

27-28 mars
Espace Bellevue
Biarritz

7^e CONGRES

GÉNÉRATION
THORAX



L'imagerie du 21^{ème} siècle au service de la pathologie thoracique

Lymphadénectomie et segmentectomies

Pascal A. THOMAS

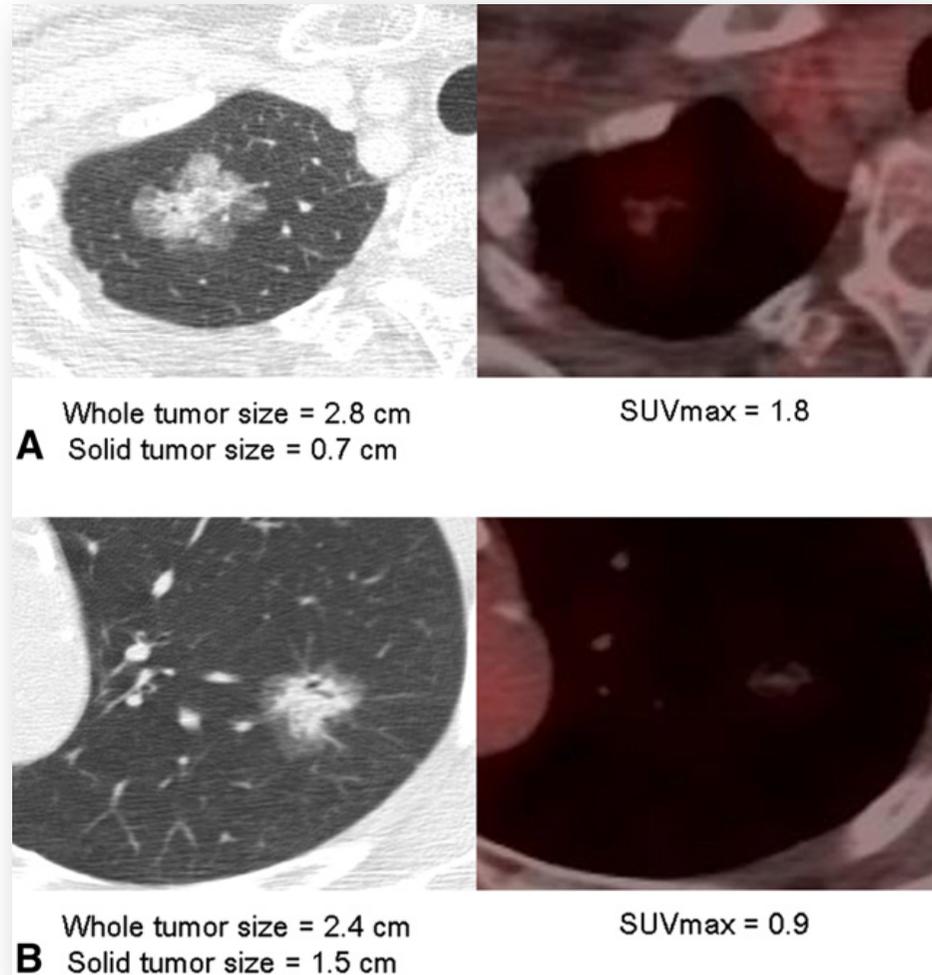
APHM – Aix-Marseille Université

Hôpital Nord -Marseille

Quelles tumeurs?

ADENOCARCINOME

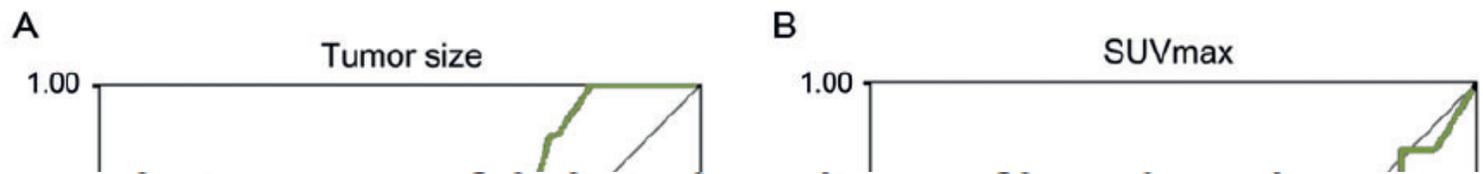
Verre dépoli
Tumeur solide < 0.8 cm
SUV (T) < 1.5



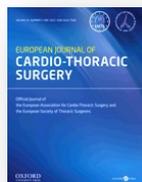
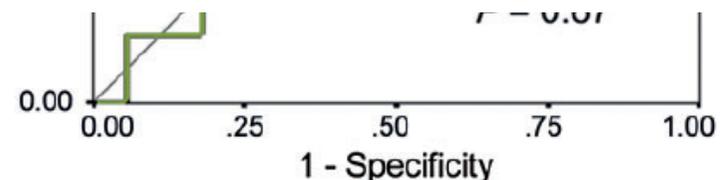
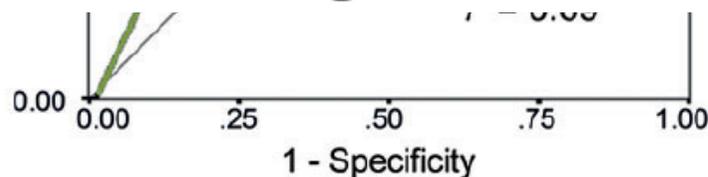
Tsutani Y, et al. Prediction of pathologic node-negative clinical stage IA lung adenocarcinoma for optimal candidates undergoing sublobar resection. J Thorac Cardiovasc Surg 2012 ;144:1365-71.

