Partial Sternotomy Due To Intrathoracic Foreign Body Suspected Implant Migration: A Case Report

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Abstract

Intrathoracic foreign bodies pose notable surgical challenges, particularly with concerns of implant migration. This case report details a 55-year-old male admitted to the ICU, exhibiting symptoms of coughing and hematemesis following partial sternotomy due to presumed implant migration. Comprehensive clinical assessment revealed stable vital signs and leukocytosis, but no signs of infection. The management strategy included a multidisciplinary approach encompassing infection control, wound care, and pharmacologic support. Partial sternotomy was performed, allowing for effective retrieval with minimized postoperative complications. Postoperative care emphasized respiratory support and regular monitoring of laboratory parameters to detect potential complications. The case underscores the importance of integrating traditional and innovative surgical techniques while prioritizing patient safety and health outcomes. Close monitoring and a tailored care plan were essential in managing the escalating symptoms and potential complications arising from the intrathoracic foreign body.

Keywords: *Intrathoracic Foreign Body; Partial Sternotomy and Implant Migration.*

I. INTRODUCTION

Intrathoracic foreign bodies present significant surgical and clinical challenges, particularly when implant migration is suspected [1]. These cases require meticulous assessment and tailored surgical strategies to ensure patient safety and optimal outcomes. For example, vascular implants can migrate, leading to complications ranging from local symptoms to life-threatening vascular occlusions or embolizations [2]. A case study emphasizing the need for partial sternotomy to address an intrathoracic foreign body highlights the gravity of such situations, especially in patients with prior surgical interventions [2]. Surgical approaches for intrathoracic pathologies include median sternotomy, thoracotomy, and video-assisted thoracoscopic surgery (VATS), with the choice depending on the foreign body's nature, location, and type [3]. While minimally invasive techniques like VATS are advantageous, they may not always provide sufficient access for complex cases. For instance, median sternotomy has been successfully used to retrieve migrated vascular devices, underscoring the need for traditional methods in certain scenarios [2], [4]. Complications such as fistulas or vascular injuries near critical structures further complicate management, a tracheo-innominate artery fistula, a life-threatening condition requiring invasive surgical intervention, illustrating the high stakes in these cases [5].The incidence of complications from intrathoracic foreign bodies underscores the importance of understanding anatomy and surgical risks. Postoperative challenges, such as those from previous sternotomies or unique anatomical considerations, influence the choice between minimally invasive and more aggressive approaches [6], [7]. Surgeons must carefully weigh risks and benefits, balancing the need for thorough access against minimizing patient stress and adverse events [8]. This ongoing debate highlights the complexity of decision-making in thoracic surgery.

Post-surgical monitoring is critical, as complications like infections, embolization, or adhesions can arise, necessitating additional interventions [9]. For example, pulmonary embolization following thoracic surgery underscores the need for vigilant follow-up care [10]. A multidisciplinary approach involving thoracic surgeons, cardiologists, and intensivists ensures comprehensive post-operative care, addressing potential complications and optimizing recovery [11], [12].Cardiac support or monitoring devices, while beneficial, can introduce risks such as migration or malfunction. Despite advancements in device design, subsequent surgeries may still be required [13]. Emerging techniques like robotic resection and endoscopic

methods offer promising alternatives to traditional approaches, aiming to improve outcomes while reducing risks [14], [15]. However, the implications of each surgical decision must be carefully considered, as they significantly impact patient recovery and long-term outcomes. In conclusion, managing intrathoracic foreign bodies demands a nuanced approach, integrating traditional and innovative surgical techniques while prioritizing patient safety. Continued research and collaboration are essential to refine surgical methodologies and recovery protocols, ultimately enhancing patient care in this complex field.

II. CASE REPORT

Case Presentation

A 55-year-old male patient was admitted to the ICU CVBC on February 19, 2025, presenting with a one-day history of coughing and hematemesis, which had progressed from hemoptysis two weeks prior. The patient denied fever, foreign body ingestion, or shortness of breath and reported no significant weight loss. His medical history included a right shoulder dislocation repositioning under anesthesia in 2014 following a traumatic injury. Initial treatment was sought at Bhayangkara Hospital, and the patient was subsequently referred to RSUP Prof. Kandou for further management.

Clinical Examination

On examination, the patient was alert and responsive, reporting postoperative pain. His general condition was moderate, with stable vital signs: blood pressure of 130/60 mmHg and a heart rate of 70 bpm without support. Physical examination revealed No. signs of anemia or icterus. Thoracic inspection showed symmetrical chest expansion, a well-maintained surgical wound without pus or active bleeding, and a drain producing 100cc of serosanguinous fluid. Palpation, percussion, and auscultation of the thorax were unremarkable, with vesicular breath sounds bilaterally and No. rales or wheezing. Abdominal examination was normal, extremities were warm with a capillary refill time of <2 seconds, and a scar was noted on the right shoulder.

