

# CLINICAL CARDIOLOGY: PHYSICIAN UPDATE

## Memories of Patients With a Giant Left Atrium

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**Abstract**—This article emphasizes that the abnormalities noted on chest x-ray films of the chest can be diagnostic of giant left atrium. It also points out that a giant left atrium that occasionally occurs in patients with rheumatic mitral valve regurgitation does not occur in patients with mitral regurgitation due to other causes. (*Circulation*. 2001;104:2630-2631.)

**Key Words:** atrium ■ regurgitation ■ diagnosis ■ rheumatic heart disease

The x-ray film of the chest showing a giant left atrium that was displayed on the front cover of the August 7, 2001, issue of *Circulation* brought back past memories of a condition that is rarely seen today (Figure 1). The interesting article by Schwartzman and White<sup>1</sup> from which the photograph was taken appeared on the *Circulation* Website.

I was first introduced to a giant left atrium in the late 1940s when I arrived at the Massachusetts General Hospital to begin my cardiology fellowship with Dr Paul White. Dr White had created a cardiac museum in a small room off of the cardiology conference room, which was located in the basement of the Bulfinch building.

There it was—in a huge jar—the largest left atrium I had ever seen. The right atrium was also enlarged, but it was the huge left atrium that dwarfed the size of the larger-than-normal ventricles. A photograph of the heart that I think is the one in the jar is shown and discussed in the first edition of Dr White's classic book *Heart Disease*, which was published in 1931<sup>2</sup> (Figure 2).

During my fellowship, I observed a patient with a giant left atrium and studied the records of several other patients with the same unusual condition. This is what I learned.

- A giant left atrium is defined as one that touches the right lateral side of the chest wall.
- The condition is caused by rheumatic mitral valve disease; mitral regurgitation is more prominent than mitral stenosis. Atrial fibrillation is always present. The murmur of severe

mitral regurgitation is present and, as expected, a diastolic rumble is heard at the apex. The diastolic rumble is thought to be due, for the most part, to the massive amount of blood that crosses the mitral valve during diastole, rather than to significant stenosis of the valve.

- The chest x-ray film is often thought to show right pleural fluid. An attempt to aspirate this fluid was made by the doctor of one of the patients I studied, but the attempt was discontinued when the syringe became filled with blood.
- One patient complained of dysphagia, undoubtedly due to esophageal compression produced by the giant left atrium.
- When the patient I was following with a giant left atrium was asked to walk step by step with a patient with severe mitral stenosis, the patient with mitral stenosis had more dyspnea. This led me to wonder if pulmonary edema occurs less often in patients with a giant left atrium. If that were true, I wondered if the large and expandable left atrium blunted the rapid rise in pulmonary venous pressure.

It is interesting to note that computed tomography, without contrast media, revealed a 16×16-cm “right chest mass” in the patient discussed by Schwartzman and White.<sup>1</sup> This prompted them to obtain a biopsy of the mass. The attempt was aborted when “sanguineous fluid spurting from the trocar.”<sup>1</sup> An MRI was used to make the diagnosis of a “massively dilated left atrium.” It has been my experience that an x-ray film of the chest, such as the one shown by Schwartzman and White,<sup>1</sup> is diagnostic of a giant left atrium; no other condition produces such an unusual abnormality, and no other diagnostic tests are needed.

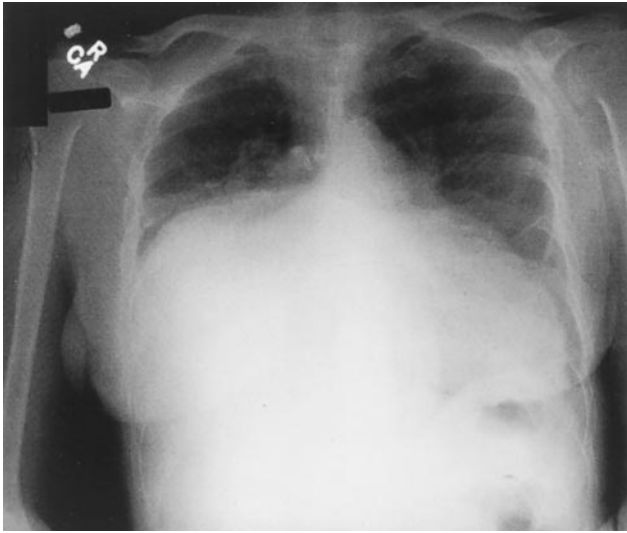
It was gratifying to read that talented cardiac surgeons reduced the size of the left atrium and repaired the mitral valve.

