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Artigo Original

Original Article

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Punção aspirativa transbrônquica por agulha de linfonodos hilares e mediastinais

Transbronchial needle aspiration of hilar and mediastinal lymph nodes

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Resumo

Introdução: A punção com agulha através da broncofibroscopia (TBNA), além de ser útil no esclarecimento das linfadenomegalias hilares e mediastinais, é também de utilidade no diagnóstico e estadiamento do carcinoma brônquico e de outras neoplasias metastáticas.

Objetivo: Avaliar retrospectivamente a eficácia das TBNA realizadas em 74 doentes consecutivos. Quarenta e nove deles do sexo masculino e com idade mediana de 49 anos. Utilizamos a agulha de Wang, 21-gauge (Bard, USA), e a técnica utilizada foi a descrita

Abstract

Background: Besides clarifying the etiology of unidentified lymphadenomegaly, puncturing hilar and mediastinal lymph nodes by a flexible bronchoscopic needle is an aid in diagnosing and staging bronchogenic cancer or other metastatic cancers. **Objective:** Our study had the principal objective to evaluate the positivity of transbronchial needle aspiration (TBNA). **Method:** We evaluated retrospectively the effectiveness of all TBNA done in 74 consecutive patients. Forty-nine patients were male and the median age was

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PUNÇÃO ASPIRATIVA TRANSBRÔNQUICA POR AGULHA DE LINFONODOS HILARES E MEDIASTINAIS

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pelos diversos autores. Dos 74 doentes estudados, 11 (15%) tinham linfadenomegalia mediastinal e 65 (85%) hilar. Observámos 72 anormalidades endoscópicas.

Resultados: De acordo com a classificação do material obtido, tivemos 32/74 (43%) cujo material foi insatisfatório para o diagnóstico; em 34/74 (46%), o material foi satisfatório e capaz de definir o diagnóstico; e 8/74 (11%) nos quais o material obtido foi satisfatório mas insuficiente para se definir o diagnóstico. Da amostra, 34 (46%) foram positivos. Destes, 30/34 (88%) eram doenças malignas. O carcinoma indiferenciado de pequenas células foi o mais comumente encontrado, com 10/34 (29%); o carcinoma escamoso, 7/34 (21%); o adenocarcinoma, 7/34 (21%); e o carcinoma de não pequenas células, 6/34 (17%). A sarcoidose foi identificada em 2/34 (6%) e a tuberculose em 2/34 (6%). **Conclusão:** O método é seguro, de fácil realização, com pequeno índice de complicações e de utilidade para o diagnóstico e estadiamento do cancro do pulmão.

59. We used Wang-needles, 21-gauge (Bard, USA), and the same technique described for different authors. Of the 74 patients evaluated, 11(15%) showed mediastinal mass and 65 (85%) hilar mass. We observed 76 endoscopies abnormalities. **Results:** According to the classification of the specimens, we had 32/74 (43%) unsatisfactory specimens, 34/74 (46%) satisfactory and diagnostic specimens, and 8/74(11%) satisfactory and non-diagnostic specimens. Thirty four (46%) of the examinations were found to be positive out of the total amount of specimens. Of the positive results, 30/34 specimens (88%) contained malignant disease. Small-cell carcinoma was the most frequent finding, with 10/34 cases (29%); squamous cell carcinoma 7/34 (21%); adenocarcinoma 7/34 (21%), non-small cell carcinoma 6/34 (17%); sarcoidosis 2/34 (6%) and tuberculosis 2/34 (6%). **Conclusion:** Our study indicated that this method is safe, easy to perform, with a minimum of complications and useful for the diagnosis and staging of pulmonary neoplasms.

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Palavras-chave: Carcinoma brônquico, citologia, estadiamento, broncofibroscopia, metástases linfonodais, punção aspirativa transbrônquica com agulha.

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Key-words: Lung cancer, cytology, staging, flexible bronchoscopy, lymph node metastases, transbronchial needle aspiration.

Introduction

Transbronchial needle aspiration (TBNA) was described in 1949 by Schieppati^{1a}, but only at the beginning of the 80s did it start to be used with flexible bronchoscope. TBNA enhanced the diagnostic positivity of fiberbronchoscopy, although it is still underused.^{1, 2}

The aim of TBNA of mediastinal lymph nodes is to clarify the cause of lymphadenopathy.

