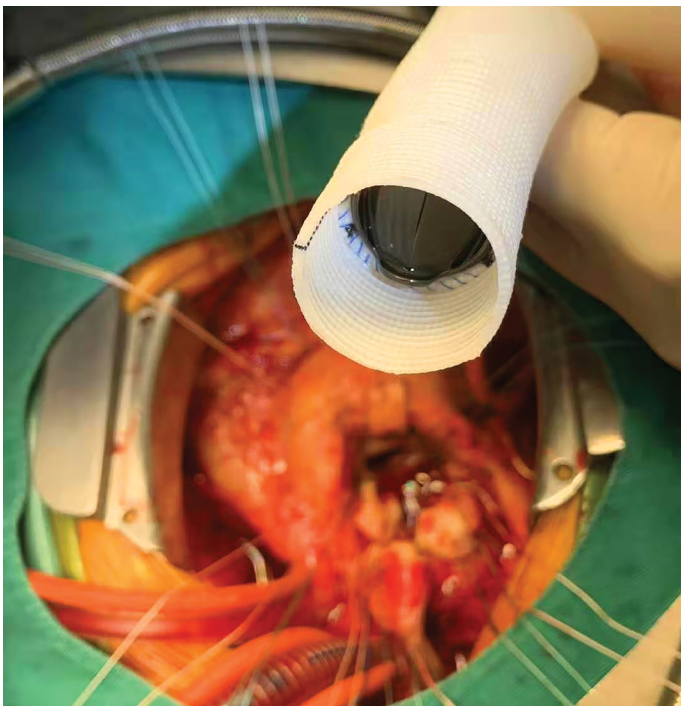


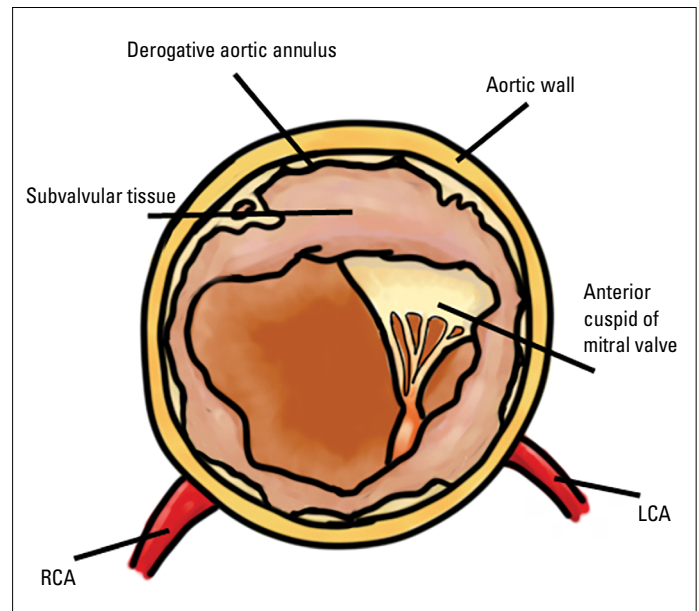
Supplementary Figure 2. Intraoperative photo of surgical procedure. The asterisk indicated a ring-like sub-valvular tissue



Supplementary Figure 3. Intraoperative photo of surgical procedure. The asterisk indicated a ring-like sub-valvular tissue

Ethics approval: This paper was approved by the Hospital Ethics Committee.

Informed consent: Written informed consent was acquired from the patient for the publication.



