CASE REPORT

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Hemorrhagic Complicated Giant Bullae

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Abstract

Objective

Giant bullous emphysema (GBE) is a rare condition often seen in young smokers but may also occur in non-smokers. We present a 45-year-old non-smoking female with progressive dyspnea and a large cystic lesion detected in the right lower lobe on thoracic CT. The lesion was identified as a giant bulla without communication with the bronchial tree. A right lower lobectomy was performed due to its size and internal vascular structures. Histopathological examination confirmed bullous emphysema with hemorrhagic and congestion. The postoperative period was uneventful. This case highlights the importance of differentiating giant bullae from pneumothorax to avoid inappropriate chest tube placement. Surgical resection via thoracotomy or video-assisted thoracoscopic surgery (VATS) remains the definitive treatment for symptomatic cases.

Keywords: Giant bullous, hemorrhagic, emphysema

Introduction

Giant bullous emphysema (GBE) is defined as the presence of a bulla occupying at least one-third of one or both hemithoraces (1). Although GBE typically occurs in young male smokers, it can also be observed in non-smokers and older individuals. The condition generally follows a progressive clinical course, with hospital admissions often prompted by respiratory failure . Bullae are most commonly located in the apical regions and are usually asymmetrically distributed .While patients with bullous lung disease are often asymptomatic, GBE is clinically marked by progressively worsening dyspnea (2,3). Hospitalization typically results from acute respiratory failure, as the expanding bullae compress adjacent lung parenchyma, contributing to respiratory compromise. In addition to bullae, paraseptal emphysema is frequently present. In some cases, centrilobular emphysema the subtype commonly associated with smoking may also be seen (2–4). It is believed that confluent areas of paraseptal emphysema may contribute to the development of giant bullae (5).

Case Report

A 45-year-old woman was admitted to our hospital with complaints of shortness of breath and a cough that worsened during the winter months. Thoracic computed tomography (CT) revealed an air-filled cystic lesion measuring 8 cm in diameter, located

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in the superior segment of the right lower lobe. The lesion exhibited a smooth, well-defined wall, demonstrated a uniform air-filled structure, and showed no evidence of communication with the tracheobronchial tree. Even when the lung appears largely destroyed, there (Figure 1). Surgical intervention was planned. Intraoperatively, the lesion initially measured at 8 cm was observed to be larger than the preoperative assessment, attributable to the thickness of its wall structure and the damage to the adjacent parenchymal tissue. A right lower lobectomy was performed due to the lesion's size 12 × 12 cm and the presence of multiple grape-like clusters and spider web-like vascular structures lining the entire inner wall of the cyst (Figure 2). The post-resection increase in the apparent size of the bullous structure, initially measured as 8 cm on preoperative CT, is attributable to the incision made by our team to

