VENTRICULOGRAFIA CARDÍACA

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Indicações

- Utilizada para paciente com doenças congênitas, valvopatias, coronariopatias e cardiomiopatias
- Avaliar fração de ejeção, mobilidade segmentar, aspecto das valvas e aspectos do músculo cardíaco (hipertrofia)

Cateteres de Injeção

- Adultos em geral 7 ou 8 F
- **Propriedades**
- Ofereça mínimo de resistência, rápida entrega do contraste e não cause distúrbios do ritmo cardíaco
- Diversos orifícios para evitar deslocamento, perfurações e arritmias

Tipos

- NIH ou Eppendorf
- Lehman
- Pigtail
- Cournand ou Multipurpose (pode dar resultados insatisfatórios)
- Gensini ou Sones (pode haver deslocamento)

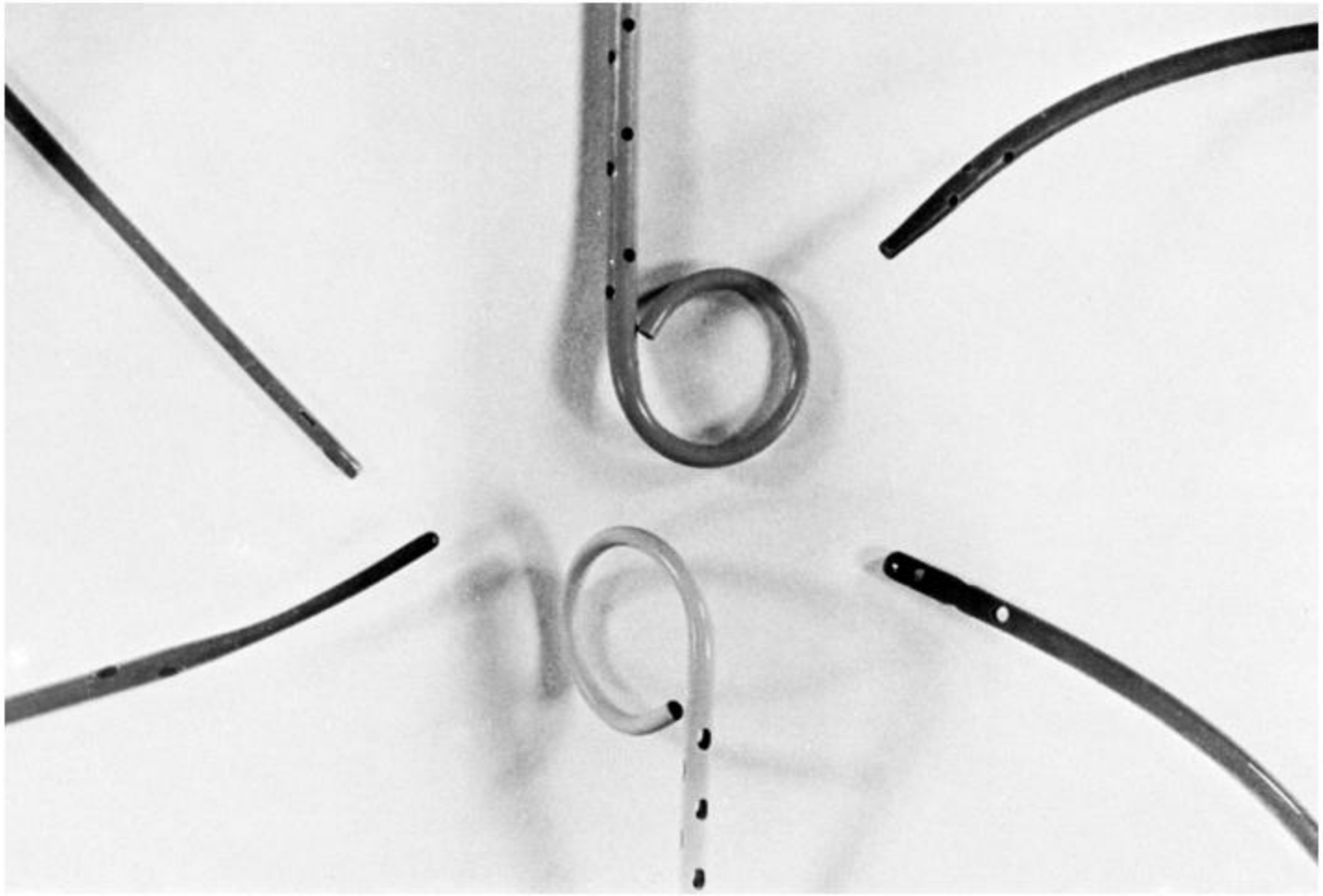

Figure 12.1 Examples of ventriculographic catheters (clockwise from the top): pigtail, 8F (Cook); Gensini, 7F; NIH, 8F; pigtail, 8F (Cordis); Lehman ventriculographic, 8F; Sones, 7.5F tapering to a 5.5F tip (see text for details).

Sítios de injeção

- **Cuidados**
- Não cause complicações mecânicas e elétricas
- Entrega ideal do meio de contraste na região do corpo e ápice do ventrículo
- Não haja interferência na valva mitral, causando regurgitação
- Não se encontre nas trabeculações para evitar lesões do miocárdio

