

# 肺がん治療

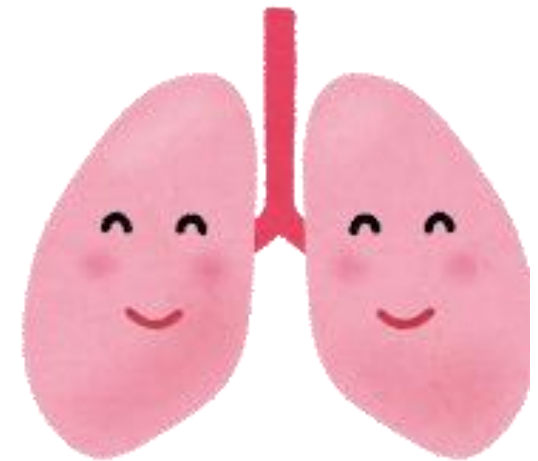
## ～QOLを考慮した手術方法について～

福岡東医療センター 呼吸器外科

諸鹿 俊彦

2022年11月16日

ひまわりサロン



独立行政法人 国立病院機構  
福岡東医療センター

# 【当院呼吸器外科の紹介】

- 年間手術件数 300件
- 肺がん手術件数 約100件



## メンバー

副院長	：	岡林	寛
部長	：	濱武	大輔
医長	：	諸鹿	俊彦
医員	：	岩中	剛
		若原	純一

「よく診て・よく聞き・やさしく治す」を診療理念に  
親身な医療を提供するよう努力して参ります



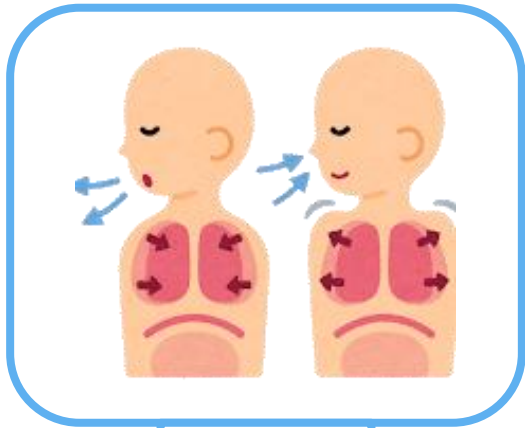
独立行政法人 国立病院機構  
福岡東医療センター

# 【肺がん手術について】

- 手術って痛そう、怖い…
- 肺って、取っても大丈夫なの？
- 手術後は元通りの生活ができるの？

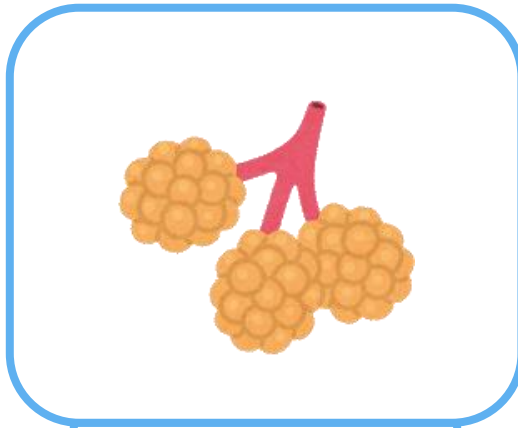


# 【呼吸機能に関する3要素】



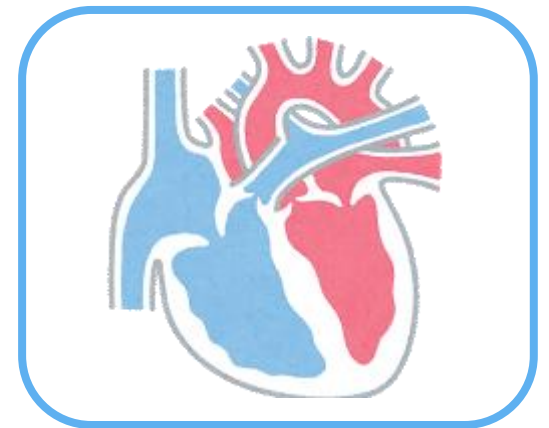
換気

- 呼吸中枢による指令
- 呼吸筋による吸気・呼気運動
- 肺の弾性
- 気道抵抗



ガス交換

- 肺胞における $O_2$ ・ $CO_2$ 交換

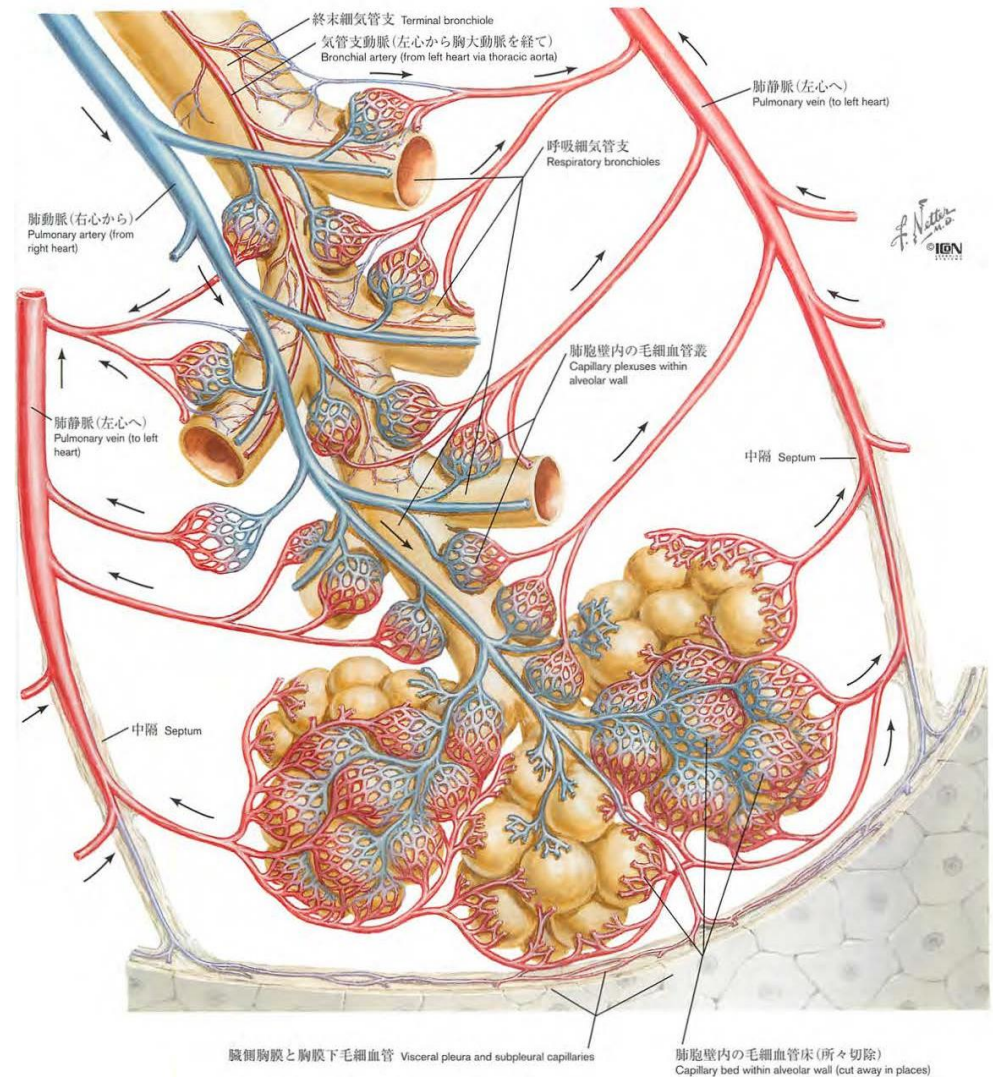
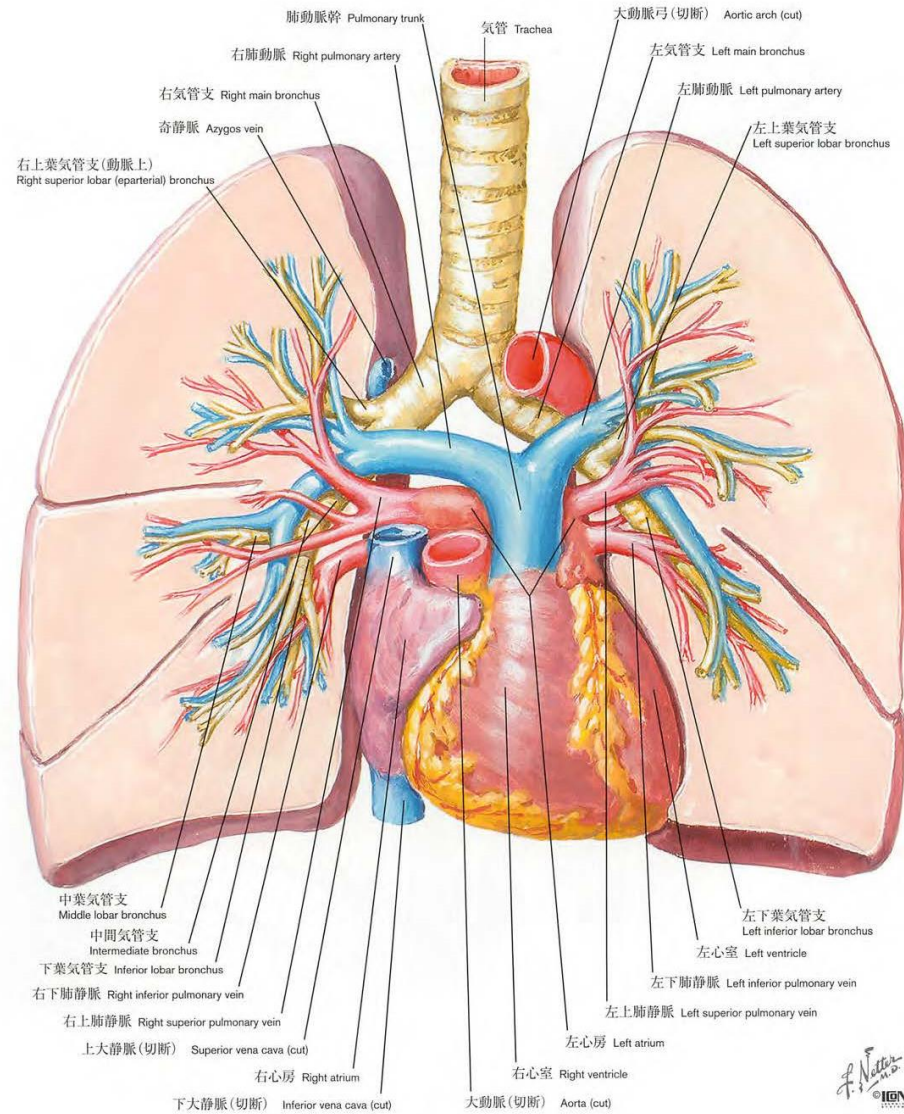


