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ORIGINAL ARTICLE

Comparison between endobronchial forceps-biopsy and cryo-biopsy by flexible bronchoscopy



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KEYWORDS

Cryobiopsy;
Bronchoscopy;
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Abstract *Background:* Invasive procedures such as bronchoscopic biopsy, bronchial washing, and bronchial brushing are widely used in the diagnosis of lung cancers. The mean diagnostic rate with bronchoscopic forceps biopsy is 74% in central tumors; the new biopsy technique of cryobiopsy appears to provide better diagnostic samples.

Aim of the work: To compare the efficacy and diagnostic yield of endobronchial cryobiopsy with forceps biopsy in the diagnosis of lung cancer.

Methods: Twenty-five patients who underwent bronchoscopy were included in this study. Three forceps biopsies and one cryobiopsy with ERBE cryo probe were obtained from each subject. Biopsies interpretations were done by one expert pathologist.

Results: Hemorrhage was the only complication in both procedures, there was no significant difference between these two procedures in the incidence of hemorrhage ($P > 0.05$). There is significant difference as regarding crushing and loss of architecture under microscopy ($P < 0.001$), forceps biopsies shows crushing and loss of architecture more than cryo. Mean diameters of samples taken with forceps biopsy and cryoprobe biopsy were 0.5 and 1.4 cm, respectively ($P < 0.001$), 20 patients (80%) were diagnosed with forceps biopsies, and 25 patients (100%) were diagnosed with cryoprobe biopsies.

Conclusions: We concluded that cryoprobe biopsies were more successful than forceps biopsies in the diagnosis of lung cancer. Nevertheless, further investigations are warranted to determine an efficacy of cryoprobe biopsy procedures and a rationale to use as a part of routine flexible bronchoscopy.

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Introduction

Invasive procedures such as bronchoscopic biopsy, bronchial washing, and bronchial brushing are widely used in the diagnosis of lung cancers. The mean diagnostic rate with bronchoscopic forceps biopsy is 74% in central tumors [1].

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A forceps-biopsy is performed to acquire tissue from patients with an endobronchial carcinoma using a flexible bronchoscope. Recently, a cryo-biopsy has also been used to acquire tissue samples. Cryo-biopsy is the diagnostic application of extreme cold for the local destruction of abnormal living tissue. This technique is safe, with no radiation danger, no risk of electrical accidents, and little risk of bleeding [2].

In studies assessing the histological material obtained using cryoprobes in cases of endobronchial tumors, the samples were found to be larger with preserved architecture and sufficient for diagnosis than those obtained with conventional forceps. This has led to considering the possibility of using cryoprobes for performing endobronchial biopsy [3,4].

Cryoprobe biopsies were more successful than forceps biopsies in diagnosis up to 92% [1].

Aim of the work

To compare the efficacy and diagnostic yield of endobronchial cryobiopsy with forceps biopsy in the diagnosis of lung cancer

Subject & methods

This study was carried out on 25 patients who attended the chest department, Minoufia university hospitals and a written consent was obtained from each patient participating in the study.

The patients underwent flexible Fiberoptic bronchoscopy; Using (Pentax FB, 19-TV, with an internal diameter of 2 mm).

Any patient having contraindication for fiber-optic bronchoscopy is excluded as;

- 1– Severe uncorrected hypoxemia despite the administration of supplemental oxygen.
- 2– Unstable cardiovascular or hemodynamic status.
- 3– Coagulation defects. The prothrombin concentration should be greater than 70%, and the platelet count greater than 60,000/mm³.
- 4– Acute exacerbation of chronic obstructive pulmonary diseases.

1- Pre-medication:

- Atropine 0.5–1 mg intramuscularly (I.M) half an hour before the procedure.
- Midazolam 2–5 mg (slow intravenous injection (I.V) over about 30 s).

2- Topical anesthesia:

A lignocaine gel was sprayed in nostrils and 10% Lidocaine solution directly into the larynx. Lidocaine 2% was used to anaesthetize the airways through the bronchoscope channel during the procedure as needed.

- The fiberoptic bronchoscopy was carried out trans-nasally except in two patients with nasal obstruction, where the trans-oral approach was used.
- Supplemental oxygen was given throughout the procedure when needed.

Full exploration of the endobronchial tree starting with the healthy side was done then 3 biopsies will be taken by forceps

and one biopsy by cyoprobe from each patient with endobronchial lesion.

Forceps biopsies were performed by passing the forceps into the bronchoscope working channel, opening the forceps, advancing the bronchoscope or forceps onto the lesion, closing the forceps thus grasping, gently tugging so as not to tear the tissue while retrieving the forceps through the working channel or barrel, and then placing it in 10% formalin. In the patients that were studied, a minimum of 3 endobronchial forceps biopsies were performed initially then endobronchial CB is performed with the following protocol; the cryotherapy probe (ERBE flexible probe used nitrous oxide which induces a temperature of -89.5°C at the tip of the probe. seen below in Fig. 1) is placed in direct contact with the lesion that is being sampled, and when approaching exophytic lesions, the probe is frozen for 3–5 s (or until the initiation of the frosting at the tip of the probe is visible), After this short period of freezing, the bronchoscope is removed en bloc with the cryotherapy probe.

Frozen biopsy material was separated from the cryoprobe by way of plunging into saline.

After having a specific code, each specimen is grossly examined to measure the largest diameter of the biopsy. After that biopsies were fixed separately in 10% buffered formalin. Then, 4 mm sections were obtained from paraffin embedded blocks and stained by hematoxylin and eosin (H&E). The slides were histologically evaluated by one pathology specialist using a light microscope.

Results

This study was done on 25 patients who attended the Chest department Minoufia University hospitals. 18 of them were males and 7 females with a mean age of 57.04 ± 6.4 years.

The above table showing the diagnosis was achieved in 100% of cases in cryo biopsy, while the diagnostic yield by forceps biopsy was 80.0% and 20.0% were not diagnosed and all of them were squamous cell carcinoma as reported by cryo (see Figs. 2–5).

Discussion

Diagnostic bronchoscopy with endobronchial forceps biopsy (FB) is primarily practiced in patients with suspected thoracic malignancy and visible endobronchial pathology.

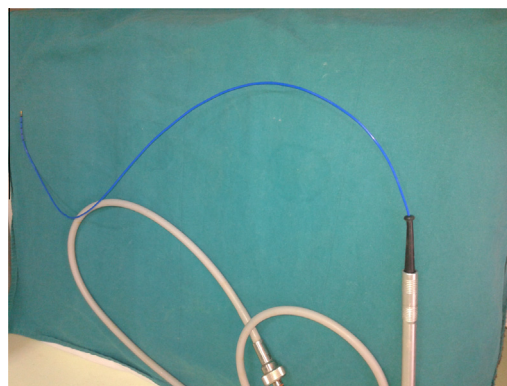


Figure 1 ERBE cryo probe used in the study.

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