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Coronary Arteriography as an Aid in Left Atrial Myxoma Diagnosis

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Abstract. In two cases of left atrial myxoma, coronary arteriography was helpful in the diagnosis because the angiogram showed "true" tumor vascularity, which differs from neovascularization seen in an organized thrombus. One patient had a small, highly vascular tumor in which echocardiography was not diagnostic. Coronary arteriography may be an important diagnostic aid for delineating intracardiac myxomas.

Key words: Atrial tumors, myxoma – Tumor vascularity – Coronary arteriography

Atrial myxomas are uncommon tumors and offer a diagnostic challenge owing to their inconsistent presenting signs and symptoms. Early diagnosis is essential for prompt surgical excision, thereby preventing life-threatening complications. Echocardiography has proved to be an excellent diagnostic tool, but false-positive and false-negative results have been reported [1, 2]. Contrast angiography is also very helpful; however, false-negative results are known to occur [3], particularly in cases of small tumors. Thus the use of additional diagnostic aids is worthwhile for this potentially curable condition.

Since 1975, five cases of atrial myxomas have been reported in the literature where tumor vascularity was demonstrated by coronary arteriography [2, 4–7]. The modality, however, has not been widely employed for diagnostic purposes. We describe two cases where coronary arteriography was helpful in making the diagnosis of left atrial myxoma.

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Case Reports

Case 1

A 53-year-old woman was admitted to the hospital with a two-week history of dyspnea on exertion. Physical examination was normal with the exception of bilateral basilar rates. Chest X-ray revealed a normal cardiac silhouette and evidence of pulmonary venous congestion. The electrocardiogram was normal. M-mode and two-dimensional echocardiography revealed a large echodense structure filling the left atrial cavity. Cardiac catheterization demonstrated a rise in the pulmonary capillary wedge pressure at 22 mm Hg with a mean diastolic gradient of 20 mm Hg across the mitral valve. Coronary arteriography showed an atrial branch from the proximal left circumflex artery, ending in a tumor blush in the left atrial cavity (Fig. 1A). Pulmonary angiography in levophase revealed a large rounded filling defect occupying nearly the entire cavity of the left atrium (Fig. 1B). A large myxoma (Fig. 1C) was excised from the left atrium using a biatrial approach (after Cooley and Norman) [8]. Histology showed characteristic findings of myxoma with only modest vascularity.

Case 2

A 73-year-old woman was admitted to the hospital with the complaint of recurrent syncope. Physical examination, chest X-ray, and 12-lead electrocardiogram were within normal limits. Echocardiography delineated small echo-densities in the left atrium, not typical of myxoma. Cardiac catheterization demonstrated normal right and left heart pressures. Coronary arteriography revealed two atrial branches from the left circumflex coronary artery that ended in a tumor blush in the left atrial cavity (Fig. 2A, B). Pulmonary angiography in levophase showed a small filling defect in the left atrial cavity (Fig. 2C). A small myxoma was excised from the left atrial cavity (Fig. 2D). A highly vascular and hemorrhagic myxomatous tumor was seen on histologic examination.

Discussion

These cases of left atrial myxoma illustrate the value of coronary arteriography in the diagnosis of cardiac myxomas. It is notable that in the second patient echocardiography was not diagnostic, most probably because of the highly vascular and

