

2023

## Contained Left Ventricular Free Wall Rupture Following a Silent Myocardial Infarction

Sherif Elkattawy

*Cardiology Department, St. Joseph's University Medical Center, Paterson, New Jersey, USA.*

Jesus Romero

*Internal Medicine Department, RWJBarnabas Health/Trinitas Regional Medical Center, Elizabeth, New Jersey, USA, je-romeros@hotmail.com*

Ana L. Romero

*Internal Medicine Department, RWJBarnabas Health/Trinitas Regional Medical Center, Elizabeth, New Jersey, USA*

Omar Elkattawy

*Internal Medicine Department, Rutgers University-New Brunswick, Jersey City, New Jersey, USA.*

Roma Patel

*Internal Medicine Department, RWJBarnabas Health/Trinitas Regional Medical Center, Elizabeth, New Jersey, USA.*

Follow this and additional works at: <https://scholarlycommons.gbmc.org/jchimp>

See next page for additional authors

---

### Recommended Citation

Elkattawy, Sherif; Romero, Jesus; Romero, Ana L.; Elkattawy, Omar; Patel, Roma; Shamooun, Razan; and Shamooun, Fayez (2023) "Contained Left Ventricular Free Wall Rupture Following a Silent Myocardial Infarction," *Journal of Community Hospital Internal Medicine Perspectives*: Vol. 13: Iss. 6, Article 2.

DOI: 10.55729/2000-9666.1240

Available at: <https://scholarlycommons.gbmc.org/jchimp/vol13/iss6/2>

This Case Report is brought to you for free and open access by the Journal at GBMC Healthcare Scholarly Commons. It has been accepted for inclusion in Journal of Community Hospital Internal Medicine Perspectives by an authorized editor of GBMC Healthcare Scholarly Commons. For more information, please contact [GBMCcommons@gbmc.org](mailto:GBMCcommons@gbmc.org).

---

## Contained Left Ventricular Free Wall Rupture Following a Silent Myocardial Infarction

### Authors

Sherif Elkattawy, Jesus Romero, Ana L. Romero, Omar Elkattawy, Roma Patel, Razan Shamoan, and Fayez Shamoan

# Contained Left Ventricular Free Wall Rupture Following a Silent Myocardial Infarction

Sherif Elkattawy<sup>a</sup>, Jesus Romero<sup>b,\*</sup>, Ana L. Romero<sup>b</sup>, Omar Elkattawy<sup>c</sup>, Roma Patel<sup>b</sup>, Razan Shamoon<sup>a</sup>, Faye Shamoon<sup>a</sup>

<sup>a</sup> Cardiology Department, St. Joseph's University Medical Center, Paterson, NJ, USA

<sup>b</sup> Internal Medicine Department, RWJBarnabas Health/Trinitas Regional Medical Center, Elizabeth, NJ, USA

<sup>c</sup> Internal Medicine Department, Rutgers University-New Brunswick, Jersey City, NJ, USA

## Abstract

A left ventricular pseudoaneurysm (LVP) is defined as an outpouching contained by the surrounding pericardium. Clinical presentation is often nonspecific with patients presenting with chest pain, dyspnea, symptoms consistent with heart failure, and post-myocardial infarction.

Cardiac magnetic resonance imaging represents an important tool for differentiating a pseudoaneurysm from a true aneurysm. Furthermore, multiple imaging modalities are available, including transesophageal and transthoracic echocardiogram and contrast ventriculography, which remains the gold standard diagnostic technique.

Early recognition and prompt surgical management are of utmost importance in patients with acute and symptomatic LVP. On the other hand, medical management may be considered in patients with chronic and small pseudoaneurysms.

Here, we are presenting a 74-year-old lady who presented with chest pain and was found to have a chronic and small LVP which was managed conservatively.

**Keywords:** Pseudoaneurysm, True aneurysm, Cardiac magnetic resonance imaging

## 1. Introduction

A left ventricular pseudoaneurysm (LVP) represents an outpouching of the left ventricle which is encircled or contained by adherent pericardium or scar tissue. This clinicopathologic entity often occurred secondary to cardiac surgery, myocardial infarction, infection, or trauma. The clinical presentation may vary on a case-by-case basis and the patients can present with chest pain, dyspnea, congestive heart failure, or arrhythmia representing a diagnostic challenge.<sup>1,2</sup>

Multimodality imaging has been developed to characterize LVP, including echocardiography, cardiac magnetic resonance imaging, and computed tomography angiogram. In most cases, surgical intervention remains to be the gold-standard therapeutic approach; however, conservative management may be considered in an asymptomatic patient with a small-sized LVP (<3 cm). Furthermore, as time passes the left ventricular false cavity stabilized decreasing the risk of rupture.<sup>3</sup>

Here, we present the case of a 74-year-old lady who presented with chest pain and was found to have an LVP demonstrated by a transthoracic echocardiogram (TTE) which was managed conservatively.