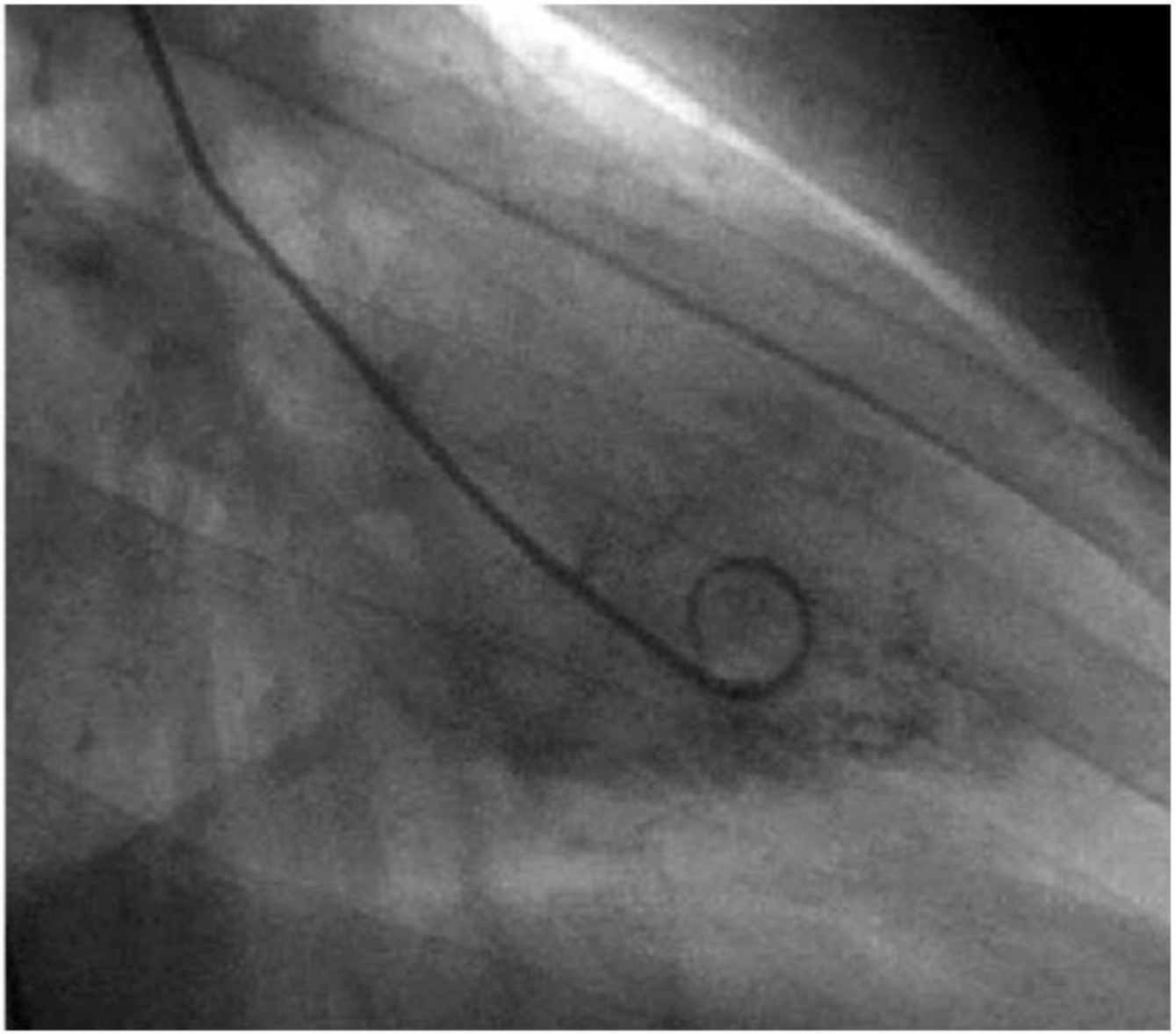

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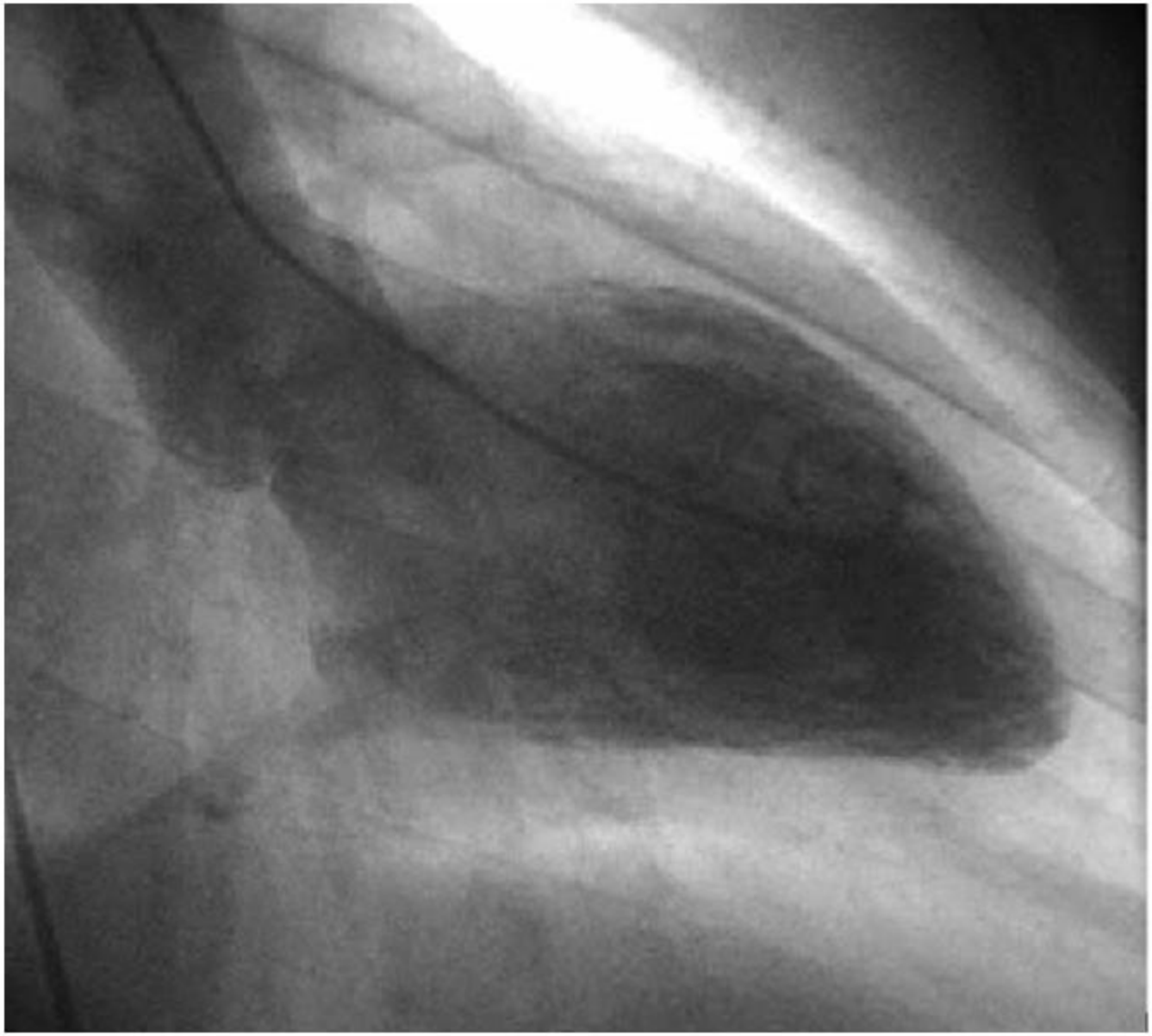
Figure 12.2A An example of midcavitary catheter position for 30° right anterior oblique left ventriculography using an angled pigtail catheter. **A.** Just before the injection of contrast material. **B.** At the end of rapid filling. **C.** At end-diastole (post A wave). **D.** End-systole.



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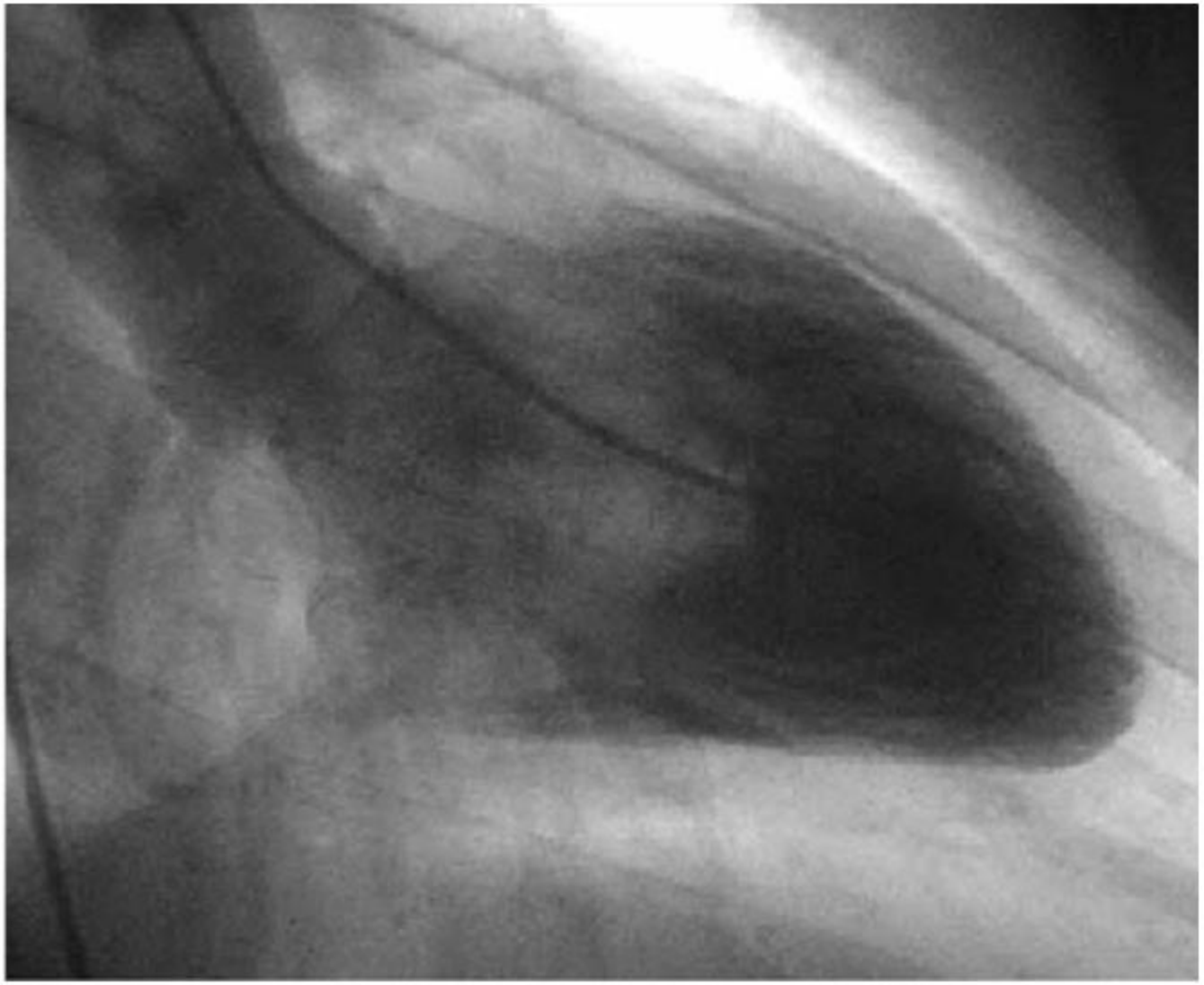

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Taxa e Volume de injeção

- **Tipos**
- Injeção por pressão
- Injeção por fluxo

- **Considerações**
- - Taxa 10-16 ml/seg e Volume máximo 30-55 ml
- - Sones não deve exceder 8-12 ml/seg
- - PCP>30, 12-16 ml/seg em 2 seg
- - pressão máxima 1000 psi
- - tipo e tamanho de catéter
- - tamanho da camara cardíaca
- - stroke volume
- - hemodinâmica preventriculografia (PCP)

Taxa e Volume de injeção

- **Observações**
- Meios de contraste não iônico e sem agentes que atuam nos canais de cálcio permitem segurança no miocárdio com função comprometida
- Realizar teste com injeção de 3 a 5 ml
- Cuidados para evitar embolia sistêmica durante acionamento e enchimento

Projeções e Técnicas

- **Avaliações**
- Ventriculografia em único plano ou biplano (preferida)
- Biplana permite avaliar mobilidade segmentar do VE em coronariopatias, repercussão valvar e complicações
- Anatomia do trato de saída do VD, valva e artéria pulmonar
- Desvantagens: Custo do equipamento, imagens sobrepostas e maior exposição da equipe ao RX

Projeções e Técnicas

- RAO 30´ : avalia mobilidade, principalmente parede anterior, aneurisma e valva mitral
- LAO 60´ : Integridade do septo interventricular, mobilidade da parede posterolateral e valva aórtica