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**Figure 1.** This photograph of an x-ray film of the chest showing a giant left atrium appeared on the front cover of the August 7, 2001, issue of *Circulation*. Note that the huge left atrium touches the right lateral wall of the chest and not the left. Reproduced with permission from Reference 1.

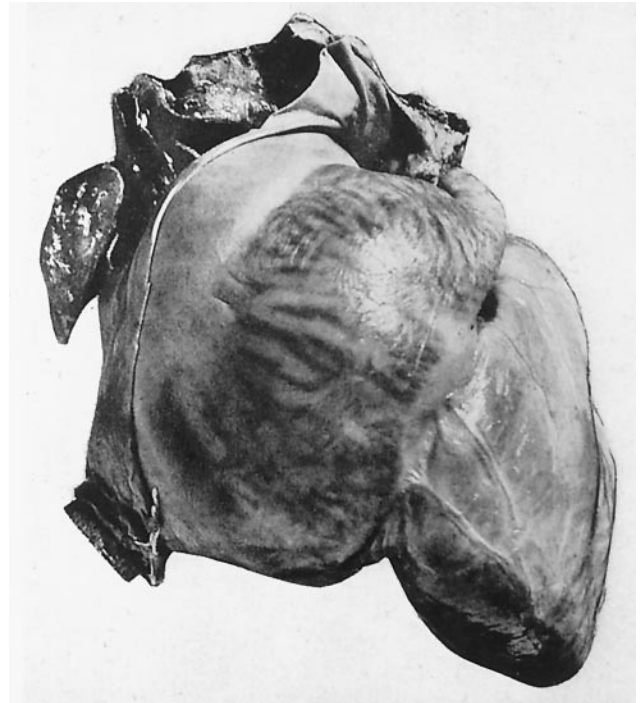
### Discussion

To the surprise of trainees in medicine, the normal left atrium is not located on the left. It is located in the middle of the chest. It is the most posterior chamber of the heart, and it abuts the spine and esophagus. When the left atrium enlarges, it moves rightward and will, in the giant left atrium syndrome, touch the right lateral wall of the chest.

Mitral stenosis produces quite a different picture on chest x-ray. The left atrial appendage may be seen below the shadow of the main pulmonary artery on the left heart border in the posteroanterior x-ray film of the chest in patients with rheumatic mitral stenosis. This makes a “4-bump” left heart border that includes the aortic knob, main pulmonary artery, left atrial appendage, and the left border of the left ventricle. The body of the left atrium may become larger than normal, but mitral stenosis never produces a giant left atrium.

Thinking further, one cannot help but wonder why the left atrium becomes so large in some patients with predominant mitral regurgitation due to rheumatic heart disease. My hypothesis is that rheumatic pancarditis damages the entire heart, including the left and right atria. The damaged left atrium then dilates more easily when mitral regurgitation fills the atrium with a large volume of blood. To support this assumption is the fact that I have never seen a giant left atrium result from severe mitral regurgitation due to a nonrheumatic cause. For example, severe mitral regurgitation due to mitral valve prolapse does not produce a giant left atrium, presumably because there is no associated primary left atrial disease.

There are many reports of a giant left atrium.<sup>2</sup> The patient reported by Minkowski and quoted by Dr White, may be the



**Figure 2.** This photograph was published in the first edition (1931) of *Heart Disease*. It shows the heart of a patient with a giant left atrium due to predominate mitral regurgitation secondary to rheumatic heart disease. The left atrium held 1760 cc of fluid and the right atrium held 650 cc of fluid. I think this is the same heart that was preserved in a jar in the cardiac museum adjacent to the cardiac conference room in the Massachusetts General Hospital in the late 1940s. Reproduced from Reference 2. The publisher of *Heart Disease* is no longer in existence. For this reason and because the book was published 70 years ago, the photograph is used under the fair use rules of copyright protection.

largest ever reported; that left atrium held 3000 cc.<sup>2</sup> The giant left atrium shown in Dr White’s book (and in Figure 2) held 1760 cc, and the right atrium held 650 cc.<sup>2</sup>

### Final Note

The prevalence of rheumatic heart disease has decreased considerably in the United States during the last 30 years. Therefore, a giant left atrium is not as likely to be seen in those born in the United States as it was in the late 1940s. However, we must be alert to the fact that many immigrants to the United States come from countries where rheumatic fever is still relatively common. Accordingly, we should not be surprised when we discover a giant left atrium in such patients.

### References

1. Schwartzman PR, White RD. Giant left atrium. *Circulation*. 2001;104:e28–29.
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*Circulation*. 2001;104:2630-2631  
doi: 10.1161/hc4701.100775

*Circulation* is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231  
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Print ISSN: 0009-7322. Online ISSN: 1524-4539

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