Quelles tumeurs?

CARCINOME EPIDERMOIDE



In conclusion, no useful clinical predictor of lymph node metastasis was identified in patients with clinical stage IA squamous cell carcinoma of the lung. Systematic lymphadenectomy is advisable for this type of tumour. When sublobar resection is planned, segmentectomy with lymph node dissection is recommended in preference to wedge resection.



Tsutani Y, et al. Prediction of pathologic node-negative clinical stage IA squamous cell carcinoma. *Eur J Cardiothorac Surg* 2015; *in press*

Envahissement ganglionnaire

| Tumeur | Fréquence N+ |
|----------------|--------------|
| Solide, < 2 cm | 23% |
| Solide, < 1 cm | 9% |



Rusch V, Tsuchiya R, Tsuboi M, Pass H, Grunenwald D, Goldstraw P. Surgery for bronchioloalveolar carcinoma and “very early” adenocarcinoma: an evolving standard of care? J Thorac Oncol 2006 ; 1 : S27-31

Envahissement ganglionnaire

| Tumeur | Fréquence N+ |
|--------------------------|--------------|
| Solide, < 2 cm NO-TDM | 11.6% |
| Solide, < 2 cm NO-PET | 11.3% |



Port J, Andrade R, Levin M, et al. Positron emission tomographic scanning in the diagnosis and staging of non-small-cell lung cancer 2 cm in size or less. J Thorac Cardiovasc Surg 2005 ; 130 : 1611-5.

Envahissement ganglionnaire

Table 2: The characteristics of patients with clinical stage IA non-small-cell lung cancer

| Variables | Number (n = 422) |
|-------------------------|------------------|
| Age | |
| Mean (range) | 63 (33-82) |
| Sex | |
| Male/female | 193/229 |
| Histology | |
| Adenocarcinoma | 380 |
| Squamous cell carcinoma | 22 |
| Others | 20 |
| Side and lobe | |
| Right: (RUL/RML/RLL) | 272 (138/51/83) |
| Left: (LUL/LLL) | 150 (95/55) |
| pN status | |
| N0 | 331 |
| N1 | 39 |
| N2 | 52 |

RUL: right upper lobe; RML: right middle lobe; RLL: right lower lobe;
LUL: left upper lobe; LLL: left lower lobe.

- c I-A 2004-2010
- Lobectomie au min.
- N+: 21.5%
 - N1: 9.2%
 - N2: 12.3%
 - -skip N2: 4.9%



Gorai A, et al. The clinicopathological features associated with skip N2 metastases in patients with clinical stage IA non-small-cell lung cancer. *Eur J Cardio-Thoracic Surg* 2015;47: 653–658

Indicateurs

- Référence: survie globale et cancer-spécifique à 5 ans
- Substituts:
 - Résection R0 (segmentectomie vs. Lobectomie)
 - *Réévaluation (« upstaging ») du stade après chirurgie (technique de lymphadénectomie)*

Danish registry



A National Study of Nodal Upstaging After Thoracoscopic Versus Open Lobectomy for Clinical Stage I Lung Cancer

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Background. Nodal upstaging is a common finding for non-small cell lung cancer (NSCLC) at the final evaluation of the chest. Data from The Society of Thoracic Surgeons (STS) demonstrated significant differences in nodal upstaging between thoracoscopic (VATS) and open lobectomy. STS data, however, are based on self-reporting, and survival data are based on a complete national registry.

and survival after lobectomy by VATS or thoracotomy.

Methods. The Danish Lung Cancer Registry was used to identify patients who underwent lobectomy for clinical stage I NSCLC from 2007 to 2011. Patient demographics, comorbidity, preoperative staging, surgical approach, number of lymph nodes harvested, final pathology, and survival were evaluated. Nodal upstaging was identified by comparing cT N M with pT N M.

Results. Lobectomy for clinical stage I NSCLC was performed in 1,513 patients: 717 (47%) by VATS and 796

Conclusions. National data confirm that nodal upstaging was lower after VATS than after open lobectomy for clinical stage I NSCLC. Multivariate survival analysis, however, showed no difference in survival, indicating that differences in nodal upstaging result from patient selection for reasons not captured in our registry.

occurred in 281 patients (18.6%). Nodal upstaging was higher after VATS than after open lobectomy (18.6% vs 11.1%; $p < 0.001$). Overall survival was similar (10.1% vs 10.1%). Overall survival was higher after VATS than after open lobectomy in sex, age, and performance score analysis, but not in multivariate analysis. Hazard ratio for overall survival and thoracotomy was 1.05 (95% CI, 0.78–1.40) and thoracotomy was 0.80 (95% CI, 0.58–1.11).

Conclusions. National data confirm that nodal upstaging was lower after VATS than after open lobectomy for clinical stage I NSCLC. Multivariate survival analysis, however, showed no difference in survival, indicating that differences in nodal upstaging result from patient selection for reasons not captured in our registry.

