BRONCHIAL AND HISTOPATHOLOGICAL EXAMINATION IN THE DIAGNOSIS OF BRONCHOPULMONARY NEOPLASM IN GORJ COUNTY

ELENA VLAD[1]

[1]*Emergency Hospital Tg-Cărbuneşti*

Keywords: *lung cancer, bronchoscopy, histopathology*

Abstract: *Bronchopulmonary cancer worldwide is a matter of public health being alarmingly increasing for the last 50-60 years. Bronchoscopy is an essential method of positive diagnosis both in peripheral bronchopulmonary cancer and in the central one. This investigation allows pre-surgical staging of lung cancer by determining the endobronchial extension. We analysed a batch of 780 patients examined from bronchoscopic and histopathological point of view at Tudor Vladimirescu Pneumophtisiology Hospital, from Runcu commune, Gorj County between 2005 and 2011 and at Tg-Cărbuneşti Emergency City Hospital from October 2011 until October 2012. Bronchoscopy with its endoscopic sampling methods (bronchial microlavage, broncho-alveolar lavage, multiple bronchial biopsies) allowed positive diagnosis, as well as histopathological diagnosis and pre-surgical staging. Lung cancer indicated the following histological types: squamous carcinoma (58,3%), adenocarcinoma (18,2%), small cells carcinoma (14,1%), big cells carcinoma (9,4%). Squamous carcinoma was more frequent in men, and adenocarcinoma was more frequent in women, which is in accordance with the specialized literature.(1,2,3,4,5,6,7)*

Cuvinte cheie: *cancer pulmonar, bronhoscopie, histopatologie*

Rezumat: *În întreaga lume cancerul bronho-pulmonar reprezintă o problemă de sănătate publică, fiind în creştere alarmantă în ultimii 50-60 de ani. Bronhoscopia este o metodă esenţială de diagnostic pozitiv atât în cancerul bronho-pulmonar periferic, cât şi în cel central. Această investigaţie permite stadializarea prechirurgicală a cancerului pulmonar prin stabilirea extensiei endobronşice. Am analizat un lot de 780 de pacienţi examinaţi bronhoscopic şi histopatologic în cadrul Spitalului de Pneumoftiziologie Tudor Vladimirescu, comuna Runcu, judeţul Gorj între anii 2005-2011 şi la Spitalul Orăşenesc de Urgenţă Târgu-Cărbuneşti în perioada octombrie 2011-octombrie 2012. Bronhoscopia cu metodele de prelevare endoscopică (microlavajul bronşic, lavajul bronhoalveolar, biopsiile bronşice multiple) a permis diagnosticul pozitiv, inclusiv histopatologic şi stadializarea prechirurgicală. Cancerul pulmonar a prezentat următoarele tipuri histologice: carcinom scuamos (58,3%), adenocarcinomul (18,2%), carcinomul cu celule mici (14,1%), carcinom cu celule mari (9,4%). Carcinomul scuamos a fost mai frecvent la bărbaţi, iar adenocarcinomul a fost mai frecvent la femei, ceea ce este în concordanţă cu literatura de specialitate.(1,2,3,4,5,6,7)*

INTRODUCTION

Bronchopulmonary cancer has recorded an alarming increase in the last 50-60 years in the entire world. Its incidence is increasing worldwide, this localization having the first place in men after 1984, outgoing gastric cancer, and reaching third place in women after breast cancer and cervix cancer.(2,3)

In Romania, this malign tumour is continuously increasing in both genders, with a 8% prevalence and a 17% prevalence;(8) From the point of view of the number of deaths caused by cancer, it occupies the first place in men and fourth place in women.(8,9)

Bronchoscopy is the main diagnosis method for bronchopulmonary cancer, because it allows to directly view the tracheal spur, the main, lobar and segmentary bronchia and to get information regarding the place of the bronchial lesion, its infiltrative character, its obstructive and/or bleeding character, its proximal extension, the existence of associated or independent bronchial compressions. Bronchoscopy allows to make a biopsy of the bronchial tumour, trans-bronchial biopsy, bronchial aspiration and all the products necessary for the histological diagnosis.(10)

From histopathological point of view, lung cancer tends to be grouped in 2 special types: non-small cell carcinoma (squamous cell carcinoma, adenocarcinoma and big cell carcinoma) and small cell carcinoma; this differentiation is necessary for therapy and prognostic.(10)

PURPOSE

The purpose of the study was to identify the various histopathological forms of lung cancer in the patients hospitalized at Tudor Vladimirescu Pneumophtisiology Hospital and Tg-Cărbuneşti Emergency City Hospital through the bronchoscopic examination performed with a Karl Storz bronchoscope, and histopathological examination was performed in the pathologic anatomy laboratory of Tg-Cărbuneşti Hospital with an Olympus CX21 Microscope and a processing camera.