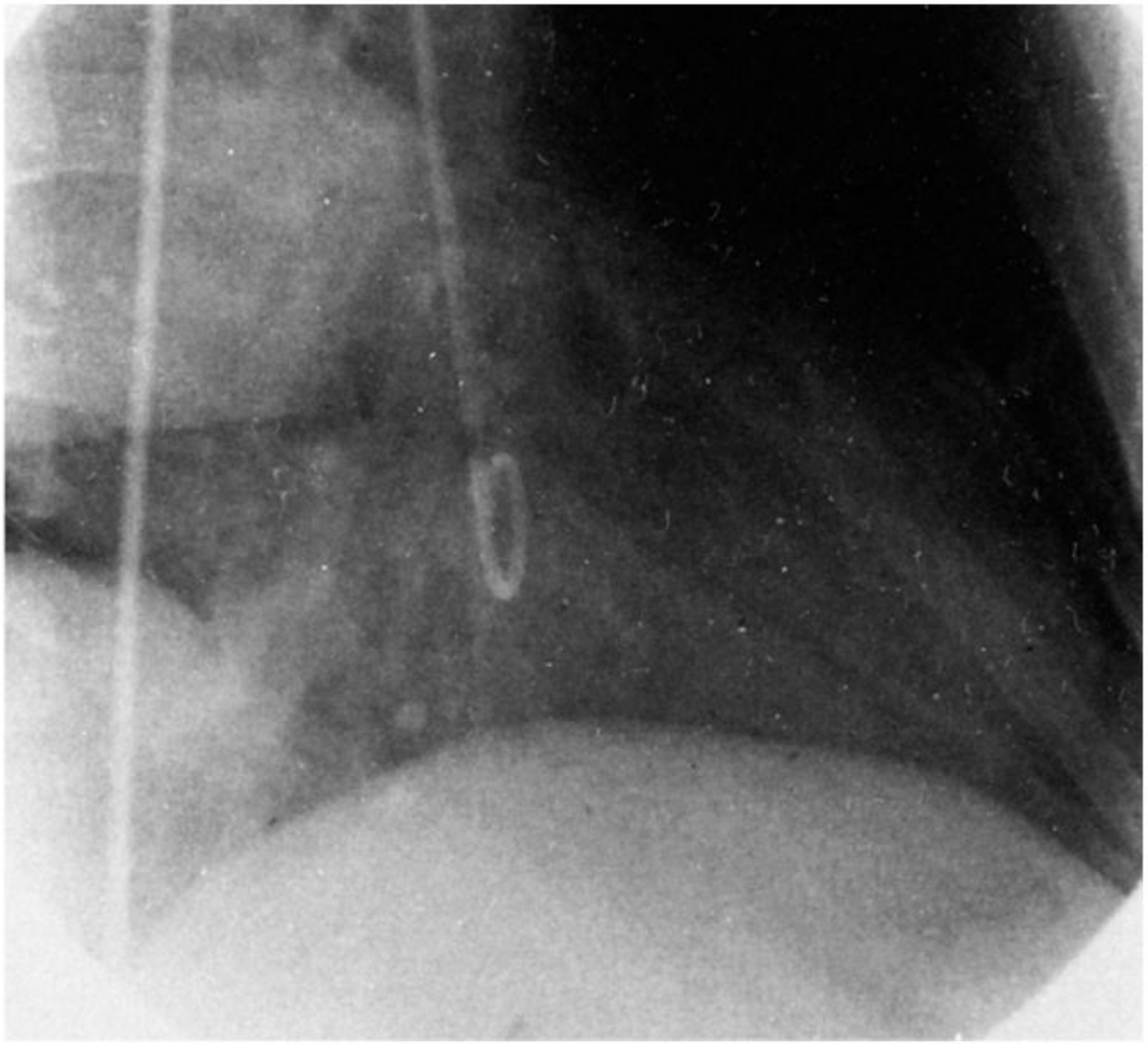

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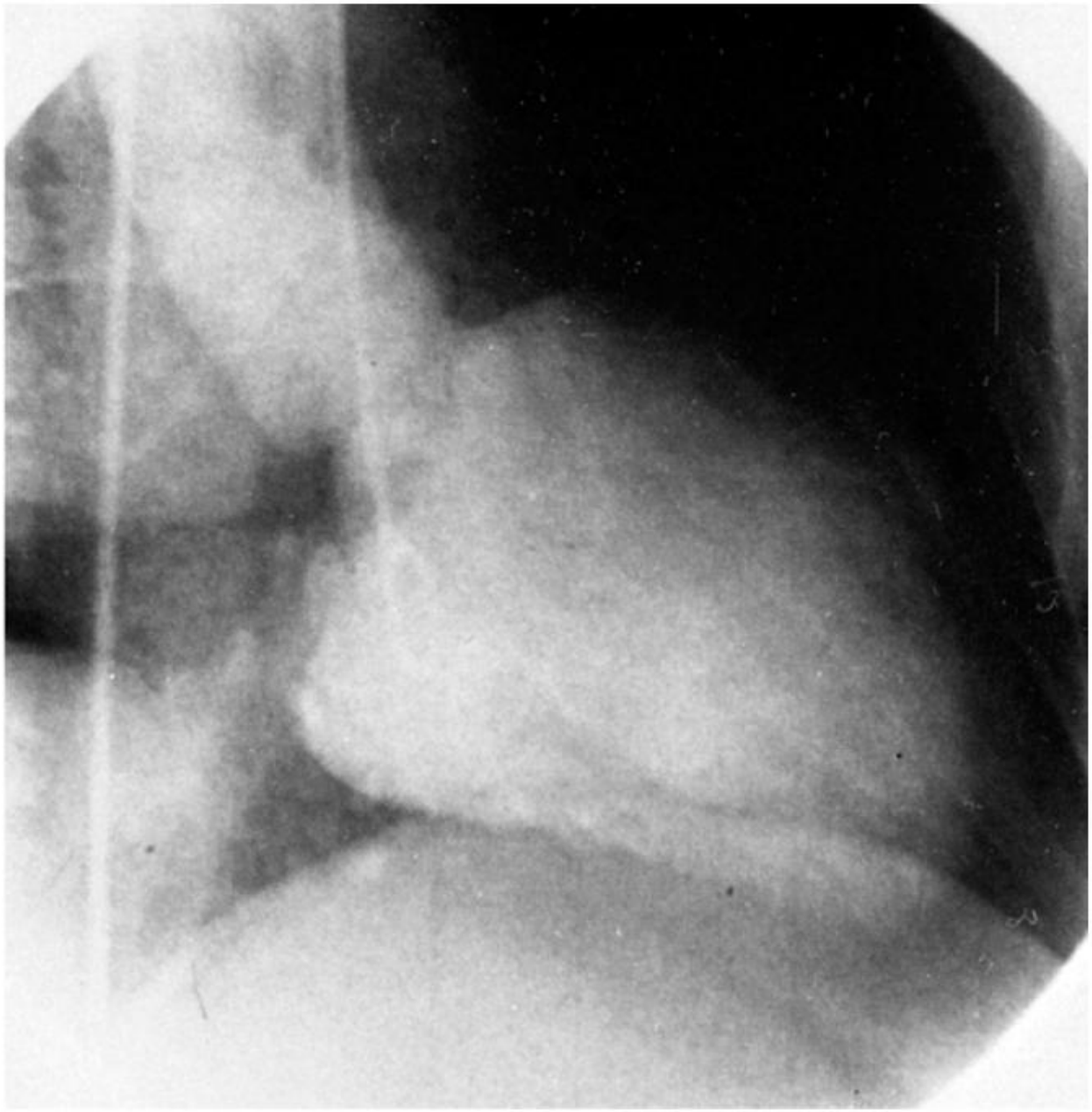
Figure 12.3A An example of a pigtail catheter positioned in the left ventricular inflow tract for 30° right anterior oblique left ventriculography. **A.** Before the introduction of contrast material. **B.** At end-diastole. **C.** End-systole. Note that this patient has a large anteroapical aneurysm with dyskinesis during systole.



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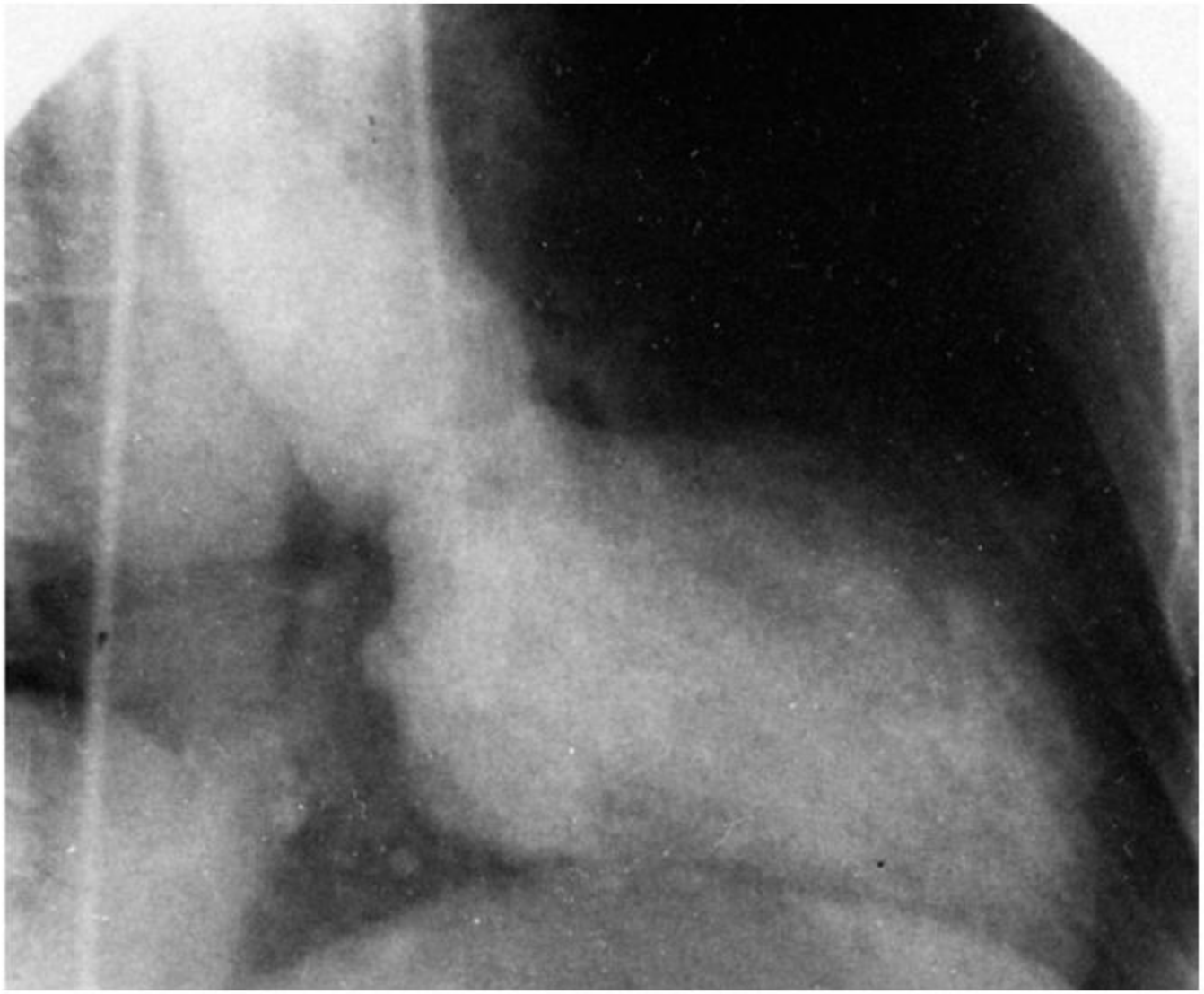

