Abstract

The term ‘complete resection’ is traditionally defined as a desired surgical procedure if a considerable survival benefit is anticipated in patients with NSCLC. From a surgeon’s viewpoint, it is therefore of great importance in patient selection for thoracotomy. In this setting, one might assume that well-known definitions of Naruke and Mountain with different meanings would subsequently result in a number of conflicting influences. As a result, patient selection criteria for surgery, the role and reliability of invasive staging procedures and futile thoracotomy rates are unavoidably conducted by the definition preferred. Interpretation of the outcomes from the series with different attitudes may also be misleading. Thus, outset of the surgical management of NSCLC should be based on the definition and preferences associated with complete resection. To conclude, if we could depict a universally accepted definition of complete resection which could also easily be attributable to the existing guidelines; contribution of surgery would have been more clearly outlined among other treatment modalities. This will in turn, not only eliminate most of the confusion that a surgeon might have in his/her mind regarding the matter, but might also provide a more stronger evidence for the role of surgery in the long term.

Keywords: Lung cancer; Complete resection; Mediastinal lymph node dissection

‘To reject one paradigm without simultaneously substituting another is to reject science itself’

Thomas S. Kuhn

The best survival rates are obtained only in patients who underwent resection in the management of NSCLC. However, only up to 30% of patients are candidates for surgery at the time of diagnosis in current practice [1]. Because surgery not only delays appropriate management but also decreases both the quality of life and overall survival, thoracotomy should not be considered if the disease does not appear to be completely resected by means of preoperative investigations. Thus, the most crucial question is whether or not the patient is a candidate for thoracotomy at initial presentation.

‘Complete resection’ (CR) is the term that is traditionally defined as a prerequisite surgical procedure if a considerable survival benefit is anticipated in patients with NSCLC [2]. Despite vigorous efforts in order to achieve precise preoperative staging, the disease is inevitably found to be non-resectable in up to 10% of patients at thoracotomy [3]. From the surgeon’s viewpoint, CR is therefore of great importance in patient selection for thoracotomy. ‘Operability’ and ‘Resectability’ are frequently used terms in the literature however; neither operability of an individual patient nor resectability of the tumour should influence the decision making for thoracotomy, concerning the role of CR on survival.

In spite of significant advances in different aspects of NSCLC including positron emission tomography, induction therapy, and video-assisted thoracoscopic procedures in the most recent years; the definitions of CR provided by Naruke [4] and Mountain [5] are still considered as appropriate. It appears that this concept will remain valid until a more contemporary and universally accepted definition is commenced. From the view of ‘T’ factor, both definitions prerequisite complete clearance of the tumour with histologically proved negative margins and therefore, have no influence on pathologic staging (pTNM) following resection. Because of significant differences between aforementioned definitions, however, the situation is more complex for ‘N’ status. According to Naruke, a complete mediastinal lymph node dissection (MLD) should accompany lung resection in order to accomplish a CR. Furthermore, he strongly recommends contra-lateral dissection if N2 disease is detected at one of the ipsilateral lymph node stations. Keeping this point in mind, any resection without ipsilateral MLD should be considered incomplete regardless of nodal status of the disease. In contrast, Mountain considers any resection as complete if the most distant ipsilateral mediastinal station...
(#2) is tumour free with no extra-capsular invasion at either of the individual mediastinal stations. Moreover, Mountain’s definition allows some flexibility to the surgeon to perform a nodal sampling rather than MLD for intraoperative staging.

If CR outlines a desired procedure that is aimed to be accomplished at the end of thoracotomy, these two definitions with different meanings would subsequently result in a number of conflicting influences. Patient selection criteria for surgery, the role and reliability of invasive staging procedures and futile thoracotomy rates are unavoidably conducted by the definition preferred. Decision for thoracotomy mostly relies on the results of these preoperative staging procedures in patients with NSCLC. However, false negative results leading to futile thoracotomies can only be detected at thoracotomy. The sensitivity of a cervical mediastinoscopy which has a paramount role according to Mountain’s definition ranges between 62 and 100% [6]. Its accuracy is significantly influenced by the technique used for intraoperative staging that is outlined by the preferred definition of complete resection. In addition, more detailed intraoperative evaluation also results in an increased number of false negative cases and consequently decreases both sensitivity and negative predictive value of the preoperative staging tools.

Above all, however, paramount consequence emerges regarding ‘pTNM’ of those patients who underwent thoracotomy. Postoperative pathology delineates the actual ‘T’ and ‘N’ status of the disease and finally confirms whether or not the resection is complete. From this view point, patients who are staged on the basis of C-factor or certainty factor (cTNM), constitute TC4 NC4 that has a predictive value equivalent to ‘pTNM’ and represent the most homogeneously staged group of patients [7]. When included in well designed clinical trials, such groups would enlighten the prospect for the management of NSCLC in a better way and influence precedence of the most recent diagnostic and therapeutic modalities, accordingly. It should therefore be our indispensable responsibility to apply the same standards of intrathoracic staging to every individual patient.

In 1998, Izbicki et al. [8] pointed out that 5.5% of N2 disease is missed by sampling at thoracotomy. Later on, Ginsberg and Port advocated that the rate of missed positive nodes might be as high as at least 10% unless MLD is performed [9]. This has confirmed the previous statement that MLD increases the frequency of N2 disease and subsequently influences the postoperative stage of the disease [10]. In recent years, it is also widely accepted that induction therapy is the management of choice if an N2 disease is detected preoperatively. However, the approach significantly differs among surgeons when N2 disease is found at thoracotomy. In this respect, type and localization of N2 disease become more crucial as to whether or not to proceed with lung resection.

Ginsberg [9], as well as some others, also believe that MLD increases survival in patients with N2 disease and strongly recommend ipsilateral dissection if a metastatic node is detected at one of the sampled mediastinal stations. Despite encouraging beneficial effects of MLD on survival [11], this observation remains to be confirmed [8]. Furthermore, MLD might have a detrimental effect on both postoperative course and overall survival due to technical and oncological consequences of extensive mediastinal dissection. Therefore patients who were staged with sampling intraoperatively should not be pooled within the same group as those with MLD.

Among many prognostic parameters, only ‘T’ and ‘N’ factors, i.e. stage of the disease, were found to be most relevant with the highest predictive values in areas under the ROC curve in a prospective multi-center study using Cox and logistic regression models [12]. Although existing guidelines address the indications for surgical treatment that are primarily based on disease stage, it is, however, more important to elucidate the minimum required criteria to properly stage the tumour during thoracotomy. The key point here is how detailed lymph node dissection is necessary to achieve this goal intraoperatively. We believe that a consensus based on the minimum requirements for intraoperative staging will more adequately guide the surgeons.

To conclude, interpretation of the results from the series of different attitudes may be misleading. Thus, outset of surgical management of NSCLC should be mainly based on the definition and the preferences associated with CR. If we could depict a universally accepted definition of CR which could also easily be attributable to the existing guidelines; contribution of the surgery would have been more clearly outlined among other treatment modalities.

References