(Ann Thorac Surg 2013;96:943–50)

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Is Video-Assisted Thoracoscopic Lobectomy Inferior to Open Lobectomy Oncologically?

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We can no longer ignore the accumulating evidence of these recent reports that suggest VATS lobectomy is inferior oncologically to open lobectomy for clinical stage I lung cancer. It is no longer enough to say VATS has less pain, fewer complications, shorter length of stay, and returns patients to normal activities more quickly. It must, at least, have equivalent survival to open lobectomy. We must not give back the few hard-won percentage points of survival that have been gained over the last 4 decades.

STS database



Lymph Node Evaluation by Open or Video-Assisted Approaches in 11,500 Anatomic Lung Cancer Resections

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Conclusions. During lobectomy or segmentectomy for clinical N0 lung cancer, mediastinal nodal evaluation by VATS and thoracotomy results in equivalent upstaging. In contrast, lower rates of N1 upstaging in the VATS group may indicate variability in the completeness of the peribronchial and hilar lymph node evaluation. Systematic hilar dissection is encouraged, particularly as more surgeons adopt the VATS approach.

Department of Thoracic Surgery, University of Colorado Denver

Background. Lymph node evaluation is of interest. We determined the frequency of nodal metastases identified in clinically node-negative tumors by thoracotomy ("open") and VATS approaches to approximate the completeness of surgical nodal dissections.

Methods. The Society of Thoracic Surgery database was queried for lobectomies and segmentectomies from 2001 to 2010.

Results. A total of 11,531 (7,137 open and 4,394 VATS) clinical stage I primary lung cancers were resected. Nodal upstaging was seen in 14.3% (1,024) in the open group

(201). Upstaging in the open group was significantly greater than in the VATS group (14.3% vs 10.8%; $p = 0.002$). In contrast, lower rates of N1 upstaging in the VATS group may indicate variability in the completeness of the peribronchial and hilar lymph node evaluation. Systematic hilar dissection is encouraged, particularly as more surgeons adopt the VATS approach.

Conclusions. During lobectomy or segmentectomy for clinical N0 lung cancer, mediastinal nodal evaluation by VATS and thoracotomy results in equivalent upstaging. In contrast, lower rates of N1 upstaging in the VATS group may indicate variability in the completeness of the peribronchial and hilar lymph node evaluation. Systematic hilar dissection is encouraged, particularly as more surgeons adopt the VATS approach.

(Ann Thorac Surg 2012;94:347-53)

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Réévaluation N0 en N1

Segmentectomies

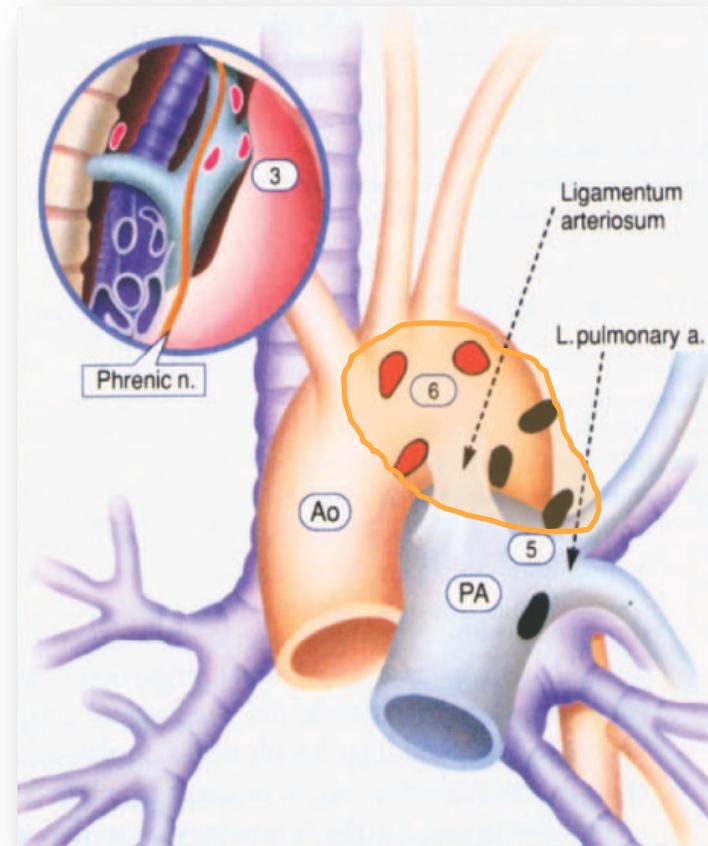
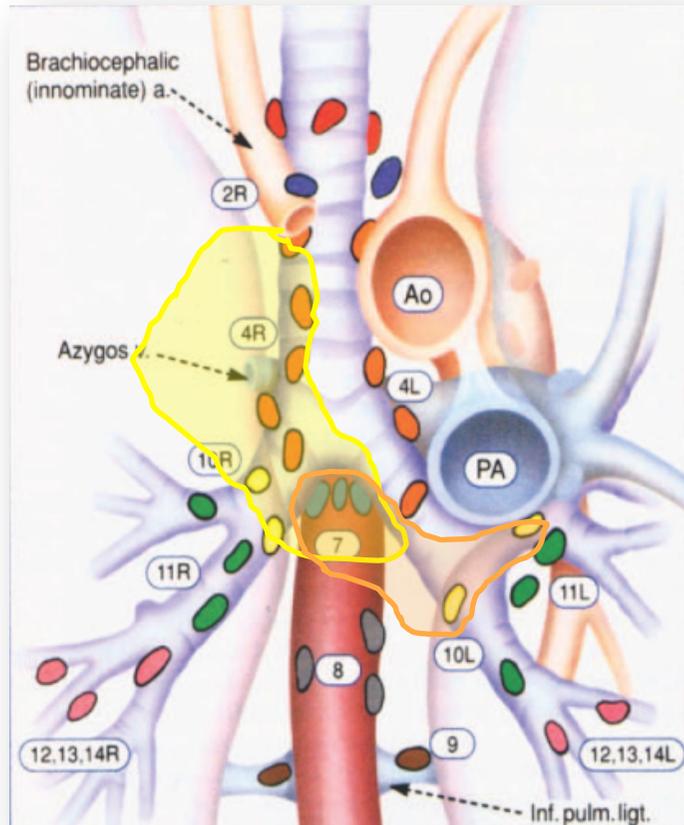
| Lobectomie (N=4824) | Segmentectomie (N=450) |
|---------------------|------------------------|
| 8.5% (Thoraco 9.6%) | 4.9% |

