Cardiac Myxoma Resection in Sanglah General Hospital Denpasar, Indonesia: Serial Case Report

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ABSTRACT

Background: Cardiac myxoma is a primary tumor that grows intracardiac. Primary heart tumors are rare, and incidents range from 0.0017 to 0.03%. Around 75% of primary heart tumors are benign, and 50-80% are cardiac myxoma. Echocardiography is the gold standard in detecting tumor mass in the heart. With the development of diagnostic modalities and cardiac surgery techniques, cardiac myxoma can be detected and treated correctly and leading to a better prognosis.

Objective: To report a series of cases of cardiac myxoma resection carried out by the Cardiac Surgery team of Sanglah General Hospital Denpasar.

Cases: Data collected from 2016 to March 2019. Six cases were diagnosed based on symptoms, history, and physical examination or cardiac surgery. All cases were done at Sanglah General Hospital Denpasar.

Conclusion: This series of cases reported six intracardiac tumor patients who were found through echocardiographic examination and five patients had open heart surgery for tumor resection; also all histopathological examination results were following cardiac myxoma. There were no reported post-treatment complications and the patients were discharged hemodynamically stable after hospitalized for approximately one week. Until now, there have been no reports of recurrence in patients who have taken resection and patients have normal daily life activities.

Keywords: myxoma, cardiac, benign tumor


INTRODUCTION

Heart tumors classified into primary and secondary heart tumors.19 Primary heart tumors are very rarely found with incidences ranging from 0.0017–0.03% of all tumor types. In contrast, the incidence of secondary heart tumors reaches 30-fold. About 75% of primary heart tumors are benign and the rest are malignant. Of all benign tumor cases, about 50-80% of cases are cardiac myxoma.2 Other benign tumors include 19% lipoma, 17% papillary fibroelastoma, 2% fibroma, 5% hemangioma, 4% atrioventricular tumor node and <1% rhabdomyoma. Seventy-five percent of all primary heart malignancies are sarcoma.1,2

Although compared to other types of tumors, heart tumors do not contribute significantly to the world's health burden, but these tumors can cause heart and systemic complaints that vary greatly. Even a small tumor but located at critical locations can be fatal to patients. With the development of diagnostic modalities and techniques for cardiac surgery, the prognosis of heart tumors is now getting better. Since the implementation of national health insurance in Indonesia, more patients could get access to health, from undergoing various examinations to get surgical intervention.

The World Health Organization (WHO) defines cardiac myxoma as a benign tumor consisting of stellate, ovoid, or spindle plump cells surrounded by the myxoid matrix.3 These tumors can occur in all age groups but are most often found at the age of the fourth decade or sixth.1,2,3 Cardiac myxoma was thought to originate from reactive endocardial thrombus, but through immunohistological investigations showed that myxoma appeared to originate from pluripotent mesenchymal cells. This condition is also one of the reasons why these tumors generally grow in the interatrial fossa ovalis septum area.2,3 Cardiac myxoma can appear in all parts of the heart, but its predilection in the left atrium is 75%, the right atrium is 10–20%, right and left ventricles are 3% each and valve <1%.1,2 Biatial or multiple tumors are commonly found in the type familial around 5% of cases.2 Right atrial myxoma often has a wider base (the part that attaches to the atrial wall) compared to left atrial myxoma, and is more often calcified so that it can be identified on
the x-ray examination of the thorax. Ventricular myxoma is more common in multicentric types. Right ventricular myxoma often appears on the free wall, whereas left ventricular myxoma tends to emerge in the proximal part of the posterior papillary muscle. Clinical findings of myxoma cardiac are very dependent on its location, size, and mobility. Patients with myxoma can show one or more of the myxoma triad, namely 1) intracardiac obstruction: 50% of cases; 2) systemic embolization: 30-40% of cases; and 3) constitutional symptoms: 20-60% of cases. Infection is a complication that rarely found in myxoma and usually similar to infective endocarditis. Infection also seems to increase the risk of systemic embolism. Cardiac myxoma accompanied by infection is an indication of immediate resection.

