

# Incidence of cardiac tumors in a high-specialty hospital

## *Incidencia de tumores cardíacos en un hospital de alta especialidad*

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### ABSTRACT

**Introduction:** primary cardiac tumors are rare entities with an incidence that varies significantly between hospitals. Advances in diagnostic techniques such as echocardiography and surgery with cardiopulmonary bypass have notably improved their management. This study aimed to determine the incidence and clinical characteristics of cardiac tumors at the General Hospital of Mexico "Dr. Eduardo Liceaga" during the 2024–2025 period. **Material:** a prospective, descriptive, and cross-sectional cohort study was conducted between March 2024 and March 2025. Eleven patients over 18 years old with a confirmed diagnosis of cardiac tumor were included. **Results:** an incidence of 4.21% was documented in relation to the total number of surgeries performed (261). The majority of patients were female (63.64%) with an average age of 56 years. All tumors were primary, with 90.9% being benign (myxomas) and 9.09% malignant (sarcoma). The most common location was the left atrium (72.72%). All patients underwent surgery via median sternotomy, with an average surgical time of 195 minutes. Two patients (18.18%) required reoperation due to bleeding. No mortality was recorded within the first 30 days postoperatively. The average hospital stay was 9.27 days. **Conclusion:** atrial myxoma is the most common primary cardiac tumor, particularly in middle-aged women, with a predominance in the left atrium. Surgery remains the treatment of choice, showing a low rate of complications and favorable short-term outcomes. Continued multicenter studies are essential to strengthen the epidemiological understanding of these neoplasms.

**Keywords:** cardiac tumor, atrial myxoma, cardiac surgery, benign tumors.

### RESUMEN

**Introducción:** los tumores cardíacos primarios son entidades raras cuya incidencia varía significativamente entre centros hospitalarios. Con el avance de técnicas diagnósticas, como la ecocardiografía y la cirugía con circulación extracorpórea, su manejo ha mejorado notablemente. Este estudio tuvo como objetivo determinar la incidencia y características clínicas de los tumores cardíacos en el Hospital General de México "Dr. Eduardo Liceaga" durante el periodo 2024–2025. **Material:** se realizó un estudio de cohorte prospectivo, descriptivo y transversal entre marzo de 2024 y marzo de 2025. Se incluyeron 11 pacientes mayores de 18 años con diagnóstico confirmado de tumor cardíaco. **Resultados:** se documentó una incidencia del 4.21% en relación con el total de cirugías realizadas (261). La mayoría de los pacientes fueron mujeres (63.64%) con una edad promedio de 56 años. Todos los tumores fueron primarios, siendo el 90.9% benignos (mixomas) y 9.09% malignos (sarcoma). La aurícula izquierda fue la localización más común (72.72%). Todos los pacientes fueron operados mediante esternotomía media, con un promedio de tiempo quirúrgico de 195 minutos. Dos pacientes (18.18%) requirieron reintervención por sangrado. No se registró mortalidad a los 30 días postoperatorios. La estancia hospitalaria promedio fue de 9.27 días. **Conclusión:** el mixoma auricular es el tumor cardíaco más frecuente, especialmente en mujeres de edad media, con predominancia en la aurícula izquierda. La cirugía continúa siendo el tratamiento de elección con baja tasa de complicaciones y buenos resultados a corto plazo. Es fundamental continuar con estudios multicéntricos para fortalecer el conocimiento epidemiológico de estas neoplasias.

