Annals of Case Reports & Reviews

Case Report

Barua A, et al. 2026(2): 1000457
doi: 10.39127/2574-5747/acrr: e457

Internal Mammary Artery Rupture Following Sternal Fracture in a Hemodynamically Stable Patient: A Case Report

Anupama Barua[1*], Clinton Okene[1], Lognathen Balacumaraswami[1]

[1]Department of Cardiothoracic Surgery, Royal Stoke University Hospital

[*]**Author for correspondence:** Miss Anupama Barua, Department of Cardiothoracic Surgery, Royal Stoke University Hospital United Kingdom.

Citation: Barua A, Okene C, Balacumaraswami L. (2025) Internal Mammary Artery Rupture Following Sternal Fracture in a Hemodynamically Stable Patient: A Case Report. Annal Cas Rep Rev: ACRR-457.

Received Date: 05 February, 2026; **Accepted Date:** 10 February, 2026; **Published Date:** 13 February, 2026

Abstract

Rupture of the internal mammary artery due to blunt chest injuries is a very uncommon complication following blunt chest trauma. It may result in hemodynamic instability, but less often patients are hemodynamically stable. This case report pertains to a patient under stable hemodynamic conditions who presented with a retrosternal hematoma post sternal fracture. The patient underwent surgery based on computed tomography finding, which revealed active bleeding in the internal mammary artery (IMA) and worsening retrosternal hematoma. Following the diagnosis, the patient went on to have median sternotomy and hematoma evacuation together with vessel ligation. A high index of suspicion, together with early CT imaging should be considered in patients with sternal fracture even if vital signs are stable, as this would help to avoid delays in treating concealed thoracic vascular injuries.

Keywords: *Internal mammary artery rupture, Sternal fracture, Retrosternal hematoma, Median Sternotomy, Case report.*

Introduction

The occurrence of the internal mammary artery (IMA) rupture is an extremely rare outcome which can occur following sternal fracture. Most reported cases in the literature often show increased incidence in patients with rib fractures following concomitant cardiopulmonary resuscitation or associated rib fractures [1]. Additionally, steering wheel injury /impact with or without airbag deployment is a known risk factor in sternal fracture. The available literature shows a handful evidence regarding IMA rupture cases that do not involve concomitant rib fractures. Diagnosing internal mammary artery rupture post sternal fracture can be a diagnostic dilemma. Medical professionals face a challenge in detecting such injuries because patients generally show minimal signs of cardiovascular instability [2]. Clinicians should be aware that blunt chest trauma, responsible for about 15% of major trauma cases in the UK, can conceal retrosternal hematomas, requiring urgent investigation even in hemodynamically stable patients [3].

Clinical Findings

A 52-year-old gentleman presented to the emergency department (ED) with localized chest pain after falling onto a high goods vehicle (HGV) steering wheel. In the beginning, he exhibited pain that primarily affected only chest area and presented without visible bruises. He reported no shortness of breath or loss of consciousness. He has a history of Graves' disease, restless leg syndrome, hypertension, gastroesophageal reflux disease, anxiety, and polycythemia. He was taking thyroid replacement therapy and antihypertensive drugs. The patient arrived in stable condition with a GCS of 15 and a national early warning score (NEWS) of 2. Respiratory and cardiovascular examination was unremarkable with exception of blood pressure which was 105/60 mm of Hg. Physical examination showed localized tenderness together with bruising across the middle region of the sternum. The patient showed no indications of respiratory complications along with normal sternum appearance and intact neurological functions. He went on to have a computed tomography (CT) scan which revealed retrosternal hematoma measuring 12.1cm X 4.2cm [Figure 1].