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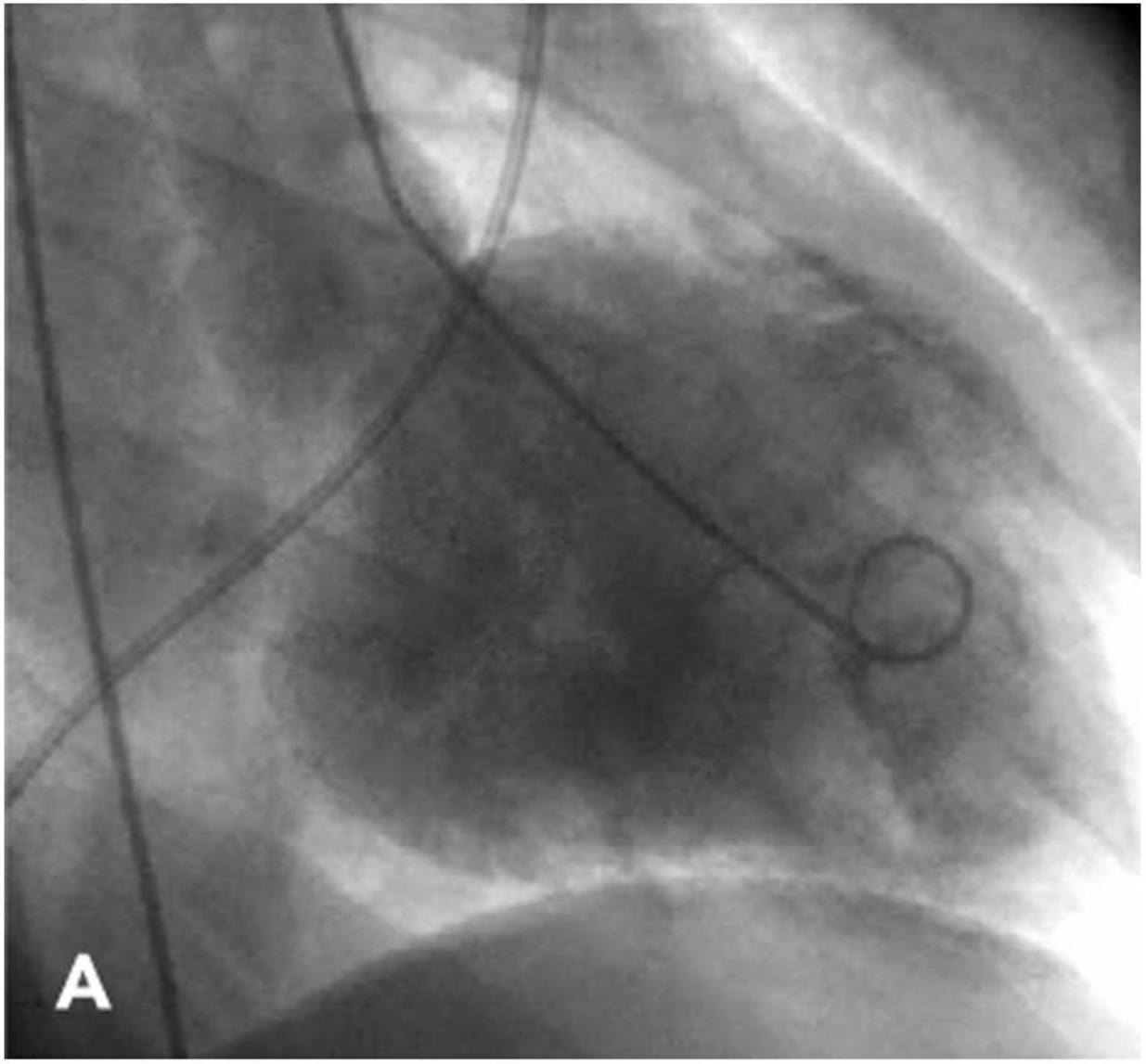
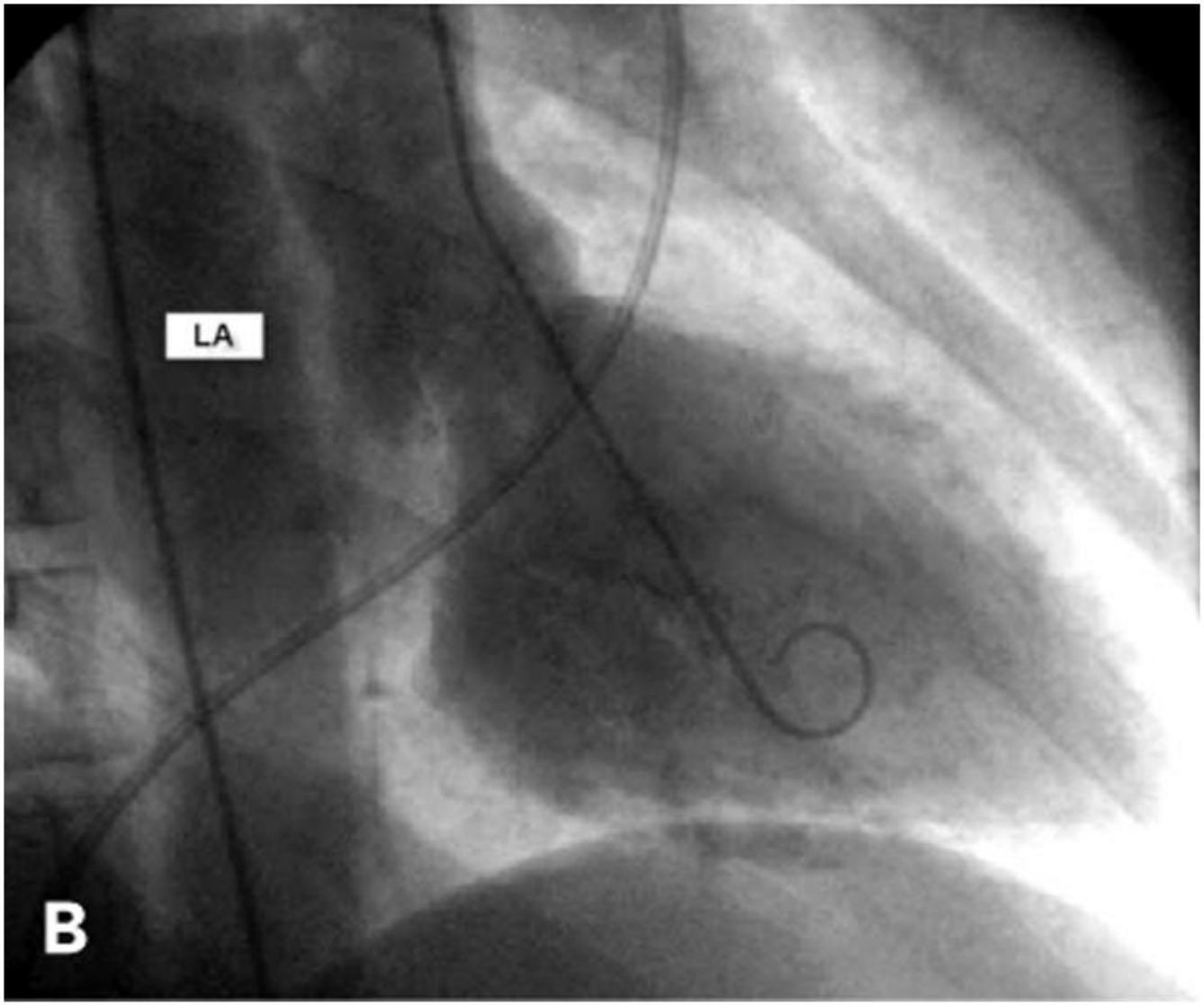


Figure 12.4A Mitral and tricuspid regurgitation. End-diastolic **(A)** and end-systolic **(B)** frames from a left ventriculogram performed in the 30° RAO projection in a patient with normal coronaries and presumptive AIDS cardiomyopathy, showing enlarged end-diastolic and end-systolic volumes, reduced ejection fraction of 38%, and 2+ mitral regurgitation. Note dye to the enlarged left atrial volume; the contrast density method underestimated the severity of regurgitation, shown to be moderately severe by a regurgitant fraction of 36% and transesophageal echo. End-systolic **(C)** frame from a right ventriculogram in the same patient performed in the 30° RAO projection showing 2+ tricuspid regurgitation (LA, left atrium; RA, right atrium; PA, pulmonary artery).