The following are reported six cases of cardiac myxoma that were handled by the Cardiac Surgery team of Sanglah General Hospital Denpasar diagnosed based on clinical, electrocardiographic (ECG), thoracic x-rays, trans-cardiac echocardiography (TEE) and histopathology (Table 1). One patient refused to undergo surgery so that the diagnosis of myxoma from the results of histopathological examination could not be established so that the differential diagnosis of intracardiac thrombus or other possible primary heart tumors should be considered.

**CASE PRESENTATION**

Patient 1 (NS), male, 49 years old, with the chief complaint of being easily tired and palpitation for 1 month before admission. Patients had a history of controlled type II diabetes mellitus. There was no family history with the same complaint. Hemodynamically stable and no abnormalities found during physical examination. Electrocardiography (ECG) reading showed atrial flutter with 3:1 AV block and 75 beats/min of ventricular rate. Laboratory examination obtained blood sugar levels 213 mg/dl and other blood test was within normal limits. From transthoracic echocardiographic examination revealed an echogenic mobile mass measuring 2,8x5 cm at the left atrium (Figure 1). Echocardiographic also showed normal systolic function from both ventricle, normal mitral valve, and mild tricuspid regurgitation. Urgent coronary angiography was performed and there wasn’t significant lesion. Tumor resection was done, and resected mass measuring 5x4,5x2 cm with weight 31,4 gram and the histopathologic finding were in accordance with cardiac myxoma. After resection, there is no atrial flutter anymore.

Patient 2 (SM), female, 43 years old, presented with easily tired for 1 month and diagnosed with left atrial myxoma after her echocardiography revealed an echogenic mass. The resection procedure had been carried out in 2016. The mass was attached to the interatrial septum (IAS) near to fossa ovalis in the left atrium and 4x3x2 cm in size, weight 33,5 gram. The mass appeared with an irregular shape, friable and mucoid, partially pearly white and reddish color (Figure 2A). The histopathologic finding was in accordance with cardiac myxoma (Figure 2B).

Patient 3 (S), female 63 years old, presented with shortness of breath for one month prior to admission. Her complaint was getting worse even after mild to moderate intensity of activities. She had uncontrolled hypertension stage II. Family history with the same complaint was denied. Her vital sign...
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Figure 3. (A) Transthoracic echocardiographic imaging from the long parasternal view of patient 3, showing a large mass within the left atrium (white arrows). (B) Echocardiographic imaging from the apical view of patient 4, also showing an echogenic mobile mass that inhibited blood flow into the left atrium from pulmonary veins (yellow arrows).

Figure 4. (A) Cardiac myxoma from patient 4 appeared as villous type myxoma. (B) The typical microscopic appearance of cardiac myxoma with a lot of nests of lepidic cells (black circle), some were spread as single spindle cells (black arrows). Recent hemorrhage was characterized by extravasation of erythrocytes (red circles) surrounded by a broad myxoid stroma (red star). Hematoxylin & Eosin, 100.

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was blood pressure 160/100 mmHg, heart rate of 82 beats/min, and respiratory rate of 20 breath/min. On physical examination, systolic murmur grade IV/V1 was audible at the apex spread to the lateral (axilla) and other findings were unremarkable. On laboratory findings, the hemoglobin level was 7.88 g/dl (severe anemia). Chest x-ray showed cardiomegaly and aortosclerosis. The transthoracic echocardiographic revealed a large round mobile mass in the left atrium measuring 3.41x4.13 cm (Figure 3A) and highly suspected as a cardiac myxoma. The patient refused surgery and since then never returned to Sanglah General Hospital.