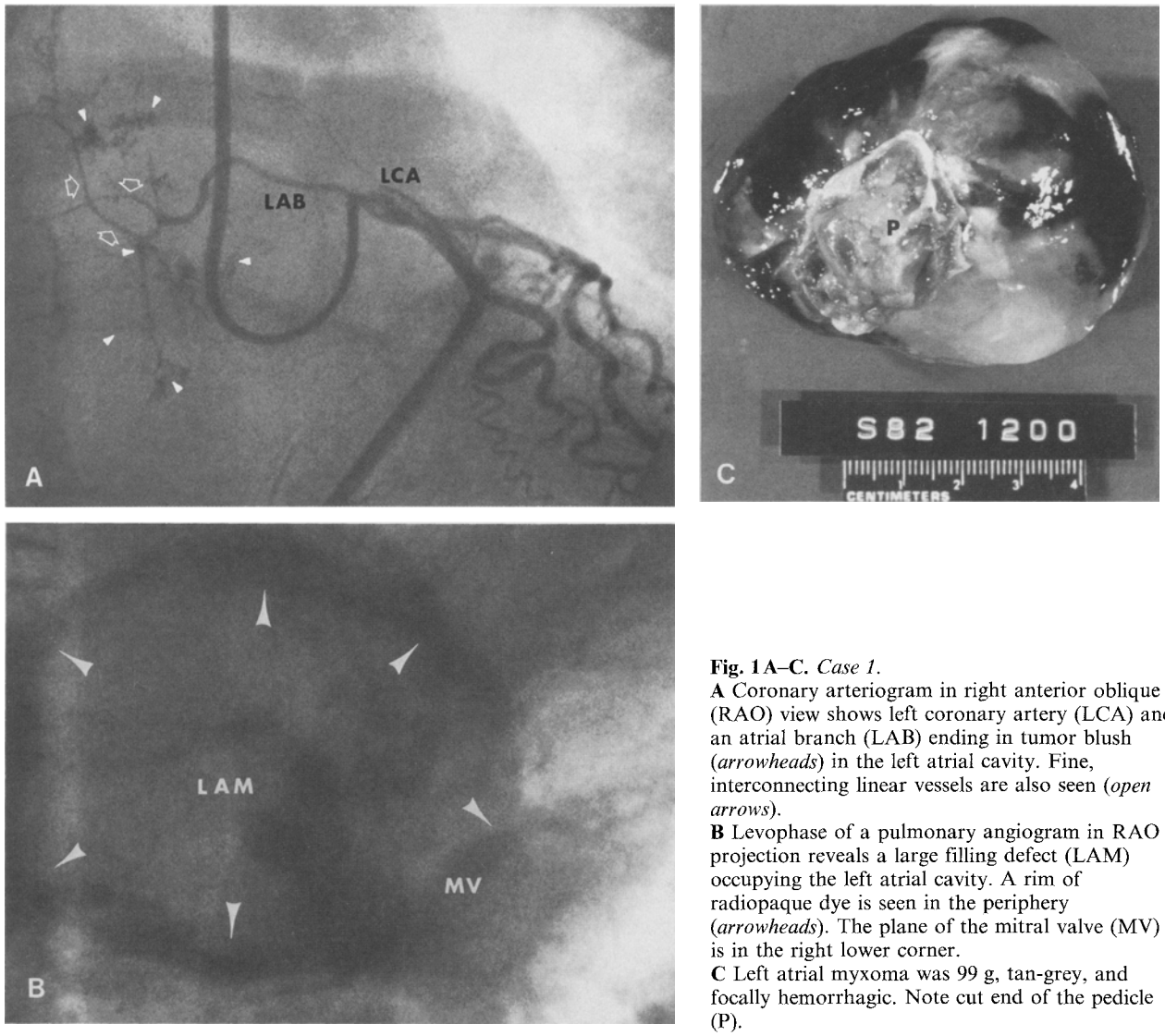
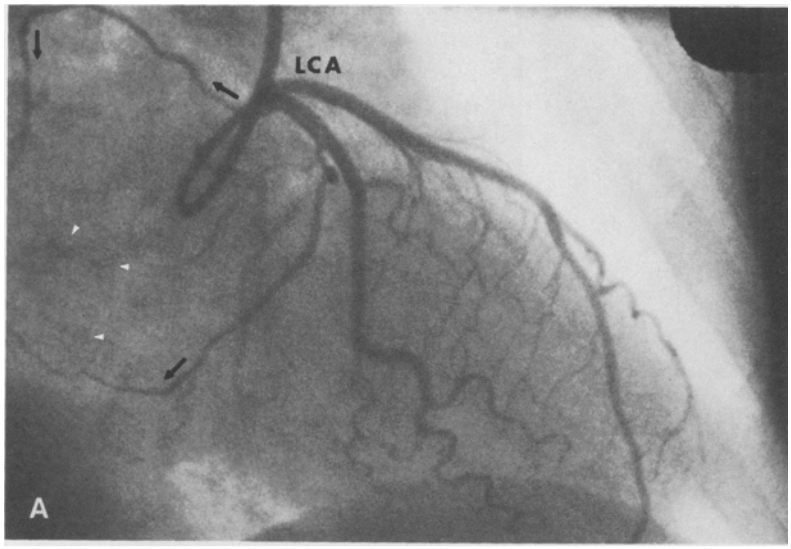


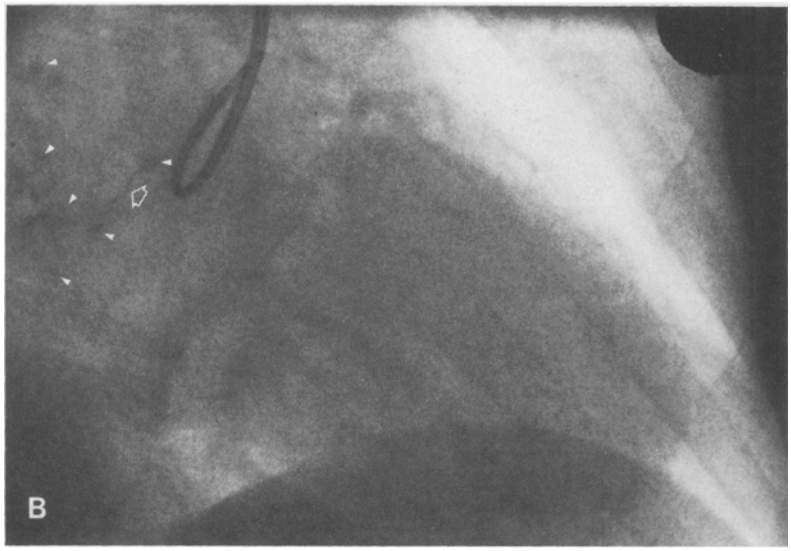
Fig. 1A–C. *Case 1.*
A Coronary arteriogram in right anterior oblique (RAO) view shows left coronary artery (LCA) and an atrial branch (LAB) ending in tumor blush (*arrowheads*) in the left atrial cavity. Fine, interconnecting linear vessels are also seen (*open arrows*).
B Levophase of a pulmonary angiogram in RAO projection reveals a large filling defect (LAM) occupying the left atrial cavity. A rim of radiopaque dye is seen in the periphery (*arrowheads*). The plane of the mitral valve (MV) is in the right lower corner.
C Left atrial myxoma was 99 g, tan-grey, and focally hemorrhagic. Note cut end of the pedicle (P).