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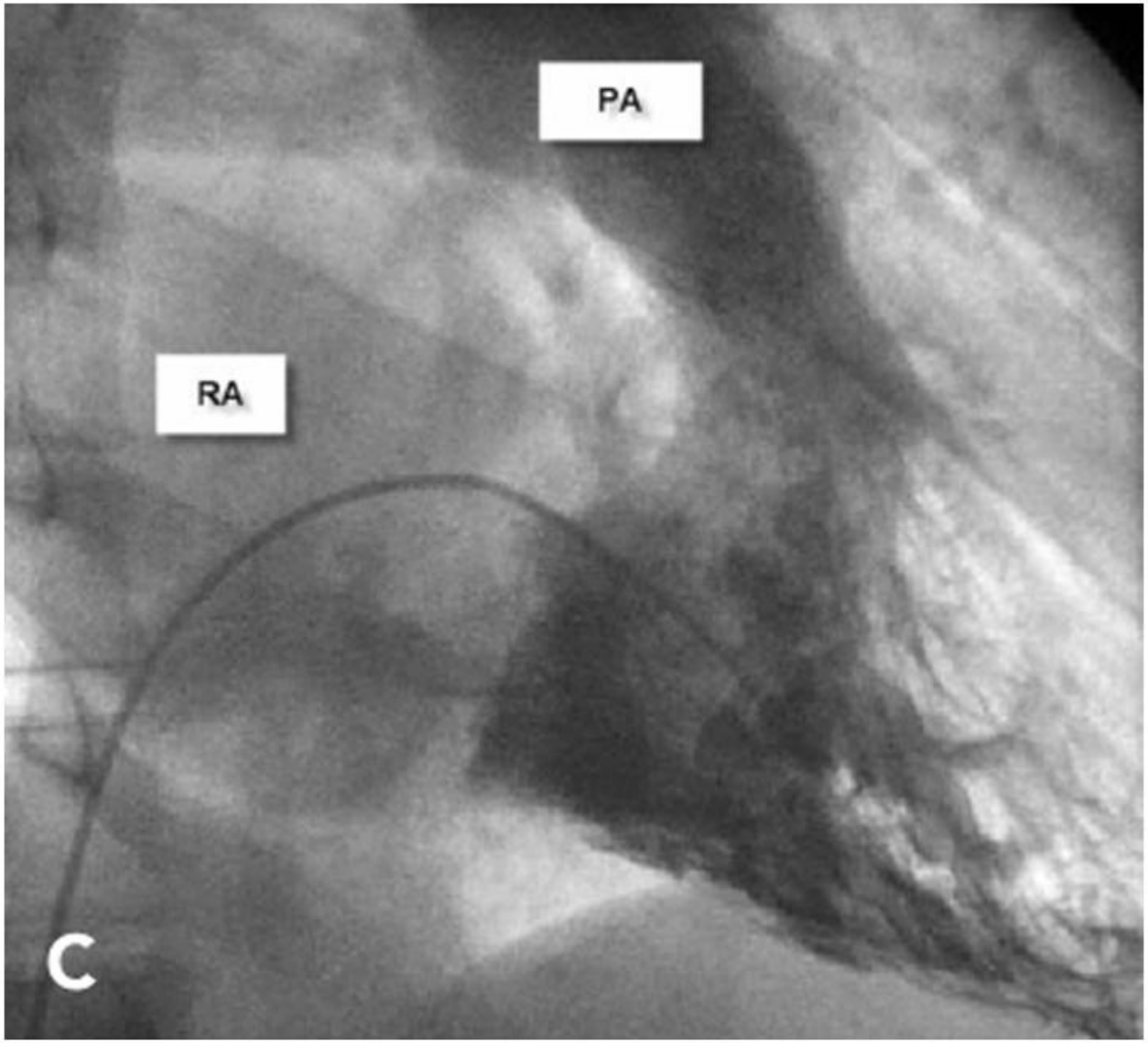

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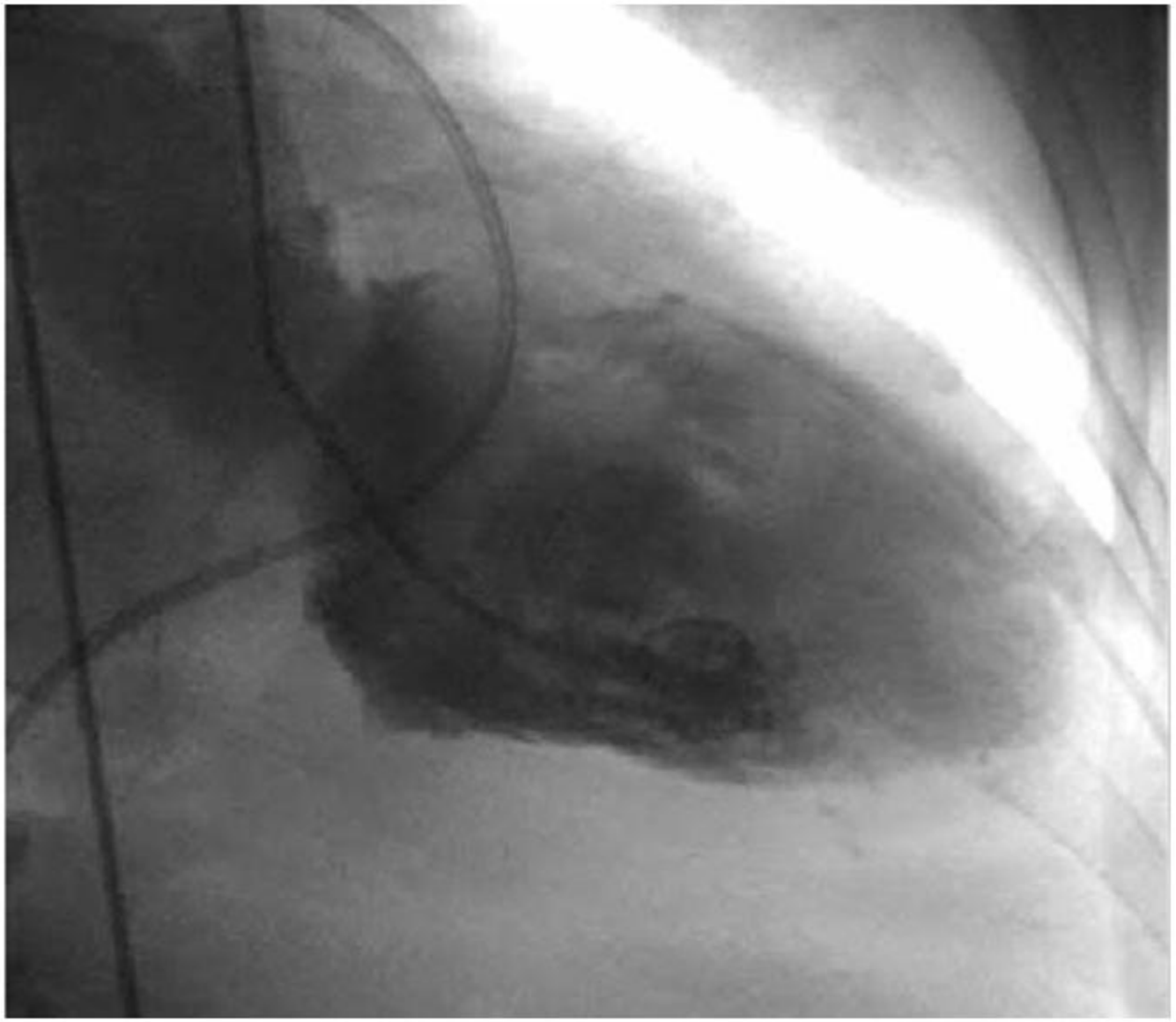
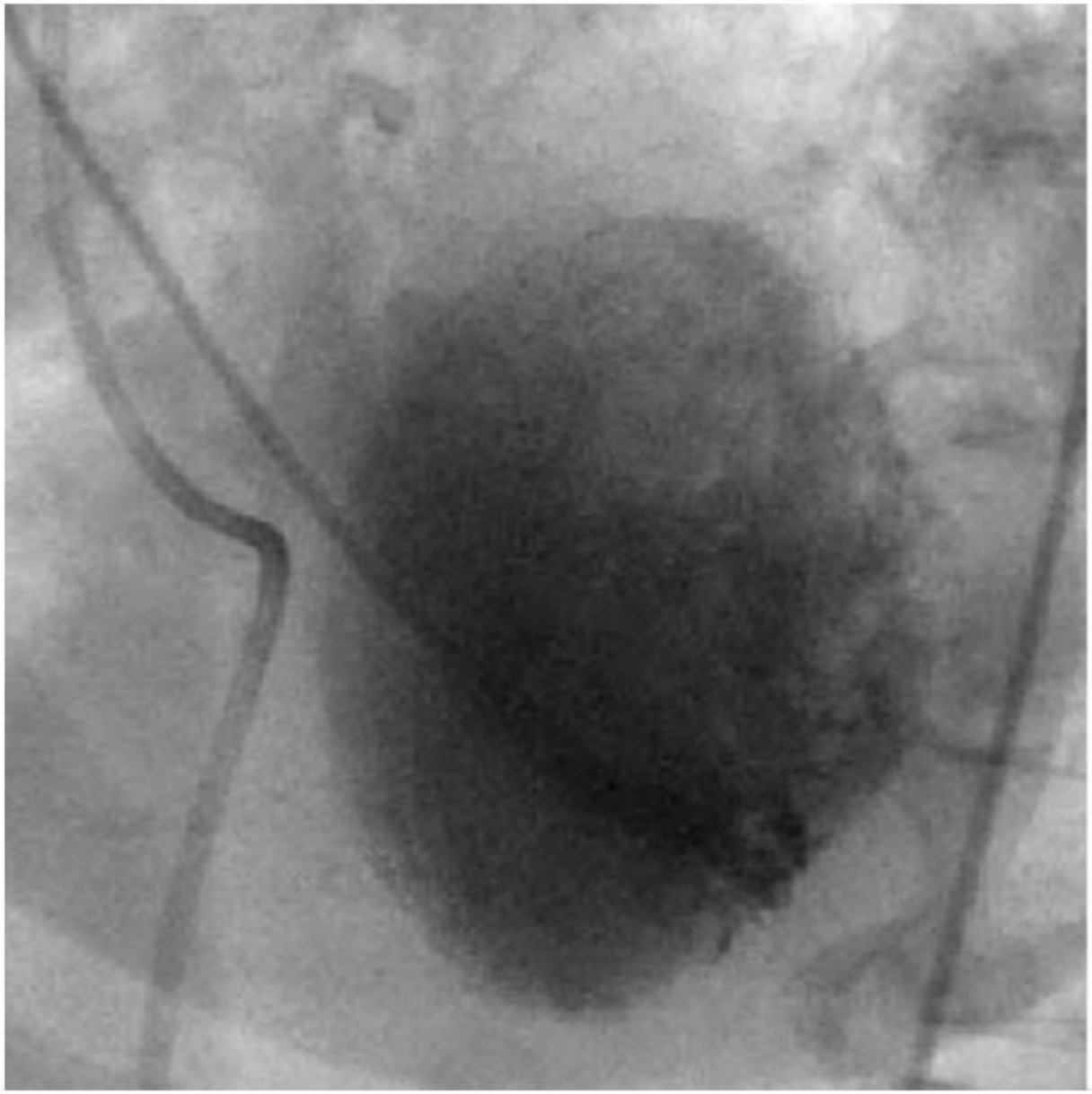


A

Figure 12.5A Biplane left ventriculogram in a patient with an acute lateral wall myocardial infarction owing to occlusion of the circumflex coronary artery. **A.** End-diastolic frame in the 30° RAO projection. **B.** End-diastolic frame in the 60° LAO, 15° cranial projection. **C.** End-systolic frame in the RAO projection showing midinferior wall hypokinesis and 3+ mitral regurgitation. **D.** End-systolic frame in the LAO projection showing akinesis of the lateral wall.