Patient 4 (MR), female 48 years old, presented with palpitations for 6 months. Palpitation sometimes followed with shortness of breath. She had no history of diabetes, hypertension, and smoking. The vital sign was stable and physical examination found unremarkable findings. ECG reading showed normal sinus rhythm with 97 beats/min of ventricular rate. On laboratory findings, the hemoglobin level was 10.5 gr/dl (mild anemia). We also performed trans-thoracic echocardiography that revealed a large echogenic mass in the left atrium, 4.97x2.83 cm in size and appeared to inhibit the left atrial filling slightly from the pulmonary vein characterized by turbulence in the pulmonary venous orifice (Figure 3B). Urgent coronary angiography was performed and there was no significant lesion. During intraoperative showing that the base of the tumor was attached around fossa ovalis. The mass appeared as villous type with irregular shape, friable and gelatinous consistency, measured 4.5x3.5x2.8 cm in size and weight 32 gram (Figure 4A). The histopathological findings were following cardiac myxoma (Figure 4B).

Patient 5 (SU), female 64 years old, presented with palpitation for 1 month that getting worse after doing mild activities. She also complained dyspnea on effort. She had a complete stroke in December 2018 and already stabilized and underwent physiotherapy. She was hemodynamically stable, and from physical examination, right-sided hemiparesis was found to improve and other findings were unremarkable. ECG reading was normal sinus rhythm with 72 beats/min of ventricular rate. On laboratory findings, the platelet count was 760.3x10^9/L (thrombocytosis) and other hematological and biochemical test within normal limits. We performed transthoracic echocardiography that suggested dilatated left atrium and an echogenic mass, 5.58x3.75cm in size, attached to the interatrial septum that moved toward left ventricle during diastolic and covers part of the anterior mitral valve leaf and returns to the left atrium when systolic. The mass was successfully resected. The mass was 6.2x3.5x4cm in size and weighed 40 gr, brownish red, lobulated with a smooth surface with a slightly dense consistency (Figure 5A). Histopathological examination showed conformity with the features of cardiac myxoma (Figure 5B).

Patient 6 (AJ), female 19 years old, came to ER complained palpitation. On ECG recording showed Supraventricular Tachycardia (SVT) typical Atrioventricular Nodal Reentrant Tachycardia (AVNRT) and hospitalized for 2 days. Her hemodynamic was stable. There was no previous history of heart nor endocrine disease. Chest x-rays findings were unremarkable. Transthoracic echocardiographic was performed and an echogenic mass was revealed within the left atrium, measured 5.63x3.46 cm. The mass appeared to caused obstruction of the mitral valve with a pressure gradient of 4 mmHg (Figure 6A). Intraoperative
a chewy texture, lobulated shape with a smooth surface and very friable (Figure 7A). The tumor was 4.3x3.5x3.5cm in size and weighed 22.3 grams. Histopathological examination was in accordance with the cardiac myxoma (Figure 7B).

Resection procedure had been carried out except for patient 3, who rejected the procedure. The surgical procedure was performed by a median sternotomy approach to open chest cavity and followed by pericardial incision. The cannulation was inserted into the right atrium or vena cava and aorta to make cardiopulmonary bypass access (Figure 6B). Systemic hypothermia was carried out and administration of cardioplegia to stop the heart. Tumors in all cases were solitary mass found in the left atrium and no additional mass was found in other parts of the heart. In general, tumors had an irregular shape with its base attached to the interatrial septum near the intact fossa ovalis. Wide excision was done by excreting small portion of the endocardium around its base. Careful evaluation when evacuating tumor fragments was done to avoid the risk of an embolism after resection procedure. No valve abnormalities were found. Resection procedure was followed by correction of the atrial septal defect. The post-operative care was carried out in the ICU and postoperative echocardiographic was performed, and there was no residual mass and also heart valves were in functioning well. All patients were stable and the complaints improved after the procedure with an average length of stay 6-7 days. There are no reports of recurrence post-resection and patients had been returned to their normal activities.