## 2. Case presentation

This is a 74-year-old lady with a past medical history of type 2 diabetes mellitus, hypertension, coronary artery disease (CAD) s/p stent placement in 2013, and a history of ischemic stroke in 2017 who presented to the Emergency Department (ED) complaining of chest pain. The patient states that her chest pain started 2–3 days prior to presentation; she described the pain as sharp in quality, located in the left hemithorax, 8/10 in intensity, and lasting for around 5 min without radiation. Associated with the chest pain, the patient also endorsed multiple episodes of nausea and non-bilious, non-bloody vomits, prompting her to visit the ED.

In the ED the patient was hypertensive with a blood pressure of 197/78 mmHg, heart rate of 66

Received 29 March 2023; revised 8 June 2023; accepted 27 June 2023.  
Available online 4 November 2023

\* Corresponding author.  
E-mail address: [je-romeros@hotmail.com](mailto:je-romeros@hotmail.com) (J. Romero).

<https://doi.org/10.55729/2000-9666.1240>

2000-9666/© 2023 Greater Baltimore Medical Center. This is an open access article under the CC BY-NC license (<http://creativecommons.org/licenses/by-nc/4.0/>).

beats per min, respiratory rate of 16 breaths per min, a temperature of 97.4 Fahrenheit, and saturating 98% on room air. On physical examination, the patient was comfortable and in no acute distress, bilateral breath sounds were evidenced on lung auscultation without wheezing, rales, or rhonchi. On cardiac auscultation, she had a regular rate and rhythm, S1 and S2 were present without extra heart sounds, and no murmurs, rubs, or gallops were appreciated.

Pertinent labs on admission include troponin 0.03 [ $<0.5$  ng/ml], and lipase 28 [22–51 U/L]. ECG showed Q-waves in the lateral leads. CT scan of the abdomen revealed a  $7.9 \times 4.9$  cm in size oval-shaped mass on the left side of the chest which appeared to be attached to the left ventricle. A 2D echo with Definity was performed and it showed a pseudoaneurysm located at the posterior aspect of the left ventricle (Fig. 1). The patient was started on medical management including beta-blockers as an antianginal agent and angiotensin converter enzyme (ACE) inhibitor for afterload reduction. Also, cardiothoracic surgery at Newark Beth Israel was contacted for surgical evaluation and possible transfer.

The patient was successfully transferred to Newark Beth Israel. Medical records from the patient indicated that she had a preexistent left ventricular pseudoaneurysm which was diagnosed back in 2021, however, the size of the pseudoaneurysm at that time was not specified. After careful evaluation by the cardiothoracic team, the patient was not considered a surgical candidate mainly due to the chronicity of the condition. An extensive discussion was held for notifying the patient why she was not considered a surgical candidate and the risk of medical management alone. The palliative care team was also involved in the discussion. She was discharged with close follow-up as an outpatient.

### 3. Discussion

Ventricular pseudoaneurysm is typically contained by the pericardium or pericardial adhesions. Differentiating between LVP and a true aneurysm might be challenging. True aneurysms are characterized by a full wall thickness involvement while pseudoaneurysms resulted from the disruption of the free wall with sparing of the overlying pericardium. Echocardiography is an important diagnostic tool for differentiating these two entities by assessing the diameter of the orifice or neck of the aneurysm with a maximal diameter of the orifice to the cavity between 0.25 and 0.50 for the pseudoaneurysm and 0.90–1.0 corresponding to the true aneurysm.<sup>4</sup> Furthermore, the most significant and challenging aspect lies in identifying the presence or absence of myocardial continuity. Pseudoaneurysms manifest as ruptures with evident discontinuity in the myocardium, resulting in blood leakage outside the cardiac chamber. Conversely, true aneurysms are characterized by thinning of the myocardium with outward bulging, and they typically do not exhibit external blood loss.<sup>5</sup>

Patients with LVP tend to present with a wide variety of symptoms which can range from asymptomatic presentation to chest pain, dyspnea, congestive heart failure, syncope, acute myocardial infarction, and even sudden cardiac arrest. In the case of LVP after an acute myocardial infarction, depending on the timeline and onset of the aneurysm formation, they can be classified as acute (within the first 2 weeks), subacute (between 2 weeks and 3 months), or chronic (more than 3 months). It is of paramount importance to consider the fact that the risk of LVP rupture is inversely correlated with the timing of acute myocardial infarction onset.<sup>3</sup>