The analysis of the frequency of various histopathological types of lung cancer concerned the frequency

[1]Corresponding author: Elena Vlad, Str. Cernădia, Nr. 21, 210170, Târgu Jiu, Judeţul Gorj, România, E-mail: elvlad2005@yahoo.com, Tel: +40723 052600

Article received on 25.09.2013 and accepted for publication on 08.10.2013
ACTA MEDICA TRANSILVANICA December 2013;2(4):231-233

of the squamous carcinoma, small cell adenocarcinoma and big cell carcinoma.

METHODS

We analysed a number of 780 patients hospitalized at Tg-Cărbunești Emergency City Hospital between 2005-2012 diagnosed with bronchopulmonary carcinoma which were applied the bronchoscopy manoeuvre.

The biologic material sampled through bronchial biopsy, bronchial aspiration and bronchial lavage was sent to the Pathologic Anatomy Service within Tg-Cărbuneşti Emergency City Hospital for processing and cyto and histopathological examination. The cytopathological examination consisted in Haematoxylin-Eosin colouring of fixed smears (alcohol, fixing spray), and the histopathological examination was performed through the classic histopathological technique of paraffin inclusion, in order to perform optical microscopy studies.

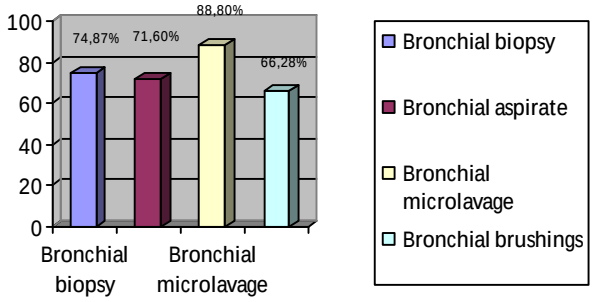
RESULTS

In the patients of the batch, fibrobronchoscopy allowed:

- Directly viewing the endobronchial alterations in the bronchopulmonary carcinoma (tumour formations, extrinsic formations, mucous membrane infiltrations) in all patients;
- Achieving histopathological material through positive bronchial biopsy in 74,87% of the patients;
- Achieving cytological material through:
  - positive bronchial aspiration result in 71,6% of the patients with bronchopulmonary cancer
  - positive bronchial microlavage in 88,8% of the patients
  - positive bronchial brushing in 66,28% of the patients.

The histopathological confirmation percentage of BPC using bronchoscopy can be compared with the one in literature (11), increasing up to maximum 88,8% using cytological sampling methods (figure no. 1).

Figure no. 1. The positivity percentage of various methods of collecting cytological and histopathological material

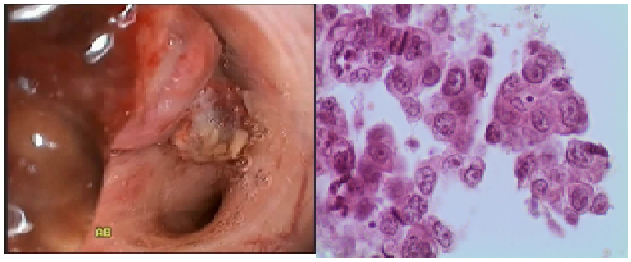


As a result of the histopathological exam, we got the following types of anatomo-pathological types:

- 1st place: 455 cases of squamous carcinoma representing 58,3%;
- 2nd place: 142 cases of adenocarcinoma representing 18,2%;
- 3rd place: 110 cases of small cell carcinoma representing 14,1%;
- 4th place: 73 cases of big cell carcinoma representing 9,4%.