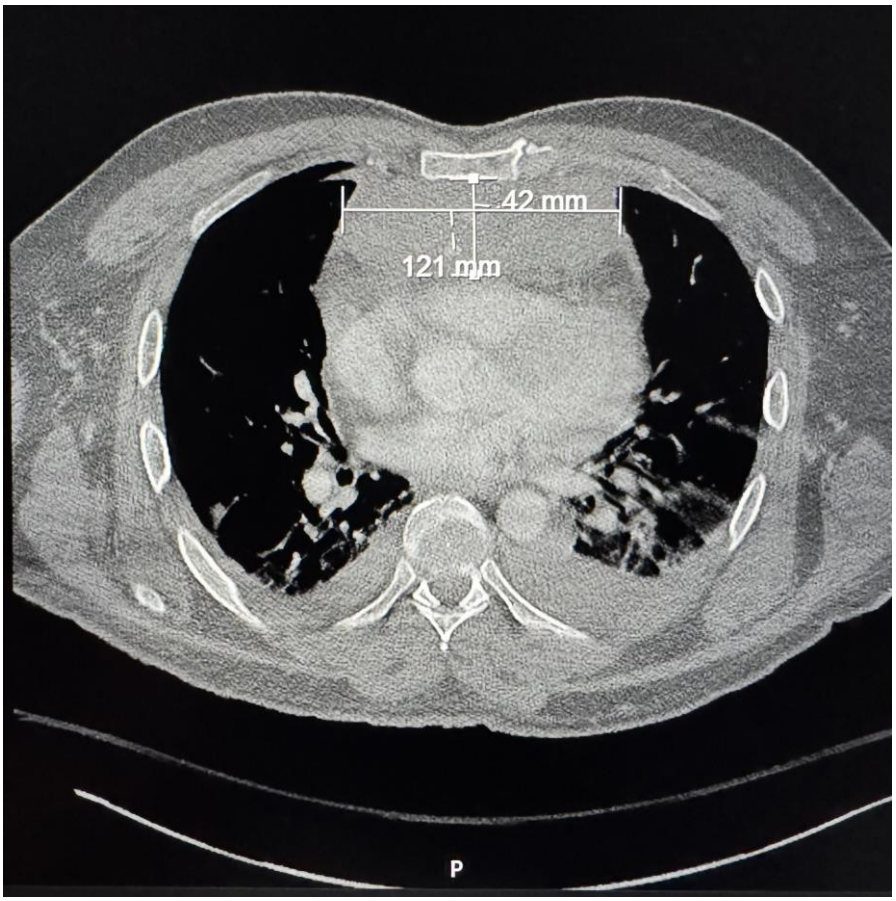

Figure 1: Early CT scan showing sternal fracture with retrosternal haematoma.

Following worsening pain and concerns of aortic injury, a repeat contrast-enhanced CT of the thorax was preformed and rrevealed an increasing volume of the anterior mediastinal haematoma (measuring 13.2x4.3cm) [Figure 2] with mass-effect on the heart, compressing the right ventricle, increasing volume of bilateral haemothoraces with associated consolidative lung changes. The patient was transferred to our center for further management.

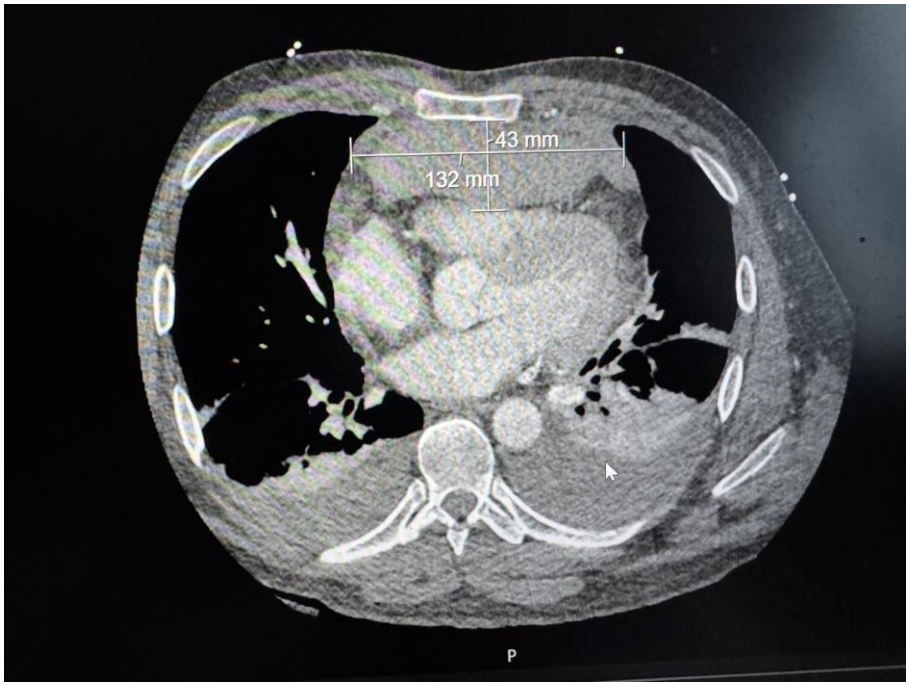

Figure 2: Late CT scan showing sternal fracture with increased size retrosternal haematoma compressing the right ventricle.

An emergency median sternotomy and evacuation of hematoma was performed as a repeat CT scan revealed expanding retrosternal hematoma. During the operation, active bleeding from the side branches of the left internal mammary artery (IMA) was found. The vessel was ligated by using liger clips, and hematoma was evacuateed. Two litres of blood-stained pleural fluid was drained. The decision to perform surgery was

due to expanding hematoma size and the risk of both tamponade and impending hemodynamic compromise.

