Monitoring and improving care in thoracic surgery

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Chapter 6

Patient Related Outcome Measure: Quality of Life

The optimal surgical management of pulmonary metastases: VATS versus thoracotomy

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Abstract

Survival benefit after pulmonary metastasectomy is under question. Therefore we focused on functional recovery after pulmonary metastasectomy by thoracotomy and VATS. We used prospective data on 100 patients operated for pulmonary metastasis by either VATS or thoracotomy. We found that VATS yields a better physical performance 1 month after the operation, a shorter hospital stay, duration of chest tube drainage and epidural analgesia. Therefore, we conclude that VATS remains the preferable approach because of the superior functional outcome.
Quality of life after pulmonary metastasectomy

In current literature, the value of pulmonary metastasectomy is still under debate and surrounded by unanswered questions about the actual survival benefit. Despite the lack of substantial evidence, the practice of pulmonary metastasectomy has increased significantly in the last decade\(^1\). Therefore, the question arises ‘what is the state of the art for pulmonary metastasectomy: open resection or a minimal invasive approach (VATS)?’ In retrospective studies, comparing an open to a minimally invasive technique, no approach has shown a superior oncological outcome\(^2,3\). Eckardt et al. showed that the use of VATS resulted in missed nodules with a potentially malignant origin\(^4\). However, the clinical relevance of these missed nodules is not clear. With the addition of more unanswered questions, we should focus on the functional outcome for patients with pulmonary metastasis susceptible to operation and ask ourselves: ‘What is the effect of both surgical techniques on quality of life (QoL) in patients with pulmonary metastasis?’

To answer this question we used our prospectively collected data, including the results of QoL questionnaires to compare the short- and long-term functional recovery after pulmonary metastasectomy by thoracotomy and VATS. From April 2006 to December 2011, 100 patients operated for pulmonary metastasis were carefully selected to undergo either a minimally invasive approach or a thoracotomy. Which operative approach the team of thoracic surgeons chose depended on tumour size, tumour location and patients health status. In general, in patients with large and/or centrally located tumours, an open approach was used. Small, peripherally located nodules in patients with limited pulmonary function were removed by the VATS technique.

Patients were identified in a multidisciplinary care path for thoracic surgery in the Netherlands Cancer Institute\(^5\). All patients with (potentially) malignant pulmonary lesions scheduled for lung resection were asked to participate in this care path, including prospective data registration, which was approved by the Institutional Review Board. Patient, tumour, treatment and outcome characteristics were collected. Exclusion criteria for participation were being under 18 years of age, the inability or refusal to complete the QoL questionnaires and a resection of lung tissue as part of a chest wall resection. Also, patients were excluded receiving adjuvant and/or surgical treatment within 6 months after the primary metastasectomy (thoracotomy N=18, VATS N=20).
QoL and pain scores were evaluated preoperatively and at 1, 3 and 6 months postoperatively using the SF-36 questionnaire and the Brief Pain Inventory. Differences between the two treatment groups (i.e. VATS and thoracotomy) were assessed by the chi squared or Fisher exact test for categorical variables and by the Student t-test or Mann-Whitney U test for continuous variables. A paired sample t-test was used to compare QoL scores at baseline and 1, 3 and 6 months after the operation within a treatment group. QoL after 6 months was compared between treatment groups by means of linear regression, using the score at baseline, the treatment group and the type of resection as covariates and the score after 6 months as the outcome variable. A p-value <0.05 was regarded to be significant. The data was analysed using SPPS Statistics version 20.0.

Comparing VATS to an open approach in the direct postoperative period, a significant difference was seen with regard to the physical performance of patients 1 month after the operation (Bodily Pain \( p=0.011 \) and Role Physical \( p=0.006 \), Figure 1), in favour of the VATS technique. Also, the VATS approach was associated with a shorter hospital stay (mean 5 days SD 2.0 versus mean 7 days SD 2.6, \( p<0.001 \)), a shorter duration of chest drainage (mean 3 days SD 0.8 versus mean 4 days SD 2.3, \( p=0.005 \)) and a shorter duration of epidural analgesia (mean 4 days SD 1.8 versus mean 5 days SD 1.7, \( p=0.002 \)). QoL 6 months after the operation was comparable to baseline for both surgical techniques and no significant differences were seen in QoL and pain scores between the two approaches.

Although baseline characteristics between the two surgical approaches were well balanced (i.e. age, sex, co-morbidity, lung function, number, size and location of metastases, tumour histology and recurrence rate 6 months postoperative), wedge resection was the preferred resection when the VATS technique (49 out of 51 patients) was used. In the thoracotomy group more segmentectomies and lobectomies (17 out of 49 patients) were performed. Therefore, comparing the VATS technique to the open approach, we used a linear regression analysis to correct for the type of resection and found no difference in QoL 6 months after the operation. Also, performing a linear regression analysis only including patients in whom wedge resection was the resection of choice, no differences in QoL 6 months after the operation was seen.
To our knowledge, this is the first study evaluating QoL after pulmonary metastasectomy. Long-term functional outcome (i.e. QoL and pain) has been evaluated in patients operated for primary lung cancer\(^6\),\(^7\). Handy et al. compared QoL after a minimally invasive and open approach after lobectomy for NSCLC and found that the functional change from the pre- to the postoperative situation in the VATS group was significantly better in the physical functioning scales\(^6\). Aoki et al. observed a quicker recovery regarding to QoL in patients operated using a minimally invasive technique\(^7\).

In our study, the benefits of a less invasive approach are obvious in the direct postoperative course: a better physical performance 1 month after the operation, a shorter hospital stay, a shorter duration of chest tube drainage and epidural analgesia compared to an open approach. In a patient population with a limited life expectancy, advantages in the direct postoperative course could be of great importance. Thus, when survival benefit after pulmonary metastasectomy and best surgical practice are still under question, the focus should be on the functional outcome, in which the VATS approach is preferable.
References


