Case report of a multi-purpose indwelling pleural catheter for complex hydropneumothorax with empyema as a bridge to novel targeted therapy

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Background

Malignant pleural effusions (MPEs) are the second leading cause of exudative effusions, accounting for greater than 125,000 hospitalizations and estimated inpatient charges of over $5 billion per year in the US[1]. In patients with symptomatic MPEs, indwelling pleural catheters (IPCs) are a minimally invasive treatment to reduce dyspnea and limit patient encounters with the health system. Traditionally, IPCs serve the single purpose of MPE management. We present a case where an IPC was used to manage multiple complex pleural diseases and ultimately serve as a bridge to a novel therapy for non-small cell lung cancer (NSCLC) that significantly prolonged a patients life.

Case Report

A 56-year-old female with KRAS-positive stage IVb adenocarcinoma presented with a right upper lobe (RUL) obstructing tumor and a right sided pleural effusion. She was dyspneic with significant functional limitation. A right main bronchus (RMB)/bronchus intermedius (BI) stent and IPC were placed. Subsequently, she reported significant improvement in dyspnea and functional capacity. Over the next 21 months, the IPC was used to successfully manage the MPE, a pneumothorax, and two distinct empyemas. Unfortunately, her cancer continued to progress despite chemotherapy and radiation. In July of 2021 a novel KRAS inhibitor, Sotorasib, became available to the patient as a part of a clinical trial[4]. She experienced a significant clinical response to Sotorasib. Subsequently, the MPE resolved as evident by lack of continued drainage and her disease appeared radiographically stable. The IPC was removed 21 months after placement.

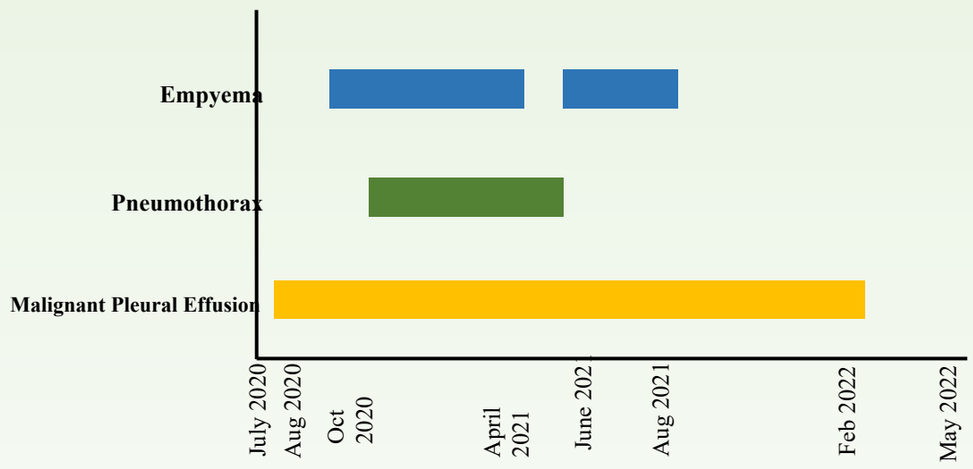

Figure 1: Bar graph demonstrating the time course for the different pleural diseases that were managed with the indwelling pleural catheter.

Discussion

This case demonstrates the potential multipurpose use of a strategically placed IPC to manage different pleural diseases over time. After initial placement of the Aspira IPC drainage system to manage MPE, the patient began to have purulent output consistent with an empyema. By adjusting the drainage interval and amount of suction using the manual bulb pump provided with the Aspira indwelling pleural catheter drainage kit we were able to successfully manage multiple combinations of pleural disease as shown in Figure 1., largely on an outpatient basis. By minimizing the need for additional intervention and repeated health care encounters, we believe this IPC played a crucial role in bridging this patient with resistant NSCLC to a novel therapy that ultimately prolonged her life.