肺循環

- 心機能
- 臓器・組織への酸素運搬

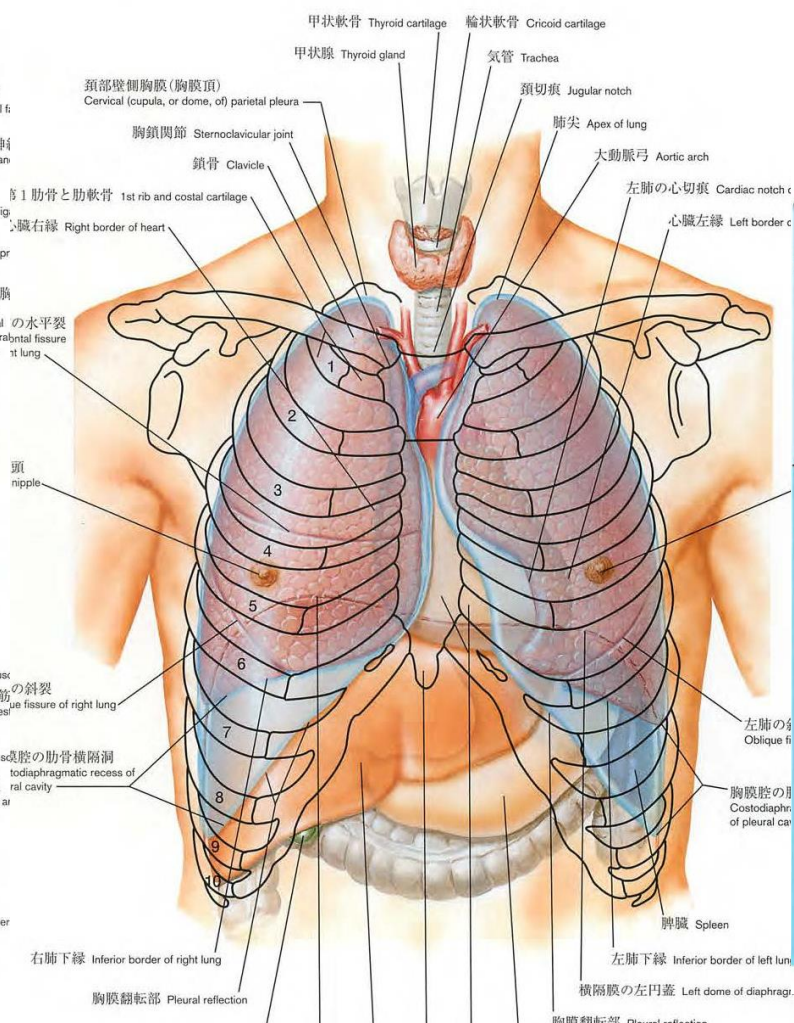
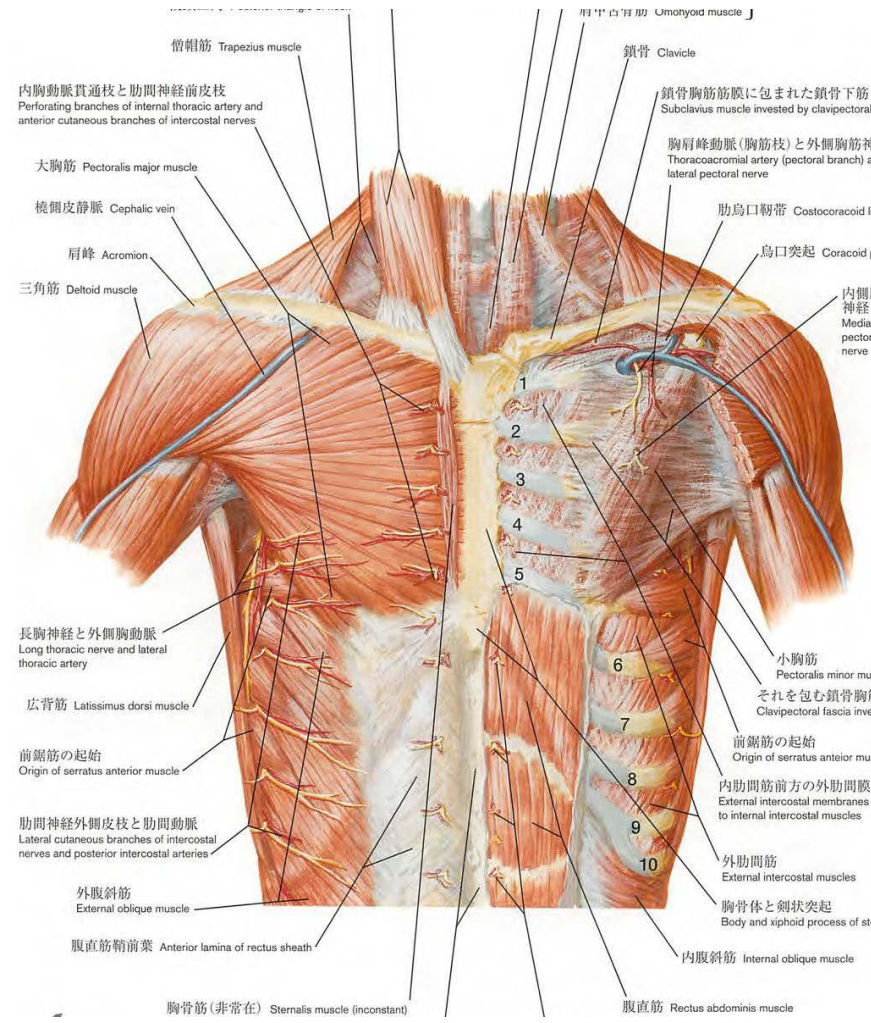


