The value of Nuclear Medicine ^{99m}Tc Technegas ventilation scanning in the localisation of a Persistent Air Leak (PAL)

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Background: A 56 year old male with productive cough, headache and lethargy presented to the Emergency Department febrile and with dyspnoea.

A CT scan showed collapse of the right lung due to a large tension pneumothorax. A chest x-ray confirmed mediastinal shift to the left.

An intercostal chest catheter was inserted, initially resulting in improvement of breathing, Chest x-ray confirmed placement of the chest drain and interval reduction in the size of the pneumothorax.

Serial chest x-rays over the next few days showed interval enlargement of the pneumothorax. The chest-drainage system showed persistent bubbling in the water seal chamber, prompting the treating team to consider the possibility of a persistent air leak.

Method: A ventilation Nuclear Medicine lung scan was performed using 500MBq ^{99m}Tc-Pertechnetate loaded into the Technegas generator.

The referring Thoracics Physician accompanied the patient to clamp off the chest drain, assess the patient throughout and to open the drain once imaging was complete.

Inhalation of ^{99m}Tc-Technegas continued until 5K counts were seen from the posterior image on the p-scope.

A Siemens Intevo gamma camera was used to acquire anterior and posterior dynamic images, followed by a SPECT/CT scan.

Results: Foci of increased tracer uptake was seen in the midzone of the collapsed right lung, concluding that the air leak was at the lateral segment of the right middle lobe.

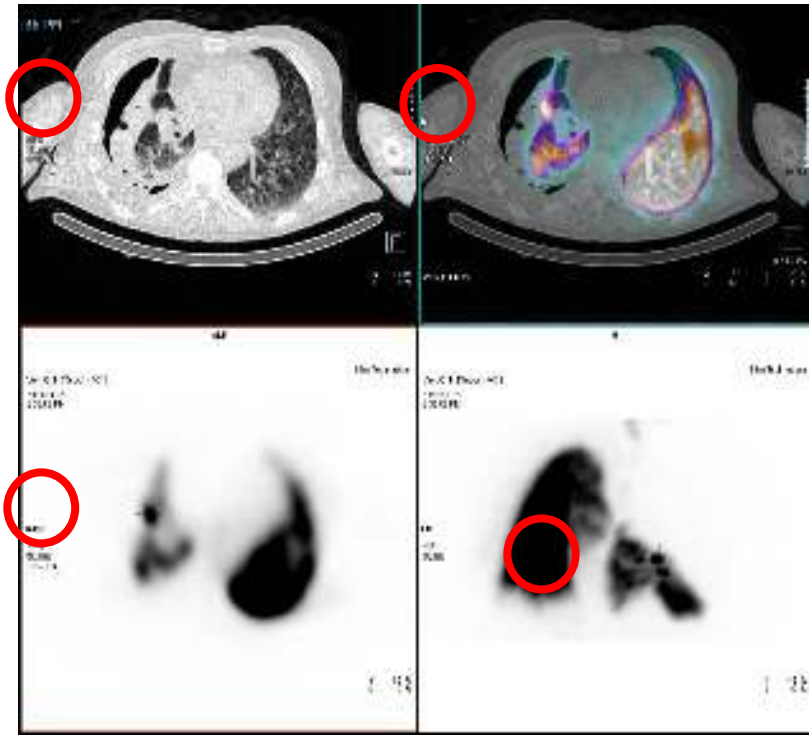

Figure 1: SPECT/CT Transverse slices, showing the suspected air leak

Discussion: Following the scan, the patient underwent insertion of an Endobronchial valve into the right middle lobe. This procedure requires accurate localization of the site of the persistent air leak.

Options to localise persistent air leaks are limited and invasive. Other medical imaging modalities offer minimal diagnostic information.

Conclusion: The Nuclear Medicine ventilation scan was immensely valuable in localizing the site of a persistent air leak. The findings of our study enabled a life-saving endo-bronchial valve to be accurately inserted. A chest x-ray taken 10 weeks later showed inflation of the formerly collapsed lung, indicating resolution of the pneumothorax.