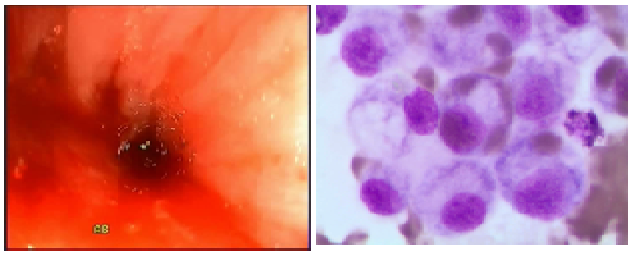
Macroscopic, the squamous carcinoma appearance (figure no. 2) was more frequently a polypoidal, exophytic, completely obstructive formation associated with infiltrative alterations of the related mucous membrane (figure no. 2 - left). Microscopy (Sediment to paraffin, Col. HE) revealed an atypical, poorly differentiated squamous-cellular population (nuclei increased with anisocytosis and pleomorphism, prominent nucleoli) (figure no. 2 - right).

Figure no. 2. Squamous carcinoma - macroscopic and microscopic examination



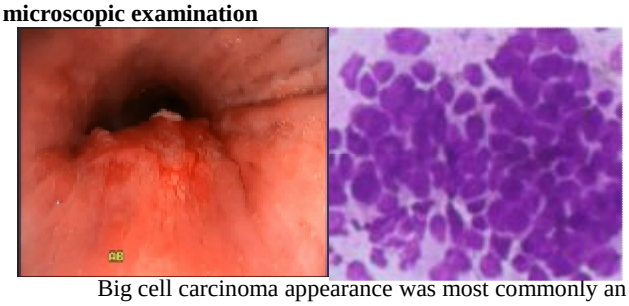
Endoscopic, the adenocarcinoma appearance (figure no. 3) was predominantly an extrinsic compression in varying degrees (figure no. 3 – left, in approximately 90%) with mucosa infiltration and spontaneous bleeding. In figure no. 3 – right is represented a microscopic appearance of adenocarcinoma with an atypical epithelial population, nuclei increased, variation of form and sizes, atypical mitoses and cytoplasmic vacuolation suggestive for glandular origin (smear – col. Panoptic).

Figure no. 3. Adenocarcinoma - macroscopic and microscopic examination



Macroscopic, small cell carcinoma appearance was predominantly a diffuse infiltration of the mucosa associated with tumor formation in different sizes, covered or not covered by whitish areas of necrosis (figure no. 4 – left). Microscopic appearance was an atypical small cellular population with hyperchrome, pleomorphic nuclei; “moulding” aspect, (figure no. 4 – right – col. Panoptic).

Figure no. 4. Small cell carcinoma – macroscopic and microscopic examination

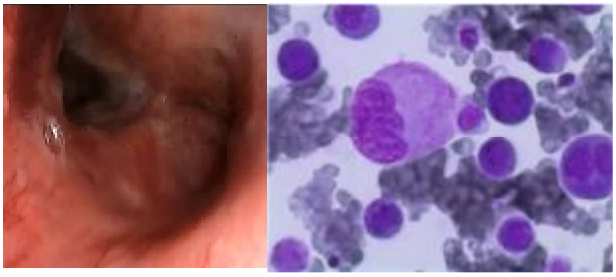


Big cell carcinoma appearance was most commonly an endoscopic extrinsic compression. In figure no. 5 – left is shown an extrinsic compression of the posterior wall of the distal trachea and the tracheal Carina, which obstructs 1/3 of the lumen primitive right and almost completely primitive left, with tumor infiltration of the mucosa.

Microscopic, (figure no. 5 - right - col. Hematoxylin - Eosin) were present big atypical epithelial cells with variable

nuclei in form and sizes, frequently multiple, reveling prominent nucleoli.

Figure no. 5. Big cell carcinoma – macroscopic and microscopic examination

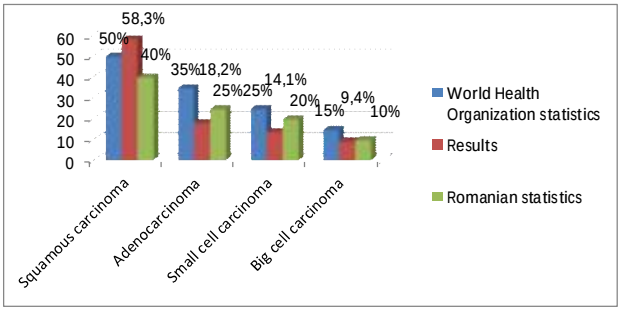


DISCUSSIONS

Histopathological types obtained relative to international statistics (12,13) were: the squamous carcinoma had an increased frequency compared to WHO statistics (35-50%), and to Romania (45%). The adenocarcinoma frequency was at the lower limit compared to WHO statistics (15-35%) and low compared to Romanian statistics (25%). The small cell carcinoma had a low incidence frequency compared to WHO statistics (20-25%) and to the Romanian statistics (20%).