TBNA is a safe procedure, barely invasive, with low incidence of complications. It provides not only cytological but also histopathologic specimens. This method is currently being used in the diagnosis of mediastinal lymph nodes and masses, submucous lesions, and peripheral nodules or masses.^{1,2} Nowadays, it is being indicated more and more for diagnosis and staging of lung cancer, where it has shown to be an useful procedure for the reduction of

morbid-mortality and to reduce costs of mediastinoscopy, mediastonotomy and thoracotomy.¹⁻⁴

Despite the widening range of indications – a) diagnosis or mediastinal and hilar lymphadenomegaly and staging lung cancer; b) vascularized, visible endobronchial lesions and submucosal changes with bleeding disposition; c) peripheral round opacities; d) diagnosis of mediastinal cysts and e) definition of the resection line – the use of this technique has been rather neglected.²⁻⁵

Objective

To evaluate the positivity of TBNA in the diagnosis of pulmonary and mediastinal lesions.

Material and methods

To evaluate retrospectively all TBNA done in 74 consecutive patients who were under diagnostic investigation in the Thoracic Surgery Service at the National Cancer Institute, from 1998 to 2005.

Of these 74 patients, 49(66%) were male with ages ranging from 28 to 83 (median = 59). All the bronchoscopies were carried out through a Pentax VB 1830. All patients were previously submitted to a thoracic CT scan. Lymph nodes bigger than 1 cm, in its smallest diameters, viewed in the CT scan, were chosen for aspiration. The nodal stations aspirated were divided into mediastinals (4 R, 4 L and 7), and hilars (11 R and 11 L). (Fig. 1).

Technique

For sampling, a needle inserted into a flexible catheter, advanced from a metal hub (Wang needle, 21-gauge, Bard, USA), was

used. The distal end of the flexible bronchoscope should not be bend until after, being introduced through the instrument channel, the metal hub is exposed at the tip of the bronchoscope. It was easiest to perforate the bronchial wall with a single rapid movement. Asking the patient to cough facilitated penetration of the needle between the cartilaginous rings. Using a large syringe, multiple suction were carried out through the proximal orifice while the needle was plunged in and out. To eliminate contamination from endoluminal secretions, the needle was withdrawn from the bronchial wall only after releasing suction. The tip of the bronchoscope was then placed upright, the needle was withdrawn into the little metal hub, and it was retracted with a continuous motion from the endoscope. Care was taken not to thrust the catheter with an exposed needle into the bronchoscope to avoid serious injury of the inside channel.¹⁶

TBNA was carried out before the inspection of the bronchial tree, and 3 to 5 specimens were taken of the nodal station that was affected. The fiberbronchoscope was introduced without using the suction pipe. After collecting the specimen, the material was smeared onto a slide and was fixed with 95% alcohol. After that, the needle was washed with a saline solution and both needle lavage and slide were sent to the pathological anatomy laboratory. All the bronchoscopies were done without fluoroscopy.

All specimens collected were classified as (1) satisfactory and diagnostic, (2) satisfactory and non-diagnostic or (3) unsatisfactory. All specimens considered satisfactory had to have a predominance of lymphocytes and