| Seg. Thoracotomie (N=280) | Seg. VATS (N=1700) |
|---------------------------|--------------------|
| 5.3% | 4% |



Boffa DJ et al. Lymph Node Evaluation by Open or Video-Assisted Approaches in 11,500 Anatomic Lung Cancer Resections. *Ann Thorac Surg* 2012; 94:347–53

Quelle lymphadénectomie médiastinale et hilaire?



Darling G et al. J Thorac Cardiovasc Surg 2011;141:662-70

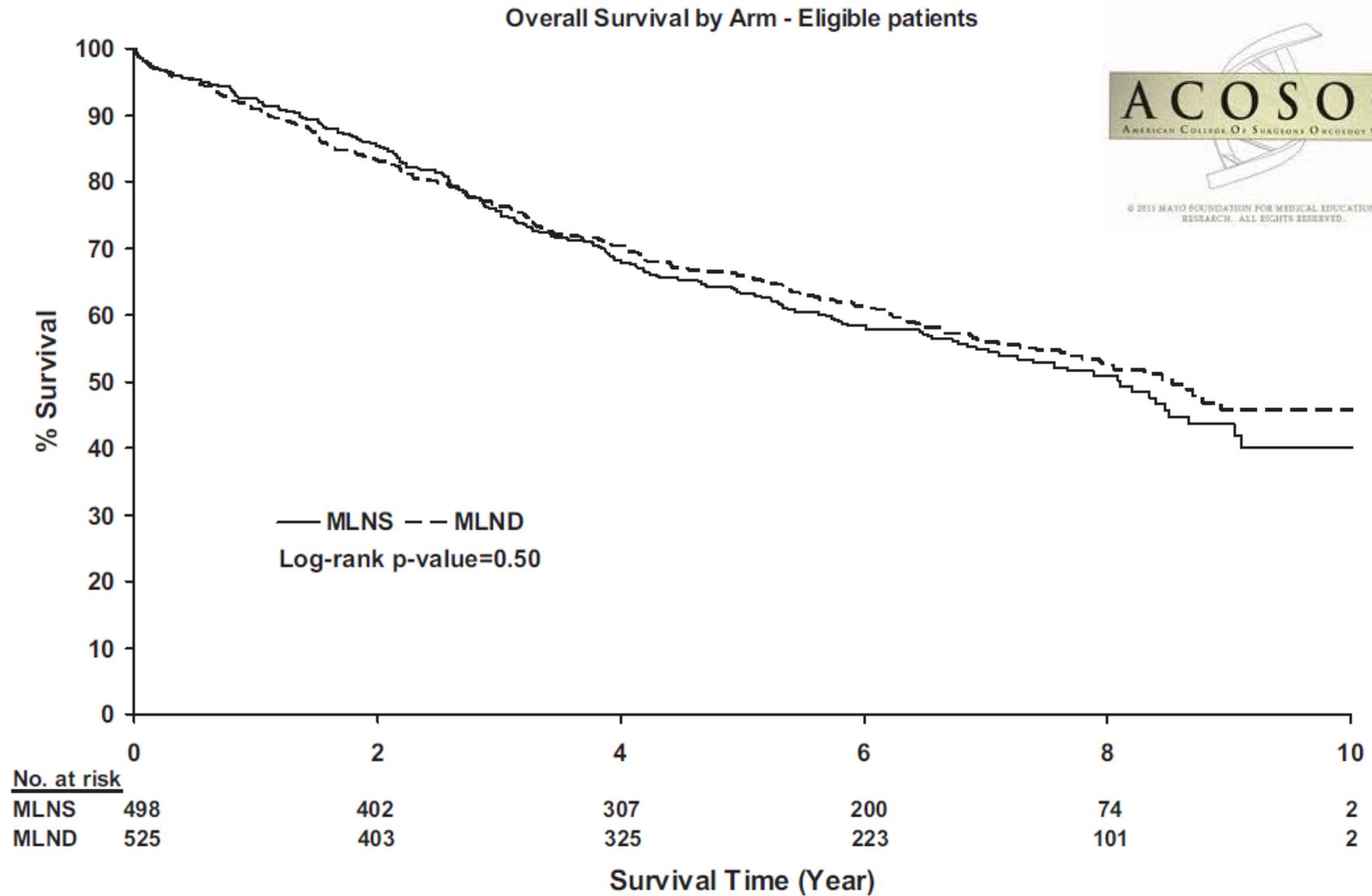
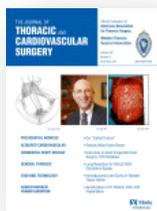


FIGURE 2. Overall survival. *MLNS*, Mediastinal lymph node sampling; *MLND*, mediastinal lymph node dissection.



