



Case report

Successful endobronchial ultrasound-guided transbronchial needle aspiration of tumour thrombus in the left pulmonary vein to achieve histological diagnosis

Aaron Braddy^{a,b,*}, Rahul Janardan Mogal^b, Anthony John Maddox^c, Andrew Bryan Timothy Barlow^b

^a National Heart & Lung Institute, Imperial College London, London, UK

^b Department of Respiratory Medicine, West Hertfordshire Hospitals NHS Trust, Watford, UK

^c Department of Histopathology, West Hertfordshire Hospitals NHS Trust, Watford, UK

ARTICLE INFO

Keywords:

Endobronchial ultrasound
Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA)
Lung cancer
Tumour thrombus

ABSTRACT

A symptomatic 66-year-old gentleman presented with a large left upper lobe mass, thought likely to be malignant. Further imaging suggested direct tumour extension into the left pulmonary vein. During a subsequent EBUS (endobronchial ultrasound) histological diagnosis was not achieved from sampling higher order lymph nodes, thus intra-procedurally the decision to sample, by Transbronchial Needle Aspiration (TBNA), an area thought to relate to tumour thrombus in the left pulmonary vein was taken. A diagnosis of a non-small cell lung cancer was made on histological testing of the tumour thrombus sample. Considering the bleeding risk, direct probe contact with the endobronchial wall was maintained for several minutes but no bleeding was observed. There were no complications as a result of the procedure. It may be safe to sample tumour thrombus from within a pulmonary vein via EBUS-TBNA to achieve positive histology.

1. Introduction

Intravascular tumour thrombus is defined as tumour extension into a vessel. Its presence changes stage, prognosis, and treatment. Whilst a rare complication of solid cancers, predominantly associated with renal cell carcinoma, Wilm's tumour, testicular carcinoma, adrenal cortical carcinoma and hepatocellular carcinoma [1], lung cancer tumour thrombus can occur, predominantly in non-small cell lung cancers [2]. It may extend to involve the pulmonary veins, extending towards and even into the left atrium as reported in a few case reports [3–6].

EBUS-TBNA is commonly used to stage mediastinal lymph nodes in lung cancer. Moreover, it can approach the tumour itself if located adjacent to the bronchus and can diagnose other various diseases, such as tuberculosis and sarcoidosis [7]. A pilot study demonstrated the possibility of detecting pulmonary embolism using EBUS [8]. Furthermore, a case series in 2007 [9] and a case report from 2011 [10] has suggested that a transaortic EBUS approach may be safe. A single case report of pulmonary artery tumour embolism being sampled by

EBUS-TBNA in a case of metastatic hepatocellular carcinoma has been published [11].

Pulmonary vein tumour thrombus is a rare occurrence without an established diagnostic method. We report the case of a 66-year-old male patient non-small cell lung cancer diagnosed by EBUS biopsy of primary tumour mass and tumour thrombus within the left pulmonary vein.

2. Case report

A 66-year-old gentleman presented acutely to secondary care with acutely worsening, progressive shortness of breath. His past medical history includes congestive cardiac failure, hypertension, wheelchair bound due to previous polio and chronic obstructive pulmonary disease (ex-smoker with a 40-pack year smoking history). His chest x-ray on admission showed a left upper lobe mass lesion (Fig. 1).

A CT thorax, abdomen and pelvis was reported as showing a large lobulated soft tissue mass in the left upper lobe measuring 7.2 cm × 6.9 cm × 7.5cm which was contiguous with the soft tissue extending from

Abbreviations: EBUS, Endobronchial Ultrasound; TBNA, Transbronchial Needle Aspiration; CT, computerised tomography; ROSE, Rapid On-Site Evaluation; TTF-1, Thyroid transcription factor 1.

* Corresponding author. National Heart & Lung Institute, Imperial College London, London, UK.

E-mail address: aaron.braddy@nhs.net (A. Braddy).

<https://doi.org/10.1016/j.rmcr.2020.101177>

Received 8 May 2020; Received in revised form 7 July 2020; Accepted 20 July 2020

Available online 25 July 2020

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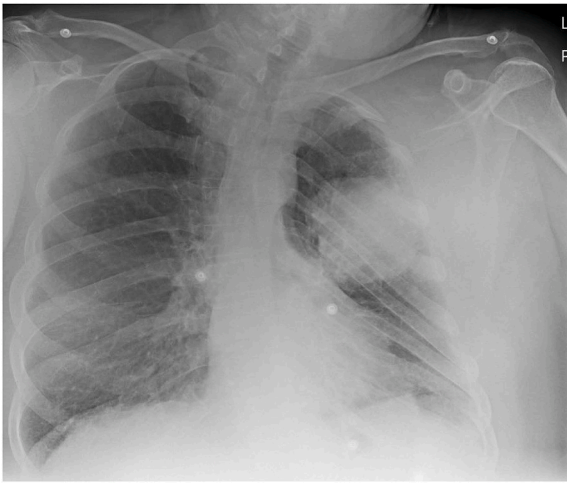


Fig. 1. Chest x-ray showing a left upper lobe mass lesion.

