INTRACARDIAC TUMOURS - EXPERIENCE WITH 12 CASES

Lt Col D GANGULY^{*}, Surg Capt JM BORCAR⁺,
Col RS RAJAN[#], Lt Col V RAVISHANKAR^{**},
Lt Col MR WAGHRAY⁺⁺, Lt Col KS RAO^{##}

(Departments of Cardiothoracic Surgery, Anaesthesiology and Cardiology, Military Hospital (Cardiothoracic Centre), Pune)

ABSTRACT

Twelve cases of intracardiac tumours operated during the period 1975 to 1994 are presented. There were 8 males and 4 females in the age range of 18 years to 64 years. Tumours were located in the left atrium in 10 patients and in the right atrium in 2 patients. Standard cardiopulmonary techniques were followed. The right atrial tumours were approached through a right atrial incision while the left atrial tumours were approached through a bi-atrial trans-septal approach. One patient underwent a perineal urethrolithotomy for an impacted urethral calculus at the same sitting. Eleven of the tumour masses excised were myxomas confirmed on histopathology. The last patient, operated for synovial sarcoma of the left knee 2 years before, presented with a metastatic tumour mass in the left atrium. No deaths occurred in the series.

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KEY WORDS : Heart neoplasms; Heart surgery; Myxomas.

Introduction

Primary cardiac tumours represent only 5 to 10 per cent of all neoplasms of the heart metastatic disease accounting for the remaining [1,2]. Approximately 70 per cent of cardiac tumours are benign and 30 per cent are malignant and potentially capable of invasion or metastasis. Of the benign tumours 50 per cent are myxomas while rhabdomyomas account for another 20 per cent. Sarcomas are virtually the only primary malignant tumours of the heart [1,2].

Myxomas are found primarily in the atria. Seventy-five per cent occur in the left atrium although they have also been reported in the right atrium and both ventricles [1,3,4]. A left atrial myxoma was successfully removed using cardiopulmonary bypass by Craafoord in 1954 [4]. A few years later successful excision of myxomas of the right atrium were also performed [5,6]. Since then a large number of successful operations for removal of left atrial myxomas have been reported [3,7-9] as have smaller numbers of excisions of myxomas from the right atrium and both ventricles [4,7]. Gerbode

in 1967 described recurrence of a left atrial myxoma 4 years after the initial excision [10].

This report is on 12 patients with atrial tumour masses which were surgically excised successfully at Military Hospital (Cardiothoracic Centre), Pune. Early and late clinical results were reviewed wherever possible in order to determine the clinical course of these patients.

Material and Methods

Twelve cases of atrial tumours were treated surgically at the Military Hospital (Cardiothoracic Centre) Pune from April 1975 to August 1994 (Table 1). All patients were evaluated clinically and their symptomatology and clinical findings recorded. Diagnosis was obtained by either cardiac catheterization or echocardiography or both. Cardiac catheterization was performed on patients in the earlier part of the series but the later patients were diagnosed on 2-D echocardiography alone (Table 2). This was primarily because of non-availability of 2-D echocardiograph earlier and the realization that cardiac catheterization in patients

^{*}Classified Specialist (Cardiothoracic Surgery), ⁺Prof and Head, Dept of Cardiothoracic Surgery, ^{**}Classified Specialist (Surgery), ⁺⁺Head, Dept of Cardiothoracic Anaesthesia, ^{##}Classified Specialist (Cardiology), Military Hospital (CTC), Pune; [†]Sr Adviser (Surgery & Cardiothoracic Surgery), Command Hospital (CC), Lucknow.

with intracardiac masses was prone to potential complications. Surgical excision was performed promptly after diagnosis. Excision of the tumour masses was performed using cardiopulmonary bypass with moderate hypothermia in all patients. Histopathology of all the tumours excised was done.

TABLE 1

Intracardiac tumours : Age and sex distribution, presentation and follow-up

Pt No.	Age (yr)	Sex	Clinical presentation	Follow-up
1	32	M	CHF, AF, malaise	Well, 36 mth
2	40	M	CHF, MI, murmur	Well, 12 mth
3	25	M	MS, CHF, malaise	Well, 52 mth
4	25	F	CHF, dyspnoea	Well, 12 mth
5	28	M	CHF, MS	Lost to FU
6	38	M	Fever, arthralgias, murmur	Well, 12 mth
7	50	F	CHF, MS, dyspnoea	Lost to FU
8	40	F	CHF	Well, 11 mth
9	51	M	CHF, MS, dyspnoea	Well, 13 mth
10	64	M	CHF, MS, murmur	Lost to FU
11	18	F	Dyspnoea, fever	Well, 6 mth
12	26	M	CVA, murmur	Well, 4 mth

