

# CT scanning before fiberoptic bronchoscopy improved the accuracy of bronchoscopy in suspected endobronchial carcinoma

Laroche C, Fairbairn I, Moss H, et al. Role of computed tomographic scanning of the thorax prior to bronchoscopy in the investigation of suspected lung cancer. *Thorax*. 2000 May;55:359-63.

## QUESTION

In patients with suspected endobronchial carcinoma, does computed tomographic (CT) scanning done before fiberoptic bronchoscopy improve the diagnostic yield of bronchoscopy and reduce the number of further diagnostic tests?

## DESIGN

Randomized (allocation concealed\*), blinded (test readers),\* controlled trial comparing CT scanning of the chest and upper abdomen before fiberoptic bronchoscopy with fiberoptic bronchoscopy alone using diagnostic results that included biopsy as the diagnostic standard.

## SETTING

A lung cancer investigation unit in Cambridgeshire, England, United Kingdom.

## PATIENTS

171 of 172 consecutive patients (mean age 67 y, 62% men) with suspected lung cancer and in whom bronchoscopy was considered the most likely route to obtain diagnostic samples. Exclusion criterion was presence of clearly defined peripheral mass on chest radiography and no proximal component.

## INTERVENTION

All patients received CT scanning. 90 patients were allocated to have their CT scan discussed with a bronchoscopist before

further procedures were done. 81 patients were allocated to go directly to fiberoptic bronchoscopy (CT scan results were not available to the bronchoscopist).  $\geq 5$  bronchial biopsy specimens of visual tumors were taken; bronchial washing was done; and if no visible tumor was seen, bronchial brushing was done. Additional follow-up tests were done as needed using information from the CT scans. Follow-up was 100%.

## MAIN OUTCOME MEASURES

Number of tests used and proportion of true positive and negative results using biopsy as the diagnostic standard.

## MAIN RESULTS

78% of the patients had confirmed lung cancer. In the CT-scanning group, 6 patients (2 with cancer) did not have further invasive testing, and 16 had alternative invasive testing (12 needle biopsies). 68 patients in this group had bronchoscopy

after CT scanning. A comparison of the 2 groups showed that initial CT scanning led to more accurate testing (Table). The groups did not differ for total adverse effects (pneumothorax requiring conservative treatment,  $P = 0.2$ , and minor hemorrhage,  $P = 0.3$ ) or costs (£525/patient for initial CT scanning vs £534/patient in the bronchoscopy group).

## CONCLUSION

Computed tomographic scanning before fiberoptic bronchoscopy influenced the choice of initial diagnostic tests and improved the diagnostic accuracy of bronchoscopy in patients with suspected endobronchial carcinoma.

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\*See Glossary.

## Computed tomographic (CT) scanning before bronchoscopy vs bronchoscopy alone for patients with suspected endobronchial carcinoma

Patients	Outcomes	Initial CT	Bronchoscopy first	P value
All	Bronchoscopy is diagnostic	73%	54%	0.015
All	First invasive procedure is diagnostic	76%	55%	0.005
With cancer	Sensitivity of bronchoscopy	89%	71%	0.012
With cancer	Histologic diagnosis on first invasive procedure	90%	71%	0.004

## COMMENTARY

Since its introduction in 1972, fiberoptic bronchoscopy has been the main technique used to obtain histologic evidence of suspected bronchial carcinoma. Although several retrospective studies have suggested that CT scanning before bronchoscopy might aid precision and therefore diagnostic yield, the study by Laroche and colleagues is the first to provide prospective evidence.

The study is well designed and shows that CT scanning before bronchoscopy for all patients had 3 benefits. First, 7% of all patients had diseases requiring no further investigation. Second, CT scanning showed that in 19% of persons with lung cancer, an alternative approach, such as transthoracic needle biopsy, was more appropriate. Third and most important, CT scanning before bronchoscopy increased the diagnostic yield of bronchoscopy in patients with cancer from 71% to 89%. The study also shows that CT scanning before bronchoscopy is only cost-effective in facilities that are now sending > 60% of their patients for CT scanning at some stage in the disease process. Therefore, facilities with lower CT scanning rates will have

increased costs if routine CT scanning before bronchoscopy is introduced.

The study took place in a large, free-standing specialist unit: It should be replicated in different settings, including general hospitals, before initial CT scanning can be generally adopted. Any advantage from CT scanning depends strongly on individual radiologists' expertise, especially in assessing the detailed anatomy of the bronchial tree. This expertise may be less well developed in the average general hospital. Furthermore, CT scanners in general hospitals are often extremely busy: Adding CT scanning for every patient with suspected lung cancer may cause problems with accessibility.

Nonetheless, if the study results prove applicable, CT scanning before bronchoscopy in all patients may well refine our use of bronchoscopy and improve our investigation of suspected lung cancer.

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