# 【肺の構造】





# 【胸部の構造】



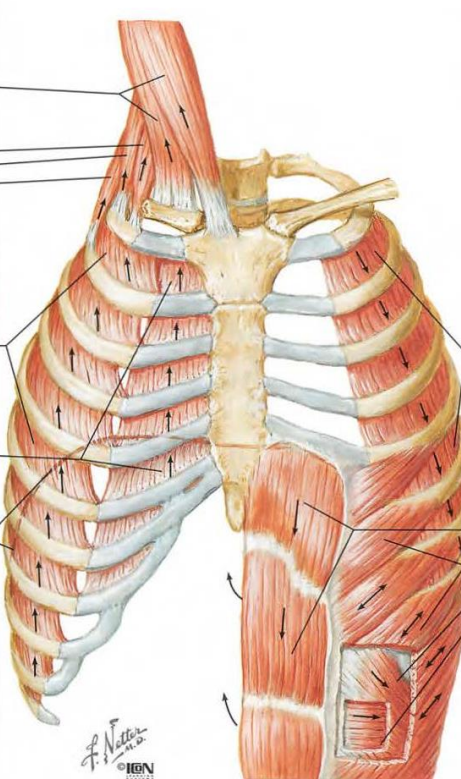
**吸気に関する筋**  
Muscles of inspiration

**補助的な筋肉**  
Accessory

- 胸鎖乳突筋 (胸骨を挙上する)  
Sternocleidomastoid
- 斜角筋  
前 Anterior  
中 Medius  
後 Posterior  
(上位肋骨を挙上し固定する)

**主要な筋肉**  
Principal

- 外肋間筋  
External intercostals  
(肋骨を挙上し胸腔の横径を拡大する)
- 内肋間筋の肋軟骨部  
Intercostal part of internal intercostals  
(肋骨を挙上する)
- 横隔膜  
Diaphragm  
(横隔膜の円蓋を押し下げて胸腔の縦径を拡大する; 下位肋骨も挙上する)



**呼気に関する筋**  
Muscles of expiration

**安静時呼吸**  
Quiet breathing

呼気は肺と肋骨ケージの受動的な反跳の結果である

**努力呼吸**  
Active breathing

肋軟骨部を除く内肋間筋  
Internal intercostals, except intercostal part

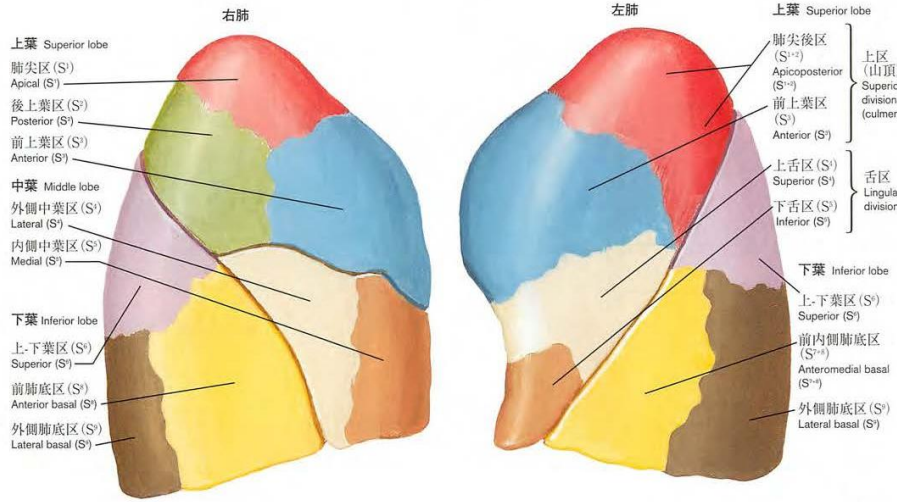
腹筋群 (下位肋骨を押し下げ、腹腔内容を圧縮して横隔膜を押し上げる)  
Rectus abdominis muscle group (pushing down lower ribs, compressing abdominal contents to push up diaphragm)

- 腹直筋 Rectus abdominis
- 外腹斜筋 External oblique
- 内腹斜筋 Internal oblique
- 腹横筋 Transversus abdominis



# 【肺葉、肺区域について】

外側面



《右肺》

上葉：3区域

中葉：2区域

下葉：5区域

計10区域

《左肺》

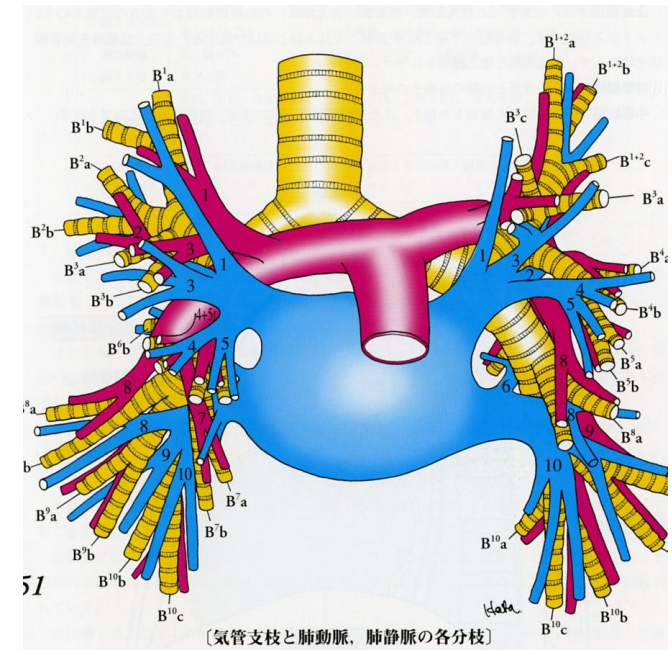
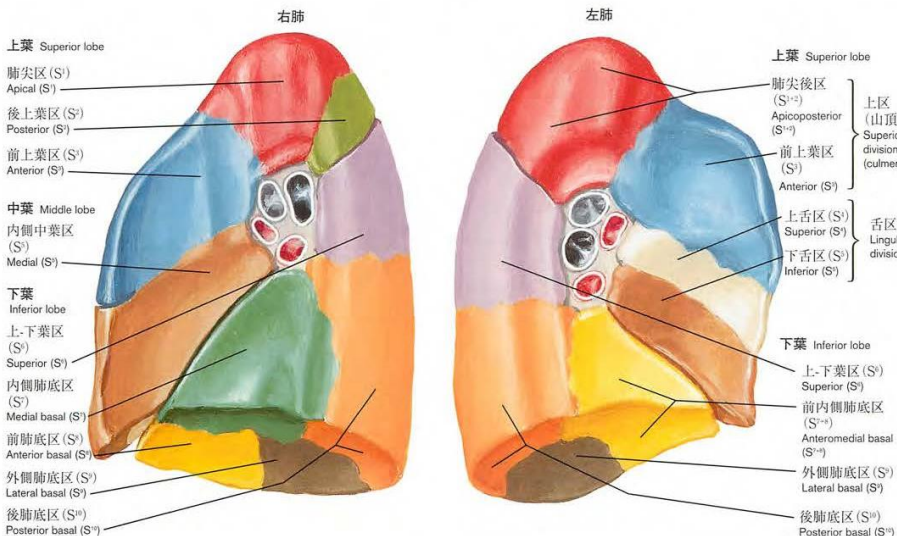
上葉：4区域

