Utility of Wang Transbronchial Needle Biopsy in Sarcoidosis

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Abstract

Sarcoidosis is a multisystem granulomatous disease of unknown aetiology, commonly seen in the western world. The incidence varies and may be as high as 40/100,000 of the population per year. The commonest mode of presentation is as hilar and mediastinal lymphadenopathy on a chest radiograph. Even though sarcoid is in general a benign disease and most patients will not progress to chronic lung disease, a tissue diagnosis is necessary for management as other differential diagnoses such as lymphoma, tuberculosis and other causes of interstitial lung disease need to be excluded.

The usual method of obtaining a tissue diagnosis is transbronchial forceps biopsy (TBBx), via a fibre-optic bronchoscope (FOB). The presence of non-caseating granuloma in the biopsy specimen is diagnostic of sarcoidosis if the tissue is stain and culture negative for tuberculosis and fungi. However TBBx carries significant complications – in particular there is a risk of pneumothorax (10-20 per cent) and significant and rarely life-threatening haemorrhage has been reported. Furthermore, a diagnosis of sarcoidosis is made by TBBx in only approximately 70 per cent of cases. Thus in about 30 per cent of cases a further procedure such as mediastinoscopy or open lung biopsy is required to obtain a tissue diagnosis.

We report a patient with suspected sarcoidosis who had negative TBBx in whom the diagnosis was confirmed using a Wang transbronchial needle (MW-319, Mill Rose Lab., U.S.A.) to biopsy mediastinal lymph nodes via the FOB.

Introduction

Sarcoidosis is a common multisystem granulomatous disease of unknown aetiology with an incidence in Ireland of 40 per 100,000 of population. It can affect virtually any organ in the body but very commonly presents to respiratory physicians with mediastinal/hilar lymphadenopathy and/or interstitial lung disease on chest radiograph. Sarcoid is a benign condition, but up to 30 per cent of patients develop progressive lung disease with pulmonary fibrosis requiring oral corticosteroid therapy. A tissue diagnosis is necessary as lymphoma, tuberculosis and other causes of interstitial lung disease can mimic sarcoid. Transbronchial forceps biopsy (TBBx) via a FOB is the usual method for obtaining diagnostic tissue. TBBx is positive for sarcoid in approximately 70 per cent of cases and the remainder require either mediastinoscopy or open lung biopsy to establish the diagnosis. All 3 of the above procedures carry an appreciable risk of complications and the last 2 require a general anaesthetic. Transbronchial needle aspiration (TBNA) provides a safe and effective alternative method of obtaining cores of tissue from mediastinal or hilar nodes without recourse to more risky procedures.

The history of TBNA goes back to 1949 when Eduardo Schieppati presented his new technique of endoscopically puncturing mediastinal lymph nodes across the tracheal spur. In 1958 he published his results on 83 patients describing the technique in which a stiff needle was passed through a rigid bronchoscope to puncture the carina and obtain lymph node biopsies. Cancer was diagnosed in 26 patients. TBNA did not become accepted until much later as mediastinoscopy was introduced in 1959 and surgeons preferred this technique to the blind approach of TBNA.

More recently several authors, mainly in the American literature, have published their experience with TBNA and conclude that it is a safe and effective method of obtaining cores of tissue for the histological diagnosis of benign and malignant disease in the mediastinal and hilar lymph nodes. They feel that it may become the procedure of choice for stage I, II sarcoidosis, mediastinal lymphoma and other mediastinal conditions. There is a learning curve associated with using the Wang needle but the only complications associated with its use are damage to the FOB if the needle is advanced unsheathed through the biopsy channel and failure to obtain adequate tissue for a histological diagnosis. Even if a major blood vessel such as the aorta or pulmonary is punctured in error or due to distortions of anatomy, and there are reports of this, the bleeding settles once the needle is withdrawn due to elasticity of the tissue and the small size of the needle. All patients should have a normal coagulation screen before the procedure.

Materials and Methods

The needle used for TBNA was a MW-319 (Mill-Rose Laboratories, INC., Mentor, OH 44060, U.S.A.). At the distal end of this instrument is a 15 mm long 19-G metal needle with a flat, cone-shaped tip that has an inward tapering cutting edge (Figure 1). The needle is attached to a 140-cm-long flexible plastic catheter with an outer
diameter of 1.8 mm. A 21-G, 13-mm-long bevelled, retractable needle, attached to a guide wire, is housed within the 19-G needle. The proximal end of the plastic catheter bears 2 ports, 1 to accommodate the proximal end of the guide wire with its locking mechanism and the other for applying suction while obtaining a tissue specimen. By adjusting the guidewire one can both retract the 21-G needle within the 19-G needle and the 19-G needle within the metal hub at the distal end of the catheter. This set-up avoids damage to the biopsy channel of the FOB during insertion.

The catheter is advanced through the FOB with both needles retracted as mentioned above. When the metal hub appears through the distal end of the FOB both needles are fully advanced so that the 21-G needle is protruding through the distal end of the 19-G needle (Figure 2). This ensures easier passage through the tracheal or bronchial wall and the 21-G needle prevents plugging of the 19-G needle by mucosa from the tracheo-bronchial wall. The site of aspiration is identified via the FOB (e.g. anterior or posterior carinal, right para-tracheal and aortopulmonary window for the purposes of this case) and the needle is advanced by a quick thrust or by advancing the body of the bronchoscope with the needle. When the whole length of the 19-G needle has penetrated through the bronchial wall, the 21-G needle is withdrawn into the 19-G needle, and suction is applied from the side arm at the proximal end by a 20-ml syringe. During negative suction, the 19-G needle is partially withdrawn and readvanced several times, while angulating the needle in different directions within the lymph node.

Once finished the negative suction is released and the whole apparatus is withdrawn from the FOB, and the specimen is flushed into formalin for histologic examination (Figure 3).

**Patient Details**

A 23 yr old woman was referred with bilateral hilar and mediastinal lymphadenopathy on routine chest radiograph. Her clinical examination was normal and her past history was unremarkable. After discussion with the patients of the risks and benefits she underwent elective bronchoscopy at which time she had TBBx from the right lower lobe for histology and broncho-alveolar lavage from the right middle lobe for immuno-pathological analysis. The patient also had TBNA from her anterior and posterior carinal lymph nodes and from the right paratracheal lymph nodes using an MW-319 needle.

The results of the forceps biopsy showed non-specific fibrosis, but the tissue obtained from the mediastinal lymph nodes by TBNA showed non-caseating granulomata, stain and culture negative for tuberculosis and fungi, consistent with sarcoidosis.

**Discussion**

The patient presented with mediastinal and hilar lymphadenopathy on chest radiograph. Transbronchial forceps biopsy (TBBx) x 5, the usual modality for establishing a diagnosis of sarcoid, was negative and the diagnosis was established unequivocally by transbronchial needle aspiration (TBNA). This procedure saved the patient the risks and cost of mediastinoscopy or open lung biopsy.

In summary, the current modalities for diagnosing for sarcoid are not foolproof and there are drawbacks associated with all of them. TBBx establishes the diagnosis in 70 per cent of cases, but is associated with a