Epidemiology of Cardiac Myxoma in a Spanish Population. A 30-year Surgical Series

Epidemiología del mixoma cardiaco en una población española. Una serie quirúrgica de 30 años

To the Editor,

The incidence of primary cardiac tumors remains unknown. Figures vary widely depending on the series consulted (0.0017-0.19%),[1–3] and data can be biased depending on the type of population cohort analyzed.

The aim of this study was to perform an epidemiological analysis of the age-adjusted incidence of cardiac myxoma (CM), the most common primary cardiac tumor, and to determine if there had been an increase in the number of cases diagnosed in our historical series spanning 30 years.

To establish the incidence of CM in our institution, we reviewed the pathology reports of samples sent from the cardiac surgery operating room between 1976 and 2016, in collaboration with the Epidemiology Division of the Department of Health of the Murcia region of Spain. An analysis was carried out of the age-adjusted incidence (AAI) of CM, using the world and European populations as references, and 2 historical periods were compared: 1990 to 2001 and 2002 to 2014. Cases diagnosed before 1990 were excluded because the records from before this date were not computerized. Survival analysis was performed with the Kaplan-Meier estimator (KM, log-rank test), and the cumulative incidence function was calculated using 1 – KM, censoring all competing events. A linear regression model was used to establish if there had been an increase in the number of diagnosed cases of CM, in 5-year periods. The statistical programs used were MedCalc 16.4.3 (MedCalc Software BVBA; Ostend, Belgium) and STATA 12 (StataCorp LP; College Station, Texas, USA).

Sixty-three patients were identified. The mean age at diagnosis was 57.3 ± 13.7 years. Sixty-two percent (n = 39) were women, and the female:male ratio was 1.25:1.

Adjusting to the world population as a reference, we obtained an AAI of 0.16 (95% confidence interval [95%CI], 0.11-0.20) per 100 000 population, and we found an increase when we compared the 2 historical periods 1990 to 2001 (n = 14; AAI = 0.08; 95%CI, 0.04-0.13) and 2002 to 2014 (n = 38; AAI = 0.23; 95%CI, 0.15-0.29). Adjusting to the European population, we obtained an AAI of 0.21 (95%CI, 0.15-0.26)/100 000; we also found an increase when comparing the periods 1990 to 2001 AAI = 0.11; 95%CI, 0.05-0.17) and 2002 to 2014 (AAI = 0.30; 95%CI, 0.21-0.38). Linear regression showed a significant increase in the number of cases of CM diagnosed in the last three 5-year periods of the series (β coefficient = 0.84; 95%CI, 0.74-5.12; $P = .019$). The cumulative risk of CM until age 75 years was calculated at 0.02% for the period 2002 to 2014 (95%CI, 0.016-0.069) in the absence of competing risks of mortality.

Table 1 shows the presence of cardiovascular risk factors and associated neoplasia, the clinical presentation, and the tumor pathology. Dyspnea was the most common clinical presentation, in 23 patients (36.5%), followed by stroke: 16 (25.4%) and ischemic heart disease: 8 (12.7%). In-hospital mortality was 3.20% (n = 2). Five-year survival was 93.65%, with a median survival of 25.97 (95%CI, 23.69-28.25) years (Figure 1A). Over the whole period studied, 4 patients (6.35%) had tumor recurrence, 2 with Carney complex (3.1%) and 2 with isolated recurrence (3.1%); the median time to recurrence was 24.99 (95%CI, 22.13-27.85) years (Figure 1B).

The most important contribution of our study to current knowledge of CM is that detection and diagnosis have increased in recent years, indicating a higher incidence. In 2011, Sigurjonsson et al.[4] carried out the first epidemiological study of the AAI of CM, and found an incidence of 0.11 cases/100 000 population. Our AAI of 0.16 along with the increase when comparing the 2 historical periods indicates an underdiagnosis in previous decades (assuming an incidence lower than the real incidence) and the crucial role played by the development of cardiac imaging techniques for the differential diagnosis of cardiac masses.[5] Increased accessibility to echocardiography and professional specialization in the field could explain this marked increase in the number of cases of CM diagnosed per year, bearing in mind that changes in the use of the diagnostic techniques and in the organizational structure of the facility could have influenced the estimates performed and the incidence data obtained.