CHF = Congestive heart failure; MI = Mitral insufficiency; MS = Mitral stenosis; CVA = Cerebrovascular accident; FU = Follow up; Mth = Months

TABLE 2

Intracardiac tumours : Location, sites, size and associated conditions

Pt No.	Location	Site of origin	Size (cm)	Associated conditions
1*	RA	FO	8 x 7 x 6	None
2*	LA	AS-FO	7 x 3 x 1.5	MI
3*	LA	AS	8 x 6 x 5	MO
4*	LA	FO	5 x 4 x 3.5	None
5*	LA	LA wall	3.5 x 2.5	MO
6*+	RA	RA wall	6 x 5 x 2	None
7*+	LA	FO	8 x 5 x 2	MO
8*+	LA	AS-FO	6 x 4 x 2.5	None
9*+	LA	FO	7 x 4 x 3	None
10+	LA	AS	5 x 4 x 2	MO
11+	LA	FO	6 x 2 x 2	None
12+	LA	LUPV	6 x 5 x 2	Tumour from LUPV

*Cardiac catheterization; + Echocardiography;

MI = Mitral valve insufficiency; MO = Mitral valve obstruction; RA = Right atrium; LA = Left atrium; FO = Foramen ovale; AS = Atrial septum; LUPV = Left upper pulmonary vein

Results

The age of the 12 patients ranged from 18 to 64 years (mean 40 years). There were 8 (66.7%) males and 4 (33.3%) females. Ten tumour masses were located in the left atrium and 2 (16.67%) in the right atrium. No primary ventricular tumours were encountered although several prolapsed into the ventricular outflow tracts. Nine tumours arose from the atrial septum or foramen ovale area, 2 from the atrial wall and 1 was an extension of a tumour from the left upper pulmonary vein (Table 2).

Congestive cardiac failure was the primary clinical symptom. Nine patients (75%) had dyspnoea or frank congestive heart failure as a result of atrio-ventricular valve obstruction or insufficiency. Two patients (16.7%) had constitutional symptoms. One patient, a case of synovial sarcoma left knee operated 2 years previously (above-knee amputation), presented with an embolic cerebrovascular accident and a cardiac murmur. Echocardiography revealed a tumour mass in the left atrium. The commonest finding was a mid-diastolic murmur in the mitral area (Table 1).

Diagnoses were obtained by echocardiogram and cardiac catheterization (Table 2). Cardiac catheterization was performed in 9 patients, the last 3 patients being diagnosed on 2-D echocardiography alone. The presumptive pre-operative diagnosis in 11 patients was that of an atrial myxoma. In the patient with synovial sarcoma left knee there remained a reasonable doubt whether the mass in the left atrium was a myxoma or a metastasis. Histopathology of the excised tumour masses in 11 (91.7%) cases confirmed them to be myxomas. The last case however proved to be a metastatic synovial sarcoma.

Surgical excision was performed promptly after diagnosis. This was true also in the case of the patient with the metastatic synovial sarcoma in the left atrium, though the patient had presented with a cerebrovascular accident in the right middle cerebral artery territory 24 hours previous to referral to this Centre, presumably due to tumour embolization. Excision was performed in all patients using cardiopulmonary bypass with moderate hypothermia. One patient required a perineal urethrolithotomy due to an impacted urethral calculus. This

was performed at the same sitting prior to excision of the left atrial myxoma.

In every patient with a left atrial tumour mass, excision was done through a bi-atrial, trans-septal approach. The 2 patients with an exclusive right atrial tumour were approached through a right atrial incision. In the 9 patients whose tumours were attached to the atrial septum, excision included a part of the septum. Six of these cases required patch closure of the surgically created defect in the atrial septum while 3 had primary suture closure. The 2 patients in whom the tumours arose from the atrial wall required primary closure of the surgically created defect in the wall. In the case of the metastatic synovial sarcoma in the left atrium though the approach was bi-atrial and trans-septal, the tumour was found to be arising from a stem attached to the left upper pulmonary vein and the atrial septal incision could be directly sutured. No patient required valve replacement or repair.