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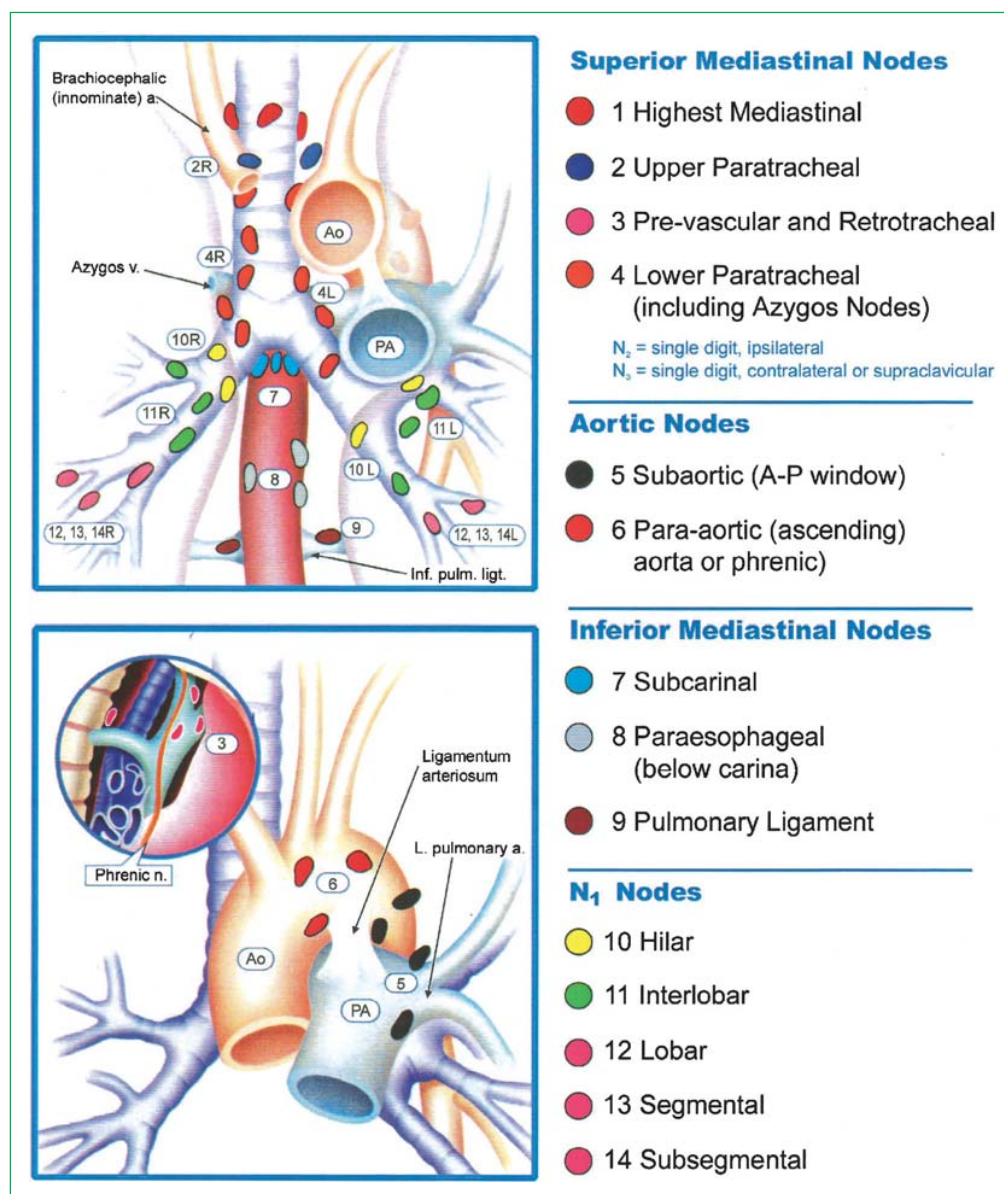


Fig. 1 – Nodal station for lung cancer staging (According to the American Thoracic Society)

rare epithelial cells, whether or not they were considered diagnostic. The specimens that did not contain affected lymph nodes were considered non satisfactory.^{4,5}

As TBNA in this service is also used for teaching purposes, all patients were submitted to other kinds of diagnostic procedures independent of TBNA positivity.

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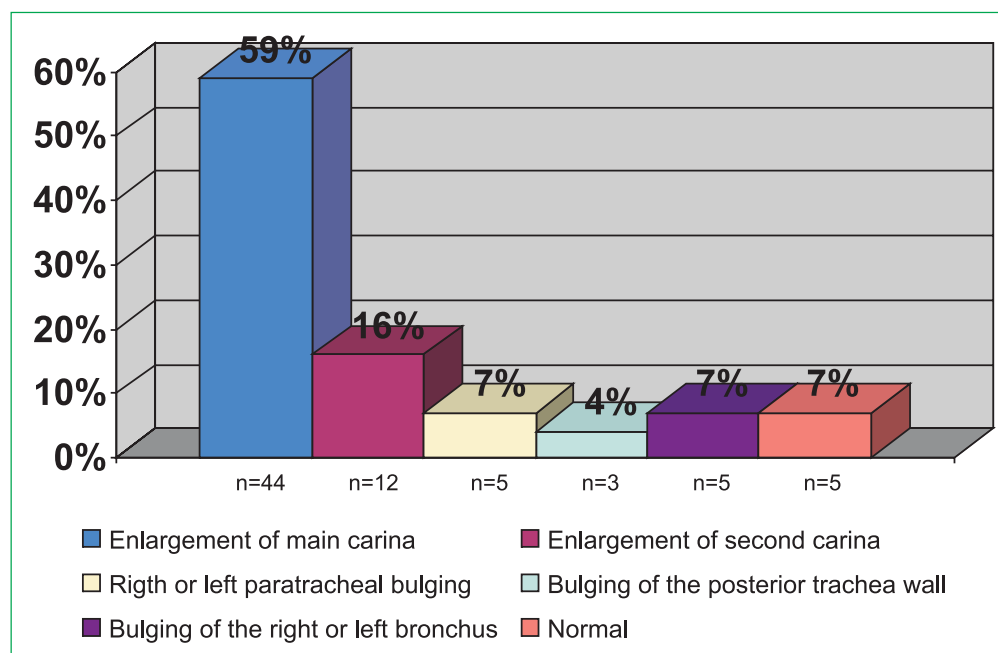


