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Accordance of clinical versus pathological stage (pTNM) in patients with surgically treated non-small cell lung cancer

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In a group of 350 patients with non-small cell carcinoma of the lung, who were subjected to operation during the period from May 1983 to June 1987 at our institution, the agreement between the preoperative, the intraoperative and the pathological TNM stage (4th ed.) was examined. The preoperative stage was identical with the pathological classification in only 46% of patients, underestimated in 47% and overestimated in 7%. With regard to the staging of intrapulmonary lymph nodes involvement (N1), the agreement between the intraoperative and the pathological classification reached 68%. In this group we overestimated the lymph nodes involvement in 23% and underestimated it in 9%. The accordance between the intraoperative and the pathological stage of mediastinal lymph nodes (N 2) was in 70%, in 26% mediastinal lymph node metastasis was suspicious, but the result was negative and in 4% the evaluation of these nodes was underestimated. We can conclude that the preoperative and the intraoperative staging of lung cancer is very inaccurate, and doubts, concerning the actual degree of the tumour extension, especially in the lymph nodes, can ultimately be solved in most cases only by thoracotomy, node dissection and pathological examination.

Key words: lung neoplasms-surgery; neoplasms staging, TNM classification

Introduction

Survival of patients with non-small cell lung cancer is related to the stage of disease at the time of diagnosis. Stage I and II of the disease have a favorable prognosis and are best treated by pulmonary resection when cardiopulmonary status allows it. Locally aggresive disease (stage IIIa and stage IIIb) and distant metastatic disease (stage IV) are advanced stages for which survival rates are poor.[1] Once metastatic disease has been ruled out, the search for locally advanced cancer should be undertaken.[2]

The exact preoperative staging is a prerequisite for establishing an adequate treatment plan for patients. The preoperative staging of bronchial carcinoma is mainly based on plain chest x-ray examination, bronchoscopy, CT scan of the chest, mediastinoscopy and mediastinotomy.[3]

The aim of our retrospective study was to evaluate the accuracy of preoperative and intraoperative staging, compared with the defini-

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tive pathological stage. Special attention was devoted to the ability to identify macroscopically intrapulmonary and mediastinal metastatic lymph nodes.

Patients and methods

In the period from May 1983 to June 1987 we operated 350 patients with non-small cell carcinoma of the lung (NSCLC) in our institution. We included in the study only those patients for which we determined, after preoperative clinical investigation, that they were clinical stage I and II of the TNM classification (4^{th} ed.).

In that period the determination of clinical stage consisted of a detailed examination of the patient, chest x ray, bronchoscopy, ultrasound of the abdomen and bone scan in patients with pains. In patients with enlarged hilus, suggestively abnormal mediastinal shadow or when either structure was obscured by overlying tumour or parenchymal disease, a CT scan was done. When nodes were 1 cm or larger, the preoperative exploration was performed with cervical mediastinoscopy and/or anterior mediastinotomy. In the beginning of that period we used CT scan very rarely, but later more and more frequently. It was the same with mediastinoscopy and mediastinotomy. In the whole group, we have performed CT scan in 24%, cervical mediastinoscopy in 11% and anterior mediastinotomy in 9% of patients. At thoracotomy the surgeon determined the intraoperative TNM stage and recorded it in the operative protocol. At that time we did not perform radical mediastinal lymphadenectomy routinely, but carried out the excision of all enlarged and visible lymph nodes (sampling).

The presence or absence of tumour in nodes and pathological staging was made by Dr. T. Rott at the Institute of Pathology in Ljubljana.

Results

The results of definitive (pathological) stage of our patients are in Table 1.

Table 1. Pathological stage of 350 patients with NSCLC of the lung.