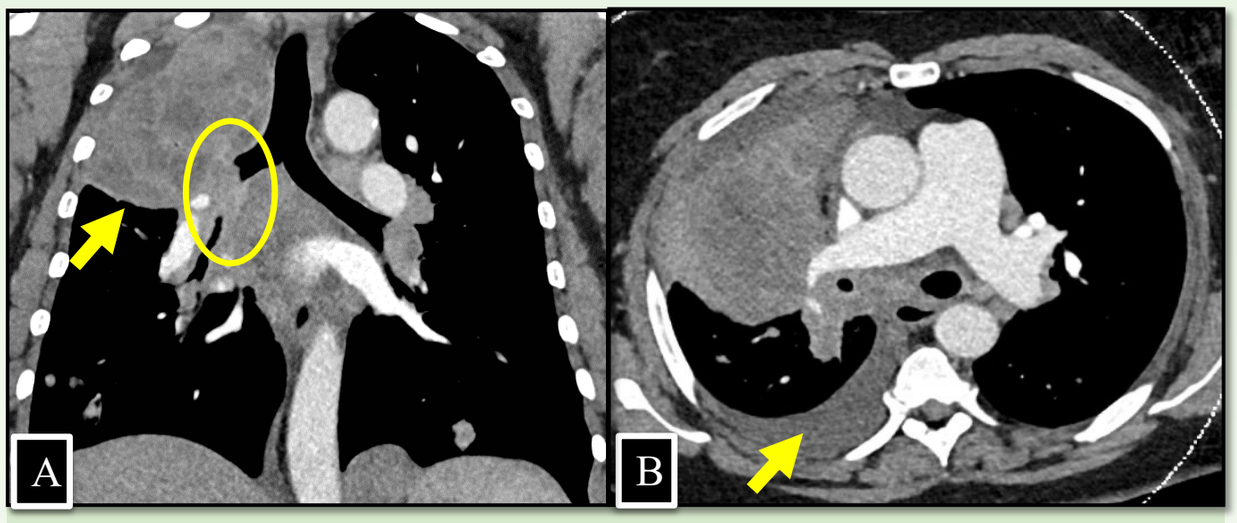

Figure 2: CT imaging before IPC/stent placement.
Coronal (A) and axial (B) imaging demonstrating complete obstruction of the RUL with narrowing of bronchus intermedius. RUL lobulated, heterogeneous mass with right pleural sided pleural effusion.

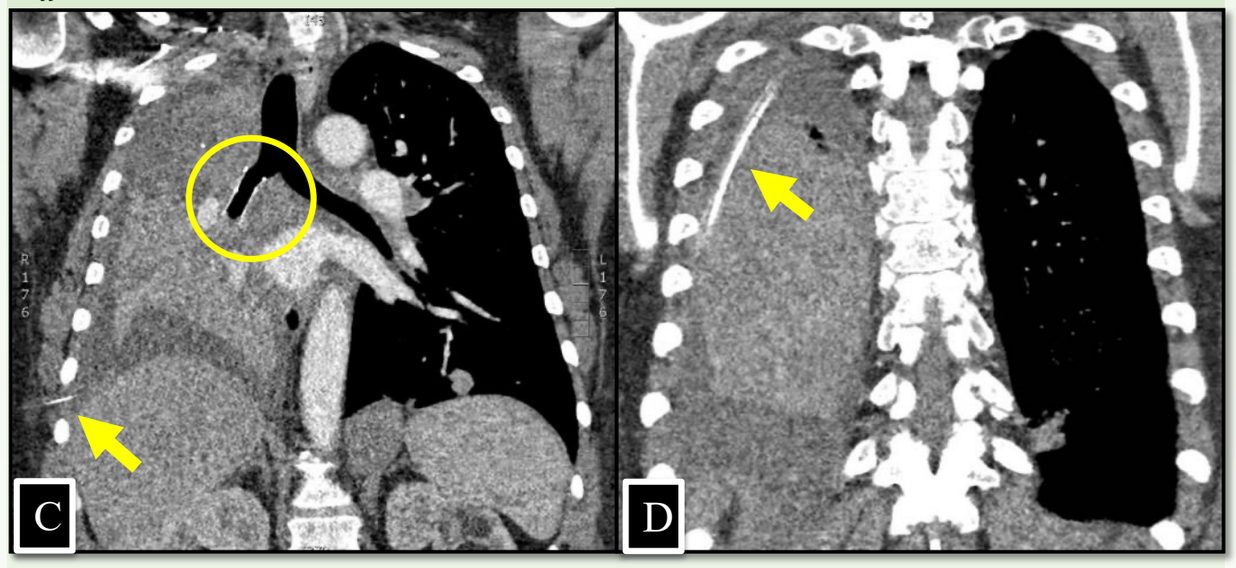

Figure 3: CT imaging following IPC/stent placement.
Pleural drain entry (C) with visualization of RMB stent, with drain extending apico-posteriorly (D) until termination in the apex.