Supplementary Figure 4. Illustration of the severely damaged aortic annulus

Video 1. Regular intraoperative TEE

Video 2. Intraoperative TEE with Doppler imaging

Video 3. Regular postoperative TTE

Video 4. Postoperative TTE with Doppler imaging

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Multimodality imaging of a thymoma within the superior venae cava extending into the right atrium 🎥

A 44-year-old female with facial edema and dizziness for six months was admitted to our hospital. Transthoracic echocardiogram showed the dilated superior venae cava (SVC) occluded by a mass. The mass in the SVC was extending into the right atrium (RA) (Fig. 1a–1c, Videos 1-2). Color Doppler flow imaging indicated a narrowed blood flow in the SVC with an increased velocity of 1.6 m/s (Fig. 1d, 1e, Video 3). Contrast-enhanced computed tomography (CT) scan revealed a soft tissue density mass mea-

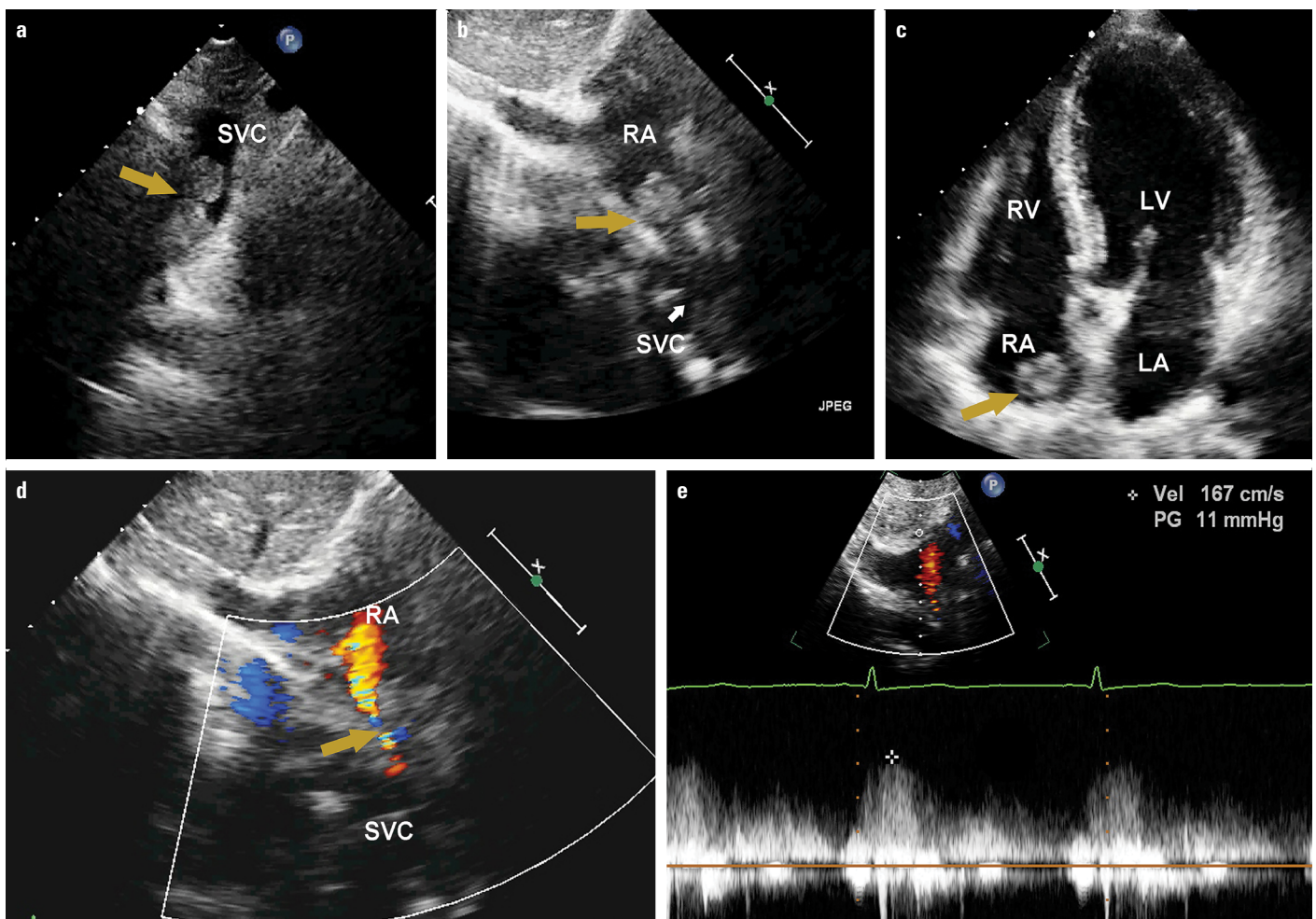


Figure 1. (a) Transthoracic echocardiogram showing a mass within the SVC. (b) The subcostal view revealing the mass extending into the right atrium via the SVC. (c) The apical four-chamber view demonstrating the mass extending into the right atrium. (d) Color Doppler flow imaging indicating a narrowed blood flow in the SVC. (e) Continuous-wave Doppler echocardiography showing an increased blood flow velocity
SVC - superior vena cava; RA - right atrium; RV - right ventricle; LV - left ventricle; LA - left atrium