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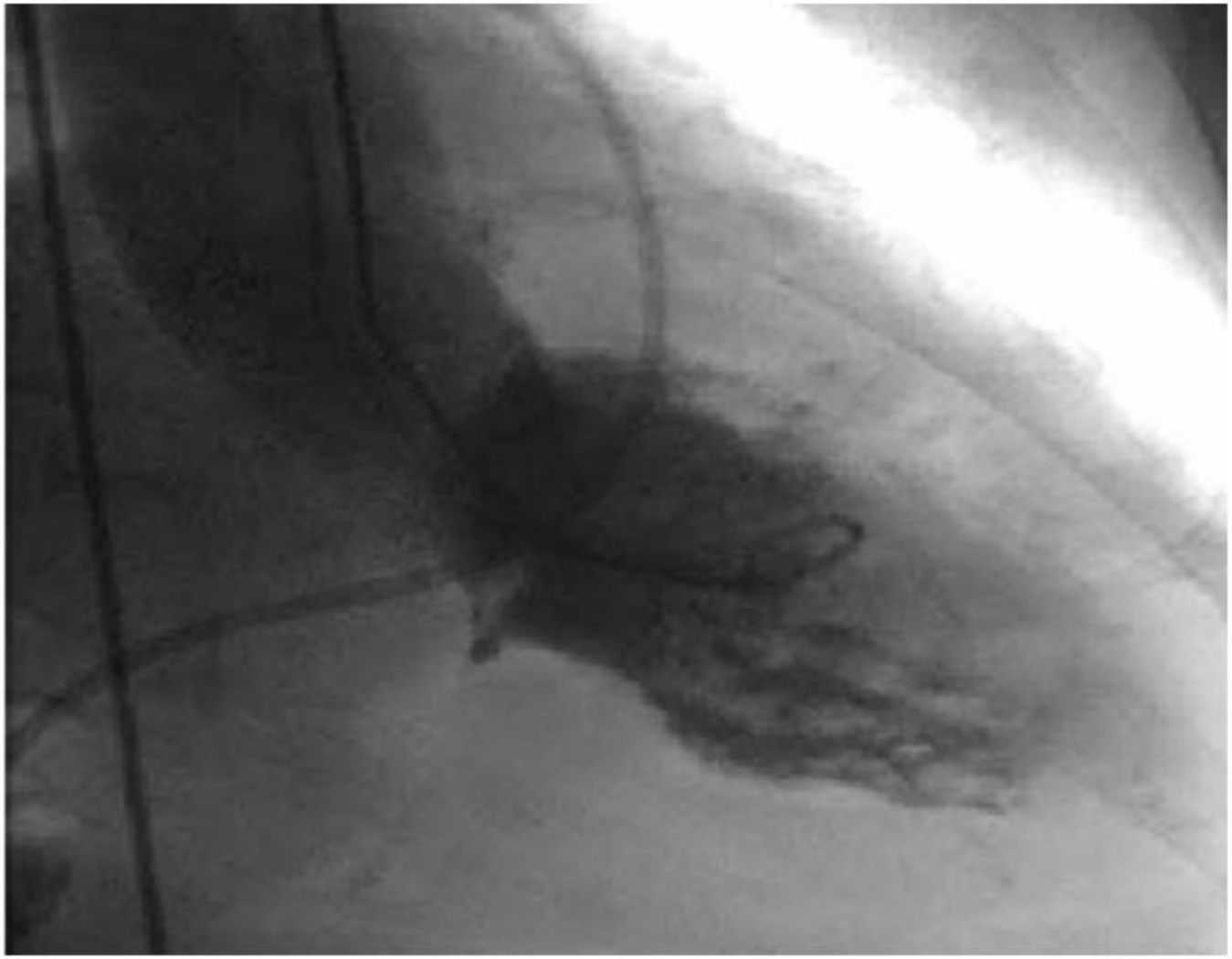

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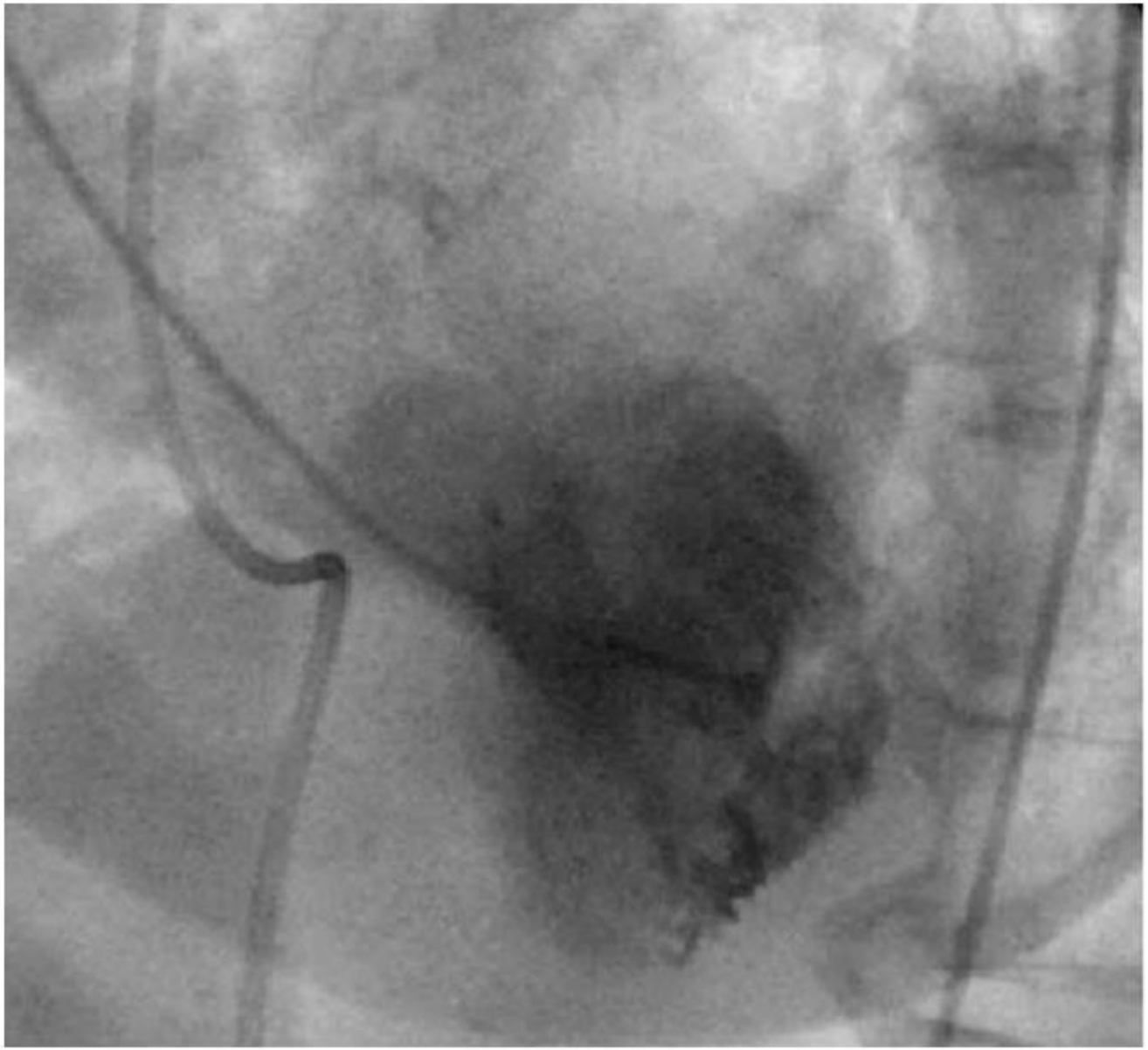


D

Figure 12.5D Biplane left ventriculogram in a patient with an acute lateral wall myocardial infarction owing to occlusion of the circumflex coronary artery. **A.** End-diastolic frame in the 30° RAO projection. **B.** End-diastolic frame in the 60° LAO, 15° cranial projection. **C.** End-systolic frame in the RAO projection showing midinferior wall hypokinesis and 3+ mitral regurgitation. **D.** End-systolic frame in the LAO projection showing akinesis of the lateral wall.