DISCUSSION

Based on the WHO classification of the heart tumors, cardiac myxoma is the most common adult primary heart tumor, 75% of heart tumors are benign, and 50-80% of them were myxoma.1,2 These tumors can be found in all age groups, but often manifest in the 40-60 years age group. Women are twice as often as men. More than 90% present in an isolated fashion (sporadic) and the remaining associated with Carney complex.1,2 In this serial cases, we present six cases, consist of 5 women and 1 man with age from the youngest 19 years old and oldest 64 years old (Table 1). All cases appear as sporadically. These demographic findings were following our cases, where cases of cardiac myxoma in the last three years in Sanglah General Hospital Denpasar were more common in women, mostly aged at fourth to sixth decade, and all cases were sporadic.

Patients with cardiac myxoma often presented with very variable complaints and often associated
with obstruction, systemic embolization, and non-specific constitutional symptoms. Approximately 10-20% were asymptomatic and incidentally were found when carrying out chest radiographs or echocardiography due to other medical conditions or during an autopsy. However, tumors with location, size, and mobility that were quite critical could cause symptoms of severe heart failures such as syncope, dyspnea, chest pain, and palpitations. Most patients presented with complaints of fatigue, shortness of breath and palpitations, which had been complained about more than 1 month and getting worse. Those complaints were related to tumors that inhibit (obstruction) normal blood flow in the heart, both intermittent and throughout the heart cycle. Sometimes complaints would improve when the patient was lying down because of intermittent obstruction to the mitral valve. Constitutional symptoms can vary greatly, from weight loss, fever, fatigue, anemia, leukocytosis, increased sedimentation rate to a paraneoplastic syndrome, including vasculitis or vasculopathy, pancreatitis, demyelinating neuropathy, and epistaxis. These constitutional symptoms in myxoma are often associated with increased production of IL-6, IL-4, IL12p70, γ-IFN, and TNF by tumor cells and immunological reactions due to increased immunoglobulin. These symptoms were reported to tend to improve after the tumor resected.

Embolization is the second largest clinical manifestation (30-40%). The fibrotic type or solid type of myxoma tended to cause valve obstruction while the villous type or tumor with a large myxoid stroma tended to cause emboli (Figure 8). As reported in one case, patient 5 had a complete