measuring 9.0×3.3 cm within the SVC extending into the RA (Fig. 2a, 2b). Cardiac magnetic resonance (CMR) imaging demonstrated a heterogeneous mass within the SVC extending into the RA. The mass appeared isointense on the T1-weighted images and slightly hyperintense on the T2-weighted images (Fig. 2c, 2d). Positron emission tomography (PET)/CT scan showed a mass with no significant uptake of 18F-fluorodeoxyglucose (FDG) (Fig. 2e). She underwent the surgical resection of the tumor and a reconstruction of SVC. During the operation, a soft and ashen mass, measuring 10×3×2.5 cm, was found to be located within the SVC extending into the RA (Fig. 2f). Histopathological examination revealed a thymoma (Fig. 2g, 2h). At the six-year follow-up, the patient is well without any evidence of tumor recurrence.

Thymoma is a rare epithelial tumor and its overall prevalence is approximately 0.15 cases per 100,000 population. Although thymoma may involve the pleura, pericardium, and great vessels, its extension into the RA via the SVC is exceptionally rare. Our case emphasizes that multimodality imaging is crucial in characterizing the thymoma and determining the surgical plan.

Informed consent: The informed consent was obtained from the patient for this study.

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Video 1. Transthoracic echocardiogram showing a mass within the superior vena cava.

Video 2. An apical four-chamber view demonstrating the mass extending into the right atrium.

Video 3. Color Doppler flow imaging indicating a narrowed blood flow in the superior vena cava.

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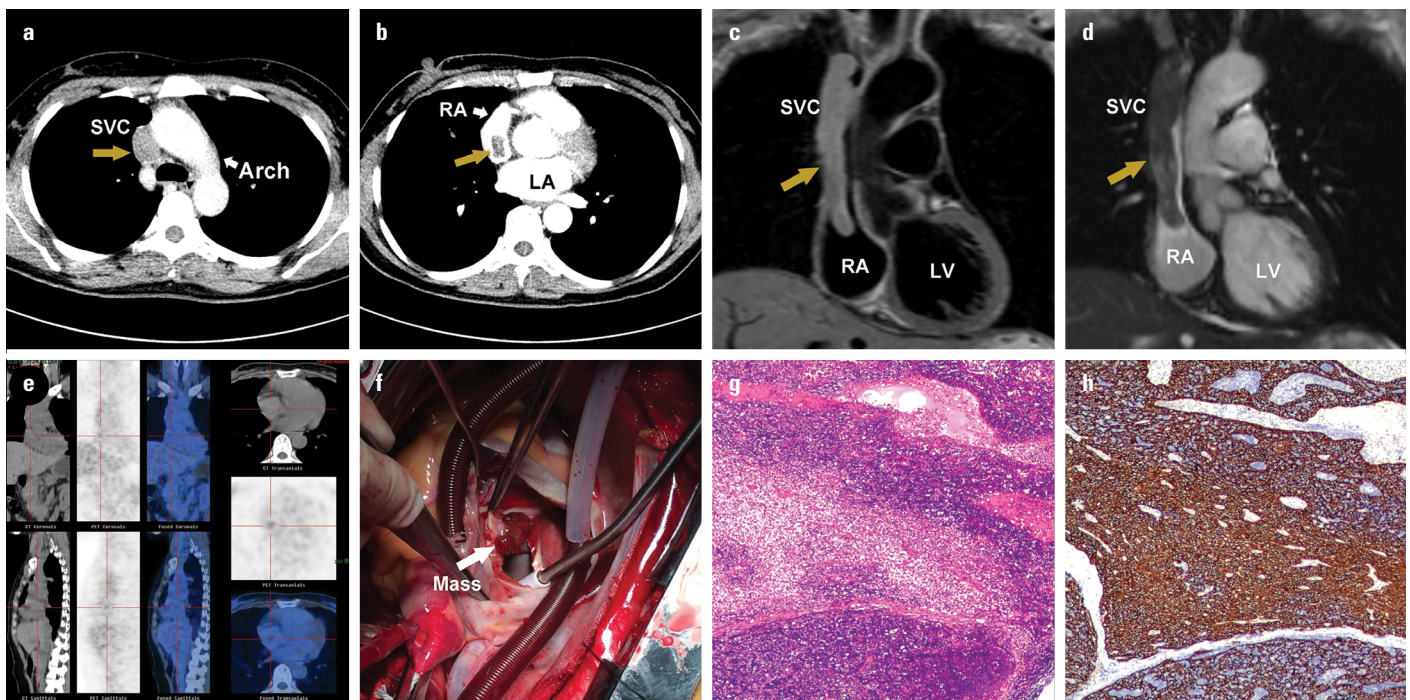