STAGE	No. of patients	%
Stage 0	1	0.3
Stage I	134	38
Stage II	87	25
Stage III a	90	26
Stage III b	29	8
Stage IV	9	3
	350	100

There is only one patient in our group with carcinoma in situ and stage 0. In 119 patients (37%) the pathological stage was higher than determined preoperatively (stage III a, III b and IV). The preoperative stage was identical with the pathological classification in only 46% of patients, underestimated in 47% and overstimated in 7%. In 58 patients (16%) the preoperative stage was underestimated due to tumour invasion in the surrounding organs of the chest, and only in 9 patients (3%) we discovered metastases during the thoracotomy. The disagreement between the clinical and the pathological classification was mainly due to the misinterpretation of intrathoracic lymph nodes.

Table 2. Agreement between intraoperative and pathological classification of intrapulmonary lymph nodes (N 1).

N 1 intraop. – pathol.	No. of patients	%
Identical	216	62
Underestimated	50	14
Overestimated	74	21
Unknown	10	3
	350	100

In table 2 we have evaluated intrapulmonary lymph nodes, not only N 1 disease; important was only the correct classification. Unknown are cases in which we did not examine nodes due to inoperability or for other reasons.

We did not achieve good results in patients with N 1 disease.

Table 3. Intraoperative classification of lymph nodes in patients with N 1 disease.

I. / op. classification	No. of patients	%
N 1	28	26
N 0	47	43
N 2	33	31
	108	100

The correct classification was only in 26 %, in 43 % the macroscopic appearance was normal and in 31 % we suspected mediastinal lymph nodes metastatic involvement. In patients with normal intrapulmonary lymph nodes our macroscopic classification was correct in 50 %.

Table 4. Intraoperative classification of lymph nodes in patients with N 0 disease.

I. / op. classification	No. of patients	%
N 0	81	50
N 2	49	31
N 1	29	19
	159	100

The accordance between the intraoperative and the pathological stage of mediastinal lymph nodes was in 73 %; in 22 % mediastinal lymph nodes were suspicious, but the result was negative, and in 2 % the evaluation of these nodes was underestimated.

Table 5. Agreement between intraoperative and pathological classification of extrapulmonary lymph nodes (N 2).

N 2 intraop. – pathol.	No. of patients	%
Identical	254	73
Overestimated	78	22
Underestimated	10	3
Unknown	8	2
	350	100

More accurate staging was effected for malignant lymph nodes, where the accordance between macroscopic and pathological evaluation was in 92 %, underestimated in 5 % (N 0) and 2 % (N 1).

Discussion

Surgery is the treatment of choice in NSCLC for stage I and II. Unfortunately, when the diagnosis is established, slightly less than one fourth of the patients are in these two stages, one fourth have stage III a and III b, and half have the disseminated stage IV disease.[4] From our results we can conclude that the preoperative and macroscopic intraoperative staging is very inaccurate, especially that of lymph nodes.

It is unacceptable that we operated 128 patients (37 %) with preoperative stage I or II, but later established that they were in stage III a or higher. This can be partially explained with the fact that at that time the CT scan was not in routine use, and especially at the beginning of our study, only a small proportion of the patients was examined by this method. The average preoperative underestimation of the N stage in recent literature is about 25 %.[5, 6] For the best selection of patients who can benefit from operation, in many institutions the mediastinal exploration is the standard preoperative method of evaluating the status of mediastinal lymph nodes.[2, 7, 8, 9] On the other hand, 10 to 20 % of patients with positive nodes may have resectable lesions, with a good 5 years survival.[10, 11, 12, 13] The incidence of patients with microscopic involvement of mediastinal lymph nodes was 29 %, and the survival rate was higher than that of patients with gross involvement of these nodes.[10] We now agree with a selective approach and perform CT scan in any potential surgical candidate, and when nodes are 1 cm or larger, a preoperative exploration of mediastinum is done. If biopsy proves metastatic mediastinal node disease this contraindicates surgery.[1, 14, 15] Due to inaccuracy of surgical staging and because metastases are found in approximately 30 % of lymph nodes smaller than 1 % cm, routine systematic radical lymphadenectomy of all lymph node regions that are surgically accessible is mandatory for exact staging, better survival and proper selection of patients for adjuvant therapy.[16]

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