

More Emphasis on Resection Rates!

Trond-Eirik Strand, MD, PhD

Overall lung cancer survival rates are mainly driven by the proportion of patients undergoing curative surgery. The resection rate usually includes all patients operated upon and is thus strongly related to survival. However, although resection rate is increasingly more emphasized as a quality indicator, it is not an indicator of appropriate selection of patients to lifesaving treatment. The term resection rate is not even properly defined, and there is no standard for how it should be reported. Therefore, one should be cautious in comparing resection rates that may differ by several percentage points depending on their context. For example, whether small-cell lung cancer (SCLC) and other less frequent histological subgroups are excluded, whether cases based on death certificate only (DCO) are included, whether only curative resections are counted, and whether histologically unconfirmed cases are a part of the denominator. A definition should also account for what should be regarded as a resection in terms of completeness of tumor removal. Should synchronous tumors be counted separately or together? Further, overestimation might occur if the completeness of the cancer registration in the population under investigation is poor.

The series from Iceland reported in this issue of *Journal of Thoracic Oncology* highlights the resection rate, which is relatively high, at 26.4% for a whole nation.¹ One should, however, be aware that 306 cases without histological diagnosis were excluded, along with SCLC, carcinoids, sarcomas, and carcinoma in situ. If those without tissue diagnosis were included, the resection rate would be 22.0%, which is still an optimistic number. The authors should be praised for putting resection rates on the agenda of research. Several studies have previously reported national resection rates, but there has been too little attention, research, and knowledge devoted to this very important indicator. In England, the median national rate was 9% between 2004 and 2006, excluding from the denominator SCLC cases and cases reported from DCOs.² Denmark's latest results were 16.0% for 2007, probably including SCLC but without information on which selection criteria were used.³ For older reports on national resection rates, Wilkin et al.⁴ have summarized a dozen European countries in a benchmark report from 2008. In Norway, we recently found a rate of 19.1% including SCLC and 22.5% excluding SCLC, while excluding DCOs for both.⁵

What the optimal resection rate for lung cancer is has never before been properly investigated. We also lack evidence based research to support recommendations for what range one should aim for. Laroche⁶ has been quoted to set the standard for limits in the United Kingdom at 20%. In Denmark, 25% is the goal.³ When Torsteinsson et al. report their national results with high quality (complete) data and good survival of patients, they contribute to empirical knowledge of what resection rates should be at a national level. They can present a reliable denominator because registration of cancer cases is considered complete in Iceland with the country's high quality national registry.

Why is a small country such as Iceland performing so well? On average, only 27 patients had a resection each year in Iceland, and surgical treatment is certainly centralized. We can only speculate; but at the same time as this is a national material, it is also a report from a single center as only one hospital performed thoracic surgery in Iceland. In other countries, resection rates vary widely among different regions. In England, regional resection rates vary between 3% and 18%;² in Denmark, rates vary between 13% and 24%;³ and in Ireland, the rates varied between 8% and 16% between 1998 and 2001.⁷ The largest

Cancer Registry of Norway, Oslo, Norway.

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Address for correspondence: Trond-Eirik Strand, MD, PhD, PO Box 5313, Majorstuen, Oslo 0304, Norway. E-mail: strtro@yahoo.no

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span has been observed in Norway, including SCLC cases and those diagnosed before death, where the biennial rate varied from 7% and 31% among 19 counties in three periods between 1994 and 2007.⁵

The explanation for Iceland's numbers could be regional variation but, nevertheless, the results have been stable over many years. Also, the population in Iceland seems to be comparable to that of other European countries in terms of baseline characteristics. In accordance with encouraging results from England, where great efforts have been made to increase the poor resection rates, patients in Iceland had already benefited from multidisciplinary team meetings for many years throughout the whole study period. The fact that only six surgeons were involved is probably also a positive contributing factor.

From the results of resection rates, survival, postoperative mortality, and complication rates, one can read that much has been done correctly for lung cancer patients on the Saga island.¹ We are presented with an extremely low postoperative mortality of 1.0% in a small nation. Internationally, few countries can document better results. Only one report from Japan has previously demonstrated a lower rate of 0.6%.⁸

Overall 5-year crude survival in Iceland is 11% and 13% for men and women, respectively, in the period 1997–2006 (personal communication, The Icelandic Cancer Registry). This is a confirmation that Iceland is at the top among European countries regarding long-term survival.⁹ The favorable survival rate in Iceland should be viewed in the light of focus on surgery, and both inclusion to treatment and care for the patients. The survival for resected patients is reported from Iceland both according to the previous (6th) and the relatively new and current (7th) edition of the Tumor, Node, Metastasis staging system. Not unexpectedly, long-term survival is higher

in stages I and II according to the latter version. How classification with the new system influences the ability to select the right candidates for surgery remains to be seen. For example, whether the downstaging of patients with multiple tumors in one lobe from T4 to T3 leads to more resections. Population-based registries such as that of Iceland may play a role in the follow-up of this question.

REFERENCES

1. Thorsteinsson H, Alexandersso A, Oskarsdóttir GN, et al. Resection rate and outcome of pulmonary resections for non-small cell lung cancer—A nationwide study from Iceland. *J Thorac Oncol* 2012;7:1164–1169.
2. Riaz SP, Lüchtenborg M, Jack RH, et al. Variation in surgical resection for lung cancer in relation to survival: population-based study in England 2004–2006. *Eur J Cancer* 2012;48:54–60.
3. Dansk Lunge Cancer Gruppe & Dansk Lunge Cancer Register. Annual report 2008. Available at: <http://www.lungecancer.dk/documents/00089.pdf>. Accessed April 20, 2012.
4. Wilkin N, Högberg D, Kasteng F, Jönsson B. Benchmarking Report of Lung Cancer Care in selected Countries. Available at: http://www.comparatorreports.se/Lung_cancer_benchmarking_080526.pdf. Accessed May 10, 2012.
5. Strand TE, Bartnes K, Rostad H. National trends in lung cancer surgery. *Eur J Cardiothorac Surg* 2012 Mar 7 [Epub ahead of print].
6. Laroche C, Wells F, Coulden R, et al. Improving surgical resection rate in lung cancer. *Thorax* 1998;53:445–449.
7. Walsh PM, Comber H. Patterns of care and survival of cancer patients in Ireland 1994 to 2001: time-trends and regional variation for breast, colorectal, lung and prostate cancer. Summary Report. Cork, *National Cancer Registry*, Ireland 2006.
8. Watanabe S, Asamura H, Suzuki K, Tsuchiya R. Recent results of postoperative mortality for surgical resections in lung cancer. *Ann Thorac Surg* 2004;78:999–1002; discussion 1002.
9. Berrino F, De Angelis R, Sant M, et al.; EUROCARE Working group. Survival for eight major cancers and all cancers combined for European adults diagnosed in 1995-99: results of the EUROCARE-4 study. *Lancet Oncol* 2007;8:773–783.