Post-operative recovery was uneventful and was discharged home on 4th postoperative day. The were no post-operative complications and the patient was well established into his daily activities post op review.

Discussion

Blunt chest trauma can result in internal mammary artery rupture stemming from sternal fracture and or rib fractures. A high index of suspicion together with early imaging should be performed on hemodynamically stable patients to avoid delays in treating concealed thoracic vascular injuries [3]. The occurrence of internal mammary artery rupture is an extremely rare outcome post blunt chest trauma and show isolated sternal fracture damage. Most reported cases in the literature show patients with rib fractures combined and hemodynamic instability. All clinicians should be aware that blunt trauma can conceal retrosternal hematoma in a hemodynamically stable patient, requiring urgent investigation even when the patient appears stable [4]. This case report demonstrates that IMA injuries do not always manifest with obvious hemodynamic instability symptoms thus favouring reports by Aikins et al (2023) [5], Tokioka et al (2018) [1] and Ma et al (2021) [6].

The early deployment of contrast-enhanced CT can help establish a diagnosis of IMA rupture even in hemodynamically stable patients. The advent of high-resolution Computed Tomography scan has revolutionized the diagnosis of IMA injuries. Majority of IMA rupture cases documented in literature relate to rib fractures with CPR or significant force trauma which often leads to diverse clinical signs [6,7]. Our patient's stable vital signs created a misleading sense of safety which underscores the necessity to perform diagnostic imaging during trauma assessment regardless of blood pressure stability.

Medical professionals must consistently suspect vascular damage during thorough assessments of patients with sternal fracture. The positive patient symptoms and early CT findings combined with prompt surgical response preparation are key to better patient outcomes.

Funding: None

Conflict of Interest: None

International Review Board approval or waiver: None

Informed consent: Consented

References

1. Tokioka, S., Masuda, S., Shirokawa, M. and Shibui, T., 2018. Internal mammary artery injury without chest wall fractures after cardiopulmonary resuscitation: a case report. *Case Reports in Emergency Medicine*, *2018*(1), p.1948151.
2. Noh, D., Chang, S.W. and Ma, D.S., 2021. Extra-pericardial tamponade due to internal thoracic artery rupture after blunt trauma: A case report. *Journal of Trauma and Injury*, *34*(3), pp.183-186.
3. Nishimura, H., Mochida, Y., Ogino, S., Fukushi, K., Yamazaki, H., Miyakuni, Y., Kaita, Y., Minamishima, T., Soejima, K. and Yamaguchi, Y., 2022. Critical anterior mediastinal hematoma without internal mammary artery injury caused by cardiopulmonary resuscitation: A case report. *Trauma Case Reports*, *37*, p.100587.
4. Prangenberg, C., Zellner, A.A., Roos, J., Zalepugas, D., Ossendorff, R., Ben Amar, S., Cucchi, D. and Scheidt, S., 2024. Open sternal fracture with bilateral dislocation of the sternoclavicular joints after a high-speed bicycle accident: a case report. *Journal of Medical Case Reports*, *18*(1), p.528.
5. Aikins, K.A., Anderson, Z.N. and Koci, T.M., 2023. Traumatic Pseudoaneurysms of the Internal Mammary Artery: Two Cases and Percutaneous Intervention. *Diagnostics*, *14*(1), p.63.
6. Ma, D.S., Ryu, J.W. and Noh, D., 2021. Direct cardiac rupture associated with sternal fracture following blunt trauma: A report of two case. *Trauma Case Reports*, *32*, p.100430.
7. Gallego-Navarro, C., Latif, O., Pislaru, S.V., Sinak, L.J., Greason, K.L., Stulak, J.M. and Arghami, A., 2024. Right Ventricular Perforation by Fractured Sternal Wires: A Narrative Review. *Brazilian Journal of Cardiovascular Surgery*, *39*(6), p.e20230461.
8. Graça, L.A.L., Lopes, R., Branco, C. and Pancas, R., 2025. Sternal Reconstruction with Titanium Prosthesis for Complicated Sternal Dehiscence with Right Ventricle Herniation after Cardiac Surgery: A Case Report. *Journal of Chest Surgery*, *58*(2), p.60.
9. Khouzam, M.S., Jacobsen, K., Boyer, J.H., Zeeshan, A., Spurlock, D., Karas, T.Z., Suarez-Cavelier, J.E., Rinewalt, D., Bogar, L., Silvestry, S. and Palmer, G.J., 2023. Fractured sternal wire causing a cardiac laceration. *Journal of Cardiothoracic Surgery*, *18*(1), p.358.
10. Yuan, S.M., 2022. Sternal fractures due to blunt chest trauma. *J Coll Physicians Surg Pak*, *32*(12), pp.1591-1596.