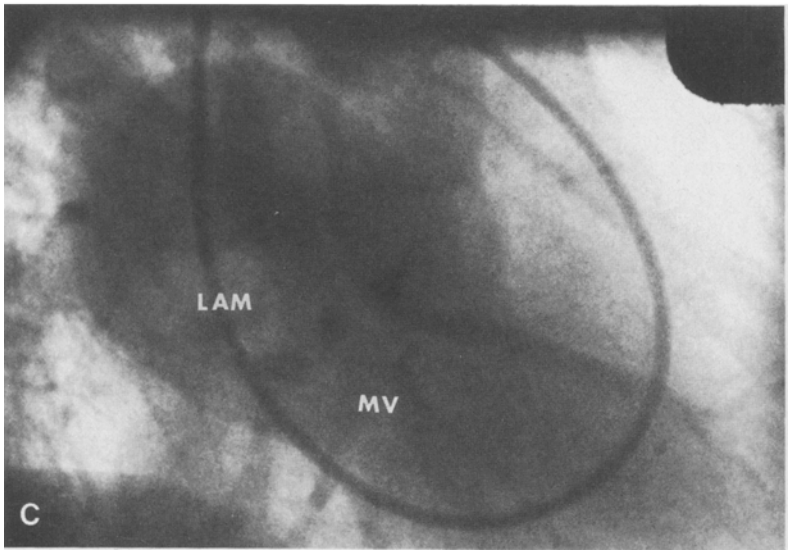
hemorrhagic nature of the tumor, making it acoustically similar to blood in the left atrial cavity. Stewart et al. [2] reported a similar observation. Coronary arteriography may well be superior to echocardiography for diagnosing such tumors. On the other hand, in our first patient, the tumor was larger, containing abundant stroma and only a few blood vessels. It was easily visualized by echocardiography. This case illustrates that arteriographic tumor blush is not a characteristic of highly vascular tumors only.

Myxoma is a neoplastic tumor and the presence of a pedicle, which also contains the tumor's blood supply, differentiates it from an organized thrombus [9]. The paucity of case reports demonstrating tumor blood supply is likely a result of failure to perform coronary arteriography to detect this relatively rare tumor. The procedure is easy to conduct and, we believe, should be used as a diagnostic aid. It may offer the additional advantage of uncovering myxomatous tumors in unusual locations in the heart. Both atrial and ventricular myxomas have been visualized with selective coronary angiography. Demonstration of pathologic vessels may require exposure at the end of the end of the arteriographic phase (see Fig. 2C). Theoretically, necrosis of the tumor, especially at the pedicle, may abolish the vascularity as is seen to occur in other tumors [10].

Neovascularization in an organized thrombus may produce a somewhat similar appearance during coronary arteriography [11, 12]. Closer scrutiny, however, will show subtle differences. If thrombus is present, lakelike vascular spaces are seen without intervening "capillaries" [11]. In our cases of myxoma, fine linear vessels were seen to







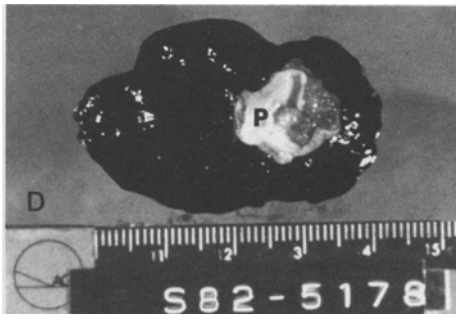


Fig. 2A–D. *Case 2.*
A Early phase of coronary arteriogram in RAO view shows left coronary artery (LCA) and two atrial branches (*arrows*) ending in a tumor blush (*arrowheads*) in the left atrial cavity.
B End of the arteriographic phase better delineates tumor blush (*arrowheads*). Note the interconnecting linear vessel (*open arrow*).
C Levophase of pulmonary angiogram in RAO projection reveals a small filling defect (LAM) in the left atrial cavity. Plane of the mitral valve (MV) is shown.
D Left atrial myxoma, is 10 g, gelatinous, tan-red. Note cut end of the pedicle (P).

interconnect with the vascular spaces (see Figs. 1A, 2C). Other case reports [2, 4], in which the illustrations are of good quality, when viewed carefully show a similar angiographic pattern. We believe that this finding represents "true" tumor vascularity.

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