Table 1. Cardiac Myxoma in Sanglah General Hospital from 2016 to March 2019

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<tr>
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<tbody>
<tr>
<td>Gender/Age</td>
<td>NS, M/ 49 y.o</td>
<td>SM, F/ 43 y.o</td>
<td>S, F/63 y.o</td>
<td>MR, F/ 48 y.o</td>
<td>SU, F/ 64 y.o</td>
<td>AJ, F/ 19 y.o</td>
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<tr>
<td>Main complaint</td>
<td>Easily tired for 2 m.o. Palpitation (+)</td>
<td>Easily tired for 1 m.o</td>
<td>Dyspnea for 1 m.o</td>
<td>Palpitation for 6 m.o. dyspnea (+)</td>
<td>Palpitation for 1 m.o</td>
<td>Palpitation for 1 m.o</td>
</tr>
<tr>
<td>Previous history</td>
<td>Diabetic Mellitus Type II</td>
<td>-</td>
<td>Hypertension Gr II</td>
<td>-</td>
<td>Complete non-hemorrhagic stroke</td>
<td>-</td>
</tr>
<tr>
<td>Physical examination</td>
<td>Hemodynamic was a stable and unremarkable physical examination</td>
<td>Hemodynamic was a stable and unremarkable physical examination</td>
<td>TD 160/100 mmHg, Mural systolic, blowing, apex level 3/6 that spread to the lateral side.</td>
<td>Hemodynamic was a stable and unremarkable physical examination</td>
<td>Hemodynamic was a stable and unremarkable physical examination</td>
<td>Tachycardia 112 bpm, regular. Unremarkable physical examination.</td>
</tr>
<tr>
<td>ECG</td>
<td>Atrial flutter 3:1</td>
<td>Normal sinus rhythm</td>
<td>Normal sinus rhythm</td>
<td>Normal sinus rhythm</td>
<td>Normal sinus rhythm</td>
<td>SVT typical (AVNRT)</td>
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<tr>
<td>Chest x-ray</td>
<td>-</td>
<td>-</td>
<td>Cardiomegaly and atherosclerosis</td>
<td>-</td>
<td>Cardiomegaly</td>
<td>No abnormalities seen</td>
</tr>
<tr>
<td>Transthoracic echocardiography</td>
<td>Showing an echogenic mass in LA attached to IAS, 2.8x5cm in size</td>
<td>Showing an echogenic mass in LA</td>
<td>Showing an echogenic mass in LA attached to IAS, 3.4x1.4x13 cm in size</td>
<td>Showing an echogenic mass in LA attached to IAS, measured 4.97x2.83 cm</td>
<td>Showing an echogenic mass in LA attached to IAS, 5.58 x 3.75 cm in size</td>
<td>Showing an echogenic mass in LA attached to IAS, 5.63x3.46 cm in size</td>
</tr>
<tr>
<td>Laboratorium</td>
<td>RBS 213 mg/dL</td>
<td>Within normal limits</td>
<td>Severe anemia (Hb 7.68 gr/dL), normal MCH,MCV level</td>
<td>Mild anemia (Hb 10.5 gr/dL), normal MCH,MCV level</td>
<td>Trombocitosis (760,3x10^12/L)</td>
<td>Within normal limits</td>
</tr>
<tr>
<td>Intraoperative</td>
<td>Solitary tumor within LA with its base attached to IAS</td>
<td>-</td>
<td>The patient refused the surgical procedure</td>
<td>Solitary tumor within LA with its base attached to IAS</td>
<td>Solitary tumor within LA with its base attached to IAS</td>
<td>Solitary tumor within LA with its base attached to IAS</td>
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<td>Makroskopis</td>
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<td>Histopathology</td>
<td>Following cardiac myxoma</td>
<td>Following cardiac myxoma</td>
<td>Highly suspected cardiac myxoma with dd/ thrombus</td>
<td>Following cardiac myxoma</td>
<td>Following cardiac myxoma</td>
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<td>Diagnosis</td>
<td>Cardiac Myxoma</td>
<td>Cardiac Myxoma</td>
<td>Cardiac Myxoma with dd/ thrombus</td>
<td>Cardiac Myxoma</td>
<td>Cardiac Myxoma</td>
<td>Cardiac Myxoma</td>
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1 F = female; M = male; ECG = electrocardiography; TTE = transthoracic echocardiography; LA = left atrium; RBS = random blood sugar; IAS = interatrial septum.
Table 2. Diagnosis Criteria of Carney Complex

<table>
<thead>
<tr>
<th>Major criteria</th>
<th>Supplemental Criteria</th>
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<tr>
<td>Cardiac myxoma</td>
<td>Inactivating mutation of the PRKAR1A gene</td>
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<tr>
<td>Another myxoma (e.g., breast, cutaneous, or mucosal)</td>
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<td>Spotty skin pigmentation or blue nevus</td>
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<td>Cushing syndrome</td>
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<td>Acromegaly</td>
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<td>Large cell calcifying Sertoli cell tumor</td>
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<td>Psammomatous melanotic schwannoma</td>
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<tr>
<td>Osteochondromyxoma</td>
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*Diagnosis of Carney complex requires the presence of two major criteria or one major and one supplemental criterion.

