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Case report

Initial Experience With Real-Time Elastography Using an Ultrasound Bronchoscope for the Evaluation of Mediastinal Lymph Nodes☆

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ABSTRACT

Real-time elastography performed during endoscopic ultrasonography is a relatively new method for characterizing tissue stiffness, and has been used successfully as a predictor of malignancy in mediastinal lymph nodes.

This case report describes our practical experience with this technique using an ultrasound bronchoscope to examine mediastinal lymph nodes. We present a case of sectorial endobronchial ultrasound and the first published case of endoscopic ultrasound elastography using ultrasound bronchoscope in two patients with non-small cell lung carcinoma. Qualitative tissue color pattern was obtained in both cases and correlated with pathological evaluation.

The initial feasibility results are promising and suggest that ultrasound bronchoscopy techniques, such as guided nodal staging, merit additional studies. It may be important to categorize the risk of malignancy to facilitate sampling decisions.

Experiencia inicial con elastografía en tiempo real mediante ecobroncoscopio en la evaluación de ganglios linfáticos mediastínicos

Palabras clave:
Elastografía
Ultrasonografía endobronquial
Ultrasonografía endoscópica
Cáncer de pulmón

RESUMEN

La elastografía en tiempo real realizada durante la ultrasonografía endoscópica digestiva es una técnica relativamente nueva que permite caracterizar la dureza de los tejidos, y ha sido utilizada con éxito como predictor de malignidad en ganglios mediastínicos.

En la presente nota clínica se describe nuestra experiencia práctica en la técnica de la elastografía con ecobroncoscopio en el estudio de los ganglios linfáticos mediastínicos. Presentamos un caso realizado mediante ultrasonografía endobronquial sectorial y el primer caso publicado de elastografía por ultrasonografía endoscópica con ecobroncoscopio, en 2 pacientes con carcinoma de pulmón no microcítico. El patrón cualitativo en color del tejido se obtuvo en ambos casos y se correlacionó con la evaluación anatomopatológica.

Los resultados de viabilidad iniciales son prometedores y las aplicaciones ecobroncoscópicas, como la estadificación ganglionar guiada, requieren ser evaluadas. Categorizar el riesgo de malignidad puede ser importante para ayudar a tomar decisiones en la obtención de muestras.

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Introduction

Precise classification of lymph nodes as benign or malignant is essential for lung cancer staging. B-mode morphological ultrasound criteria for the detection of malignant lymph nodes during endobronchial ultrasound (EBUS) may be useful for predicting metastasis.[1,2] However, inter- and intra-observer agreements for most sonographic signs are not sufficiently reliable.[3] An alternative could be the use of endoscopic ultrasound elastography. With this technique, structural deformation caused by compression or vibration is mapped to produce color images representing the relative elasticity or stiffness of tissue. From these images, anomalies can be classified as benign or malignant. Only 1 previous publication[4] on EBUS elastography is available, but this technique has been successfully applied in endoscopic ultrasound (EUS), with excellent inter-observer agreement.[5]

Case Reports

Case 1

A 66-year-old man, former smoker for 4 years, with a history of moderate COPD and left pleural effusion and cytology negative for malignancy. In the previous 4 months, he had 2 episodes of left lower lobe (LLL) pneumonia. He presented in the emergency room with left pleuritic pain, increased cough and poor general condition. Positron emission tomography-computed tomography (PET-CT) revealed a hypermetabolic necrotic mass in the LLL and hypermetabolic left lower paratracheal, left subcarinal-paratracheal and left para-aortic lymphadenopathies, suggestive of metastasis. Bronchoscopy was performed, showing endobronchial tumors in LLL segment 10. Bronchial brushing cytology showed squamous cell carcinoma. EBUS (BF-UC180F Olympus, Japan) was performed, with

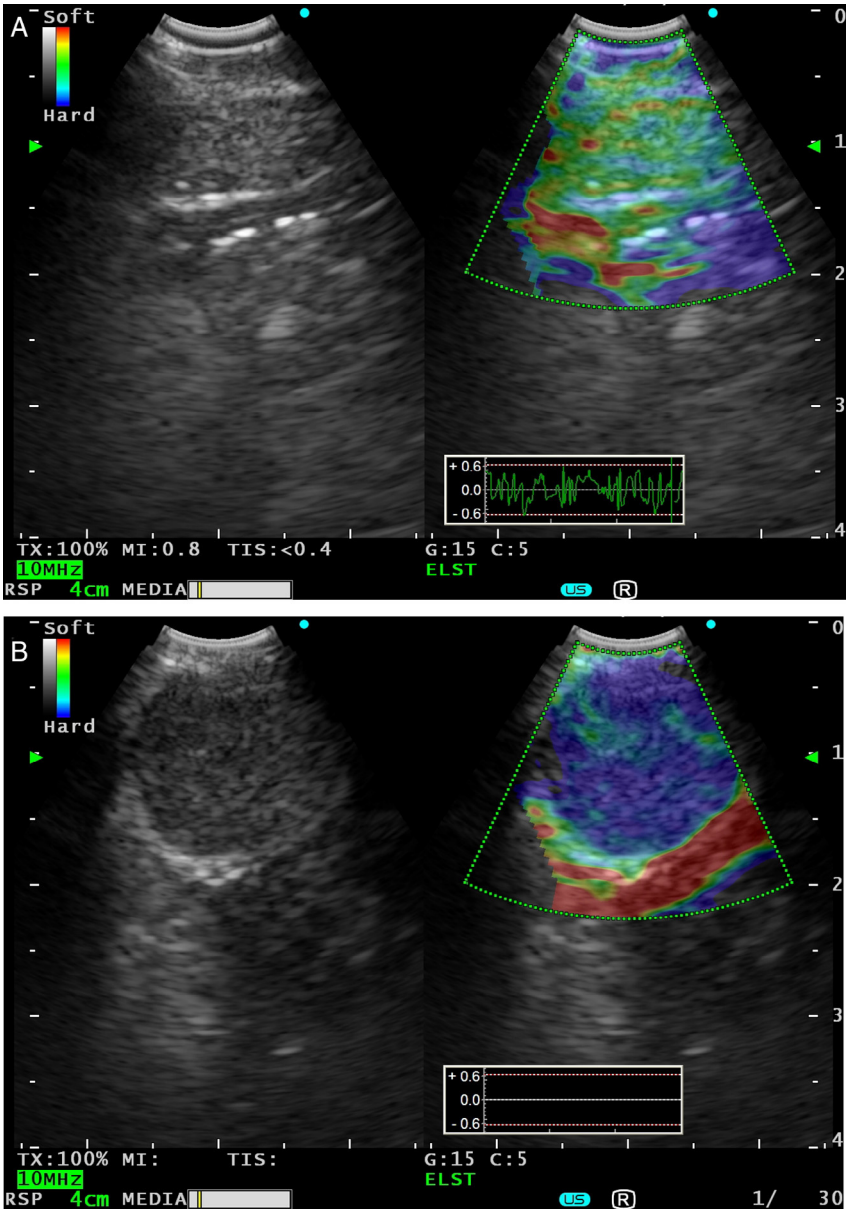

Fig. 1. (A) Conventional black and white EBUS B-mode image (left) and with real-time EBUS elastography (right), showing a 6.6 mm benign subcarinal lymph node, seen as an area of intermediate rigidity (green). (B) EBUS elastography (right) showing a 12.6 mm malignant subcarinal lymphadenopathy, seen as a stiff area (dark blue-cyan), due to squamous cell carcinoma infiltration.