The additional findings of our study relate to the clinical behavior of CM. In 25% of the patients, the clinical presentation was stroke. This confirms CM as a cause that should be included in the differential diagnosis of ischemic stroke in patients in the fifth decade of life, and a reason for performing more exhaustive imaging tests in cases of stroke of unknown origin (approximately 1/3 of diagnosed strokes in patients aged 45 to 64 years).[6] Few studies have looked at the coexistence of other tumor types in patients with CM.[1,3] In our series, 26.5% of the patients had a second diagnosis of a different tumor in a different location, the most frequent being breast cancer. This high incidence highlights

Table 1
Demographic, Clinical, and Pathological Variables

Patients	63
Medical history	
Smoking	21 (33.3)
Hypertension	27 (43)
Type 2 diabetes mellitus	14 (22)
Chronic obstructive pulmonary disease	11 (17.5)
Dyslipidemia	20 (31.7)
Concurrent tumors	13 (26.5)
Breast cancer	4 (8.2)
Clinical presentation	
Ischemic heart disease	8 (12.7)
Stroke	16 (25.4)
Peripheral embolism	2 (3.2)
Valve obstruction	18 (28.6)
Dyspnea	23 (36.5)
Palpitations	9 (14.3)
Syncope	9 (14.3)
Weight loss	9 (14.3)
Fever	4 (6.3)
Anemia	31 (49.2)
Pathology	
Size, cm	4.5 [3.5-5.5]
Tumor morphology	
Sessile	33 (52.4)
Pedunculated	23 (36.5)
Broad attachment	41 (65)
Necrosis	1 (1.6)
Bleeding	41 (65.1)
Mitosis	4 (6.3)
Free margins	32 (51)
Gamna-Gandy bodies	7 (11)
Calretinin +	20 (31.7)

Values are expressed as: No. (%) or median [interquartile range].

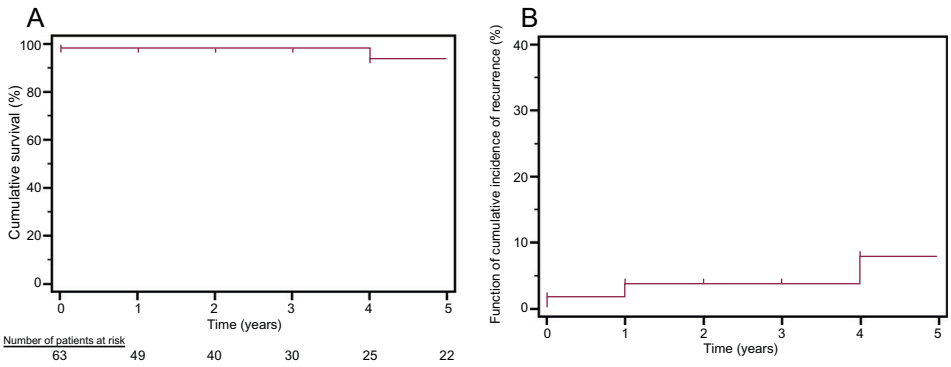

Figure 1. A: cumulative survival. B: function of cumulative incidence of recurrence.

the need to perform additional investigations at the time of CM diagnosis to look for other concurrent cancers and open avenues of clinical research into the etiology and natural history of this type of tumor.

In conclusion, the most precise data on CM incidence show an increase in the diagnosis of these tumors in recent years and demonstrate the essential role of echocardiography.

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Psychiatric Symptoms and Sex-related Differences in Patients With Myocardial Infarction With Nonobstructive Coronary Arteries

Síntomas siquiátricos y diferencias relacionadas con el sexo en pacientes con infarto de miocardio con arterias coronarias no obstructivas

To the Editor,

In a recent Position Paper of the European Society of Cardiology,[1] the following criteria for diagnosis of myocardial infarction with nonobstructive coronary arteries (MINOCA) were proposed: *a)* acute myocardial infarction according to the criteria defined by the III universal definition; *b)* absence of ≥ 50% stenosis on angiography; *c)* exclusion of other clinically overt specific etiologies. Anxiety and mood disorders seem to be more common in women than in men, and there is emerging evidence linking anxiety to coronary artery disease (CAD) development, particularly among women.[2] A previous study demonstrated sex differences in the prevalence of psychiatric disorders in patients with unstable angina.[3] Little is known about sex differences in the prevalence of psychiatric symptoms in patients with MINOCA. The aim of this study was to examine the relationship between sex and psychiatric symptoms in patients with MINOCA.

We prospectively evaluated 131 patients with a final etiologic diagnosis of MINOCA who underwent coronary angiography at the Cardiology Department of a University Hospital from October 1, 2011 to December 31, 2017. Nonobstructive CAD was defined as the presence of coronary stenosis > 0% but < 50% of lumen diameter in at least 1 major epicardial coronary artery.[1] We excluded 17 patients with a diagnosis of *tako-tsubo* syndrome confirmed by echocardiography or cardiac magnetic resonance, 10 patients with a suspected diagnosis of myocarditis confirmed by cardiac magnetic resonance, 13 patients without obstructive CAD but with evidence of coronary thrombosis on an unstable plaque confirmed by intravascular ultrasound, 2 patients with coronary embolism, and 1 patient who underwent cardiotoxic substance administration (cocaine). Hence, 88 patients were included in the study (Figure 1). The study was approved by the local ethics committee and all patients gave written informed consent before angiography.

Once their clinical condition had stabilized, all patients completed the 45-item Symptom Assessment (SA-45).[4] The SA-