下葉：4区域

計8区域



内側面



# 【肺切除術の種類】

## ➤ 肺全摘術

- 片側の肺を全て切除
- 中枢にある大きな癌に対して選択される

## ➤ 肺葉切除術

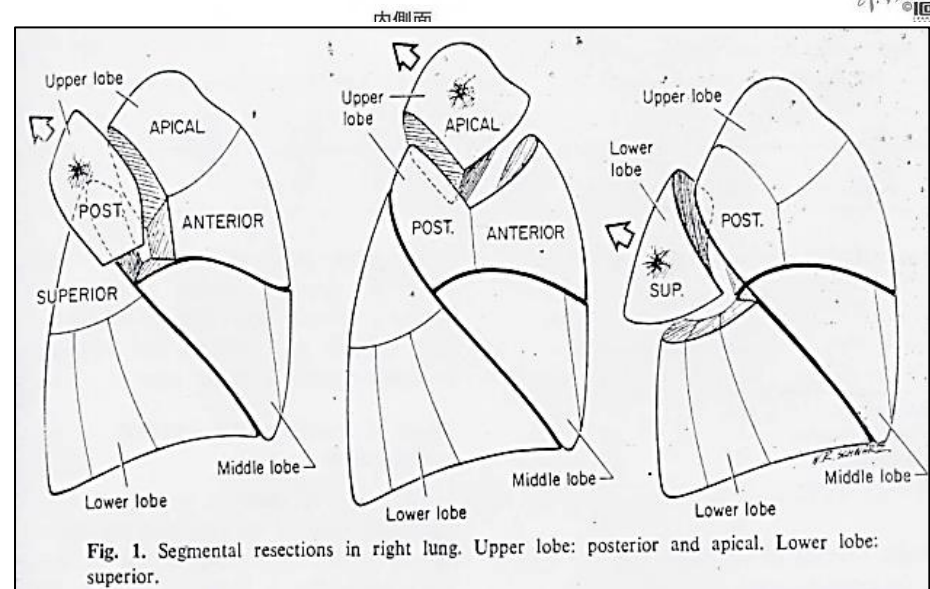
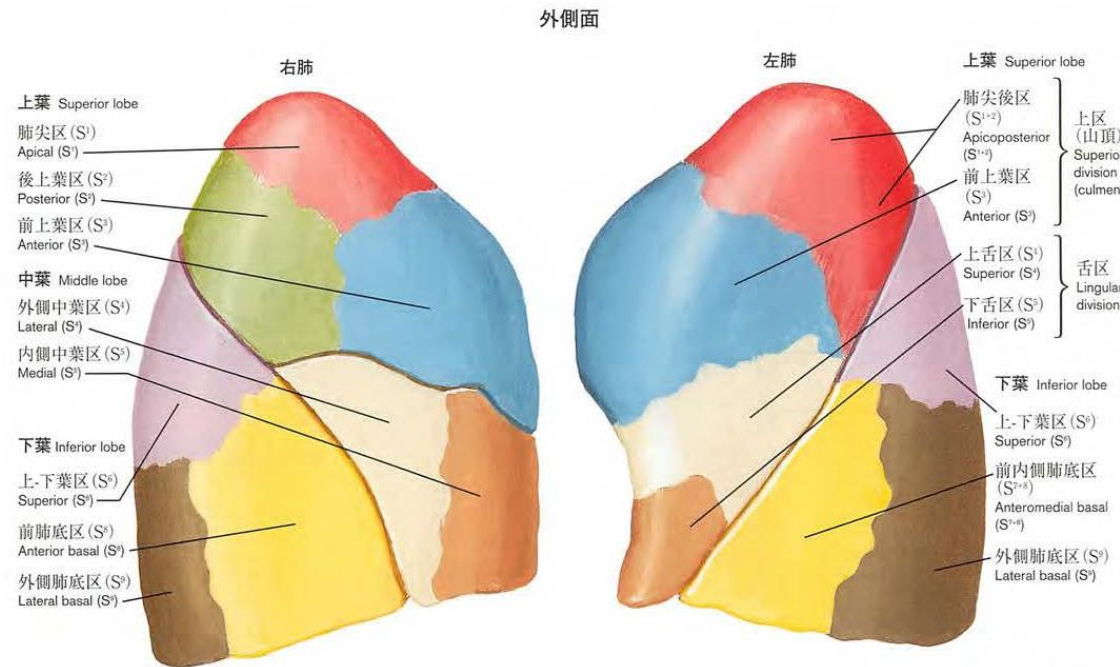
- 肺癌に対する標準術式

## ➤ 区域切除術

- 低肺機能等の理由で肺葉切除が不可能な患者における消極的（妥協的）縮小手術
- 早期小型肺癌に対する積極的（根治的）縮小手術

## ➤ 部分切除

- 縮小手術、気胸に対する肺嚢胞切除など



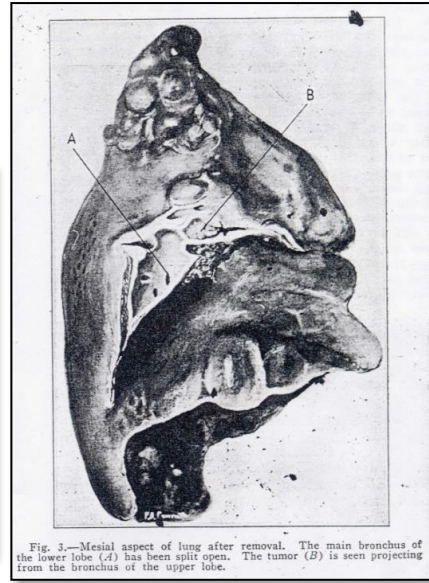
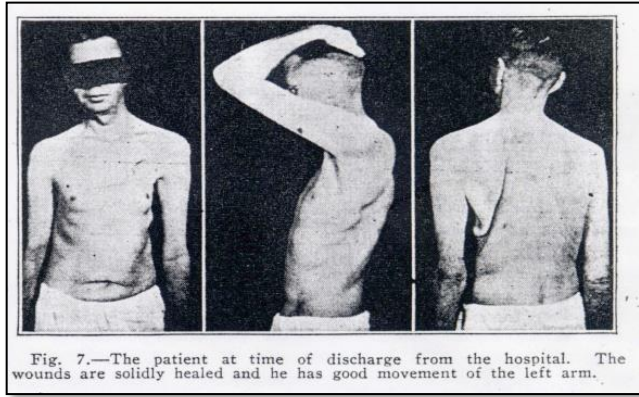
【区域切除】



# 【肺癌に対する外科的治療の歴史】

## 《肺全摘術》

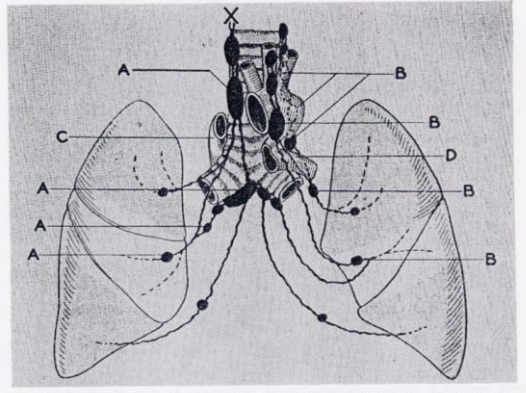
1933年



Graham EA, and Singer JJ.  
Successful removal of an entire lung  
for carcinoma of the bronchus.  
JAMA. 1933

肺癌手術における  
初の長期生存例の報告

1951年



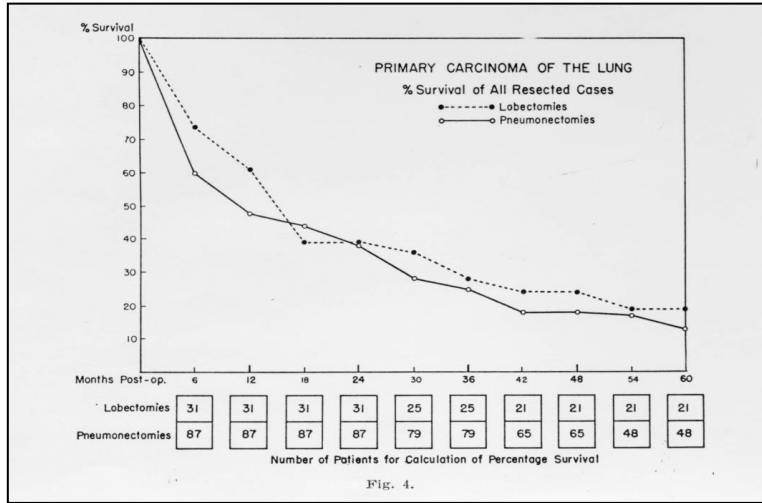
Cahan WG, Watson WL, MD, Pool JL.  
Radical pneumonectomy.  
J Thorac Surg. 1951

所属リンパ節郭清を伴う  
肺全摘術の報告

# 【肺癌に対する外科的治療の歴史】

## 《肺葉切除術》

1950年



Churchill ED, Sweet RH, Soutter L, Scannell JG.  
The surgical management of carcinoma of the lung.  
A study of the cases treated at the Massachusetts  
General Hospital  
J Thorac Surg 1950

肺全摘術と肺葉切除において同等の生存率

1960年

The Journal of  
Thoracic and  
Cardiovascular Surgery  
VOLUME 39  
MAY 1960  
NUMBER 5

Original Communications

**RADICAL LOBECTOMY**  
William G. Cahan, M.D.,\* New York, N.Y.

THIS SURVEY defines a radical lobectomy as an operation in which one or two lobes of an entire lung are excised in a block dissection with certain of their regional hilar and mediastinal lymphatics.

The technical steps and clinical implications of the procedure to be discussed are based upon an experience with 48 radical lobectomies performed on the Thoracic Surgical Service of Memorial Center.

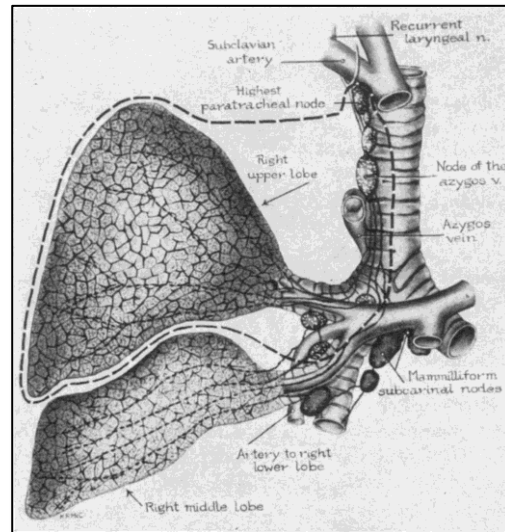
**TECHNIQUE**

In the description of the technique to follow, emphasis is placed upon the method of lymph node dissection. The ligation and division of the tributary vessels and the bronchi to the various lobes are not included.