Darling G et al. J Thorac Cardiovasc Surg 2011; 141(3):662-70

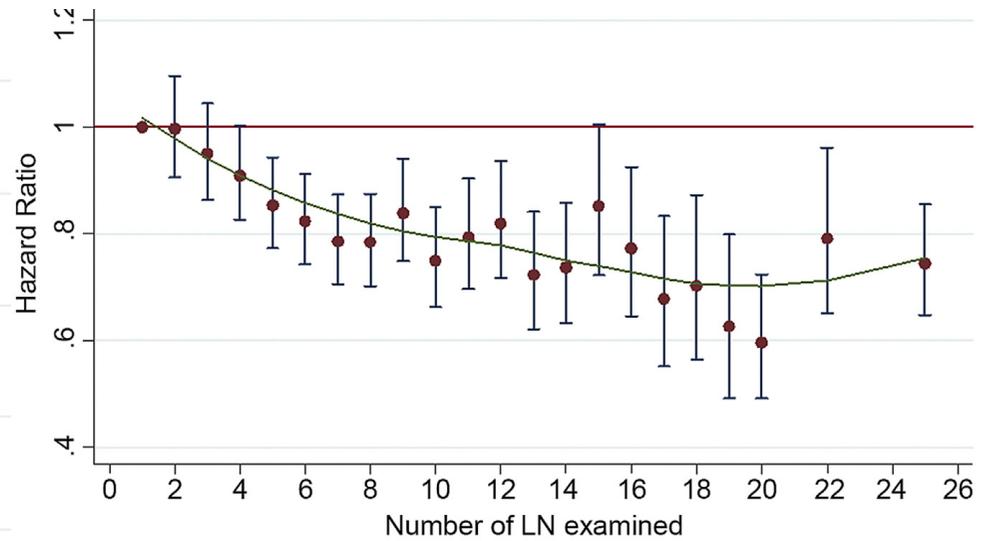
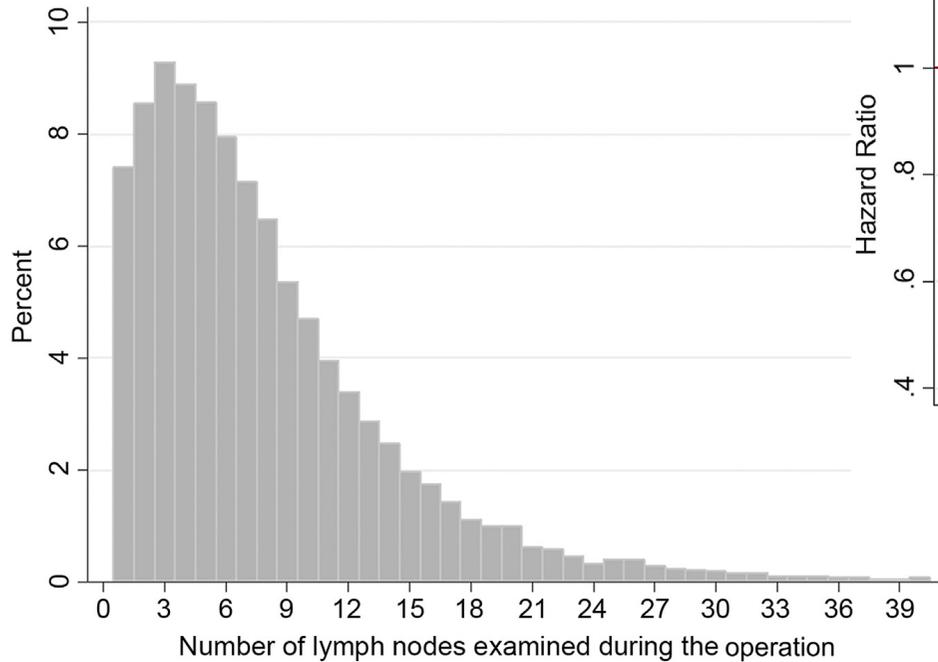
Equivalence si.....

