

Is More Really Better?

Joaquín Sanchis

Servicio de Neumología, Hospital de la Santa Creu i Sant Pau, Barcelona, Spain

In anesthesiology, there has long been considerable interest in developing clinical applications based on knowledge of respiratory physiology and pathophysiology. In turn, in respiratory medicine, there has been interest in the effects of anesthesia on breathing and postoperative complications. Thoracic surgery stands at the intersection of these mutual interests and partakes of both specialties. The thoracic surgeon, for example, is aware that receiving anesthesia by epidural catheter—a procedure requiring more training and greater skill than placement at other spinal levels—rather than intravenously has advantages for the patient in terms of pain, comfort, and cooperation during recovery. In the ANESCAT study,¹ the median time required for pneumonectomy or lobectomy was 180 minutes. In terms of duration of procedures reported, thoracic surgery ranked fourth, after heart surgery, neurosurgery, and plastic surgery, and median times (90 minutes) were longer than for orthopedic and trauma surgery, digestive surgery, or the other 6 specialties analyzed. Anesthesiologists and thoracic surgeons concur that thoracic surgery demands special attention and skill and that requirements for analgesic resources are almost as great as for heart surgery.¹ The study by Vilà and colleagues² published in this issue of the journal is part of the ANESCAT project and is a good example of this mutual interest. This is a study that can be of equal benefit to both anesthesia and thoracic surgery and, consequently, to respiratory medicine. The authors set out to estimate the volume of thoracic surgery in Catalonia in order to provide useful information for the planning of their workload and of the training needs of anesthesiologists in this type of surgery.² To this end, they used a carefully designed survey carried out in all hospitals performing any type of surgery in Catalonia. From the sample of 23 136 questionnaires, completed on 14 randomly chosen days in 2003, the authors were able to estimate that 603 189 anesthetic procedures were performed in Catalonia during that year. Thoracic surgery accounted for 0.94% of all surgical procedures, and the authors calculated that this represented 4458 interventions.²

I do not wish to detract from the considerable interest and overall quality of the ANESCAT project or the information contributed by Vilà and colleagues,² yet it should be noted that while the data gathering and sample selection procedures seem appropriate to the general aim, there are nevertheless some limitations in interpretation regarding an activity such as thoracic surgery, which accounts for less than 1% of the total. However, in the absence of more solid direct data concerning the volume of thoracic surgery, it might prove useful to speculate on the basis of the information provided by Vilà and colleagues.²

What thoughts spring to mind? One, suggested by the authors, is that we might consider using the data to establish the requirements for specific activities in anesthesiology³ and thoracic surgery⁴ residency programs. The thoracic surgery training program requires 20 major operations, 40 minor ones (biopsy, pleural abrasion, etc), and 40 thoracoscopies. Is this adequate, or should more be required? And how much time do residents need to spend on each of these requirements in order to familiarize themselves with the major procedures of this type of surgery (pneumonectomy, lobectomy, open lung biopsy, etc)? How and where can residents obtain this experience? Not in many hospitals, if we are to judge by the data of the study just published.

According to Vilà and colleagues,² thoracic surgery was performed in only 27 of the 131 hospitals surveyed and 90.6% of the volume was concentrated in the city of Barcelona and its province.¹ The hospital that performed the most major surgery performed 24 of a total of 171 operations during the 14 days evaluated, compared to the 6 operations performed in the hospital ranking tenth among the 27 hospitals. In other words, there was a 4-fold difference between the hospital ranking first and the one ranking tenth. In the 10 hospitals ranking last of the 27, a total of 12 such procedures were performed, or fewer than 2 resections a month in each hospital (unpublished data from the ANESCAT study). Thus, activity was concentrated in a handful of hospitals, and in most of them, there was very little. These data may be useful for the accreditation of hospitals for thoracic surgery residency programs and in defining the residency program's experience requirements. It would be useful to remember that lung cancer surgery will probably increase in the near future due to current screening and early detection efforts.

Moreover, mastery of the skills needed for thoracic surgery can only be acquired through broad and varied

Correspondence: Dr J. Sanchis
Servicio de Neumología, Hospital de la Santa Creu i Sant Pau
Avda. Sant Antoni M. Claret, 167
08025 Barcelona, Spain
E-mail: jsanchis@santpau.cat

experience. For a lucid discussion of this point, I refer the reader to the article by G. Ramos⁵ published in this journal. This raises the much debated question of the relationship between surgical volume and quality of intervention.⁶⁻⁹ The difference in mortality rate from pneumonectomy between hospitals with higher and those with lower surgical volumes may be more than 5%.^{7,11-13} The difference for lobectomy is similar.⁹ Survival rates are also affected by hospital volume: 5 years following lung cancer surgery, 44% of the patients who had undergone surgery in higher-volume hospitals were alive, while only 33% of those treated in lower-volume hospitals had survived. Postoperative complications (20% compared to 44%) and 30-day mortality rates (3% compared to 6%) showed the same pattern for high- and low-volume hospitals, respectively.⁷ These and other studies¹¹ suggest that these differences are attributable to both the surgeon and the hospital.^{8,10} Hospitals with a higher surgical volume are more likely to have staff surgeons who specialize in specific procedures. In addition, higher-volume hospitals can, and usually do, have better equipped intensive care units, better qualified nurses, and more technical and diagnostic resources to handle surgical complications.^{9,13} A recent meta-analysis, which I highly recommend, evaluated the impact of surgeon and hospital volume and of specialization on patient outcome.¹⁴ In addition to showing the negative correlations between volume and mortality, complications, and length of stay in hospital, it showed that the surgeon's caseload and specialization were more important than hospital volume. Some of the studies evaluated in the meta-analysis set the minimum number of lobectomies or pneumonectomies necessary for the surgeon to obtain minimally satisfactory results at 20 per year⁷ and at 50 per year to obtain optimal results.¹¹ In view of these data, it is difficult, if not impossible, to speak of a "cardiothoracic" surgeon, as cardiac surgery and thoracic surgery each requires high levels of surgical activity and of specialization.

One interesting and somewhat polemic initiative undertaken in the United States that takes the volume-quality relationship into account was the setting of standards, including surgical volume, for certain procedures, based on the results of an extensive list of hospitals that in 2006 represented 57% of the urban hospitals of the country.¹⁵ The list of hospitals and their results is available to professionals, insurance companies, and the general public from Leapfroggroup.org. Another line of action, more in line with Spain's own health care system, is the planned regionalization of the distribution and allocation of resources for more complex thoracic surgery. Neither the proposal⁶ nor the reservations that have been expressed⁸ are new, and there has been no lack of expressions of objections to it.^{7,12} It is argued, for example, that referring patients to only a few hospitals can have undesirable consequences on the quality of intervention both for the hospitals to which patients are referred, as they may suffer

from case overloads, and for low-volume hospitals, in which the patients who remain may suffer from ever greater limitations. Survival after lung cancer resection and the number of postoperative complications have both been seen to be inversely related to a hospital's surgical volume.⁷ Perhaps, then, it would be more useful to identify those modifiable variables that can affect results so that treatment can be improved regardless of the hospital in which patients undergo surgery. In any case, when technical complexity coincides with low frequency or the need for special immediate postoperative care, as is the case in pulmonary resection, special consideration on the part of health care planners and an official stance on the part of relevant scientific societies are called for. The patients of thoracic surgeons and pulmonologists have a great deal at stake.

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