Open Respiratory Archives 7 (2025) 100481

Sociedad Española de Neumología y Cirugía Torácica SEPAR

Open Respiratory Archives

www.elsevier.es/ora

Clinical Report

Foreign Body Granulomatous Reaction Mimicking Tumor Recurrence After Lung Cancer Surgery: A Case Series

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ARTICLE INFO

Article history:
Received 2 July 2025
Accepted 31 July 2025

Keywords:
EBUS-TBNA
Lung cancer
Oxidized cellulose

ABSTRACT

Mechanical hemostatic agents, such as oxidized cellulose (Willocell©), are frequently used in thoracic surgery. Although considered safe, they can induce granulomatous reactions that mimic tumor recurrence. In this retrospective study, we analyzed patients from the Hospital Universitari de Bellvitge (July 2024–March 2025) who underwent EBUS due to lymphadenopathies with increased SUV on PET-FDG following surgery for lung cancer. Nine patients, who had undergone anatomical lung resections (VATS or RATS), presented with suspicious lymphadenopathies ipsilateral to the surgical site. EBUS-TBNA revealed no malignancy but showed amorphous material compatible with a foreign body reaction attributable to Willocell©. Only one patient was diagnosed with tumor recurrence.

This case series underscores the importance of maintaining a broad differential diagnosis when evaluating potential causes of increased metabolic activity on PET/CT scans, as its specificity is limited. EBUS-TBNA proves to be a key tool for achieving an accurate diagnosis in these scenarios.

Reacción granulomatosa a cuerpo extraño que simula una recurrencia tumoral después de una cirugía de cáncer de pulmón: serie de casos

Palabras clave:
EBUS-TBNA
Cáncer de pulmón
Celulosa oxidada

RESUMEN

Los agentes hemostáticos mecánicos como la celulosa oxidada (Willocell©) se utilizan frecuentemente en cirugía torácica. Aunque son seguros, pueden provocar reacciones granulomatosas que simulan recidiva tumoral. En este estudio retrospectivo, analizamos pacientes del Hospital Universitario de Bellvitge (julio 2024-marzo 2025) que se sometieron a EBUS por linfadenopatías con captación aumentada en PET-FDG tras cirugía por neoplasia pulmonar. Nueve pacientes, operados mediante resección pulmonar anatómica (VATS o RATS), presentaron ganglios linfáticos sospechosos ipsilaterales al sitio quirúrgico. El EBUS-TBNA no mostró malignidad, pero sí material amorfo compatible con reacción a cuerpo extraño atribuible al Willocell©. Solo un caso presentó finalmente recidiva tumoral. Esta serie de casos destaca la importancia de mantener un diagnóstico diferencial amplio ante posibles causas de aumento de la actividad metabólica en la PET/TC siendo el EBUS-TBNA una herramienta clave para un diagnóstico certero.

Mechanical hemostatic agents, such as oxidized cellulose (e.g. Willocell©), are widely used in thoracic surgery. These agents form a physical matrix that provides a barrier over the bleeding site while also enhancing platelet aggregation, degranulation

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https://doi.org/10.1016/j.opresp.2025.100481

Image 1A:

Patient	Tumor histology	Type of Surgery	Laterality of surgery and LNs	SUV values of LNs	Sampled LNs by EBUS	Time surgery to PET (in months)	Histopathological result in EBUS	Hemostatic agent used
1	Adenocarcinoma	Segmentectomy by VATS	Ipsilateral	8,2	4R	13	Foreign body reaction	Willocell
2	Adenocarcinoma	Lobectomy by RATS	Ipsilateral	10,02	4R	7	Foreign body reaction	Willocell
3	Adenocarcinoma	Lobectomy by RATS	Ipsilateral	5,9 and 7,3	10L y 11L	2	Foreign body reaction	Willocell
4	Adenocarcinoma	Segmentectomy by VATS	Ipsilateral	7,95	11R inf	3	Foreign body reaction	Willocell
5	Adenocarcinoma	Lobectomy by RATS	Ipsilateral	10,6	4R	7	Foreign body reaction	Willocell
6	Adenocarcinoma	Lobectomy by RATS	Ipsilateral	8,2	7	7	Foreign body reaction	Willocell
7	Adenocarcinoma	Lobectomy by RATS	Ipsilateral	4,8 and 5,1	7 y 4R	7	Foreign body reaction and malignancy cells	Willocell
8	Adenocarcinoma	Lobectomy by RATS	Ipsilateral	4,2	4R	15	Foreign body reaction	Willocell
9	Carcinoma	Lobectomy by RATS	Ipsilateral	4,6	4R	10	Foreign body reaction	Willocell

Image 1B:

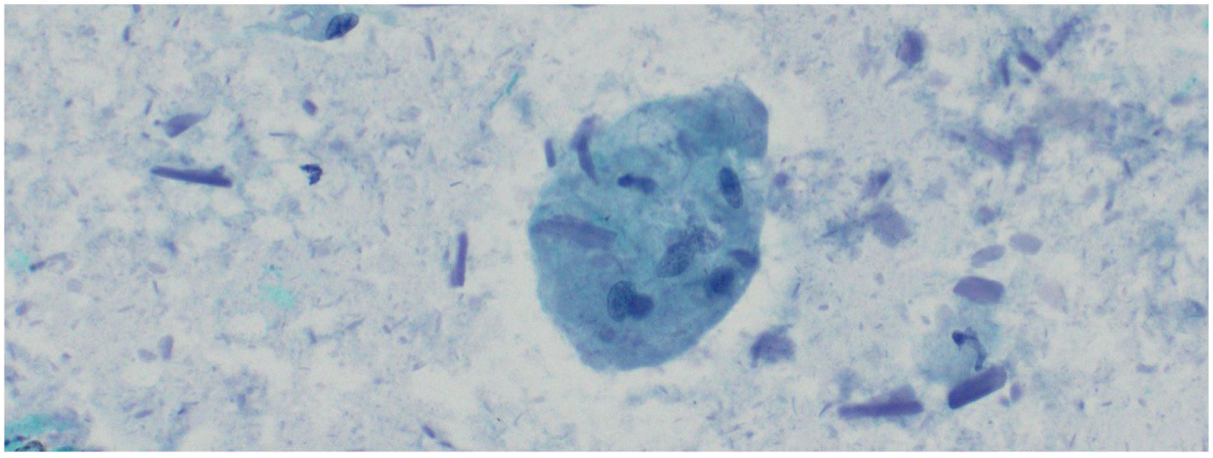

Fig. 1. (A) Table description of the cases. (B) Abundant acellular foreign material of cylindrical morphology, associated with a histiocytic reaction and the presence of multinucleated giant cells of the foreign body type.

and the release of clotting factors.[1] Their use is considered safe and effective. However, in some cases, remnants may persist in the tissues, triggering a granulomatous reaction.[2] This can mimic tumor recurrence on imaging studies and may lead to unnecessary invasive procedures if not considered in the differential diagnosis. We performed a retrospective chart review of patients from July 2024 to March 2025 who underwent Endobronchial Ultrasound (EBUS) for Computerized Tomography (CT)-enlarged and increased SUV in Positron Emission Tomography with Fluorodeoxyglucose (PET-FDG) lymphadenopathies (LNs) after lung cancer surgery at Hospital Universitari de Bellvitge. The mean SUVmax of the suspicious lymph node was 7.08 (standard deviation 2.05) and the median time between PET-FDG and surgery was 7 months. Cases with a histopathological diagnosis of foreign body inflammatory reaction were selected and described in this series.

We describe nine patients who underwent anatomical lung resection: four by Video-Assisted Thoracic Surgery (VATS) (lobectomy $n=2$ or segmentectomy $n=2$) and five by robotic-assisted thoracic surgery (RATS) (lobectomy $n=5$). All patients were enrolled in a post-surgical follow-up program that included thoracic CT scans. During follow-up all patients were referred to the Interventional Pulmonology Unit for the characterization of newly developed hilar and/or mediastinal LNs detected by CT imaging and showing intense metabolic activity on PET/CT scans. LNs were ipsilateral to the surgical site. Pathological sampling of suspicious LNs were obtained with EBUS-Transbronchial needle aspiration (EBUS-TBNA) with a 22G needle in all patients. The sampled LNs were: right inferior paratracheal (4R) ($n=6$), subcarinal (7) ($n=2$), left hilar (11L and 10L) ($n=1$ each) and right hilar (11R inferior) ($n=1$) as illustrated in Fig. 1A. Cytopathological analysis revealed no atypical cells but showed abundant amorphous material consistent with foreign body inflammatory reaction (Fig. 1B). The foreign material was identified as an oxidized regenerated cellulose product (Willocell©), which had been reported to be used in the surgical fields for the hemostasis, without subsequent removal, given its complete resorption within 7–14 days according to its product information. Cancer recurrence was confirmed in only one patient.

This case series highlights the importance of maintaining a broad differential diagnosis for potential causes of increased metabolic activity on PET/CT scans. Given the relatively low specificity of PET in distinguishing malignancy from inflammation, tissue confirmation remains essential. In this context, EBUS-TBNA

emerges as a safe, cost-effective, and evidence-supported procedure for diagnosis of lung cancer.[3] Moreover, a thorough surgical history is essential, especially when evaluating recently operated patients. Similar findings have been described by Zuccatosta et al.[4]

Artificial Intelligence Involvement

We haven't used artificial intelligence in this clinical report.

Informed consent

Informed consent from all patients for the use of their information for publication was obtained prior to the diagnostic test that confirmed the presence of an inflammatory reaction due to a foreign body.

Funding

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

Authors' contribution

MP, DM, PT, MP, CD and RL take care of medical management of the patients. LP and CG made the anatomical pathology diagnosis. MP and DM wrote the manuscript. All authors revised the final version of the manuscript.

Conflicts of interest

The authors declare not to have any conflicts of interest that may influence directly or indirectly the content of the manuscript.

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