**Palabras clave:** tumor cardíaco, mixoma atrial, cirugía cardíaca, tumor benigno.

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The first description of cardiac tumors was made by Realdo Colombo in 1559. The advent of cardiopulmonary bypass in 1953, pioneered by John Gibbon, and the development of echocardiography, enabling non-invasive diagnosis of intracardiac masses, significantly influenced their management. Today, surgical techniques have been standardized, yielding minimal mortality rates.<sup>1</sup> Cardiac tumors can be divided into primary cardiac tumors, which originate in the heart, and secondary tumors, which have metastasized to the heart. Primary cardiac tumors can be further subdivided into benign tumors representing 75% and malignant tumors accounting for 25%.<sup>2</sup> Primary cardiac tumors are rare, with an incidence of 1.38 to 30 per 100,000 people per year. The most common tumors in patients over the age of 16 are myxomas (50%), lipomatous tumors (21%), and papillary fibroelastomas (16%).<sup>3</sup> Secondary involvement of the heart is relatively uncommon. It has been found that 10-20% of patients who die from metastatic cancer have involvement of the heart or pericardium. Surgical resection is rarely possible or advisable for these tumors, and treatment is usually limited to the drainage of malignant pericardial effusions and/or diagnostic biopsies.<sup>1-4</sup> The clinical presentation of cardiac tumors varies according to tissue origin and may manifest as valvular lesions, infarction or myocardial dysfunction, atrial fibrillation, hypercoagulable syndromes, or antiphospholipid syndrome.<sup>1-5</sup>

## MATERIAL

We conducted a prospective, descriptive cohort study with a non-experimental, cross-sectional design, collecting



**Figure 1:** Transthoracic echocardiogram showing an intracavitary mass in the right atrium compatible with a cardiac tumor.



**Figure 2:**

Large right atrial myxoma with estimated dimensions of 12.5 × 9 cm, observed during surgical resection.

primary data from March 2024 to March 2025, at our institution. The study focused on patients diagnosed with cardiac tumors in the Department of Cardiology, aiming to determine the incidence of these tumors. Our sample consisted of 11 patients aged 18 and above.

## RESULTS

Eleven cases of cardiac tumors were documented between March 2024 and March 2025, accounting for 4.21% of 261 surgeries performed. A female predominance was observed, with 63.64% (n = 7) of cases, while males represented 36.36% (n = 4). The mean age at presentation was 56 years ( $\pm 14$ ), with a range of 42 to 71 years. All tumors were primary, with 90.9% (n = 10) being benign and 9.09% (n = 1) malignant, corresponding to myxomas (Fig. 1) and a sarcoma (Fig. 2), respectively. The left atrium was the most common location, accounting for 72.72% (n = 8) of cases, followed by the right atrium with 27.27% (n = 3); all tumors were attached to the atrial septal wall.

Surgical management via median sternotomy was performed in all patients. Cardiopulmonary bypass averaged 71 minutes (range: 34-180 min), with aortic cross-clamp time averaging 51 minutes (range: 32-75 min) for left atrial tumors. The mean operative time was 195 minutes (range: 102-300 min), and intraoperative blood loss averaged 727.27 mL (range: 50-3,000 mL). Tumor resections were associated with valve replacement in 18.18% of cases (n = 2), due to damage to the valvular annulus anatomy causing severe insufficiency. Reoperation was required in 18.18% (n = 2) of patients due to postoperative bleeding within the first 24 hours. No mortality was recorded within the first 30 days after the operation.

Histopathological examination revealed atrial myxoma as the predominant benign tumor type, while the malignant

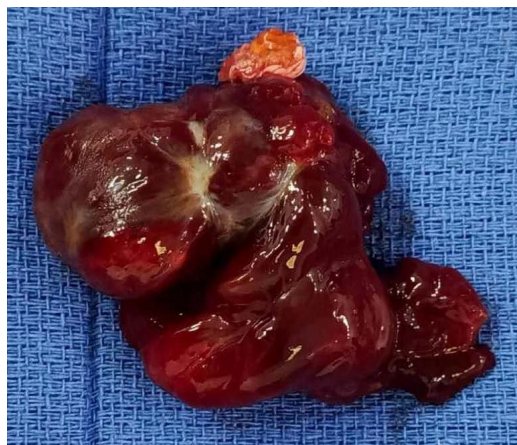
tumor was diagnosed as a high-grade spindle cell sarcoma. Tumor dimensions ranged from  $4.3 \times 3.8$  cm to  $12.5 \times 9$  cm (Fig. 3). The average length of hospital stay was 9.27 days (range: 6-15 days). All relevant information for this case series is summarized in Table 1.

## DISCUSSION

Over the years, the incidence of cardiac tumors has been studied in an effort to identify epidemiological patterns and characterize the affected patient population. Therefore, it is appropriate to compare the results found in different healthcare centers to identify each of these determining elements.