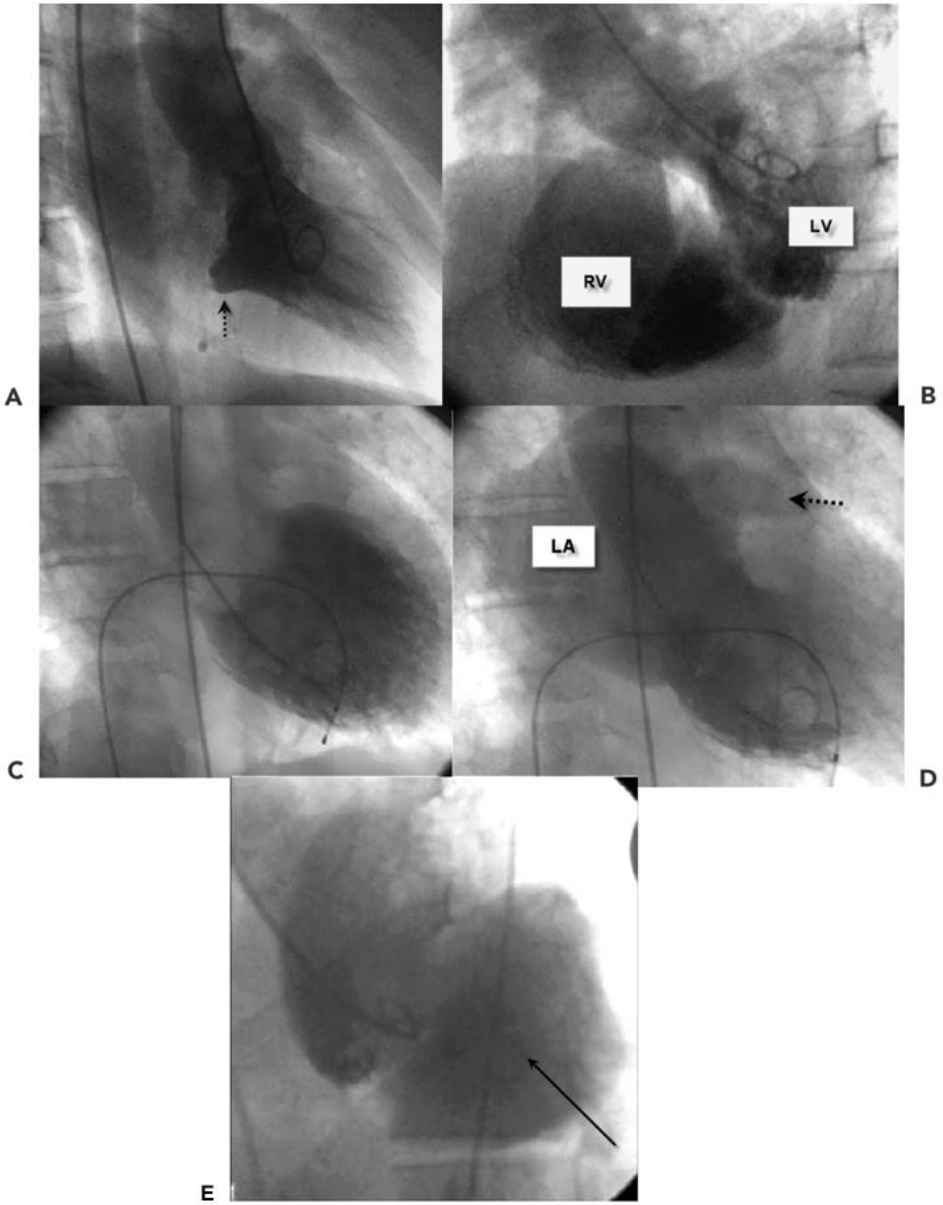


Figure 12.6 Various other pathology seen on left ventriculography. **A.** Mitral valve prolapse, with prolapse of a thickened posterior leaflet behind the fornix *(dotted arrow)* and mitral regurgitation in the RAO projection. **B.** Ventricular septal defect 3 days post inferior myocardial infarction owing to single-vessel right coronary occlusion, with contrast crossing from left to right ventricles in the LAO-cranial projection. **C and D.** Papillary muscle rupture 5 days post inferior myocardial infarction (diastolic and systolic frame respectively, showing dense contrast filling the left atrium and left atrial appendage *(arrow).* **E.** Pseudoaneurysm (contained myocardial rupture, *arrow*) seen several weeks following a lateral wall myocardial infarction owing to single-vessel circumflex marginal disease.

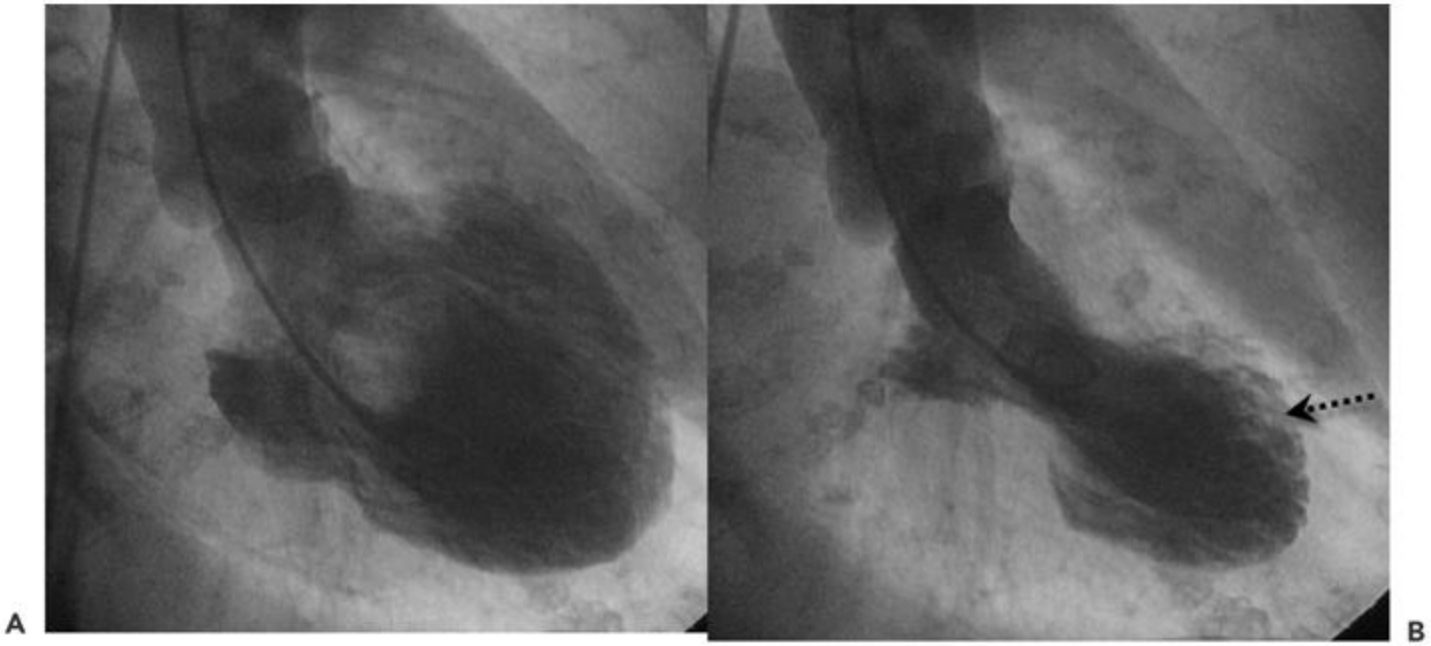
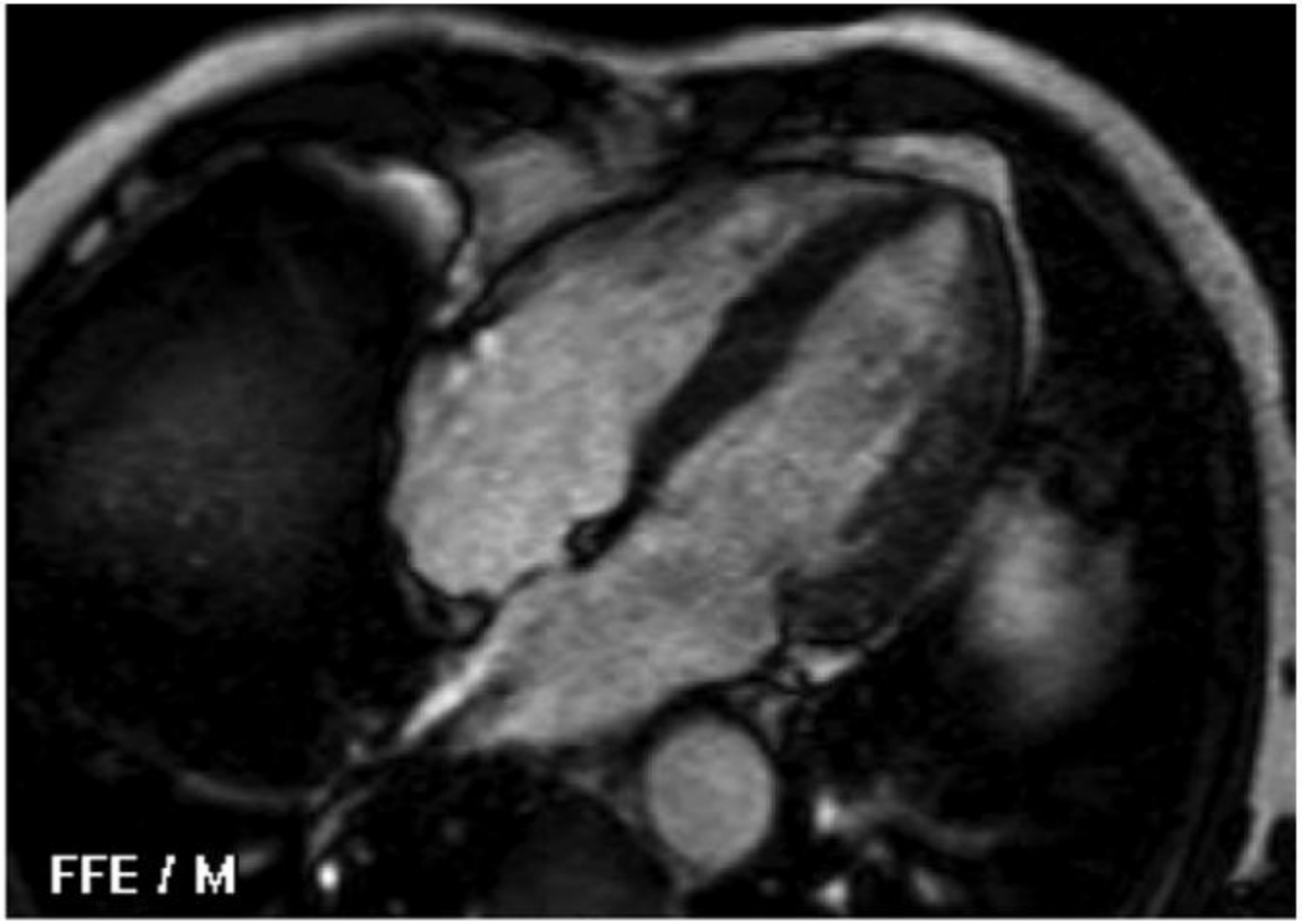
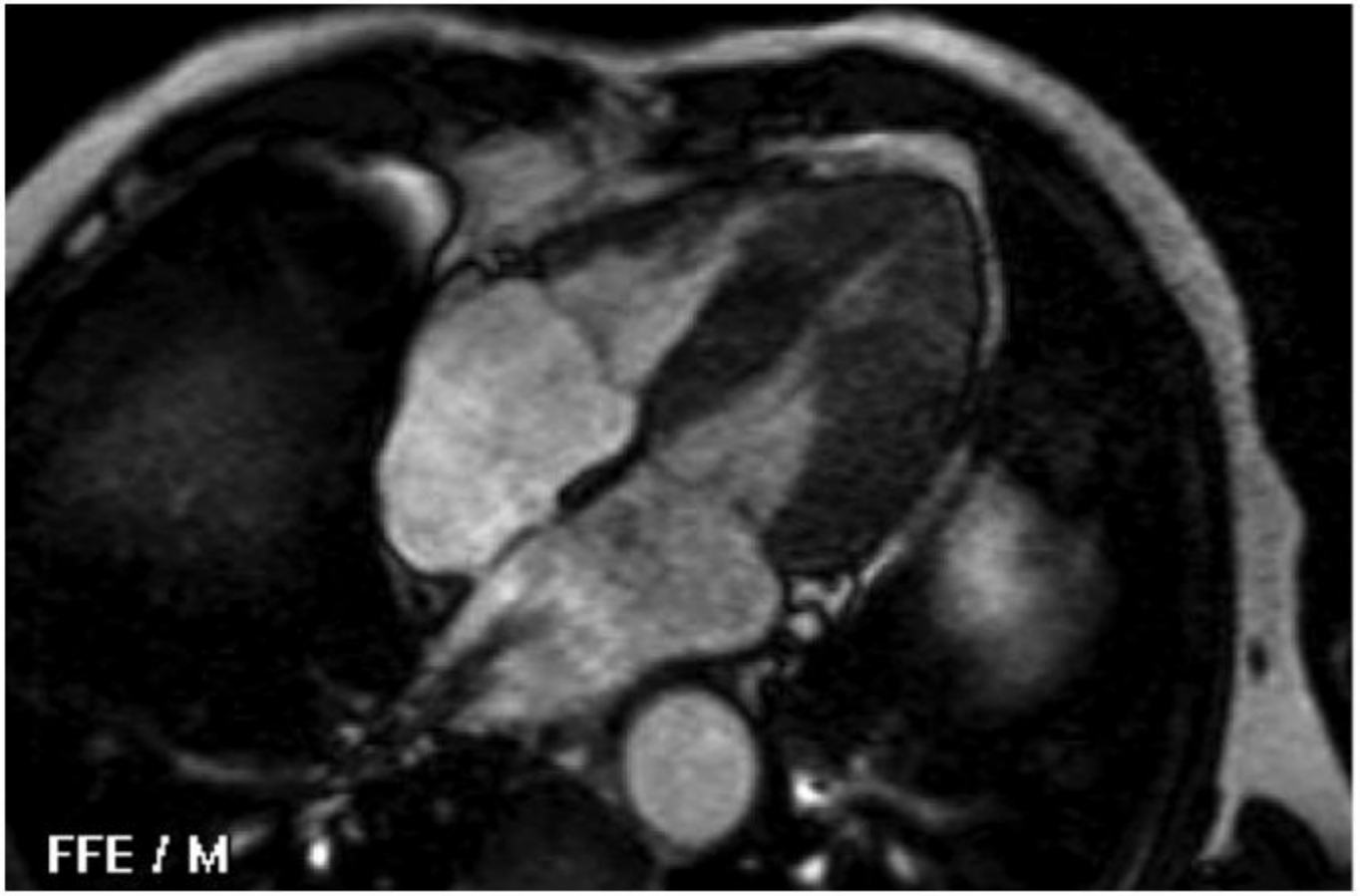


