INTRODUCTION

Myxoma is the most frequent primary cardiac neoplasm. The clinical signs and symptoms may be non-specific. Myxomas occur most frequently in the left atrium. A typical myxoma is a well-defined mass which shows a lower attenuation than that of intracavitary blood (1). An atypical myxoma with internal hemorrhage shows high attenuation and contrast filled tumor. If myxomas grow bigger, it is more likely that they shift into the left ventricle during diastole via the mitral valve, thereby causing mitral valve obstruction. We report CT findings of two left atrial myxomas causing mitral valve obstruction.

CASE REPORT

Case 1

A 37-year-old man was admitted to our hospital due to exertional dyspnea for one month. Physical examination revealed diastolic murmur and an electrocardiogram showed atrial fibrillation. Vital signs were stable and a blood analysis including cardiac biomarkers was within normal limits. Chest radiographs showed cardiomegaly and engorged pulmonary vasculatures in the upper lungs (Fig. 1A). The patient underwent a transthoracic and transesophageal echocardiography.

We report multidetector row CT (MDCT) findings of two left atrial myxomas causing mitral valve obstruction and dyspnea of patients. Cardiac MDCT showed well-defined left atrial masses attached to the interatrial septum and shifting of tumors into the left ventricle causing mitral valve obstruction during diastole in a 37-year-old male and in a 69-year-old female. Also, we observed intratumoral hemorrhage in the second case. Myxomas were resected and the patients were discharged without dyspnea.

Index terms

Tomography, X-Ray Computed
Heart Neoplasms
Myxoma
Mitral Valve Stenosis
irregular marginated left atrial mass about $8.4 \times 6.3 \times 4.4$ cm which abutted the inter-atrial septum with left atrial enlargement. The mass showed hypoattenuation relative to intra-atrial blood. There was no significant stenosis in the coronary arteries (not shown) and the mass was radiologically diagnosed as cardiac myxoma.

The patient underwent surgery for excision of the atrial mass. The intra-operative specimen consisted of several gelatinous lumps. The endocardium was attached to the mass, measuring $2.0 \times 1.0$ cm. The external surface of the mass was vaguely lobulated, smooth, and glistening. Further, the mass was soft and partly friable (Fig. 1E). A typical myxoma was proven pathologically.

After a tumorectomy, exertional dyspnea disappeared and the patient was discharged without complication.
The patient underwent resection of the mass and the gross specimen appeared as a whitish ovoid mass. The external surface was described as lobulated, whitish myxoid, and firm. For the section, the inner component of the mass was soft and whitish myxoid with hemorrhagic areas which showed a glistening cut surface and prominent vascular structures (Fig. 2F). Atypical hemorrhagic myxoma was proven. The patient fully recovered and discharged without dyspnea.

DISCUSSION

Cardiac myxoma is the most common benign neoplasm of the heart and is found in the left atrium (75% of cases). Typi-
cularly, the findings consist of a well-defined mass with relatively low attenuation compared to enhancing intra-cardiac blood (1). Myxomas can mimic thrombi, radiologically and Myxomas are significantly larger than thrombi. The location of a thrombus usually depends on the underlying heart disease, and may occur in any of the heart's chambers. LA thrombi most often originate from the appendage, while myxomas most often originate from the fossa ovalis. The shapes of myxomas are usually polypoid, but can be villous. Similarly, thrombi are also usually polypoid (2). Atypical findings of cardiac myxomas are low-attenuation lesions within the mass which suggest thrombus, as seen in our case. The dot-like enhancements which suggest the presence of vasculature are seen in the center of thrombus. In our case, we had differential diagnoses including a hemorrhagic cyst with active bleeding, myxoma with degenerative hemorrhagic cyst, hemorrhagic metastasis, and sarcoma with internal hemorrhage. Sometimes, we should distinguish myxomas from sarcomas involving the heart. Angiosarcomas tend to occur in the right atrium and involve the pericardium. Other sarcomas affect the left atrium more frequently. Malignant fibrous histiocytomas usually occur from the posterior wall of the left atrium and may invade the pulmonary veins (3). Myxosarcomas are a rare form of primary malignant tumors. It is very difficult to differentiate myxosarcomas from myxomas. Myxosarcomas show local recurrences, involving the pulmonary artery, pericardium or pleura and distant metastases, and the brain (4).

Most patients with large myxomas in the left atria present symptoms consistent with the classic triad of obstructive cardiac and embolic signs, or constitutional and systemic manifestations. The most common symptoms are dizziness, dyspnea, palpitation, and pulmonary edema, which are related to mitral valve obstruction. In our cases, the patients complained of dyspnea. Systemic emboli that may occur in any vascular beds lead to a variety of signs and symptoms (5).

In cases with large left atrial myxomas causing mitral valve obstructions, radiographs exhibit left atrial enlargement and pulmonary venous hypertension with pulmonary vascular redistribution and interstitial edema. If the myxoma is small and does not cause valvular obstruction, a chest radiograph may show normal findings (1). Transthoracic and transesophageal echocardiographies have a high sensitivity and specificity for the diagnosis of cardiac myxomas. Tumors manifest as spherical masses attached to the endocardial surface with occasional internal hypoechoic areas, speckled echogenic foci, and frondlike surface projections. Prolapse across the atrioventricular valve during diastole may also have been demonstrated. Doppler echocardiography can be used to evaluate associated valvular regurgitation or stenosis (6). In conventional coronary angiography, tumor vascularities such as clusters of small and tortuous vessels arising from the coronary arteries can be seen (7). CT scans with contrast enhancement usually demonstrate well-defined spherical or ovoid intracavitary masses with lobular contours. Tumors show lower attenuations than those of unopacified blood (8). Heterogeneous attenuation of the tumor is a common finding and this is related to hemorrhage, necrosis, cyst formation, fibrosis, calcification, or ossification (9). In our second case, we observed heterogeneous attenuation in the myxoma due to intratumoral hemorrhage. Cardiac CT with ECG-gating provides functional information such as obstruction of the mitral valve by multiphase images and detailed anatomical information on the coronary arteries.

For the treatment of typical and atypical myxomas causing mitral valve stenoses, surgical resections are requested due to the potential life-threatening sequelae of cardiac myxoma such as emboli and acute symptoms of valvular obstruction. Surgical excisions are safe and show good prognoses (10).

In conclusion, cardiac MDCT with ECG-gating enables the diagnosis of cardiac myxomas that cause mitral stenosis.

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송모판 폐쇄를 일으킨 좌심방 점액종의 역동적 다절편 CT 소견

양지연 · 김동훈 · 서혜선 · 허 근 · 김희경

저자들은 송모판 폐쇄증과 호흡곤란을 유발한 좌심방 점액종 2예의 다절편 CT 영상을 보고하고자 한다. 37세 남자와 69세 여자 환자에서 심장 다절편 CT로 심방중격에 연결된 경계가 좋으며 이완기에 좌심실로 돌출되어 송모판 협착을 일으키는 종괴를 볼 수 있었다. 또한, 점액종 1예에서 종괴 내 출혈을 볼 수 있었다. 점액종은 제거되었고 환자들은 모두 호흡곤란증후군이 사라진 후 퇴원하였다.

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