On the other hand, big cell carcinoma had a lower frequency compared to WHO statistics (10-15%) and to Romanian statistics (10%) (figure no. 6).

Figure no. 6. The percentage of various pathologoanatomic types of BPC as compared to WHO statistics and to Romanian statistics.



The squamous carcinoma was more frequent in men, 364 men being diagnosed with this type of pulmonary cancer, which means 80% of the studied patients.

The adenocarcinoma was more frequent in women, 94 patients being diagnosed with this histopathological type of BPC, which is 66,2% of the studied patients. The small cell carcinoma was diagnosed in 110 patients, being more frequent in men (81,8%) compared to women. Big cell carcinoma was diagnosed in 73 patients, being more frequent in men (68.4%) than in women.

CONCLUSIONS

Bronchoscopy with the endobronchial sampling methods (bronchial microlavage, broncho-alveolar lavage, multiple bronchial biopsies) allowed the positive diagnosis of 88,8%, including histological diagnosis and pre-surgical staging.

Bronchoscopy is a simple, repetitive method, which does not imply major side effects.

The histopathological types occurred were: squamous carcinoma (58,3%), adenocarcinoma (18,2%), small cell carcinoma (14,1%) and big cell carcinoma (9,4%).

The squamous carcinoma, small cell carcinoma and big cell carcinoma were more frequent in men, while adenocarcinoma was more frequent in women.

The squamous carcinoma was more frequent than in WHO statistics and Romanian statistics, while the other forms were within the lower limits reported in these statistics.

REFERENCES

1. Schwarz MI, Epstein PE. Pulmonary Medicine and Critical care Knowlegde self- assessment Programe, Atlanta; 1999.
2. Parkin OM, Pasani P, Ferloy J. Global cancer statistics. CA Cancer J Clin 1999;49:33-64.
3. Greenlee RT, Murray T, Boldens et al. Cancer statistics, 2000, Cancer J Clin 2000;50:7-33.
4. Franklin WA. Diagnosis of lung cancer. Pathology of invasive and preinvasive neoplasia chest. 2011;117:72S-79S.
5. Stradling P. Diagnostic Bronchoscopy, sixth edition, Ed. Churchill Livingstone; 1991. p. 141-142.
6. Khanavkar D. Bronchoscopy in the diagnosis of Early Lung Cancer. Results of 400 examinations and European Early Lung Cancer, Study Abstracts from symposium.Diagnosis and endobronchial management of early lung cancer; 1998. p. 12-14.
7. Miyazu Y, Miyazawa T, Iwamota Y, Kano K, Kurimoto N. The role of endoscopic techniques in choice of appropriate therapy for bronchial cancer, J Bronchol 2001;8:10-16.
8. Ciuleanu TE. Carcinoamele bronhopulmonare: principii şi practică. Editura Medicală Universitară Iuliu Haţeganu Cluj Napoca; 2003. p. 3-74.
9. Gherasim L (sub redacţie). Medicină Internă, volumul I, ediţia a-II-a, Bolile aparatului respirator, Editura Bucureşti; 2002. p. 433-479.
10. Ghilezan N. Oncologia generală, Editura Medicală, Bucureşti; 1992. p. 15-31.
11. Cancer Facts-Figures - Washington DC: American Cancer Society; 1995.
12. Lin NS, Spitz MR, Kemp BL, et al. Adenocarcinoma of the lung in young patients. Cancer 2000;88:1837-1841.
13. Williams S, Goulet R, Thomas G. Newer aspects in the diagnosis, treatment and prevention of lung cancer. Current Problems in cancer .1996;20:3.
14. Edelman MJ, Gandara DR. Lung cancer in manual of clinical oncology, 4th edition, eds. Casciato DA, Lowitz BB-Lippincott Williams and Wilkins Philadelphia; 2010. p. 157-171.
15. Păun R. Medicină internă, vol I, Editura medicală, Bucureşti; 1983. p. 621-627.