The first step of each radical lobectomy ideally proceeds from the most distal area of potential spread and works back toward the hilum and the tumor. However, this cannot always be achieved because adhesions and many other conditions in the thorax can obliterate clear anatomic planes. Instead of starting with the lymphatic dissection it may be necessary to begin at the hilum of the lobe by entering their fissure and proceeding distally, or by using a combination of these techniques. Another technical variant may be indicated when the tumor invades chest wall. It may be difficult to approach the hilum until this extension or peripheral fixation is mobilized to rest free, attached to the lung.

\*From the Thoracic Surgical Service, Memorial Center for Cancer and Allied Diseases, New York.

Reprinted by permission from the Journal of Thoracic and Cardiovascular Surgery, Vol. 39, No. 5, pp. 555-565, 1960.



Cahan WG.  
Radical lobectomy.  
J Thorac Cardiovasc Surg. 1960

所属リンパ節郭清を伴う  
肺葉切除術の報告



# 【肺癌に対する外科的治療の歴史】

## 《肺葉切除術 vs. 縮小手術（部分切除・区域切除）》

**Randomized Trial of Lobectomy Versus Limited Resection for T1 N0 Non-Small Cell Lung Cancer**  
 Lung Cancer Study Group (Prepared by Robert J. Ginsberg, MD, and Lawrence V. Rubinstein, PhD)

**Background:** It has been reported that limited resection (segment or wedge) is equivalent to lobectomy in the management of early stage (T1) N0 non-small cell lung cancer.

**Methods:** A prospective, multicenter, randomized trial was conducted comparing limited resection with lobectomy for patients with peripheral T1 N0 non-small cell lung cancer documented at operation. Analysis included hospital and disease recurrence rates, 5-year survival rates, postoperative morbidity and mortality, and late pulmonary function assessment.

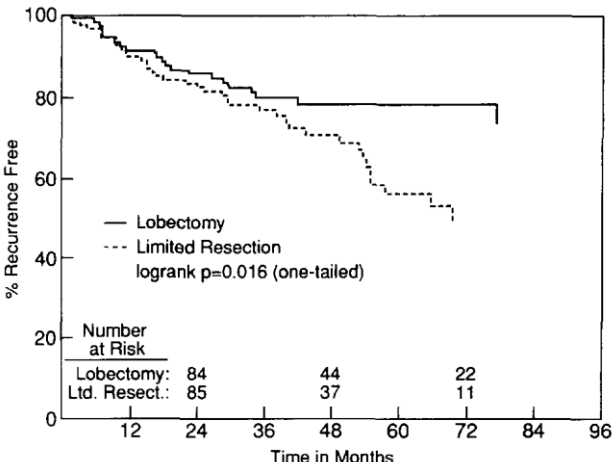
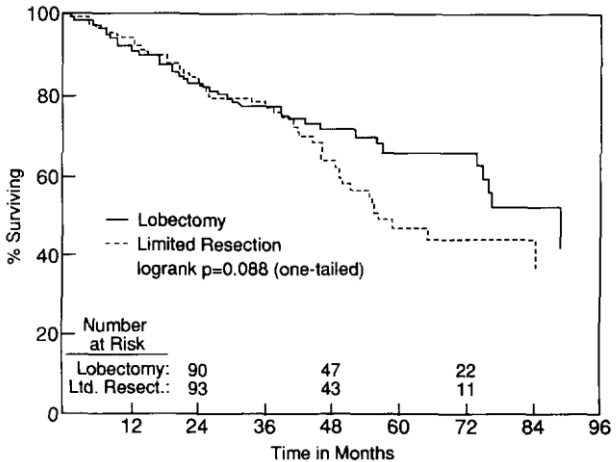
**Results:** There were 276 patients randomized, with 247 patients eligible for analysis. There were no significant differences for all stratification variables, selected prognostic factors, postoperative morbidity, mortality, or late pulmonary function. In patients undergoing limited resection, there was an observed 7% increase in recurrence rates ( $p = 0.016$ , one-sided), attributable to an observed slipping of the local recurrence rate ( $p = 0.008$  two-sided), an observed 30% increase in overall death rate ( $p = 0.08$ , one-sided), and an observed 50% increase in death with cancer rate ( $p = 0.08$ , one-sided) compared to patients undergoing lobectomy ( $p = 0.18$ , one-sided) was the predefined threshold for statistical significance for this equivalence study.

**Conclusions:** Compared with lobectomy, limited pulmonary resection does not confer improved postoperative morbidity, mortality, or late postoperative pulmonary function. Because of the higher death rate and locoregional recurrence rate associated with limited resection, lobectomy still must be considered the surgical procedure of choice for patients with peripheral T1 N0 non-small cell lung cancer. (Ann Thorac Surg 1995;60:425-31)

**Non-small cell lung cancer (NSCLC) affects more than 180,000 people in the United States annually. An estimated 14% of these patients will be cured of their disease, most curable patients presenting with early stage (I or II) disease [1]. For the past 40 years, the standard surgical treatment for early stage lung cancer has been lobectomy whenever possible [2]. After lobectomy, patients with T1 N0 NSCLC experience up to an 80% 5-year cancer-free survival [3], in an attempt to preserve pulmonary function, in 1975 Jenak and colleagues [4] were the first to suggest that lesser resection (segmentectomy) might be an adequate operation for this stage of disease. Many other investigators have subsequently reported results using lesser resections (wedge or segmental resection) for stage I disease, but these were viewed by most surgeons as a "compromise" procedure for patients having limited pulmonary function [5-9]. However, recently some centers have advocated lesser resections as appropriate treatment for patients with T1 N0 NSCLC [10-12]. The theoretical advantages of such a procedure include preservation of pulmonary function, decreased postoperative morbidity and mortality, and the ability of the patient to undergo further resections in the future if a second primary lung cancer should develop [13, 14]. The theoretical disadvantage would be the possibility for an increased local recurrence rate and, ultimately, a poorer cure rate for this deadly disease.**

In 1983, the North American Lung Cancer Study Group initiated a prospective, randomized trial comparing limited resection (segmentectomy or adequate wedge resection) with lobectomy for the treatment of patients with T1 N0 NSCLC. Accepted to the study was concluded in November 1988. After a minimum follow-up of 43 years, we report the results of this trial.

**Material and Methods**  
**Patient Eligibility**  
 All patients had suspected lung cancer diagnosed on chest roentgenogram. Patients were screened prospectively and "screened" to carry into the study if they had a clinical T1 N0 peripheral tumor (1 cm or less in all dimensions on posteroanterior and lateral chest roentgenogram) suspected or proven to be a lung cancer that was not visible on flexible bronchoscopy. All patients were able to tolerate a lobectomy as assessed by cardiac-pulmonary function. Patients were ineligible if they had a history of previously treated cancer other than breast or squamous cell carcinoma of the skin. In addition, before operation, there had to be no evidence of metastatic disease as determined by history, physical examination, and blood chemistry analysis including a normal alkaline phosphatase and serum glutamic-oxaloacetic transaminase. Absence of any of these parameters required a metastatic survey including computed tomography or



Ginsberg RJ, Rubinstein LV.  
 Randomized trial of lobectomy versus limited resection for T1N0 non-small cell lung cancer.  
 Lung Cancer Study Group.  
 Ann Thorac Surg. 1995

臨床病期 I A の非小細胞肺癌 276例

【5年生存率】

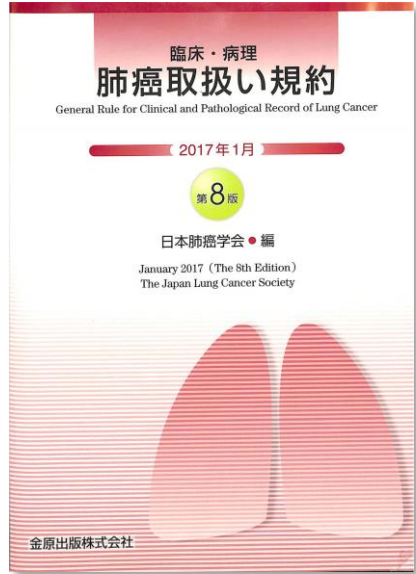
肺葉切除 63% : 縮小手術 42%

【局所再発】

肺葉切除 6% : 縮小手術 18%

→ 肺葉切除が現在の標準手術に

# 【肺癌に対する外科治療】



## TNM臨床病期分類 (UICC-8版)

8版, 2017年		N0	N1	N2	N3	M1a	M1b 単発 遠隔転移	M1c 多発 遠隔転移
T1	T1a (≤1 cm)	IA1	IIB	IIIA	IIIB	IVA	IVA	IVB
	T1b (1-2 cm)	IA2	IIB	IIIA	IIIB	IVA	IVA	IVB
	T1c (2-3 cm)	IA3	IIB	IIIA	IIIB	IVA	IVA	IVB
T2	T2a (3-4 cm)	IB	IIB	IIIA	IIIB	IVA	IVA	IVB
	T2b (4-5 cm)	IIA	IIB	IIIA	IIIB	IVA	IVA	IVB
T3	T3 (5-7 cm)	IIB	IIIA	IIIB	IIIC	IVA	IVA	IVB
T4	T4 (>7 cm)	IIIA	IIIA	IIIB	IIIC	IVA	IVA	IVB

日本肺癌学会編：肺癌取扱い規約第8版 (p4,6, 2017) . 金原出版より作成

Stage I A1～II B : 肺葉切除＋リンパ節郭清 (+補助化学療法)

Stage III A : (導入化学放射線療法後) 肺葉切除＋リンパ節郭清



# 【末梢小型肺癌に対する肺区域切除】

Saji H, et al.