In terms of incidence, the study conducted by Alfaro et al. at the Centro Médico Nacional Siglo XXI reported a rate of 0.16%, similar to that found by Naranjo at the Instituto Nacional de Cardiología Ignacio Chávez, with an incidence of 0.12%. These results contrast significantly with the findings of this study conducted at the General Hospital of Mexico “Dr. Eduardo Liceaga”, which reported a 4.21% incidence among all cardiac surgeries performed during the study period. A common finding across all comparative studies is the predominance of the female gender, with a significantly higher frequency than males, most often presenting in the sixth decade of life, exceeding 60% in all cases.<sup>6,7</sup>

Atrial myxoma was the most frequently observed primary cardiac tumor, found in 84% of cases in the study by Alfaro et al., at Centro Médico Nacional Siglo XXI, 75% in the study by Jiménez et al., at Centro Médico ABC, and 70% in the study by Naranjo (2016) at the Instituto Nacional de Cardiología Ignacio Chávez. Our findings reflect a similar trend, with atrial myxomas accounting for 90% of the cases<sup>7,8</sup>



**Figure 3:** Cardiac spindle cell sarcoma: macroscopic image of the tumor after excision.

**Table 1:** Cardiac tumor cases series.

Variable	Value
Number of cases (N)	11
Percentage of cardiac surgeries, n (%)	11/261 (4.2)
Age (years), mean $\pm$ standard deviation	56 $\pm$ 14
Age (years), range	42-71
Gender, n (%)	
Male	4 (36.7)
Female	7 (63.3)
Tumor type, n (%)	
Benign	10 (90.9)
Malignant	1 (9.09)
Tumor location, n (%)	
Left atrium	8 (72.8)
Right atrium	3 (27.2)
Cardiopulmonary bypass time (min), median [range]	71 [34-180]
Aortic cross-clamp time (min), median [range]	51 [32-75]
Operative time (min), median [range]	195 [102-300]
Intraoperative bleeding (ml), median [range]	727.3 [50-3,000]
Valve replacement, n (%)	2 (18.2)
Reoperation for chest bleeding, n (%)	2 (18.2)
30-day mortality, n (%)	0 (0.0)
Tumor size (cm)	From $4.3 \times 3.8$ to $12.5 \times 9$
Mean hospital stay (days), median [range]	9.27 [6-15]

The left atrium was confirmed as the most common anatomical location for cardiac tumors, found in 72.72% of cases in our study. This aligns with the results reported by Naranjo, who found left atrial involvement in 80% of cases, and Poterucha et al., who reported 75% involvement in the left atrium and 10-15% in the right atrium.<sup>3,7</sup>

The presentation of symptoms is generally nonspecific and variable. However, once an intracardiac mass is detected, it does not contraindicate surgical intervention. Echocardiography was the main diagnostic method used in all reported cases.

When an intracardiac mass is suspected, echocardiography is the initial diagnostic tool of choice, as it provides essential information about the size, anatomical location, and extent of the mass, as well as its functional implications, such as flow obstruction, valvular involvement, cardiac contractility, presence or absence of pericardial metastasis, and pericardial effusion.<sup>3,7,8</sup>

The most common postoperative complication reported in the literature, postoperative bleeding, was observed in 18.18% of patients in this study, necessitating surgical reintervention. No mortality was recorded within the 30-day postoperative period, consistent with the absence of perioperative deaths in the reviewed studies.

Regarding hospital length of stay, the study by Jiménez et al., reported an average stay of 9.5 days. Similarly, our study

found an average stay of 9.27 days, indicating significant concordance between both findings.<sup>8</sup>

## CONCLUSIONS

Primary cardiac tumors are rare entities, with a higher incidence of benign tumors, confirming the predominance of atrial myxoma as the most common primary tumor, most frequently located in the left atrium and more commonly affecting women. The incidence of these neoplasms was found to vary significantly among different hospital centers, highlighting the importance of conducting multicenter studies to enable a more precise characterization of their epidemiology and management.

Surgery remains the treatment of choice, with favorable outcomes in most cases, a low rate of postoperative complications, and the absence of 30-day mortality, which reinforces the safety of the surgical approach in this patient group. Finally, the comparison with previous studies reaffirms the relevance of continued analysis and documentation of the clinical course of patients with cardiac tumors to optimize therapeutic strategies and improve clinical outcomes.

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