- ❖ Stade c I
- ❖ Echantillonnage = 11R, 10R, 2&4R – 7 // 11L, 10L, 5&6 – 7
- ❖ N0 ou N1 intrapulmonaire (BE des lympho-noeuds N2 et N1 hilaires)

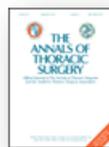




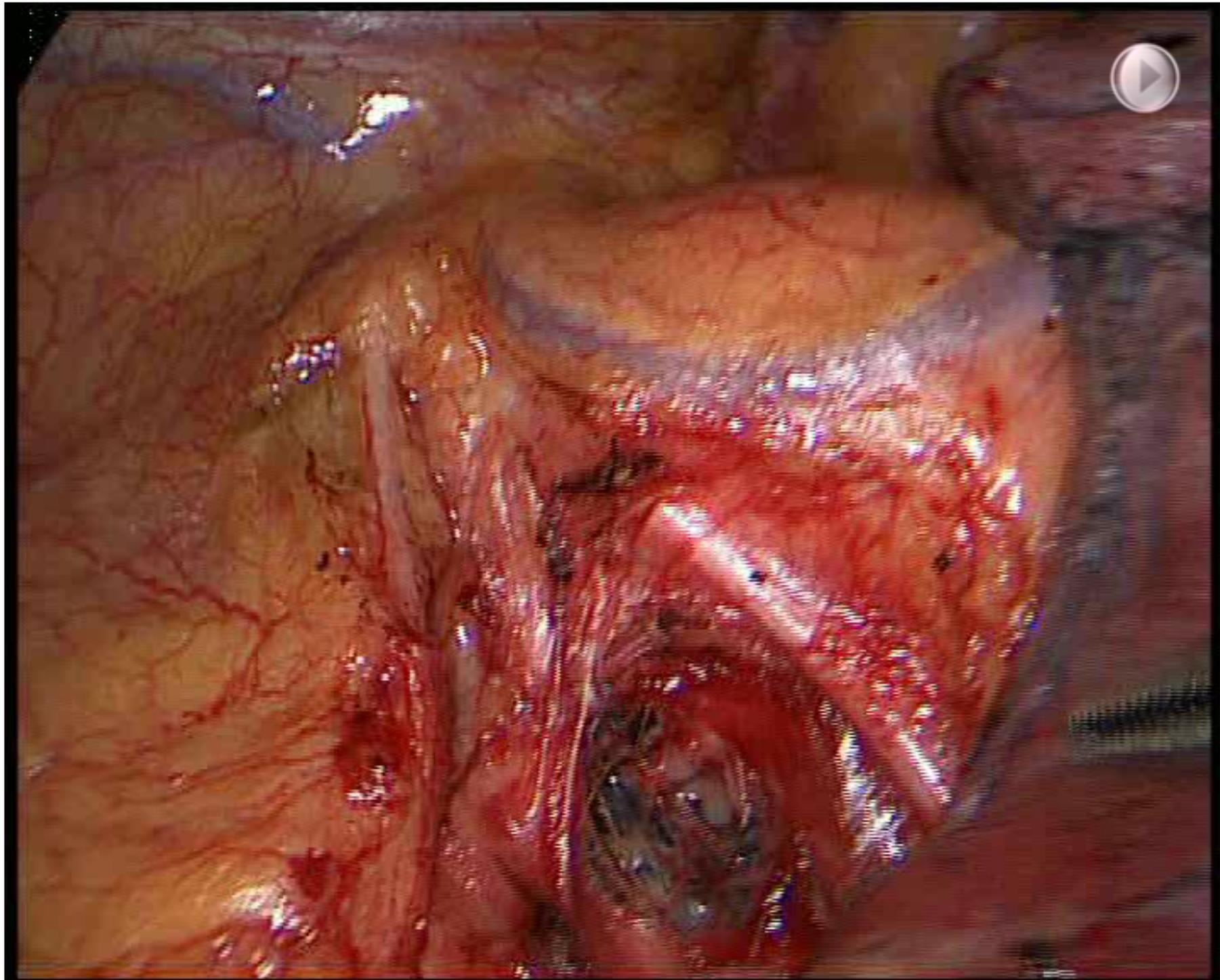
SEER Database 1998-2009



Study Cohort: at least 1 lymph node examined, pathologic “node-negative” non-small cell lung cancer n = 24,650



Osarogiagbon RU et al. *Ann Thorac Surg* 2014; 97:385-93



Quelle lymphadénectomie interlobaire?

TABLE 3. Extension of Lymph Node Dissection by Type of Procedure

| Segmentectomies | | | Lobectomies | |
|-----------------|--------|-------------|-------------|--------|
| No. | Median | LN Stations | No. | Median |
| 161 | 3 | 11–12–13 | 218 | 3 |
| 98 | 2 | 10 | 123 | 2.5 |
| 13 | 0.5 | 9–8 | 69 | 1 |
| 53 | 2 | 7 | 50 | 1 |
| 24 | 0.5 | 6 | 24 | 0.5 |
| 61 | 3 | 5 | 36 | 1.5 |
| 83 | 3 | 4 | 70 | 2 |
| 7 | 0 | 3–2 | 9 | 1 |
| 500 | 12 | | 599 | 13 |



Mattioli S et al. Does Anatomical Segmentectomy Allow an Adequate Lymph Node Staging for cT1a Non-small Cell Lung Cancer? *J Thorac Oncol* J Thorac Oncol. 2011;6: 1537–1541

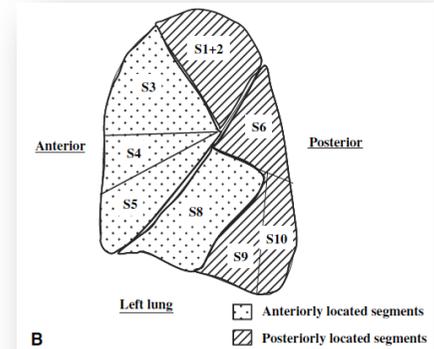
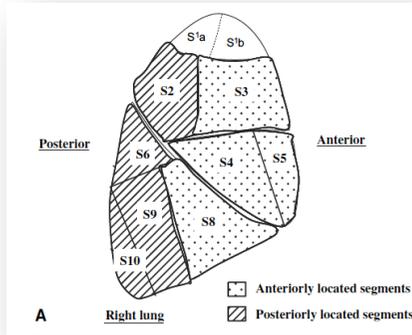


FIGURE 1. Classification of the anatomic locations of segments: A, right lung; B, left lung.

