CASE REPORT

Diagnosis and Treatment of Three Cases of Bronchial Carcinoma In Situ

Valeri Y. Andreev¹, Nikolay A. Yanev¹, Stefan K. Stanimirov¹, Temenuzhka V. Mircheva², Ivan N. Ivanov², Savelina Popovska², Petkana A. Hristova³, Yavor Y. Ivanov¹

¹ Clinic of Pneumology and Phthisiatry, Dr. G. Stranski University Hospital, Pleven, Bulgaria

² Department of Pathological Anatomy, Dr. G. Stranski University Hospital, Pleven, Bulgaria

³ Department of Social and Preventive Medicine, Medical Statistics, Pedagogics and Psychology, Medical University of Pleven, Pleven, Bulgaria

Correspondence:

Yavor Y. Ivanov, Clinic of Pneumology and Phthisiatry, Dr. G. Stranski University Hospital, Pleven, 91 Vladimir Vazov Str., 5800 Pleven, Bulgaria
E mail: pulmovan@gmail.com
Tel: +35987740377

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As part of a retrospective study on bronchoscopies performed at the Clinic of Pneumology and Phthisiatry of the University Hospital – Pleven by autofluorescence bronchoscopy we found 3 cases diagnosed with carcinoma in situ. They were treated in different ways – endobronchial electrocoagulation, extraction by forceps biopsy and open surgery, but the result was the same – clinical healing. The paper presents the three clinical cases and the analysis of the treatment.

INTRODUCTION

The bronchial lesion reported histologically as ‘carcinoma in situ’ (CIS) is challenging because it is mandatory to decide what kind of treatment should be administered. The choice lies between a follow-up approach in the case of endobronchial dysplasia and an aggressive approach if the lesion is defined as invasive carcinoma. We present three patients with CIS where the treatment was different but the end was successful.

CASE REPORT

CASE 1

A 70-year-old man was admitted to the clinic with complaints of bloody sputum after symptoms of flu. He was laryngectomized because of carcinoma of the larynx and had permanent tracheostomy. He was a heavy smoker (80 pack years)

and had an occupational exposure to pesticides. Physical examination was unremarkable. On the chest X-ray there were pulmonary emphysema and calcifications in the left lung and pleural cavity (**Fig. 1**). Videobronchoscopy revealed that the minimal bleeding source is the eperon between the left B10a and B10b. The forceps biopsy tissue found bronchial mucosa with high grade dysplasia and a piece of squamous type lung cancer (**Fig. 2**). The chest computer tomography (CT) did not find any signs of tumor at the specified site. The patient declined surgery and an endobronchial electrocoagulation was performed with autofluorescence videobronchoscope Olympus Lucera CV 260SL and a generator of electricity Olympus PSD-20. The procedure was done using a 5W electrocatheter. The result was complete coagulation of the neoplastic lesion and appearance of fluorescence positive scar (**Figs 3, 4**). These conditions were checked-up three

Figure 1. Posterior-anterior chest X-ray of case 1 patient.

Figure 2. HE, 100X. Severe dysplasia, parenchyma infiltrated by tumor, non-small cell lung cancer, p63 +/-, squamous cell cancer.

Figure 3. White light bronchoscopy. Endobronchial electrocautery applied to the lesion.

Figure 4. Autofluorescence bronchoscopy. A scar after electrocautery.

Figure 5. HE, 100X. Squamous epithelium, fibroepithelial polyp, thermal changes.

times by bronchoscopy and biopsies during the following 8 months. The histological results showed fibrotic polyp (**Fig. 5**). Next bronchoscopy revealed bleeding from the main carina and the place was biopsied. Histology showed high grade dysplasia.

CASE 2

A 58-year-old man was admitted with complaints of pain in the left shoulder for 10 days, high temperature up to 38°C, sweating and cough. He was treated at home with levofloxacin with slight effect. Because of COPD he had permanent treatment with symbicort and seebri. He was a smoker, 40 pack years. He had worked in companies producing cement and aluminium. Physical examination showed wheezing and rales at the bottom of both

lungs. Oxygen saturation was 96% and FEV1 – 33% predicted value. The chest X – ray showed pulmonary emphysema (**Fig. 6**). Bronchoscopy found bleeding infiltration at the eperon between left B1 and B2 (**Fig. 7**). Forceps biopsy histology showed a piece of bronchial wall with high grade dysplasia

Figure 6. Posterior-anterior chest X-ray of case 2 patient.

Figure 8. HE, 100X. Bronchial wall with severe dysplasia and carcinoma in situ and invasive squamous cancer. Endobronchial forceps biopsy.

to carcinoma in situ and invasive carcinoma (**Fig. 8**). After two months the patient underwent open surgery and his left upper lobe was removed. The histological result from the surgery specimen showed only one place with neoplastic changes. Against the background of squamous metaplasia, invasive squamous carcinoma was found with focal keratinization and invasion in the submucosa (**Fig. 9**).

CASE 3

A 64-year-old man was admitted to the clinic with complaints of fever, sweating, cough, and bloody sputum. He had myocardial infarction in the past and currently – ischemic coronary disease and COPD.

Figure 7. White light bronchoscopy. Bleeding endobronchial lesions in culmen of left lung.

Figure 9. HE, 100X. Against the background of incomplete squamous metaplasia invasive squamous carcinoma is found with focal keratinization and submucosal invasion. Surgical sample.