None of the 12 patients who underwent excision of their cardiac tumours died in hospital. There was only one post-operative complication which really was an extension of the patient's pre-operative neurological insult. This was in the patient who had a cerebrovascular accident in the right middle cerebral artery territory, most likely due to tumour embolization, and had presented within 24 hours of the episode with left side hemiparesis. In the immediate postoperative period he remained obtunded and needed ventilatory support for 72 hours. Thereafter, he could be weaned from the ventilator and over a period of 4 weeks showed gradual improvement with only moderate incapacitation due to a residual hemiparesis at the time of transfer to the Malignant Diseases Treatment Centre, Pune, 5 weeks from the date of surgery.

Follow-up was possible in 8 patients. Data was obtained by either personal contact or by review of hospital records. All the 8 patients who could be followed-up 4 to 52 months after operation had satisfactory functional results. Six patients were in NYHA class-I and 2 in class-II. None of the patients had any evidence of recurrence during the follow-up period. Cardiac catheterization was not repeated postoperatively in any of the patients but all of them had echocardiography done at the time of review varying 4 to 50 months postoperatively

with no suggestion of recurrence.

Discussion

Primary cardiac tumours are usually benign and are principally left atrial myxomas [11,12]. The few malignant tumours that do occur are either sarcomas, which have a poor prognosis, or secondaries. Atrial myxomas are associated with a number of haemodynamic alterations and symptoms include fever, weight loss, anaemia, dyspnoea, clubbing, arthralgia and chest pain [13,14]. Haemodynamic problems due to myxomas include systemic and pulmonary embolization, atrioventricular valve obstruction or insufficiency and obstruction to the ventricular outflow tract [1,14,15].

Traditionally, diagnosis of cardiac tumours has been made by angiocardiology but, of late, echocardiography has become the favoured diagnostic modality [16]. Trans-septal angiocardiology has been used in a number of centres but tumour embolism has been reported with this method [17]. Though angiocardiology has proved a reasonably accurate diagnostic method echocardiography is a safer and probably more accurate method of diagnosing cardiac tumours [16]. Two-dimensional echocardiography is more accurate than conventional studies [18] and transoesophageal echocardiography is being used in our Centre routinely for the diagnosis of intracavitary cardiac masses. In all patients who underwent pre-operative echocardiography in this series the diagnosis proved correct. Schumacker [19] stated in 1976 that this method of diagnosis is sufficiently accurate to recommend operation on these data alone, and that has also been the experience in this series. However, even large myxomas located within the body of the left atrium may not be apparent or may be underestimated in size with 2-D or M-mode echocardiography, probably because the acoustic impedance characteristics of the tumour may be similar to that of blood [20]. Be that as it may, echocardiography avoids the possible complications of cardiac catheterization and its added expense.

In general, surgical treatment of cardiac tumours consist of excision of the primary tumour and usually the site of origin as well. For atrial myxomas, surgical treatment is confined to excision of the tumour with a segment of atrial septum

or atrial wall. Gerbode and co-workers [10] were among the first to report recurrence of a left atrial myxoma after excision and recognized the need for wider excision of the atrial septum or atrial wall. Since then, surgeons have excised these tumours more extensively with most patients requiring pericardial or Dacron patch closure of the atrial septum or atrial wall. Sixty-seven per cent of our patients required reconstruction of the excised atrial septum. The results of surgical excision as reported in world literature have been good with an overall operative mortality of about 5 per cent [4,5]. Virtually all the deaths are related to co-existing cardiac or degenerative disease [1]. None of our patients died during surgical excision.

Recurrence of atrial myxomas was recognised in 1967 [10]. Recurrence has occurred as early as 6 months following initial excision and up to 90 months after operation. It probably was a result of either inadequate resection, intracardiac implantation, multicentric growth or peripheral embolization [1,10]. In this series of 11 cases of atrial myxomas of whom 7 patients could be followed-up no recurrence could be detected. In the case of the eighth patient with metastatic synovial sarcoma in the left atrium, the follow-up period of 4 months was too short to make an educated comment, but to date there is no sign of recurrence.

It can be concluded that excision of cardiac tumours can be performed with good results, especially in the case of atrial myxomas. Diagnosis can be accurately made by echocardiography and probably is adequate to advise operation. The recurrence of atrial myxomas can occur in as many as 14 per cent of patients but most likely occurs in about 5 per cent [21]. It appears that extensive resection of the myxoma attachment to the atrial septum or atrial wall can reduce the likelihood of recurrence [10]. Recurrence can be noted several years postoperatively and re-recurrence has also been reported [18]. Thus, long-term clinical and echocardiographic follow-up is mandatory.

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