Improved negative predictive value of EBUS-TBNA in isolated mediastinal / hilar lymphadenopathy:

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Results

A total of 100 patients underwent EBUS-TBNA for isolated mediastinal lymphadenopathy during the study period and the final diagnosis is demonstrated in Table 1.

Introduction

The traditional differential diagnosis of isolated mediastinal and hilar lymphadenopathy includes benign or inflammatory disease, infective, neoplastic and tuberculous and malignant conditions such as lymphoma and carcinoma. Each of these diagnoses requires a good diagnostic yield from radiological investigation and treatment. Lymphadenopathy in which such causes have been excluded has been termed ‘reactive lymphadenopathy’. In a prospective trial of 77 patients with isolated mediastinal lymphadenopathy EBUS-TBNA prevented mediastinoscopy in 67% of patients and demonstrated a negative predictive value of 84.5%.

Methods and Materials

The study was a prospective observational cohort of all patients undergoing EBUS-TBNA for reinvestigation of isolated mediastinal and hilar lymphadenopathy, between March 2005 and November 2012, at the lung centre, North West Lung Centre, University Hospital of South Manchester, UK. Patients were included if they had enlarged hilar or mediastinal lymph nodes (≥10mm in short axis diameter) without evidence of an intra-pulmonary mass and clinical symptoms. Patients were included if they had enlarged hilar or mediastinal lymph nodes (suggestive of sarcoidosis), and non-respiratory disease that may explain the lymphadenopathy in this group. Secondary aims were to determine the presence of respiratory co-morbidities (bronchiectasis, pulmonary hypertension, heart failure and rheumatoid arthritis) and non-respiratory, are associated with mediastinal and hilar lymphadenopathy. This included: emphysema and chronic bronchitis, interstitial lung disease, bronchiectasis, pulmonary hypertension, heart failure and rheumatoid arthritis—Lymphadenopathy in this study would fall under the term “reactive lymph nodule” following pathological sampling. This could lead to a higher prevalence of reactive lymphadenopathy in the isolated lymphadenopathy group. These patients require further surgical/trap biopsy following a negative EBUS-TBNA.

The primary objective of this study was to determine the prevalence of reactive lymphadenopathy in patients undergoing EBUS-TBNA for isolated lymphadenopathy. Secondary aims were to determine the presence of reactive and non-respiratory disease that may explain the lymphadenopathy in this group and identify for potential clinical and radiological follow up who would identify who patients may need further invasive sampling and which may undergo surveillance in cases of negative EBUS-TBNA.

Materials and methods

The study was a prospective observational cohort of all patients undergoing EBUS-TBNA for reinvestigation of isolated mediastinal and hilar lymphadenopathy, between March 2005 and November 2012, at the Lung Centre, North West Lung Centre, University Hospital of South Manchester, UK. Patients were included if they had enlarged hilar or mediastinal lymph nodes (≥10mm in short axis diameter) without evidence of an intra-pulmonary mass and clinical symptoms. The findings for each patient were based on EBUS-TBNA results, any subsequent pathological sampling and clinical-radiological follow-up, which was undertaken for a period of six months after the procedure. Diagnosis were classified as one of: sarcoidosis, tuberculosis, lymphoma, carcinoma or reactive lymphadenopathy. A lymph node was only classified as reactive if the EBUS-TBNA, any subsequent pathological sampling and 6 months of clinical-radiological follow-up failed to demonstrate any evidence of the other diagnoses. The study was approved by the local Ethics Committee.

The overall diagnostic performance of EBUS-TBNA in the cohort was:

- Sensitivity 80%
- Specificity 96%
- Negative predictive value 64.5%
- Diagnosic accuracy 91%

Reactive lymphadenopathy

EBUS-TBNA was the most common cause of isolated lymphadenopathy. There was a higher prevalence of co-morbidities compared to the other diagnostic groups (Table 2). There was only one patient in which no co-morbidities were present to account for the lymphadenopathy. Figure 2 demonstrates the co-morbidities present in those patients with reactive lymphadenopathy. Figure 2 also demonstrates the co-morbidities present in those patients with reactive lymphadenopathy. Figure 2 also demonstrates the co-morbidities present in those patients with reactive lymphadenopathy.

EBUS-TBNA prevented mediastinoscopy in 87% of patients and demonstrated a negative predictive value of 84.5%. In a prospective trial of 77 patients with isolated mediastinal lymphadenopathy, EBUS-TBNA prevented mediastinoscopy in 67% of patients and demonstrated a negative predictive value of 84.5%.


The negative predictive value of EBUS-TBNA may be significantly reduced in patients with extra-thoracic lymphadenopathy (sites included: abdominal 3, axillary 2, neck 1, inguinal 1). EBUS-TBNA correctly diagnosed 2/6 patients (sensitivity 33.3%). 67% (4/6) of patients had another mediastinal lymphadenopathy (suspected of sarcoidosis or lymphoma). Malignant diagnoses

Lymphoma accounted for 6% of the diagnoses. Lymphoma accounted for 6% of the diagnoses. Lymphoma was correctly diagnosed in 6 out of 7 patients (sensitivity 100%). Two patients (29%) were correctly diagnosed with EBUS-TBNA. Lymphoma or carcinoma accounted for 7% of diagnoses.

Conclusions

In patients undergoing EBUS-TBNA at our centre for isolated lymphadenopathy, EBUS-TBNA is a highly sensitive (97%) and specific (85%) test for reactive lymphadenopathy relative to other diagnostic approaches (bronchoscopy, tuberculosis, lymphoma, carcinoma). Clinical and radiological features that suggest a high probability of reactive lymphadenopathy and in whom there is no need for further sampling in cases of negative EBUS-TBNA include:

- 15 lymph stations enlarged with symmetrical mediastinal and hilar lymphadenopathy (suggestive of sarcoidosis)
- lung parenchymal abnormalities (upper lobe consolidation in tuberculosis and upper zone nodularity in sarcoidosis)
- non-Caucasian ethnicity (suggestive of tuberculosis),
- increased mediastinal lymphadenopathy with hilar lymphadenopathy (suggestive of sarcoidosis),
- absence of diseases associated with lymphadenopathy.

With the increasing use of CT, an ageing population and an increasing prevalence of chronic disease, the detection of reactive lymphadenopathy by CT scan alone is likely to remain an evolving problem. EBUS-TBNA is a highly accurate and safe procedure in selected patients. EBUS-TBNA is highly accurate and safe procedure in selected patients.

In conclusion, the negative predictive value of EBUS-TBNA may be significantly higher in patients with reactive lymphadenopathy.

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