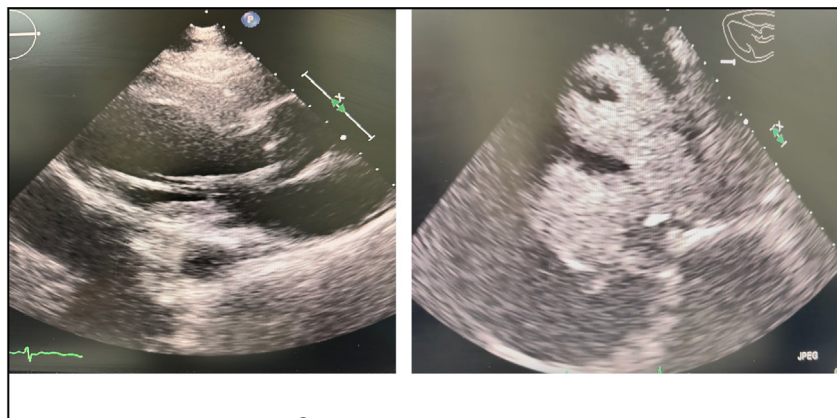


Fig. 1. 2D-Echocardiogram depicting a pseudoaneurysm in the posterior aspect of the left ventricle which is better delineating with contrast.

Contrast ventriculography remains to be the gold standard for the diagnosis of this pathology. However, multiple imagining modalities are available in clinical practice including transesophageal and transthoracic echocardiography, and cardiac magnetic resonance imaging (MRI). Furthermore, cardiac MRI has been demonstrated to be an effective diagnostic strategy to differentiate a pseudoaneurysm from a true aneurysm with a sensitivity of 100%.<sup>2</sup>

In patients with an acute and symptomatic presentation, a surgical approach with a patch or primary closure is highly recommended even though the mortality associated may be as high as 23%. However, medical management with pharmacotherapy for optimizing heart failure and strict blood pressure control for minimizing wall stress can be a therapeutic option for patients with small pseudoaneurysms (<3 cm diameter) and asymptomatic.<sup>6,7</sup>

Similar to our case, Inayat et al. described the case of a 69 years old lay who presented with chest pain and was found to have a left ventricular out-pouching measuring  $2.7 \times 1.8$  cm with a neck width of 1.6 cm. She was treated medically with an ACE inhibitor and beta-blocker since the patient refused the surgical approach. She was discharged from the hospital with close follow-up with a satisfactory outcome.<sup>2</sup> Furthermore, Kaur et al., and Reyaldeen et al. described case reports with medically managed left ventricular pseudoaneurysms with clinically stable lesions after 3 months and 12 months of follow-up, respectively.<sup>7,8</sup>

Early recognition and prompt surgical intervention are imperative for symptomatic and acute LVP

patients. In the case of asymptomatic individuals with chronic and small pseudoaneurysms, a conservative approach may be considered, as documented in previous literature through multiple case reports. However, it is imperative to conduct further extensive studies with larger sample sizes and outcomes research to ascertain the efficacy of medical management in patients with small pseudoaneurysms.

### Conflict of interest

There is no conflict of interest.

### References

1. Duan QJ, Duan CT, Yang WJ, Dong AQ. Conservative treatment of left ventricular pseudoaneurysm after mitral valve replacement due to early left ventricular rupture: a case report. *J Cardiothorac Surg.* 2021.
2. Inayat F, Ghani AR, Riaz I, et al. Left ventricular pseudoaneurysm: an overview of diagnosis and management. *J Investig Med High Impact Case Rep.* 2018.
3. Torchio F, Garatti A, Ronco D, Matteucci M, Massimi G, Lorusso R. Left ventricular pseudoaneurysm: the niche of post-infarction mechanical complications. *Ann Cardiothorac Surg.* 2022.
4. Tuan J, Kaivani F, Fewins H. *Left ventricular pseudoaneurysm.* European Journal of Echocardiography; 2008.
5. Zoffoli G, Mangino D, Venturini A, et al. Diagnosing left ventricular aneurysm from pseudo-aneurysm: a case report and a review in literature. *J Cardiothorac Surg.* 2009.
6. Meng X, Yang YK, Yang KQ, et al. Clinical characteristics and outcomes of left ventricular pseudoaneurysm. *Medicine.* 2017.
7. Reyaldeen R, Jeffries C, Hardman D, Challa P, Dahiya A. Multimodality imaging in a case of chronic massive left ventricular pseudoaneurysm. In: *CASE: cardiovascular imaging case reports.* 2018.
8. Kaur N, Panda P, Choudhary AK, Sharma YP. Left ventricular pseudoaneurysm: imaging. *BMJ Case Rep.* 2021.