TABLE 4. Sentinel nodes at the mediastinum in each lobe

| Tumor location | Sentinel node | | |
|-------------------|---------------|-----------------|-----|
| | Station | No. of patients | % |
| Right upper lobe | 3 or 4 | 12/27 | 44 |
| | 7 | 3/27 | 11 |
| Right middle lobe | 3 or 4 | 2/2 | 100 |
| | 7 | 1/2 | 50 |
| Right lower lobe | 7 | 11/25 | 44 |
| | 3 or 4 | 6/25 | 24 |
| Left upper lobe | 5 | 14/30 | 47 |
| | 7 | 2/30 | 7 |
| Left lower lobe | 7 | 3/10 | 30 |
| | 5 | 2/10 | 20 |
| | 9 | 1/10 | 10 |

TABLE 5. Correlation between the location of station 13 sentinel nodes and the anatomic location of segments resected

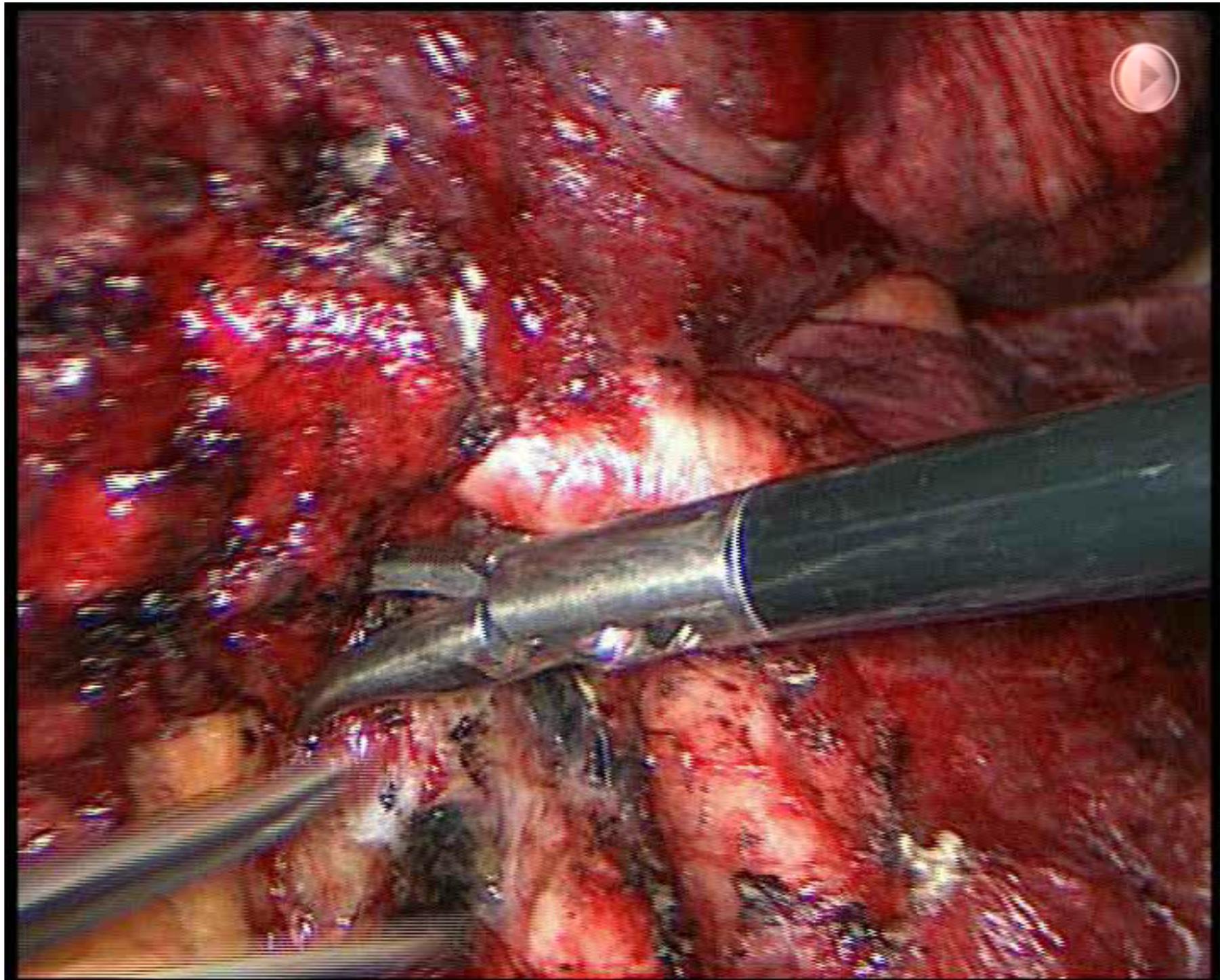
| Location of station 13 sentinel nodes | Anatomic location of segments resected | | | |
|---------------------------------------|--|-----------|----------|-----------|
| | Anterior | Posterior | Right S1 | Total |
| Resected segment alone | 4 | 13 | 1 | 18 |
| Nonresected segment alone | 3 | 0 | 0 | 3 |
| Both segments | 4 | 4 | 1 | 9 |
| Neither segment | 4 | 7 | 1 | 12 |
| Total | 15 | 24 | 3 | 42 |

Anterior, Bilateral S3, left S4 and S5, and bilateral S8; *Posterior*, right S2, left S1+2, and bilateral S6, S9, and S10.