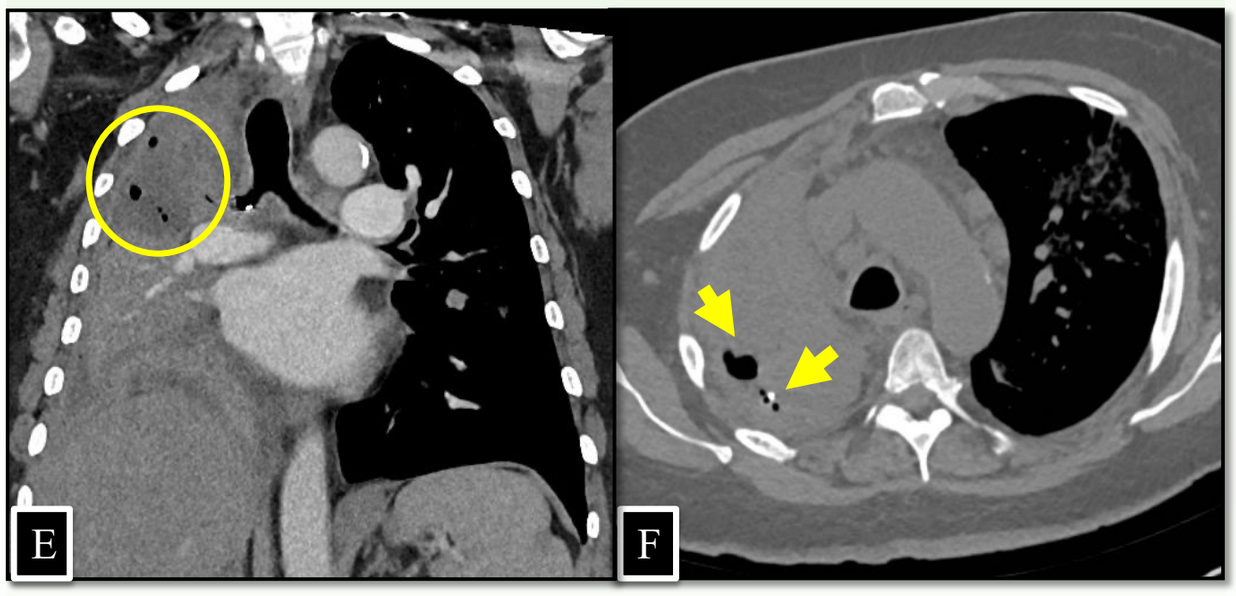

Figure 4: CT imaging performed after empyema diagnosis.
Coronal image (E) notable for large effusion and development of air/cavitation within RUL mass. Axial image (F) demonstrates air/cavitation with IPC visible.

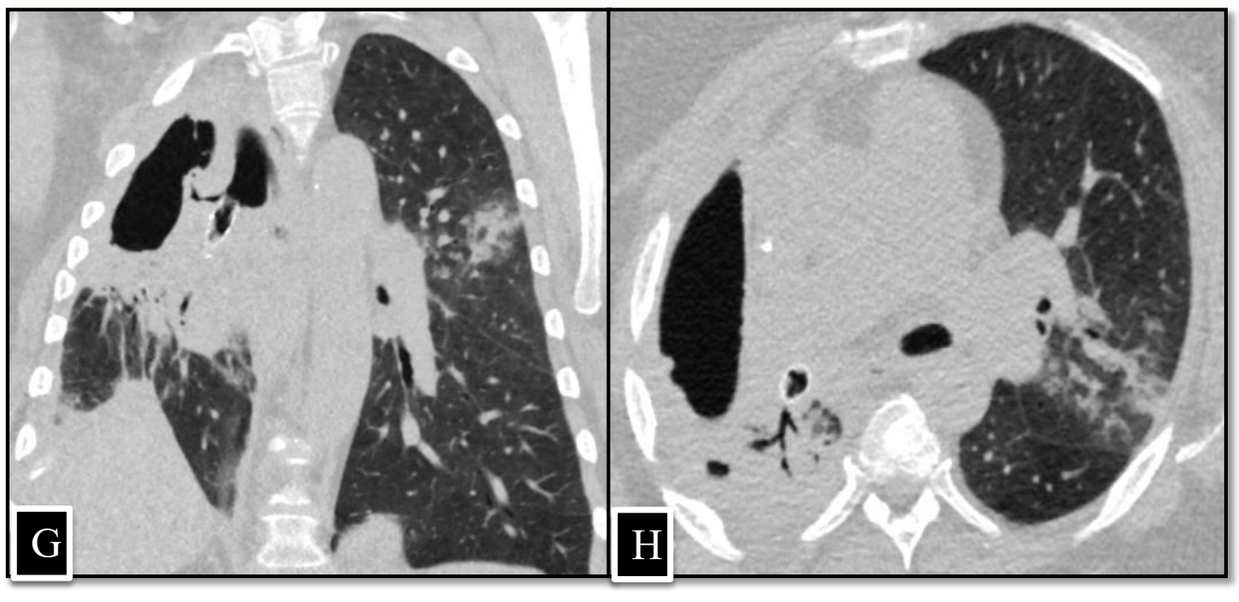

Figure 5: CT imaging just prior to IPC removal.
Coronal (G) and axial (H) notable for regression of pleural effusion and stable cavitary disease in the RUL.

References

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