Fig. 2 – Endoscopy findings

Results

Of the 74 patients evaluated, 11 (15%) showed mediastinal mass and 63 (85%) hilar mass as seen in the CT scan. We observed 76 endoscopic findings: enlargement of main carina in 44/74 patients (59%); enlargement of secondary carina in 12/74 patients (16%); right or left paratracheal bulging in 5/74 (7%); bulging on the posterior trachea wall in 3/74 (4%); bulging of the right or left main bronchus in 5/74 patients (7%) and in 5/74 patients (7%) showing no abnormalities (Fig. 2). According to the classification of the specimens, we had 32/74 (43%) unsatisfactory specimens, 34/74 (46%) satisfactory and diagnostic specimens and 8/74 (11%) satisfactory and non-diagnostic specimens (Fig. 3). Thirty four (46%) of the examinations were found to be positive out of the total amount of

specimens. Of the positive results, 30/34 specimens (88%) contained malignant disease. Small-cell carcinoma was the most frequent finding, with 10/34 cases (29%); squamous cell carcinoma 7/34 (21%); adenocarcinoma 7/34 (21%), non-small cell 6/34 (17%), sarcoidosis 2/34 (6%) and tuberculosis 2/34 (6%). (Fig. 4).

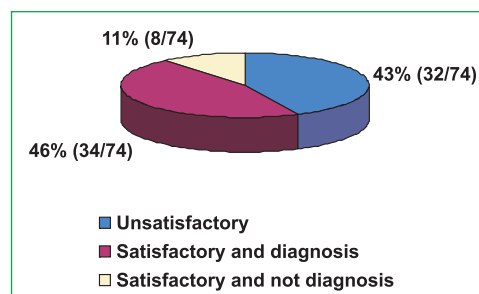


Fig. 3 – Specimen classification

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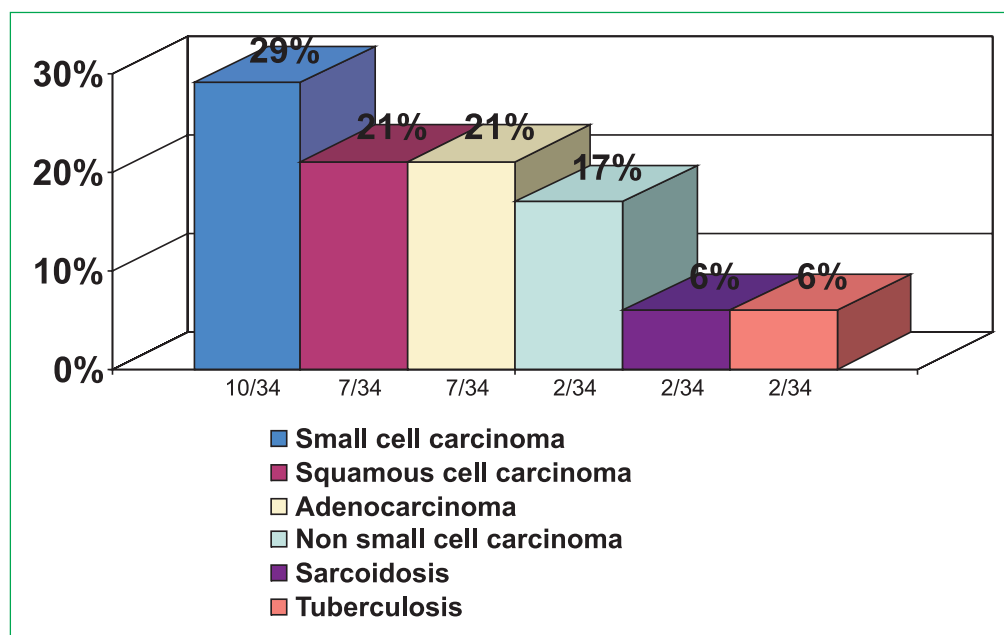


Fig. 4 – Cytology results

Discussion

In this evaluation, only patients with mediastinal or hilar lesions, viewed in a thoracic CT scan, and, in the majority of cases, with endoscopic findings corresponding to the radiological findings, were submitted to TBNA.

Normal endoscopic findings and absence of enlarged lymph nodes in the CT scan do not rule out the use of needle aspiration, but it does reduce its positivity.⁷ Chin et al.⁸ observed that higher positivity was correlated with larger diameter of the smaller lymph node in its smallest diameter using CT scan – this correspondence 4% when the lymph nodes were less than 1 cm, but 44% when they were larger than 2 cm.

