Detection of intra-thoracic bleed post-wedge biopsy of pulmonary angiosarcoma by SPECT/CT Tc99m-red blood cell scintigraphy

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Abstract

A 52 year-old male presenting with dyspnea and massive right pleural effusion was diagnosed with pleural angiosarcoma following wedge biopsies of pulmonary lesions. Patient was investigated for post-operative bleed with CT angiography, which failed to identify the bleeding site. Technetium-99m labelled red blood cell (Tc99m-RBC) scintigraphy with SPECT/CT of the chest was performed, and the bleeding site was rapidly localized. To our knowledge, this is the first case reported in the literature of intra-thoracic bleeding localisation with SPECT/CT Tc99m-red blood cell scintigraphy.

Key words:

SPECT/CT; angiosarcoma; bleeding; embolization; labelled red blood cells

<u> TEXT</u>

Introduction

Tc99m-red blood cell (RBC) scintigraphy is frequently used for localisation of gastro-intestinal bleed *(1)*, but it can be used for virtually any site of active bleeding (intraperitoneal, intra-articular, pericardial, vascular, hematoma formation), especially when conventional investigations fail to identify bleeding site. We present a case of intra-thoracic bleed localized with Tc99m-RBC scintigraphy using SPECT-CT.

Case Report

A 52 year-old male was transferred to our center from a community hospital with severe dyspnea and massive right pleural effusion. Investigation with a thoracic CT revealed pleural based lesions of the right middle and right lower lobes, as well as a right adrenal lesion and multiple bone lesions. Wedge biopsies of the right lower and right middle lobes lesions were obtained, and histopathological findings were compatible with pleural angiosarcoma. Post-operatively, the patient developed constant bleeding through the right pleural drain. A pulmonary CT angiography was performed, but failed to identify a site of active bleeding. Due to high clinical suspicion of ongoing bleeding, the decision was made to pursue investigation with a Tc99m-RBC scintigraphy.

Discussion

A dynamic acquisition of the thoracic region was obtained for 8 min, demonstrating early extravasation of the labelled red blood cells in the right peri-hilar region (Fig. 1a). A well vascularised bone metastasis to the right scapula was also clearly visible. A SPECT/CT acquisition of the chest was obtained and revealed the bleeding originated from the central portion of the right middle lobe (Fig. 1 b-f). The patient was then transferred to interventional radiology for embolization, with resolution of the active thoracic bleed. To our knowledge, this is the first case report of intra-thoracic bleeding localisation with SPECT/CT Tc99m-red blood cell scintigraphy. Only a few previous cases of thoracic bleed have been reported using planar Tc99m-red blood cell scintigraphy or Tc99m-sulfur colloid (*2*, *3*, *4*, *5*). Tc99m-red blood cell scintigraphy with dynamic acquisition proves most useful to detect active bleeding at the time of imaging, especially when conventional imaging fails to identify the culprit vessel. Indeed, conventional imaging may confirm that a bleed has occurred due to indirect signs (hematoma, collection), but may not localize the exact bleeding site. This case is particularly interesting as it directly guided an interventional procedure to treat the patient's acute condition.

Conclusion

The advent of SPECT/CT and fusion images allow even more precise localization of active bleeding sites (1) and anatomical correlates can be used to guide interventional radiology procedures or surgery, as was successfully done in this case. This case shows that SPECT/CT Tc99m-red blood cell scintigraphy can be used for localization of intra-thoracic bleed, but virtually any site of active bleeding could be identified using this very useful and often under-utilized nuclear medicine tool.

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DISCLOSURE

No conflict of interest relevant to this article.

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FIGURE LEGEND



Frame from dynamic flow study following Tc99m-RBC injection (A). Selected SPECT-CT fusion axial (B) and coronal (C) images, maximal intensity projection (MIP) rendering (D) and non-attenuation corrected axial (E) and coronal (F) tomographic images reveal normal blood pool activity as well as active bleeding site in right middle lobe.