Segmentectomy versus lobectomy in small-sized peripheral non-small-cell lung cancer (JCOG0802/WJOG4607L). Lancet 2022; 399: 1607-17.

## 小型（2cm以下）、末梢非小細胞肺癌に対する区域切除vs.肺葉切除（JCOG0802/WJOG4607L）

- Stage I A（腫瘍径 ≤ 2cm）、C/T比 > 0.5、肺末梢1/3に存在
- 肺葉切除 554例、区域切除 552例
- Primary endpoint：全生存率
- Secondary endpoint：術後呼吸機能（6, 12ヶ月）、無再発生存率、局所再発、術後合併症

Articles

**Segmentectomy versus lobectomy in small-sized peripheral non-small-cell lung cancer (JCOG0802/WJOG4607L): a multicentre, open-label, phase 3, randomised, controlled, non-inferiority trial**

Hasebe Saji, Mochitoh Okada, Masahiro Tsuboi, Ryo Nishijima, Kenji Suzuki, Kazuo Adachi, Tadahiko Anai, Jun Okami, Ichiro Yoshino, Hiroyuki Ito, Naohiko Kusunoki, Masaharu Yamaguchi, Naohiko Baba, Kazuo Wakabayashi, Kazuo Nakamura, Haruhiko Fukuda, Shoichiro Nakamura, Tetsuya Mitobuchi, Shun-ichi Watanabe, Hisao Asanuma, on behalf of the West Japan Oncology Group and Japan Clinical Oncology Group\*

**Summary**  
**Background** Lobectomy is the standard of care for early-stage non-small-cell lung cancer (NSCLC). The survival and clinical benefits of segmentectomy have not been investigated in a randomised trial setting. We aimed to investigate if segmentectomy was non-inferior to lobectomy in patients with small-sized peripheral NSCLC.

**Methods** We conducted this randomised, controlled, non-inferiority trial at 70 institutions in Japan. Patients with clinical stage IA NSCLC (tumour diameter ≤ 2 cm, consolidation-to-tumour ratio > 0.5) were randomly assigned 1:1 to receive either lobectomy or segmentectomy. Randomisation was done via the minimisation method, with balancing for the institution, histological type, sex, age, and thin-section CT findings. Treatment allocation was not concealed from investigators and patients. The primary endpoint was overall survival for all randomly assigned patients. The secondary endpoints were postoperative respiratory function (6 months and 12 months), relapse-free survival, proportion of local relapse, adverse events, proportion of segmentectomy completion, duration of hospital stay, duration of chest tube placement, duration of surgery, amount of blood loss, and the number of automatic surgical staples used. Overall survival was analysed on an intention-to-treat basis with a non-inferiority margin of 1.54 for the upper limit of the 95% CI of the hazard ratio (HR) and estimated using a stratified Cox regression model. This study is registered with UMIN Clinical Trials Registry, UMIN00000237.

**Findings** Between Aug. 10, 2009, and Oct. 21, 2014, 1106 patients (intention-to-treat population) were enrolled to receive lobectomy (n=554) or segmentectomy (n=552). Patient baseline clinicopathological factors were well balanced between the groups. In the segmentectomy group, 22 patients were switched to lobectomies and one patient received wide wedge resection. At a median follow-up of 7.3 years (range 0.0–10.9), the 5-year overall survival was 94.3% (92.1–96.0) for segmentectomy and 91.1% for lobectomy (95% CI 83.4–93.2); superiority and non-inferiority in overall survival were confirmed using a stratified Cox regression model (HR 0.663; 95% CI 0.474–0.927; one-sided p=0.0003 for non-inferiority; p=0.0082 for superiority). Improved overall survival was observed consistently across all predefined subgroups in the segmentectomy group. At 1 year follow-up, the significant difference in the reduction of median forced expiratory volume in 1 sec between the two groups was 3.5% (p=0.0001), which did not reach the predefined threshold for clinical significance of 10%. The 5-year relapse-free survival was 83.0% (95% CI 83.0–90.4) for segmentectomy and 87.9% (84.8–90.3) for lobectomy (HR 0.998; 95% CI 0.753–1.323; p=0.9839). The proportions of patients with local relapse were 10.5% for segmentectomy and 5.4% for lobectomy (p=0.0018). 52 (63%) of 83 patients and 27 (47%) of 58 patients died of other diseases after lobectomy and segmentectomy, respectively. No 30-day or 90-day mortality was observed. One or more postoperative complications of grade 2 or worse occurred at similar frequencies in both groups (142/26%) patients who received lobectomy, 148/27% who received segmentectomy).

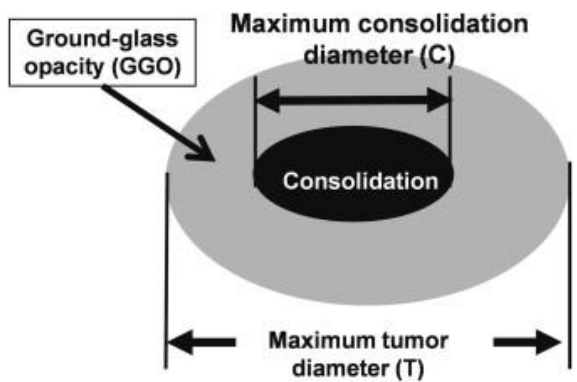
**Interpretation** To our knowledge, this study was the first phase 3 trial to show the benefits of segmentectomy versus lobectomy in overall survival of patients with small-peripheral NSCLC. The findings suggest that segmentectomy should be the standard surgical procedure for this population of patients.

**Funding** National Cancer Center Research and the Ministry of Health, Labour, and Welfare of Japan.

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**Introduction** Lung cancer is the leading cause of cancer-related deaths worldwide, and the incidence has increased over the past two decades. Surgical resection is the gold standard of treatment for early-stage lung cancer, with lobectomy being the standard mode of surgery since 1960<sup>1</sup>. To date, only one randomised controlled trial has compared lobectomy with sublobar resection in

www.thelancet.com Vol 399 April 23, 2022 1607



# 【末梢小型肺癌に対する肺区域切除】

## 《Primary endpoint》 全生存率

Segmentectomy versus lobectomy in small-sized peripheral non-small-cell lung cancer (JCOG0802/WJOG4607L): a multicentre, open-label, phase 3, randomised, controlled, non-inferiority trial

Hiroshi Saji, Masahito Okada, Masahiro Tsuboi, Ryo Nishijima, Kenji Suzuki, Kazuo Adachi, Tadahiro Anai, Jun Okami, Ichiro Yoshino, Hiroyuki Ito, Nobuhito Kusunoki, Masaharu Yamaguchi, Naohiko Inoue, Kazuo Wakiabayashi, Kazuhiko Nakamura, Haruhiko Fukuda, Shoichihiro Nakamura, Tetsuya Mitobuchi, Shun-ichi Watanabe, Naoto Asanuma, on behalf of the West Japan Oncology Group and Japan Clinical Oncology Group\*

### Summary

**Background** Lobectomy is the standard of care for early-stage non-small-cell lung cancer (NSCLC). The survival and clinical benefits of segmentectomy have not been investigated in a randomised trial setting. We aimed to investigate if segmentectomy was non-inferior to lobectomy in patients with small-sized peripheral NSCLC.