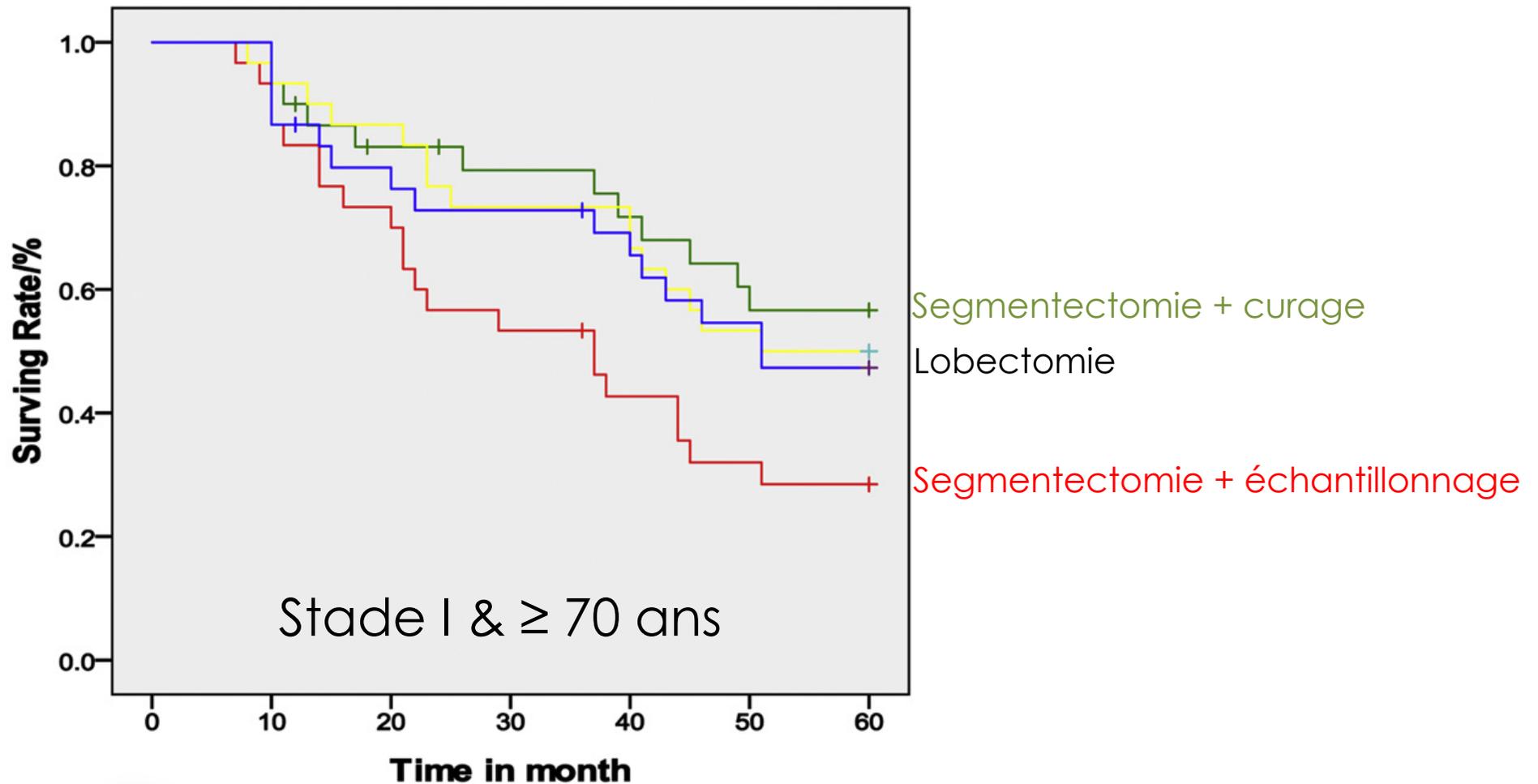
gether, we advocate that lymph node sampling at station 13



Nomori H, et al. Required area of lymph node sampling during segmentectomy for clinical stage IA non-small cell lung cancer. J Thorac Cardiovasc Surg 2010;139:38-42.



Quel impact sur la survie ?



Cheng YD et al. Clinical controlled comparison between lobectomy and segmental resection for patients over 70 years of age with clinical stage I non-small cell lung cancer. EJSO 2012;38:1149-1155

Conclusions

- La lymphadénectomie est une composante du traitement des cancers de stade précoce par segmentectomie
- La lymphadénectomie hilare et médiastinale peut et doit être identique à ce qui est réalisé lors d'une lobectomie
- Une extension de la lymphadénectomie aux ganglions interlobaires est souhaitable, en particulier pour les tumeurs des segments antérieurs