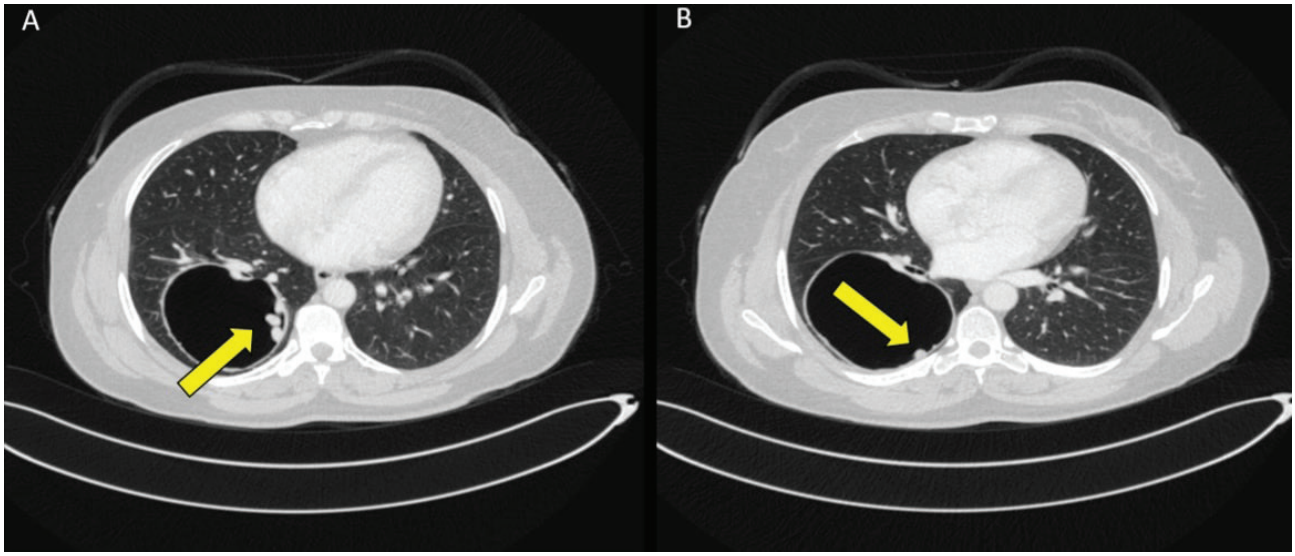

Figure 1
Giant bullae structure marked with yellow arrow in Figure A and B and vascular structures in the form of grape clusters

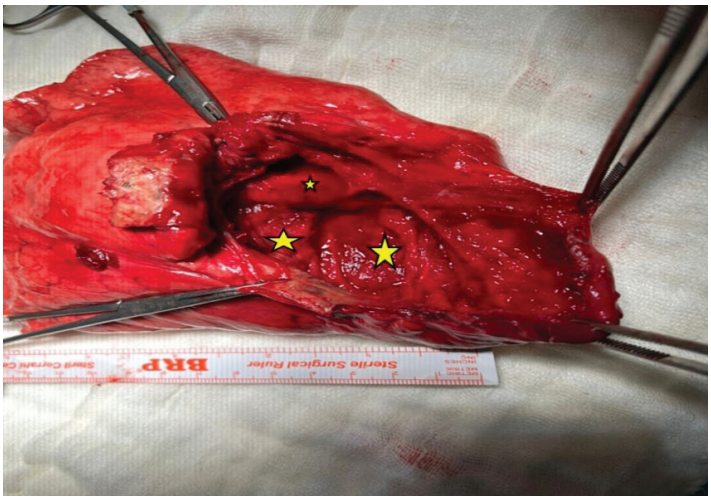

Figure 2
Right lower lobectomy material and multiple vascular structures lining the inner wall marked with an asterisk