Laboratory Findings

Laboratory results from February 18, 2025, revealed leukocytes of 15,300, hemoglobin of 14.2 g/dL, and platelets of 289,000. On February 19, 2025, values included sodium/potassium/chloride at 137/4.2/106, hemoglobin of 13.4 g/dL, leukocytes of 10,390, platelets of 354,000, blood glucose at 89 mg/dL, SGOT/SGPT at 11/12 U/L, urea/creatinine at 36/0.9 mg/dL, and negative viral markers. Follow-up labs on February 28, 2025, showed hemoglobin of 12.9 g/dL, leukocytes of 14,900, platelets of 275,000, sodium/potassium/chloride at 135/4.8/101, SGOT/SGPT at 17/12 U/L, urea/creatinine at 23/0.0 mg/dL, total calcium at 8.48 mg/dL, and procalcitonin at 0.149 ng/mL.

Fig 1. Size of the Implant

Fig 2. Instrument Used in Partial Sternotomy Procedure

Diagnosis and Management

The patient was diagnosed with post-partial sternotomy due to an intrathoracic foreign body with suspected implant migration and hypertension. Management included wound care and pharmacological therapy, such as ceftriaxone 1g IV every 12 hours, lansoprazole 30mg IV every 24 hours, paracetamol 500mg IV every 8 hours, tranexamic acid 500mg IV every 8 hours, and fentanyl 10–50 mcg/hour IV. Additional medications included N-acetylcysteine 200mg PO every 8 hours, vitamin B complex 1 tab PO every 8 hours, vitamin C 250mg PO every 24 hours, and zinc 20mg PO every 24 hours. The patient was maintained on Asering 1000mL IV every 24 hours, with an energi intake target of 2300–2760 kcal/day.

Postoperative Care and Monitoring

Respiratory management included head-of-bed elevation (15–30 degrees), periodic suctioning, and the use of baby oil moisturizer and artificial tears. The patient had a urinary catheter and nasogastric tube in place, with regular passive mobilization and body temperature regulation targeting 36.7–37.6°C. Blood glucose was monitored every 6 hours, and laboratory tests, including arterial blood gas analysis, were performed every 24 hours. Sedation and pain control were achieved with thiopental 3–5 mg/kg/hour IV and fentanyl 10–50 mcg/hour IV. Family education was provided regarding the patient's condition.

III. RESULT AND DISCUSSION

Case Overview

The case involves a 55-year-old male admitted to the ICU following a post-partial sternotomy due to an intrathoracic foreign body with suspected implant migration. His primary complaints were coughing and hematemesis, which began as hemoptysis two weeks prior and progressively worsened. The absence of fever, weight loss, or respiratory distress reduces the likelihood of infectious etiologies such as tuberculosis or malignancy. Instead, the symptoms are likely attributable to mechanical irritation, vascular injury, or localized inflammation caused by the migrating foreign body.

Clinical and Laboratory Findings

The patient's clinical examination revealed stable vital signs, with no signs of anemia or icterus. Thoracic inspection showed a well-maintained surgical wound with 100cc of serosanguinous fluid in the drain, suggesting controlled postoperative bleeding. Laboratory findings indicated leukocytosis (14,900/µL on February 28, 2025), which may reflect a systemic inflammatory response or early infection. Hemoglobin levels trended downward (from 14.2 g/dL to 12.9 g/dL), consistent with ongoing but non-severe blood loss. Procalcitonin levels (0.149 ng/mL) remained low, supporting the use of prophylactic ceftriaxone rather than broad-spectrum antibiotics. Electrolyte levels were stable, though total calcium was slightly decreased (8.48 mg/dL), possibly due to hypoalbuminemia or dilutional effects from fluid resuscitation.

Surgical Approach: Partial Sternotomy

Partial upper sternotomy, a minimally invasive alternative to full sternotomy, was performed to address the intrathoracic foreign body. This technique involves a limited midline sternal incision, typically extending from the manubrium to the second or third intercostal space, providing adequate exposure while

preserving chest wall integrity. Compared to full sternotomy, partial sternotomy offers advantages such as reduced postoperative pain, faster recovery, improved respiratory dynamics, and better cosmetic outcomes. However, it is not without risks, including postoperative bleeding, sternal instability, and infection. In this case, the presence of serosanguinous drainage (100cc) suggests controlled bleeding, necessitating careful monitoring.

Postoperative Management and Complications

The patient's postoperative care focused on wound healing, pain control, hemodynamic stability, and respiratory support. Pain management included fentanyl infusion and paracetamol, while tranexamic acid was administered to control bleeding. Prophylactic ceftriaxone was initiated to reduce infection risk, though elevated leukocyte counts warrant continued observation. Respiratory support measures, such as head-of-bed elevation (15-30°), periodic suctioning, and passive mobilization, were implemented to prevent atelectasis and pneumonia. Fluid balance was carefully maintained (0 to -500cc) to avoid volume overload while ensuring adequate perfusion.

IV. CONCLUSION

This case highlights the complexities of managing post-sternotomy complications, particularly in the context of suspected implant migration. The patient's progressive hemoptysis and hematemesis likely stem from mechanical irritation or vascular involvement, necessitating close surgical and critical care monitoring. Comprehensive multidisciplinary management, including infection control, fluid-electrolyte balance, respiratory support, and pain management, is crucial to ensuring optimal recovery. Further imaging or surgical intervention may be required if bleeding persists or worsens, emphasizing the need for vigilant postoperative care.

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