

## SURGICAL TREATMENT AFTER NEOADJUVANT / INDUCTION THERAPY



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### INTRO

Lung cancer is the most common cause of cancer-related deaths in Europe and United States. Approximately 85% of lung cancers are non-small cell lung cancers (NSCLC) [1]. Treatment options include chemotherapy, immunotherapy, targeted therapy, radiotherapy and surgery, depending on the patient's condition and the stage of the disease. Surgical treatment in the early stage (Stage I-II) provides the best survival and is the first choice. Since there is not enough data on the role of neoadjuvant/induction (N/I) therapy in this stage, it is not recommended [2]. Stage III disease is a highly heterogeneous group of 16 different TNM stages ( $T_4N_{0-3} / T_3N_{1-3} / T_{1-2}N_{2-3}$ ) according to the 8<sup>th</sup> TNM staging system of lung cancer. Depending on the "T" factor, it may have various sizes up to 7 cm, surrounding tissue invasion, or have multiple locations. According to the "N" factor, it can be N0-3. In addition, many other sub-groups [N1 (Single-multiple N1, N1 (number 10 according to station)), N2 (skip N2, single-multiple station N2, microscopic N2, bulky N2, surprise N2, persistent N2, resectable-unresectable N2), N1 and N2] have been shown [3,4] to affect survival rates. Therefore, although there is no difference in the definition of lymph nodes in the new staging system, it is suggested that the classification of lymphatic

involvement should be elaborated as suggested in Table 1 in preparation for the next staging [5].

In this section, the role of N/I for stage IIIA will be discussed with exclusion of the stage IIIB-C patient group since surgical treatment is not recommended for N3 disease [6]. When evaluating the studies in this book section and literature, the following should be taken into consideration: the definition of stage III and lymph node map (N1-N2 separation) has changed in the last twenty years, stage III is a very heterogeneous group, definitions used between the authors differ (Bulky N2, full response, multiple station-zone N2, resectable N2, etc.) mediastinal staging has become more precise due to positron emission tomography (PET-CT), endobronchial ultrasonography (EBUS), esophageal ultrasonography (EUS), video-mediastinoscopy, because of advances in technology and surgical techniques the use of minimally invasive surgery has become more common, postoperative decrease in complications and mortality, changes in chemotherapy agents used throughout the years, developments in radiotherapy technology, and changes in CT doses. As an example, in the new staging system, when the definition of stage III is compared with the previous version, there are shifts between stage IIB and IIIA-B [3,7].

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tality, you can achieve better survival than other treatment modalities”.

## CONCLUSION

- Stage IIIA NSCLC is a very heterogeneous group and treatment with different treatment algorithms is recommended. The evidence base confirms that no one treatment regime has been shown superior to another.
- Long-term survival in this group is still poor
- Most national and international guidelines agree that “The optimum treatment for potentially resectable stage III/N2 NSCLC) is multimodality treatment targeting the prevention of distant disease with systemic therapy and achieving local control through surgery, radiotherapy or both”
- All international guidelines agree on surgical multimodality management of resectable N2 disease
- Multimodality treatments require experienced and high-volume multidisciplinary teams and centers to minimize the risks from treatment and maximize benefits
- Surgery (direct or after N/I therapy) is not recommended in N3 patients
- Re-mediastinal staging after N/I therapy is recommended
- Pneumonectomy is not recommended in the presence of persistent N2
- The timing of surgery after N/I therapy should be considered
- Stage IIIA Non-Superior Sulcus Tumors: Direct surgery in physiologically fit and cT3N0/1 patients is performed after invasive mediastinal staging. Induction chemotherapy followed by surgery may benefit patients who are physiologically fit, non-bulky, or have a good response to induction chemotherapy.
- Stage IIIA Superior Sulcus Tumors: Surgery followed by postoperative chemoradiation in physiologically fit and cT3N0/1 patients. If there are persistent N2, these patients are best treated with chemo-radiotherapy and no surgery
- Stage IIIB- Non-Superior Sulcus Tumors: Surgery after induction chemotherapy may help.

If there are persistent N2, these patients are best treated with chemo-radiotherapy and no surgery

- Stage IIIB- Superior Sulcus Tumors: Surgery and postoperative chemo-radiotherapy in experienced referral center may be beneficial for physiologically fit and N0/1 patients. If there are persistent N2, these patients are best treated with chemo-radiotherapy and no surgery

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