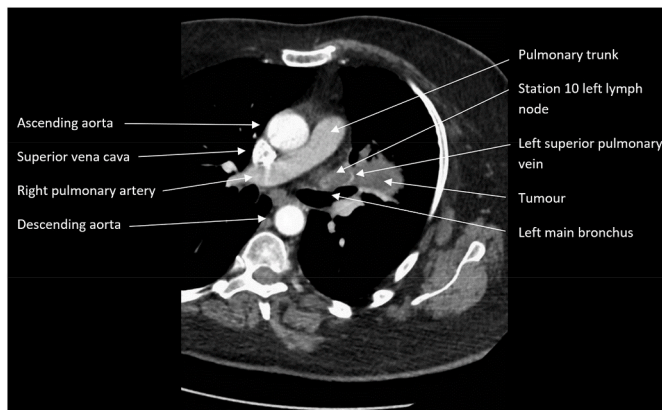


Fig. 2. Labelled computerised tomography showing left upper lobe lung tumour contiguous with station 10 left lymph node and left pulmonary vein.

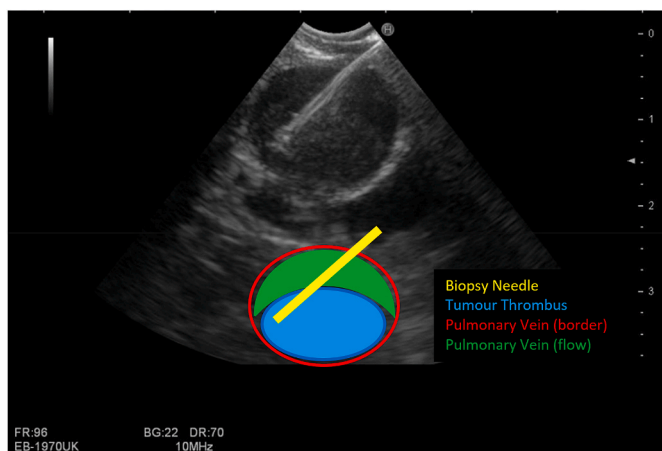


Fig. 3. Endobronchial ultrasound images showing tumour within pulmonary vein being sampled by transbronchial needle aspiration (schematic below to identify structures).

the anterior left main bronchus, suggestive of a lymph node, measuring 1.4 cm × 2.9 cm. There was evidence of direct tumour extension into the left pulmonary vein, almost into the left atrium (Fig. 2).

Following discussion in the Lung Cancer Multi-Disciplinary meeting the patient underwent an EBUS. Sampling from station 4R and 7 lymph

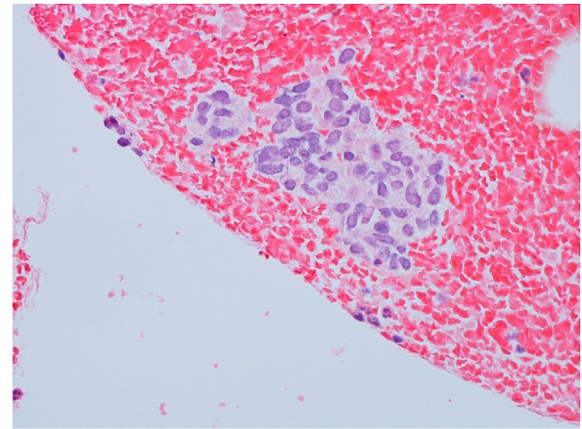


Fig. 4. Cell block showing tumour cells within pulmonary vein.

nodes showed benign lymphoid material and pigmented macrophages on ROSE, therefore the procedure continued to the area of the 10L node. Ultrasound evaluation of this area were consistent with either tumour or solid material (thought likely tumour thrombus) within the left pulmonary vein, as there was a circumferential rim of fluid that was well visualised. TBNA was performed (Fig. 3).

Direct probe contact with the endobronchial wall was maintained for several minutes looking for biopsy complications (including extravasation). There were no immediate complications as a result of the TBNA. ROSE showed blood cells only with subsequent cell block material containing scanty material suggestive of non-small cell carcinoma. During the procedure, therefore, further material was obtained from the primary left upper lobe mass which ROSE revealed to be non-small cell carcinoma. A subsequent cell block was morphologically like that obtained from the tumour thrombus, but of greater quantity, allowing immunocytochemistry. This demonstrated strong p40 and TTF1 positivity and the tumour was classified as non-small cell carcinoma, not otherwise specified (Fig. 4).

Following further discussion in the Lung Cancer Multi-Disciplinary Meeting this patient was staged as T4N0M0 non-small cell lung cancer, not otherwise specified with the plan for surgical resection.

3. Discussion

Tumour thrombus associated with lung cancer is rare but does tend to occur in non-small cell lung cancer. We have demonstrated through this case report that is potentially safe to sample tumour thrombus from within a pulmonary vein via EBUS-TBNA to achieve positive histology.

Funding

This case report did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of competing interest

The authors declare no conflict of interest.

Acknowledgments

Dr Aaron Braddy of the National Heart & Lung Institute is supported by an NIHR Academic Clinical Fellowship and acknowledges support from the National Institute for Health Research (NIHR) Imperial Biomedical Research Centre (BRC).

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.rmcr.2020.101177>.

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