Clinical presentation of cardiac myxoma depended on the size, location, mobility, and infiltration of the adjacent structure. Clinically left atrial myxoma almost resembled mitral valve disease, i.e., auscultation can be heard “tumor plop,” which often difficult to distinguish from a third heart sound (S3). The sound appeared right after the mitral valve opens quickly and the tumor hit the wall of the endocardium. The murmur depended on the position of the tumor. As found in Patient 3 physical examination, systolic murmur blowing grade IV/V1 was heard at the apex and radiated laterally. The mitral regurgitation murmur can occur due to a dysfunction of the mitral valve caused by the myxoma mass preventing the complete closure of the mitral valve during the ventricular systolic phase and also the tumor could make atrial chamber dilated. Tumors that grow in the right atrium can also produce murmurs that heard in the lower right parasternal area. Also, the sign of increasing right intra-atrial pressure was often quite clear, such as an increase in jugular venous pressure, and in severe conditions, it could resemble vena cava syndrome. An increase in right atrial pressure could also result in a right-to-left shunt through the open fossa ovalis. This condition could cause polycythemia, cyanosis, and clubbed fingers. Symptoms of venous hypertension in the inferior body can be hepatomegaly, ascites, and peripheral edema.

About 7-10% cardiac myxoma was described in the context of Carney complex, in which cardiac myxoma, cutaneous lesions, endocrine disorders, testicular, thyroid, and hypophysis tumor. Carney complex was an autosomal hereditary disorder predominantly due to the mutation of the PRKAR1A gene located at the chromosome locus 17q23-24 and 2p16. This mutation found in more than two-thirds of patients with Carney complex. The mutation of the PRKAR1A gene results in the encoding of the R1a regulatory subunit of cyclic-AMP-dependent protein kinase A (PKA) which contributes to inherited myxoma in this complex. Further genetic studies in human beings have identified an alternative genetic pathway to cardiac tumorigenesis, including mutation of the MYH8 gene that encodes perinatal myosin. Diagnose of Carney complex can be established if it presents two primary criteria or one major and any 1 supplemental criteria (Table 2). Familial myxoma with or without Carney complex is usually found in younger patients (second-third decade), the incidence of women and men is not much different, mostly in the form of multicentric tumors with atypical tumor sites. Although both have similar histological features, familial myxoma or Carney complex tend to recurrence after resection (10-20%) than non-complex (<5%). In our cases, no Carney complex or familial myxoma was found.

The diagnostic significance of chest x-ray remains very limited and only provide a non-specific sign. It is not rare to find normal chest x-ray in the cardiac tumor as in patient 6. Most common chest x-ray findings are cardiomegaly secondary to atrial chamber enlargement as we saw in most cases. A more specific but infrequent result is the presence of solid shadows due to myxoma calcification. Computed tomography (CT) and magnetic resonance imaging (MRI) are rarely done when the presumption has led to cardiac myxoma, but this modality can provide information about the infiltration of the tumor in the myocardium and surrounding tissue that is generally difficult to obtain in echocardiography alone. Hypointensity in T1-weighted and hyperintensity in T2-weighted MRI images due to gelatinous nature or high extracellular water content of myxomatous tissue. Cardiac myxoma often shows contrast enhancement due to their vascularity. Because of the high suspicion of cardiac myxoma based on
the clinical presentation and echocardiography, we didn't perform CT-Scan or MRI in all cases. But we did urgent coronary angiography, especially to patients aged over 40 years old and had risk factors such as diabetes, hypertension, smoking, or previous coronary or heart disease to exclude the possibility of coronary disease. We found no significant lesion from the patient who underwent coronary angiography. Coronary angiography also can visualize the blood supply of myxoma, sometimes present as tumor blush appearance, but in our cases, we didn't find it.

