

Lobectomy versus segmentectomy and wedge resection in the treatment of stage I non-small cell lung cancer

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We have read the two editorials of Cao *et al.* and Fiorelli *et al.* issued in the *Journal of Thoracic Diseases* with great attention (1,2). Both articles address and discuss the role of limited resections as current surgical treatment of stage I non-small cell lung cancer (NSCLC). The authors refer to the publication from the *European Journal of Cardio-Thoracic Surgery*: “Stage I non-small cell lung cancer: long-term results of lobectomy versus sublobar resection from the Polish National Lung Cancer Registry” (3). In this retrospective study overall survival of 6905 stage I NSCLC patients that underwent surgical treatment in Poland between 2007 and 2013 were analyzed. To decrease potential selection biases a propensity-score matching (PSM) with variables such as age, sex, histology, grade and date of resection was applied, selecting three groups consisting of 231 patients each. These three study groups underwent different type of resection: lobectomy, segmentectomy and wedge resection. In the matched groups of patients there was no difference in overall or/and 5-year survival observed between the lobectomy and segmentectomy group. Wedge resection was associated with a significantly lower 5-year and overall survival compared to segmentectomy and lobectomy. We have concluded that segmentectomy, but not wedge resection could be considered an alternative for lobectomy in the treatment of stage I NSCLC.

Definitively PSM is not an equivalent to randomized controlled trial (RCT) that directly compares study groups. In this study primary endpoint was overall survival in stage

I NSCLC patients undergoing curative resection. While there is lack of recently published RCTs in in this field, prospective observational studies gain more acceptance. PSM has several limitations that were highlighted both by the reviewers and the authors of the discussed editorials. Potential biases were reduced but not eliminated. Cancer free survival or cancer-specific survival are lacking what is a natural pitfall of such a large, national database. The other limitations are lack of information on the adjuvant therapy in case of recurrence, comorbidities and the data on indications for a limited resection.

However, it would be extremely difficult to conduct a RCT that compares lobectomy segmentectomy and wedge resection. To our knowledge the only pending prospective multicenter trial that compares those three methods is I-ELCART study conducted by I-ELCAP group (4). The first results are awaited in 2031.

We all know the problems with accrual to RCT trials comparing lobectomy with sublobar resections namely Cancer and Leukemia Group B (CALGB 140503) (5) and the Japan Clinical Oncology Group (JCOG 0802) (6). So in our opinion every effort should be made to conduct reliable comparison of all methods based on retrospective data as a supplement to RCT results.

PSM gives opportunity to perform better matching than any other statistical method. There is only one important remark—the data should be of a highest quality and all groups have to be selected from possibly widest population

with longest possible follow up. The selection is a key to obtain reliable results.

We find Polish National Lung Cancer Registry (pol. Krajowy Rejestr Raka Płuca - KRRP) as a reliable source of information. This registry is obligatory, covers >95% of curative operations performed in lung cancer patients and reports are provided to the web database online by all thoracic departments in Poland. The advantage of KRRP is credibility of the data reporting wedge resection and segmentectomy. All lung resections are performed only in highly specialized thoracic departments by board certified general thoracic surgeons traditionally familiar with anatomical segmentectomies that are routinely performed since decades for tuberculosis. The follow-up in the KRRP is annually updated on the basis of national data resources since at least 2007.

In our opinion the most important conclusion resulting from the study is the significant inferiority of wedge resection to segmentectomy in terms of survival. We assume that the decision to perform a limited resection largely resulted from pulmonary function limitations or significant accompanying comorbidities so it seems that the potential eligibility criteria for both treatments should remain similar. The anatomical segmentectomy allows for a larger resection margin than wedge resection. Unfortunately, we did not have an assessment of the size of the resection margin. Segmentectomy allows the unveiling of hilar structures and the resection of hilar or intraparenchymal lymph nodes and thus better staging. In the presented study, the mean number of collected lymph nodes after segmentectomy, and wedge resection were 5.2 and 2.1, respectively. The extent of performed lymphadenectomy may have a potential impact on the assessment of the stage of the disease and thus on reliable assessment of survival according to stage. Cao *et al.* have stressed the potential role of intraoperative lymph node assessment and the need to conversion to lobectomy if metastasis is present (1).

The results of the discussed paper should be interpreted with caution due to its limitations highlighted by Cao and Fiorelli. Nevertheless, the most important message from our study is the worse survival in patients after wedge resection comparing to anatomical resection in the treatment of stage I NSCLC patients. In conclusion we agree that before the results of randomized, controlled trials evaluating the

effectiveness of limited resections are published (5,6), we have to base our decisions on Lung Cancer Study Group study irrespectively to it's important pitfalls (7). But reliable retrospective analysis with appropriately applied matching gives us an important adjunct in decision making in specific clinical situations that are more and more frequent as a result of the implementation of the lung cancer screening programs.

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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