Figure 2. Contrast-enhanced computed tomography (CT) showing a mass within the (a) superior vena cava and (b) right atrium. The mass appears to be isointense on the (c) T1-weighted images and hyperintense on the (d) T2-weighted images of cardiac magnetic resonance scans. (e) Positron emission tomography (PET)/CT scan indicating a mass with no significant uptake of 18F-fluorodeoxyglucose. (f) Intra-operative photograph showing the mass in the right atrium. (g, h) Histopathological examination of the mass revealing a thymoma
SVC - superior vena cava; RA - right atrium; LA - left atrium; LV - left ventricle

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Clear demonstration of the different mechanisms of severe mitral regurgitation caused by mitral ring dehiscence during transesophageal echocardiography 🧐

A 55-year-old man was admitted to the outpatient clinic with dyspnea that occurs with minimal effort. He had a mitral repair with a Memo annuloplasty ring due to severe mitral regurgitation (MR) associated with annular dilation caused by atrial fibrillation 3 years ago and there was no residual MR in the post-operative echocardiography. Transthoracic echocardiography

revealed a left ventricular ejection fraction of 55% and moderate-severe MR. Transesophageal echocardiography (TEE) was decided as a next step. Rocking prosthetic ring and dehiscence were present in the TEE views respectively, with a severe MR (Fig. 1a, Video 1, 2). There were two MR jets. As observed in the TEE views, the first jet originated from the perimitral ring, while the second jet came from the basal portion of the posterior mitral leaflet (PML), which was suitable with the location of the mitral ring suture (Fig.1b, Video 3). Interestingly, mitral ring dehiscence possibly led to the occurrence of a defect in the PML of the junction zone, and this defect emerged as another source of MR (Fig. 1c, 1d, Video 4). Another surgical treatment was planned.

Ring dehiscence is a rare clinical entity that usually leads to severe MR and requires urgent or emergent surgical reoperation (1). Endocarditis, trauma, or procedure-related issues may be responsible for triggering the dehiscence process, and progressive left ventricular geometric remodeling may also provoke the recurrence (2, 3). The characteristics of the tissue at the ring attachment areas are another important factor; therefore, weak and calcified tissues are more prone to separation from the ring (3). Also, attachment of the mitral ring to the basal portion of the PML in the previous surgery may lead to a predisposition for ring dehiscence, and the suture site on the PML served as an independent source of MR besides the jet from the perimitral ring. In this case, the TEE demonstrative images are presented to highlight this rare clinical condition.