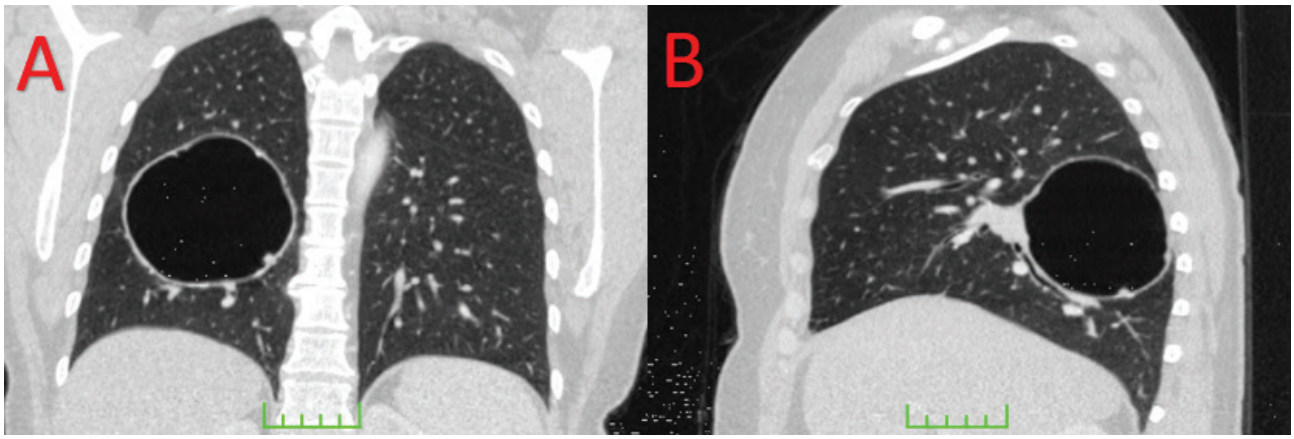

Figure 3
Coronal(A) and sagittal(B) sections of the thoracic CT scan

expose and demonstrate the internal architecture of the specimen.Histopathological examination revealed lung tissue with hemorrhage, congestion, and bullous changes. The patient is currently being followed up postoperatively without complications. Informed consent was obtained for the use of the patient's medical data in academic studies.

Discussion

Giant pulmonary bullae are more commonly observed in young smokers; however, they can also occur in elderly non-smokers. Unilateral giant bullae are often asymptomatic. Nevertheless, as they enlarge, they may compress the surrounding lung parenchyma and lead to complications such as bleeding, chest pain, and pneumothorax (6). While complications like pneumothorax are well documented, spontaneous bleeding into bullae is an exceedingly rare phenomenon, typically seen in patients receiving anticoagulant or antiplatelet therapy (7). In our patient, the absence of preoperative spontaneous bleeding is thought to be due to the lack of such medications. According to the literature, spontaneous hemorrhage in bullous lungs has predominantly been reported in association with anticoagulant or antiplatelet use. However, during the operation, the vascular structures within the bulla were found to be extremely fragile, and controlled bleeding occurred intraoperatively.In cases of bullous lung disease, recurrent pneumothoraces may occur, particularly when giant bullae are present (3). A critical consideration in these patients is distinguishing between giant bullae and pneumothorax. Misinterpreting bullae as pneumothorax may lead to unnecessary and potentially harmful chest tube insertion. In our case, based on CT findings, the lesion was identified as a giant bulla, and tube thoracostomy was avoided.Currently, surgical intervention appears to be the most effective treatment approach. The goal of surgery is to resect the bulla using a stapler and allow the underlying collapsed normal lung to re-inflate. This can be achieved via thoracotomy, thoracoscopy, or median sternotomy. Unless cancer surgery is being performed, anatomic resections are generally avoided. Even when the lung appears largely destroyed, functional tissue is often still present near the hilum. In rare cases, when an entire lobe is destroyed, an anatomic resection may be appropriate. Since the distal lung is often damaged beyond salvage, resection is commonly indicated. Treatment is generally medical in cases with minimal symptoms or when the disease is diffuse or multifocal. When complications are evident and the disease is localized, resection may be the treatment of choice (4).

In our case, due to the bullous structure occupying almost the entire right lower lobe, the absence of residual functional lung tissue, and the presence of extensive vascular structures within the bulla, limited anatomical resections such as wedge resection or segmentectomy were not feasible.

In conclusion, giant bullous emphysema (GBE) is a rare but significant cause of morbidity and mortality. Computed tomography plays a crucial role in identifying the location and extent of the bullae, as well as evaluating the surrounding lung parenchyma. Surgical treatment, either via thoracotomy or video-assisted thoracoscopic surgery (VATS), should be tailored according to the surgeon’s expertise and the specific characteristics of the case.

Conflict of Interest Statement
The authors have no conflicts of interest to declare.

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Availability of Data and Materials
Consent for data use has been received from the patient. Data available on request from the authors.

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Authors Contributions
MSO: Conceptualization; Data curation; Formal analysis; Investigation; Visualization; Writing-original draft.

RY: Investigation; Validation; Writing-original draft.

HEC: Data curation; Formal analysis; Writing- review & editing

SEA: Data curation; Writing- review & editing

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