**Methods** We conducted this randomised, controlled, non-inferiority trial at 70 institutions in Japan. Patients with clinical stage IA NSCLC (tumour diameter  $\leq 2$  cm; consolidation-to-tumour ratio  $>0.5$ ) were randomly assigned 1:1 to receive either lobectomy or segmentectomy. Randomisation was done via the minimisation method, with balancing for the institution, histological type, sex, age, and thin-section CT findings. Treatment allocation was not concealed from investigators and patients. The primary endpoint was overall survival for all randomly assigned patients. The secondary endpoints were postoperative respiratory function (6 months and 12 months), relapse-free survival, proportion of local relapse, adverse events, proportion of segmentectomy completion, duration of hospital stay, duration of chest tube placement, duration of surgery, amount of blood loss, and the number of automatic surgical staples used. Overall survival was analysed on an intention-to-treat basis with a non-inferiority margin of 1.54 for the upper limit of the 95% CI of the hazard ratio (HR) and estimated using a stratified Cox regression model. This study is registered with UMIN Clinical Trials Registry, UMIN00000237.

**Findings** Between Aug. 10, 2009, and Oct. 21, 2014, 1106 patients (intention-to-treat population) were enrolled to receive lobectomy (n=554) or segmentectomy (n=552). Patient baseline clinicopathological factors were well balanced between the groups. In the segmentectomy group, 22 patients were switched to lobectomies and one patient received wide wedge resection. At a median follow-up of 7.3 years (range 0.0–10.9), the 5-year overall survival was 94.3% (92.1–96.0) for segmentectomy and 91.1% for lobectomy (95% CI 88.4–93.2); superiority and non-inferiority in overall survival were confirmed using a stratified Cox regression model (HR 0.663; 95% CI 0.474–0.927; one-sided  $p=0.0001$  for non-inferiority;  $p=0.0082$  for superiority). Improved overall survival was observed consistently across all predefined subgroups in the segmentectomy group. At 1 year follow-up, the significant difference in the reduction of median forced expiratory volume in 1 sec between the two groups was 3.5% ( $p=0.0001$ ), which did not reach the predefined threshold for clinical significance of 10%. The 5-year relapse-free survival was 83.0% (95% CI 80.3–85.6) for segmentectomy and 87.9% (84.8–90.3) for lobectomy (HR 0.998; 95% CI 0.753–1.323;  $p=0.9889$ ). The proportions of patients with local relapse were 10.5% for segmentectomy and 5.4% for lobectomy ( $p=0.0018$ ). 52 (83%) of 83 patients and 27 (47%) of 58 patients died of other diseases after lobectomy and segmentectomy, respectively. No 30-day or 90-day mortality was observed. One or more postoperative complications of grade 2 or worse occurred at similar frequencies in both groups (142/26%) patients who received lobectomy, 148/27%) who received segmentectomy).

**Interpretation** To our knowledge, this study was the first phase 3 trial to show the benefits of segmentectomy versus lobectomy in overall survival of patients with small-peripheral NSCLC. The findings suggest that segmentectomy should be the standard surgical procedure for this population of patients.

**Funding** National Cancer Center Research and the Ministry of Health, Labour, and Welfare of Japan.

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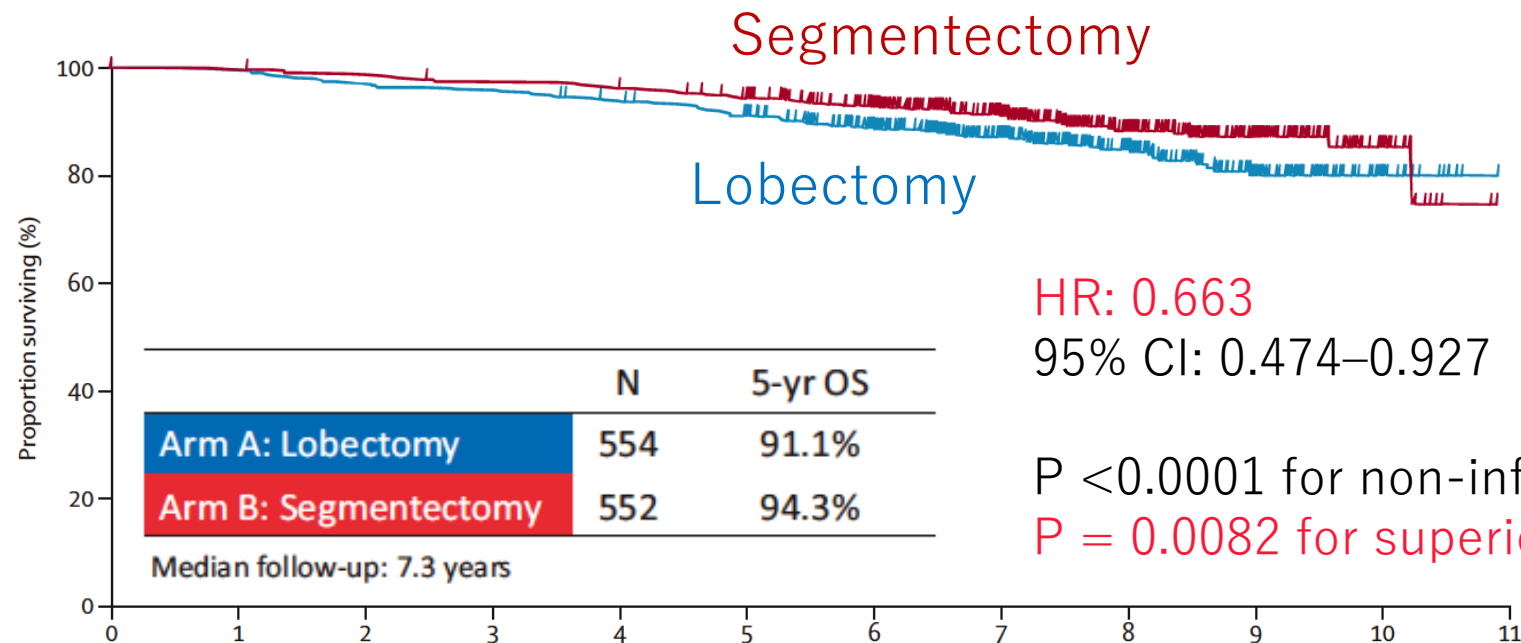
**Introduction** Lung cancer is the leading cause of cancer-related deaths worldwide, and the incidence has increased over the past two decades. Surgical resection is the gold standard of treatment for early-stage lung cancer, with lobectomy being the standard mode of surgery. To date, only one randomised controlled trial has compared lobectomy with sublobar resection in

Articles



March 2022, 169, 1607–17  
See Comment page 1724  
\*Members are listed in the Appendix (p S10).

Department of Chest Surgery, St. Marianna University School of Medicine, Kawasaki, Japan (H.S.); Department of Surgical Oncology, Research Institute for Radiation Biology and Medicine, Hiroshima University, Hiroshima, Japan (M.O.); Department of Thoracic Surgery, National Cancer Center Hospital East, Kashiwa, Japan (M.T.); Department of Thoracic Surgery, Osaka City General Hospital, Osaka, Japan (R.N.); Department of General Thoracic Surgery, Juntendo University School of Medicine, Tokyo, Japan (K.S.); Department of Thoracic Surgery, Niigata Center Hospital, Niigata, Japan (T.A.); Department of General Thoracic Surgery, Osaka University Graduate School of Medicine, Osaka, Japan (J.O.); Department of Thoracic Surgery, Chiba University Graduate School of Medicine, Chiba, Japan (I.Y.); Department of Thoracic Surgery, Kanagawa Central Hospital, Kawasaki, Japan (H.I.); Department of Thoracic Oncology, National Hospital Organization Kyushu Center Center, Fukuoka, Japan (N.K.); Department of Surgery, Tokyo Medical University, Tokyo, Japan (S.N.); Japan Clinical Oncology Group Data Center/Operative Office (M.W.); Department of Thoracic Surgery, Fukuoka Medical Center, Fukuoka, Japan (S.W.).