We didn't observe any difference in positivity between hilar and mediastinal lymph

node aspiration, agreeing with the findings of Harrow et al.⁹, who observed 43% yield for mediastinal lymph nodes and 46% for hilar lymph nodes, in a total of 360 patients evaluated.

Although there is no consensus about how many punctures must be done in each nodal station, but different authors agree that it didn't have any improvement positivity after seven consecutive punctures.^{5,8-10}

Although there is a high positive predictive value that reaches 100, TBNA has a low predictive negative value, needing, in cases of negative results, to be complemented with other diagnosis methods. False-positive results are rare and can be avoided when technical orientations are followed.^{1,5,9}

These orientations are: 1) wash the area to be punctured with saline solution or lido-

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caine; 2) interrupt aspiration before withdrawing the needle from the lymph node; 3) first aspirate those lymph nodes which have the worst prognosis and collect hystological material when necessary; 4) do the aspiration before examining the tracheobronchial tree; 5) avoid using the aspiration until TBNA has been carried out.¹⁻⁵

Before accepting the cytologic results, we must first verify the quality of the specimens collected. A satisfactory specimen is one with cytologic predominance of lymphocytes and rare or no epithelial cells, and when these characteristics are present, then specimen must be classified as positive, suspect or negative.

Among our patients with a diagnosis of a malignant disease, the type more frequently found was the small-cell carcinoma. This type of tumor has more positivity when compared with other types of lung cancer.¹⁰

TBNA allow us to access 11 nodal stations, but only five stations are useful in the staging of lung cancer. They are: station 7 (subcarinal lymph nodes), station 4 right (para tracheal inferior), station 4 left (para tracheal inferior) and station 11 left and right (hilar lymph nodes).¹

TBNA has a limited role in the diagnosis of sarcoidosis because it is necessary to identify a non-caseous granuloma in order to give the definite diagnosis. The use of TBNA plus transbronchial biopsy, enhance the positivity of the bronchoscopy¹; and for those patients with negative transbronchial biopsy who are sent to mediastinoscopy, TBNA represents a safe, economical, and less invasive way to do the diagnosis.

We had a 46% of yield, similar to those found in the literature.⁹⁻¹¹ The yield of the method depends on the skill and care of the exami-

ner, moreover it is recommended in general that a potential examiner should conduct at least 25 under the guidance of a competent practitioner before he or she is permitted to do the procedure "solo".^{12,13,14} In addition, some believe that the presence of the pathologist during the procedure to identify if the specimen taken from the lymph node would improve the yield significantly. But this is still an open question.

Since sarcoidosis can only be definitively diagnosed through the detection of non-caseous granuloma, TBNA with a fine needle plays a limited role in the diagnosis of the disease. Using TBNA concomitantly with transbronchial biopsy or even bronchial biopsy improves diagnostic efficiency.¹ In our study, sarcoidosis was diagnosed in 2 (6%) of the patients through the identification of non-caseous granuloma, which, together with the clinical history and the radiological findings, confirmed the diagnosis. Also, tuberculosis was diagnosed in another 2 patients (6%) by identifying a Langhans foreign-body type giant cell granuloma and caseous necrosis in the aspirate.

It is also important to note that this procedure is contraindicated for certain types of patients, including patients who are uncooperative in relation to it, those who are experiencing coughing bouts, those with coagulation problems, as well as those who suffer from pulmonary arterial hypertension, the latter condition, however, being relative¹⁵.

Among dangerous complications related to this examination, there have been reported: pneumothorax, pneumomediastinum and hemomediastinum and at least one case of a patient in which hepatic aspiration was said to result in right-side frenic paralysis.

Sometime we also observe a little bleeding at the site of the puncture which originates in the tracheobronchial vessel wall. Transitory fever and bacteremia can happen after the procedure, but there is no definitive indication for antibiotic prophylaxis. The most common problem associated with TBNA, from the point of view of the apparatus, is damage to bronchoscope working channel, and so the bronchoscope must be rectified during the progression of the needle and we must retract the needle into its sheath.^{1,2}

Conclusions

Although at present it is less used than some other methods, TBNA is a method that is quite helpful in the diagnosis of lung and mediastinal diseases, also enhancing the positivity of fiberbronchoscopy. When combined with other bronchoscopy methods and performed by trained, experienced practitioners, TBNA improves diagnostic efficiency. But only by improvement in the training of the professionals who carry out the procedure can we better the results the method is capable of providing.

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