Electrocardiography (ECG) is a routine examination performed on cardiac abnormalities, but this examination does not provide specific findings unless the location of the tumor is quite critical near or right at the pacemaker or conduction tissue. Axis deviation, a sign of heart chamber enlargement, and ST segment abnormalities are the most common findings.1,3,4,7 Findings of rhythm other than sinuses, such as atrial flutter or SVT are infrequent, but these conditions can significantly increase the risk of embolization, as we found in patients 1 and 6 with atrial flutter and SVT typical AVNRT. Atrial flutter might be caused by pressure on the left atrium either due to the tumor mass itself or secondary mitral regurgitation. In certain conditions, atrial flutter can occur in mitral stenosis due to pulmonary hypertension, which results in widening of the right atrial space and is characterized by tricuspid regurgitation, as found in patients 1. It seems that this condition also underlies the presence of a re-entry circuit which subsequently manifests as SVT experienced by patients 6. Atrial flutter may also occur due to inflammation. There are several reports regarding the relationship between inflammatory processes and the incidence of atrial arrhythmias. Cardiac myxoma has been known also have paracrine characteristics because it is capable of producing inflammatory cytokines such as IL-6. Resection of myxoma will be followed by a decrease in IL-6 levels, which will be followed by the loss of atrial arrhythmias.5,4 Unfortunately the authors were unable to examine IL-6 levels before and after surgery.

Transthoracic echocardiography still becomes the diagnostic imaging modality of choice for cardiac tumors because of its ability to identify masses measuring from 1-3 mm. Cardiac myxoma on echocardiography will appear as a mobile endocardial with irregular shape mass, most often arising in the left atrium (75%) attached around the fossa ovalis or interatrial septum (IAS).3,5 More sophisticated 3-dimensional echocardiography with contrast can provide complete information about tumor location, size, and appearance.1,3 Transthoracic echocardiography of all cases showed impression a mass attached to the left interatrial septal wall as an ephocenic mobile mass throughout the cardiac cycle with an average size of 14-20 cm² with an irregular shape. Some mass also results in mild mitral valve obstruction as its found in patients 5 and 6.

Surgery is the treatment of choice for cardiac myxoma.1,3,5,6 The mortality rate from the resection procedure of atrial myxoma is reported to be less than 5%. A study published on 202 resection actions performed, indicating the risk of mortality from surgery was increased in patients who were too old or have associated comorbidities. Excision of ventricular myxoma provides the highest risk of mortality (10%). Medical therapy is only used to treat complications, such as heart failure or arrhythmia.1 Five of the six patients had open heart surgery to resect intracardiac tumors after transthoracic echocardiography examination showed the impression of mass in the left atrium and their histopathological examination in accordance with cardiac myxoma. One patient refused surgery and still suspected of cardiac myxoma with a differential diagnosis of intracardiac thrombus or other primary heart tumors. Reflecting on this, the author realizes the importance of patient education. The surgical action is still the choice of therapy with low mortality and recurrence rates that must be the main points understood by patients. Education regarding the high risk of systemic embolization and heart failure if cardiac myxoma is not immediately intervened must also be understood by patients and families before deciding to perform a surgical procedure.

The macroscopic appearance of cardiac myxoma can be divided into two types, namely the solid type and the villous type (Figure 8). The solid type can be lobular in shape, oval, with a smooth surface, shiny or wavy surface, whereas the villous type has an uneven, brittle surface and a shape resembling bumps.3,5,7 Emboli can originate from the loose protrusion or due to a thrombus that escapes the surface of the tumor. These tumors have a stalk and their mobility depends on the length, width of the attachment, and the content of collagen in the stalk. Tumor size can be <1 cm³ to >15 cm³ and weighing from 8 to 175 grams. Tumors can be grayish white and blackish red due to thrombus or bleeding inside. Extensive calcification with stone-like features can also be found even though it is rare and is referred to as lithomyxoma.4 The macroscopic appearance of tumors of patients 2, 4, and 6 have characteristics of villous type myxoma with irregular surfaces and shapes, supple consistency, and friable brittle. While patients 5 tend to be solid or polypoid types
with smooth surfaces and semi-solid consistency. Tumor weight from the smallest 22.3 grams (patient 6) to the most significant 40 grams (patient 5). When the tumor sliced, the mucoid structure with the bleeding area is found. The mucoid structure originates from the component of myxoid, where the richer the stroma of myxoid, more mucoid the appearance of the tumor and more friable it will be. Cardiac myxoma characteristically shows a pattern of lepideric cells or myxoid cells embedded in a glycosaminoglycan-rich myxoid stroma. Lepideric cells have characteristic of hypocellular cells with eosinophilic cytoplasm and oval or round nucleus. Myxoma cells are stellate, ovoid, or plump spindle-shaped cells that can be arranged singly or in groups to form a ribbon or ring. These cells often surround small vascular structures or capillaries and form vasoformative rings. Inflammatory cells and multinucleated giant cells can also be found. The large, thick-walled vascular matter is often found near the stalk or base where the tumor attaches. The focus of bleeding appears both new and old. Old bleeding is characterized by hemosiderin-laden macrophage with or without iron deposits originating from tumor matrix elastin fibers (Gamma-Gandy bodies). Can also be found secondary degenerative changes such as fibrosis, changes to cystic, necrosis, thrombosis, calcification, and formation of bone metaplastic. The focus of extramedullary hematopoiesis can also be found in 7% of cases of myxoma. The histopathological examination results of patients 2, 3, 4, 5, and 6 were obtained from the Department of Anatomical Pathology of Sanglah Hospital with a conclusion that all cases showing in accordance with cardiac myxoma. Myxoma cells also show antibody reactivity to calretinin, an immunohistological feature that distinguishes it from thrombus and other tumors. Unfortunately this examination is not carried out routinely at Sanglah Hospital because the cost of studies is relatively expensive.

