion

This study retrospectively analyzed 20 patients who underwent surgical removal of cardiac myxoma at a Tertiary Referral Hospital in East Indonesia. Cardiac myxomas are typically benign tumors, most commonly originating in the left atrium and predominantly affecting middle aged females. Dyspnea was the most frequently observed symptom in this study. Echocardiography remained the primary diagnostic tool and continues to be the preferred method despite advancements in imaging technology. The surgical outcomes for myxoma patients are favorable. However, this study had several limitations. Therefore, Nationwide multicenter studies are recommended to improve data analysis and guide clinical practice.

Author contributions
Conceptualization, YES, MHD, AM, and PBTS; methodology YES, PBTS, MHD, and AM; analysis, MHD and AM; investigation, MHD and AM; Resources, PBTS, MHD, and AM; data curation MHD and AM; writing-original draft preparation, MHD, AM, and PBTS; writing-review and editing, YES, MHD, AM, and PBTS; visualization, AM; supervision, YES and PBTS; administration AM. All authors have read and agreed to the published version of the manuscript.

Conflict of interest
None

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Ethical statement
This study was approved by the Ethics Committee of Dr. Soetomo General Academic Hospital, Surabaya, Indonesia (2692/110/4/I/2024).

Informed consent
None.

Data availability statement
All data sources utilized are available in the result section.

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Figures are available in the online supplement.

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