Figure 12.7 Tako-tsubo heart. A 71-year-old woman under extreme emotional stress presented with anterior ST-segment elevation, elevated creatine phosphokinase isoenzymes, and diffuse akinesis of the left ventricular apex (including both anterior and inferior aspects), resembling the shape of a Japanese octopus trap (tako-tsubo; narrow neck and round bottom), despite angiographically normal coronary arteries. Within 3 weeks, left ventricular function had returned to near normal. The mechanism is believed to be intense sympathetic arteriolar vasoconstriction involving the apical myocardium. (Case provided by Alan Yeung, M.D., Stanford University. See also Wittstein IS, et al, Neurohumoral features of myocardial stunning due to sudden emotional stress, *N Engl J Med* 2005; 352:539–548)



A

Figure 12.8A Frames from a magnetic resonance (MR) ventriculogram in end-diastole **(A)** and end-systole **(B)** in a patient with aortic stenosis, left ventricular hypertrophy, and preserved ejection fraction. MR and echo assessments of ventricular function should be used liberally in lieu of contrast ventriculography in patients with hemodynamic instability, mural thrombus, or limited contrast tolerance.



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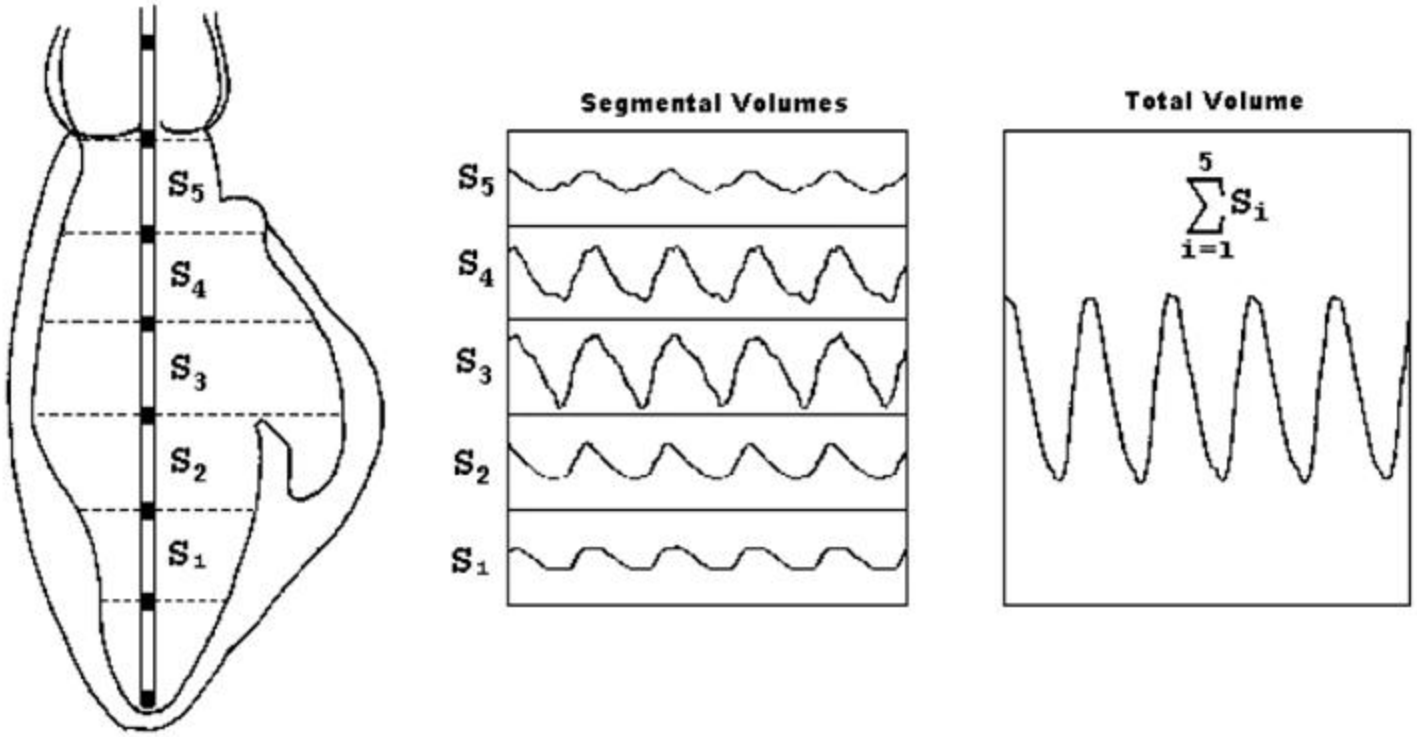

Figure 12.9 A left ventricular conductance (or impedance) catheter is shown in position along the left ventricular long axis, with calculated segmental volumes between each intervening electrode pair summed to provide the total instantaneous ventricular volume.

Ventriculografia de intervenção

- 1) Incremento da mobilida segmentar mediante catecolaminas em caso de cardiopatia isquêmica aguda grave
- 2) Paciente com quadro de EAP pode ser realizado uso de nitroglicerina
- 3) Marcapasso para distúrbios do ritmo cardíaco
- 4) Drogas para compensação clínica em caso de disfunção valvar (ax: nitroprussiato na IM)

Complicações

- Arritmias
- Injeção intramiocárdica
- Embolia
- Contraste causando vasodilatação e consequentemente queda da PA, aumento da FC e naúseas