The most common differential diagnosis of cardiac myxoma is the intracardiac thrombus or the so-called calcified amorphous tumor (if accompanied by calcification). Another primary heart tumor that is taken into consideration is papillary fibroelastoma, especially when the picture of myxoma is a villous type. Although rare, <3% of cases of myxoma have a glandular appearance on the base of the tumor without being accompanied by infiltration of the surrounding tissue. If this display is found, adenocarcinoma metastases must be considered as other differential diagnoses. The prognosis of cardiac myxoma is generally good. Mortality is usually associated with coronary or systemic embolization or due to mitral or tricuspid valve obstruction. Myxoma recurrence rates are about 1-3% in sporadic types, 12% in familial types, and 22% in Carney complex. The post-resection recurrence was related to the type of cardiac myxoma (familial or Carney complex), incomplete excision, implantation of the previous tumor segment in the other part of the heart or to the distant organ through circulation and tumor transform into malignancy. Genetic screening is recommended in patients who experience post-resection recurrence. Five of the six patients have had tumor resection and until now there have been no reports of recurrence.

CONCLUSION
Cardiac myxoma can be found in all age groups, but often found in the age group of 40-60 years, women are twice more common than men and generally appeared sporadically. This series of cases reported six patients with intracardiac tumor found through echocardiography examination and five patients had open heart surgery to resect the tumor and the histopathological examination in accordance with cardiac myxoma. There were no reported post-treatment complications and the patient was discharged hemodynamically stable after receiving treatment for approximately 1 week. Until now, there have been no reports of relapses in patients who have taken resection and patients can have regular activities. One patient refused the resection action so the diagnosis would be difficult to enforce. However, based on the patient's demographics, clinical, and the most significant suspected diagnostic investigation leads to cardiac myxoma.

SUGGESTION
Patient's education and understanding of cardiac myxoma are essential, especially in patients who intend to refuse surgery. With the provision of knowledge so that patients understand the conditions they are experiencing, it is expected that cardiac myxoma cases in the future can be carried out with immediate resection to prevent morbidity and mortality related to the high risk of systemic embolization and heart failure if surgery is not done. Also, because of the many differential diagnoses of intracardiac tumors with a macroscopic and microscopic appearance that resembles cardiac myxoma, it is expected that immunohistopathological examination can be done routinely as part of the process of establishing a diagnosis of a cardiac tumor in Sanglah General Hospital.
CONFLICT OF INTEREST
The author declares there is no conflict of interest regarding the publication of this report.

ETHICAL ASPECT
All patient has been signed informed consent and agrees for the publication of their data as a case report article.

REFERENCES