He was a smoker, 40 pack years. Crackles were found at the lung bases. There were no laboratory signs of inflammatory process. On the chest X-ray there was only reticular pattern in the lower parts of the lungs accepted as bronchiectasis (**Fig. 10**). The same pattern was found on the chest CT scan.

During bronchoscopy a foreign body was found – a transparent plastic piece partly obstructing the right lower lobe bronchus and the middle lobe

bronchus (**Fig. 11**). After removal of the body by extraction with fibroforceps granulation tissue was found along the eperon between the lower lobe and the middle lobe bronchi. It was fluorescence positive and it was removed by forceps. Histological examination showed nests with tumor tissue with characteristics of squamous carcinoma (**Fig. 12**).

Figure 10. Posterior-anterior chest X-ray of case 3 patient.

Figure 11. White light bronchoscopy. A foreign body and granulation tissue in middle lobe and lower bronchi.

A control bronchoscopy was performed after one month and fluorescence moderately positive eperon of the middle lobe bronchus was found without other changes (**Fig. 13**). Forceps biopsy was done again. The result was inflammatory changes of the mucosa (**Fig. 14**). After 5 months the investigation was repeated and the result was the same – inflammatory changes.

Figure 12. HE, 40X. Tumour tissue nests with squamous cell carcinoma pattern. Endobronchial forceps biopsy.

Figure 13. Autofluorescence bronchoscopy. Suspected lesion on the eperon of middle lobe bronchus.

Figure 14. HE, 40X. Bronchial mucosa with epithelial hyperplasia and chronic inflammatory infiltrates. Endobronchial forceps biopsy.

DISCUSSION

As a rule, the prognosis of carcinoma in situ 0 stage is excellent, especially in comparison with the results of the other stages of lung cancer (74 - 91% 5-year survival rate).¹ The classification of premalignant lesions² is shown in **Table 1**. It can be seen that the mucosa has to go through certain changes before reaching the critical point that we are discussing. There are different opinions especially on this point. P. George et al. think that treatment should be postponed while the radiological and histological approvals for progression to invasive carcinoma emerge.³ Others conclude that the key point is appearance of angiogenesis, which expresses the change of the lesion from intraepithelial to sub-mucosal.⁴ Then a change in the color of the mucosa in autofluorescence bronchoscopy takes place. As a comparison, only 29% of CISs have been discovered by white light bronchoscopy.⁵

In the first case we applied only endobronchial treatment, one session and a few bronchoscopies. Furthermore, the patient denied open surgery. Such an approach is applied routinely by different authors, but the most prominent center is T. Sutedjas's in Amsterdam.⁶ Other authors speculate with the place of CIS placing it together with moderate and high grade dysplasia in the group of preinvasive lesions.⁷ There is an opinion that this group of changes can progress spontaneously and regress also.⁸ The autofluorescence bronchoscopy was used to follow up the patient's scar (**Fig. 4**).

In the second case open surgery was applied and probably this was the best approach because

Table 1. Classification of endobronchial premalignant lesions according to World Health Organization.⁹

	Histology
A	Normal mucosa
B	Inflammation / Bronchitis
C	Hyperplasia
D	Squamous metaplasia
E	Low grade dysplasia
F	Moderate dysplasia
G	High grade dysplasia
H	Carcinoma in situ
L	Invasive carcinoma

the histological result from the surgery specimen showed invasion of submucosa. In these cases, definitely the surgery has advantages to use.^{10,11}

In the third case, the healing was an accidental case by extraction of the tumor along with the forceps biopsy. A similar case was described by R. Snyder.¹² Here the control bronchoscopy was done in an autofluorescence mode (**Fig. 14**). In this regard the latter has advantages for treating CIS lesions than white light bronchoscopy.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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Диагноз и лечение трёх случаев бронхиальной карциномы in situ

Валери Й. Андреев¹, Николая А. Янев¹, Стефан К. Станимиров¹, Теменужка В. Мирчева², Иван Н. Иванов², Савелина Поповска², Петкана А. Христова³, Явор Й. Иванов¹

¹ Клиника пневмологии и фтизиатрии, Университетская больница "Д-р Г. Странски" Плевен ЕАО, Плевен, Болгария

² Кафедра патологоанатомии, Университетская больница "Д-р Г. Странски" Плевен ЕАО, Плевен, Болгария

³ Кафедра социальной и превентивной медицины, медицинской статистики, педагогики и психологии, Медицинский университет - Плевен, Плевен, Болгария

Адрес для корреспонденции:

Явор Й. Иванов, Клиника пневмологии и фтизиатрии, Университетская больница "Д-р Г. Странски" Плевен ЕАО, ул. „Иван Вазов“ № 91, Плевен, Болгария
E mail: pulmovan@gmail.com
Tel: +359887740377

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В качестве части ретроспективного исследования случаев бронхоскопии с автофлуоресцентной бронхоскопией, проведённого в клинике пневмологии и фтизиатрии при Университетской больнице – Плевен, нами обнаружены 3 случая диагностированной карциномы in situ. Лечение было проведено разными способами - с применением эндобронхиальной электрокоагуляции, щипцовой биопсии и открытой хирургии, но с одинаковым при всех случаях результатом - клиническим излечением. Данная статья представляет все три клинических случая и анализ лечения.