00540 ELASTOGRAPHY OF LYMPH NODES FOR PREDICTING AND LOCALIZING METASTASTATIC DISEASE DURING EBUS-TBNA

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Background
Elastography is a relatively new technology that can generate images reflective of tissue stiffness (elasticity). Neoplastic tissue usually shows higher cellularity and vascularity, which results in stiffer tissue, as compared with normal structures. Elastography in combination with endoscopic ultrasound (transesophageal) has been shown to be useful for differentiating between benign and malignant paraesophageal, mediastinal, and abdominal lymph nodes.

Purpose
The aim of this study was to evaluate the feasibility and usefulness of elastography when combined with convex-probe endobronchial ultrasound (CP-EBUS) for predicting and localizing metastastatic disease during EBUS-TBNA.

Methods
Elastography results of lymph nodes performed under EBUS-TBNA were retrospectively analyzed. Convex probe endobronchial ultrasound (BF-UC260FW, Olympus, Tokyo, Japan) was used for EBUS-TBNA. Ultrasound images were processed with a universal endoscopic ultrasound scanner (EU-Y0008, Olympus) and elastography images were acquired as JPEG images and also recorded as video clips. Elastography allowed for visualization of relative elasticity differences and stiffer areas were shown in blue area on the ultrasound. Stiff area ratios (Stiff areas as blue pixels)/(lymph node areas as ROI pixels) for each lymph node were calculated using Image J 1.45 software (National Institutes of Health, USA). The stiff area ratios by elastography were collated with the metastatic regions in pathological specimens obtained by TBNA.

Results
We evaluated 49 lymph nodes in 21 patients. There were 16 metastatic nodes, including 10 lung cancer metastases and 6 metastases from extrathoracic malignancies. Mean stiff area ratios were significantly greater for metastatic lymph nodes: 0.478 for metastatic nodes and 0.216 for benign nodes (p=0.0002). Using a cut-off value of 0.394 for stiff area ratios, the sensitivity and specificity for predicting metastatic disease were 0.75 and 0.63, respectively.

Conclusion
Elastography technology can be used for mediastinal and hilar lymph nodes using CP-EBUS. Stiff area ratios on elastography images are useful for predicting metastatic lymph nodes. Stiffer areas, which are shown as blue areas, reflect cancerous tissue. Thus, this technology may be used to localize metastatic disease within lymph nodes, and real-time elastography guidance for EBUS-TBNA may improve diagnostic yield as it will allow for a precise puncture of the suspicious area within the lymph node.

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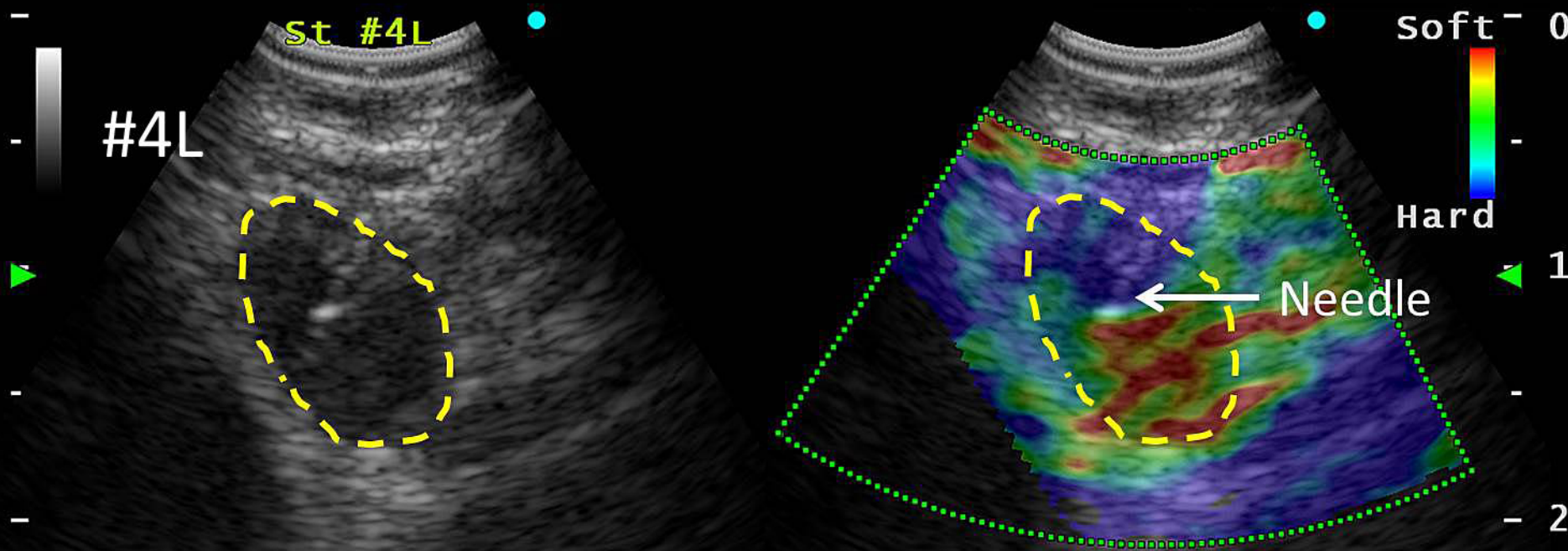
Blue area of the lymph node station #4L was selectively punctured. TBNA revealed positive for lymph node metastasis (squamous cell carcinoma).