Number at risk (number censored)

Lobectomy	554 (0)	550 (1)	537 (0)	530 (0)	525 (3)	495 (6)	426 (57)	322 (97)	190 (125)	90 (92)	23 (67)	0 (23)
Segmentectomy	552 (0)	549 (1)	543 (1)	534 (1)	528 (0)	512 (6)	457 (47)	332 (118)	202 (122)	104 (96)	25 (78)	0 (24)

区域切除群で非劣性、優越性とも証明された。



# 【現在のガイドライン】

CQ4. 臨床病期IA期，最大腫瘍径2cm以下の非小細胞肺癌に対して，縮小手術（区域切除または楔状切除）を行うよう勧められるか？

## 推奨

臨床病期IA期，最大腫瘍径2cm以下の非小細胞肺癌に対して，縮小手術（区域切除または楔状切除）を行うよう提案する。  
（推奨の強さ：2，エビデンスの強さ：C，合意率：100%）

## 解説

臨床病期I期肺癌に対する標準術式は肺葉切除であるが，これまでに腫瘍径2cm以下の肺癌に対して縮小切除を行った研究が報告されている。1つのメタアナリシスでは肺葉切除に対して縮小切除後の予後は劣らないとしているが，それぞれの報告の対象にばらつきがあり，結果に対する解釈に注意するよう結論付けられている<sup>6)</sup>。2cm以下の肺癌に対する区域切除55例の報告では，5年生存率

第1部 肺癌診療ガイドライン  
2021年版

## II. 非小細胞肺癌（NSCLC）

非小細胞肺癌の樹形図

1. 外科治療
2. 光線力学的治療法
3. 放射線治療基本的事項
4. 周術期
5. I-II期非小細胞肺癌の放射線療法
6. III期非小細胞肺癌・肺尖部胸壁浸潤癌
7. IV期非小細胞肺癌

[目次に戻る](#)

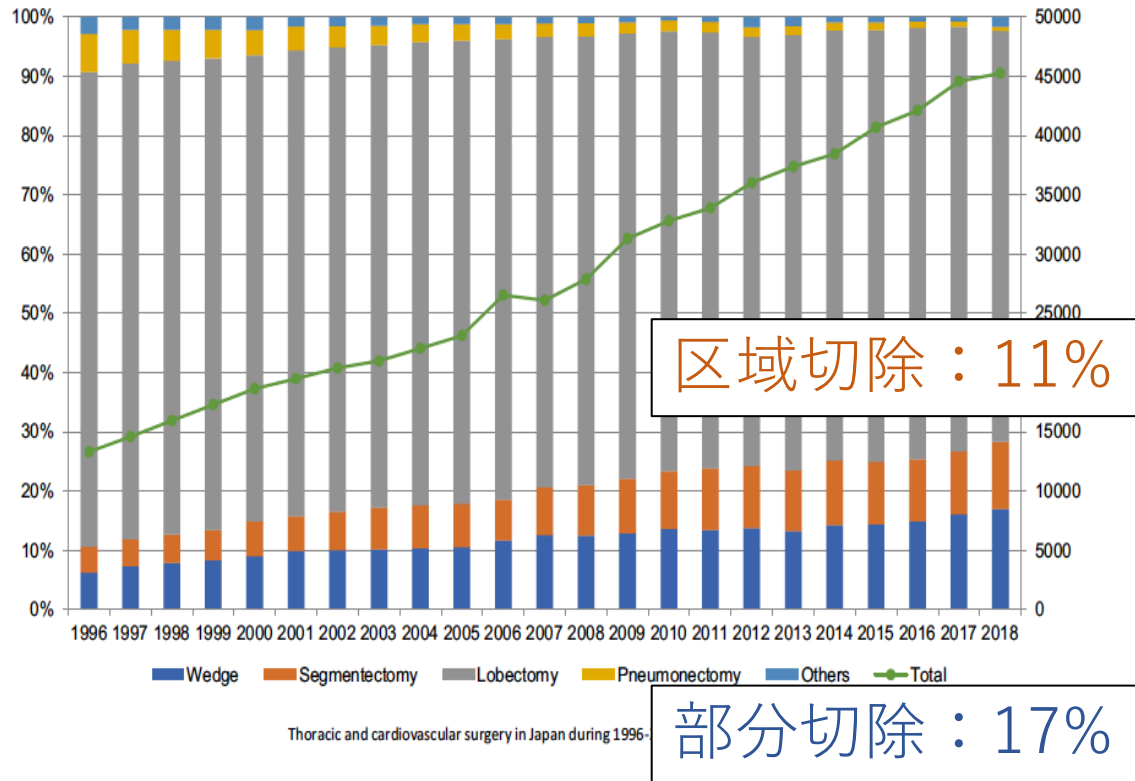
投票者の所属委員会：外科療法小委員会／実施年度：2020年

行うことを推奨	行うことを弱く推奨（提案）	推奨度決定不能	行わないことを弱く推奨（提案）	行わないことを推奨
0%	100% (9/9)	0%	0%	0%

# 【全国の施設、および当院での肺切除術の実際】

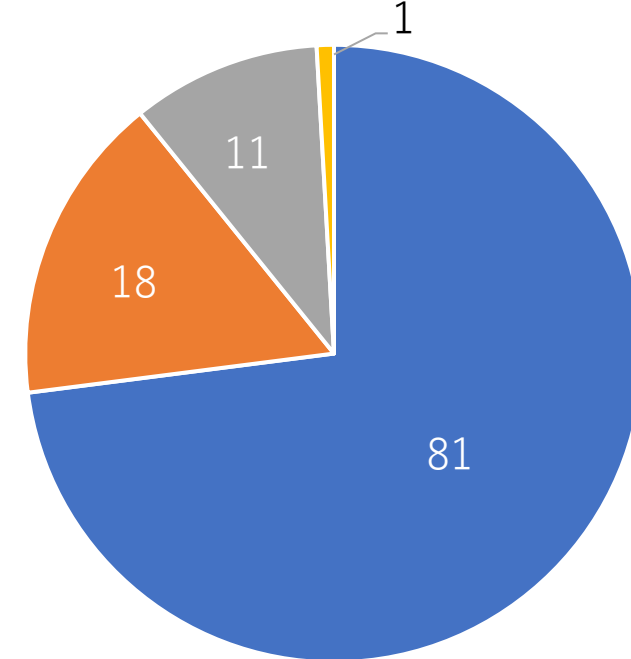
肺癌手術件数：45243

Trend of surgical procedure for primary lung cancer in Japan



2021年度 当院での呼吸器外科手術  
 総手術数 : 271例  
 肺癌手術 : 111例

当院における肺癌手術の内訳 (2021年度)



■ 葉切除 ■ 区域切除 ■ 部分切除 ■ 葉切除+区域切除

佐治 久. Sublobar Resections - Current Evidence and Future Direction. 肺癌. 2021;61:880-886.

## 【肺がんに対する手術の現在とこれから】

- 現在の肺がんに対する標準的な手術は、肺葉切除＋リンパ節郭清。
- 縮小手術（区域切除・部分切除）は、合併症が多い・肺機能の低い患者さんに行われる、消極的（妥協的）な手術の側面が大きかった。
- 肺末梢にできた小型の肺がんに対しては、区域切除は肺葉切除に劣らない、優れた手術成績であったとの論文が報告された。肺の切除量が少ない手術が行われることで、患者さんの術後QOLをより高めることができる可能性あり。
- 当院においても、最新のエビデンスに基づいた治療を選択し、患者さんに有益な手術を提供していきます。



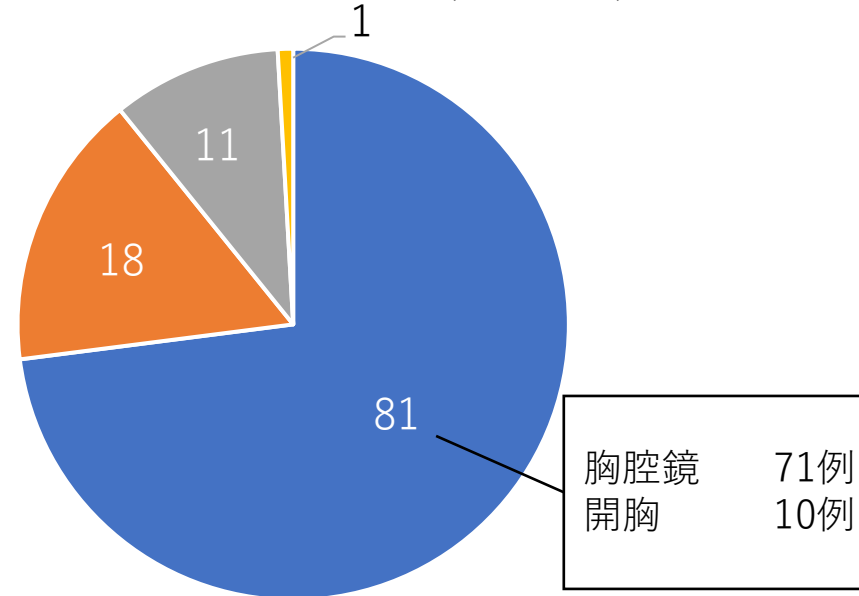
# 【肺切除のための手術アプローチ】

➤ 胸腔内へのアプローチには、胸部を構成する組織（皮膚・筋肉・肋骨）の切開・切離を伴う。

- 切開による痛み、筋損傷による胸の動きの制限→呼吸機能低下

➤ 切開する組織を少なくするため、内視鏡（胸腔鏡）手術が選択されることが多くなった。

当院における肺癌手術の内訳（2021年度）



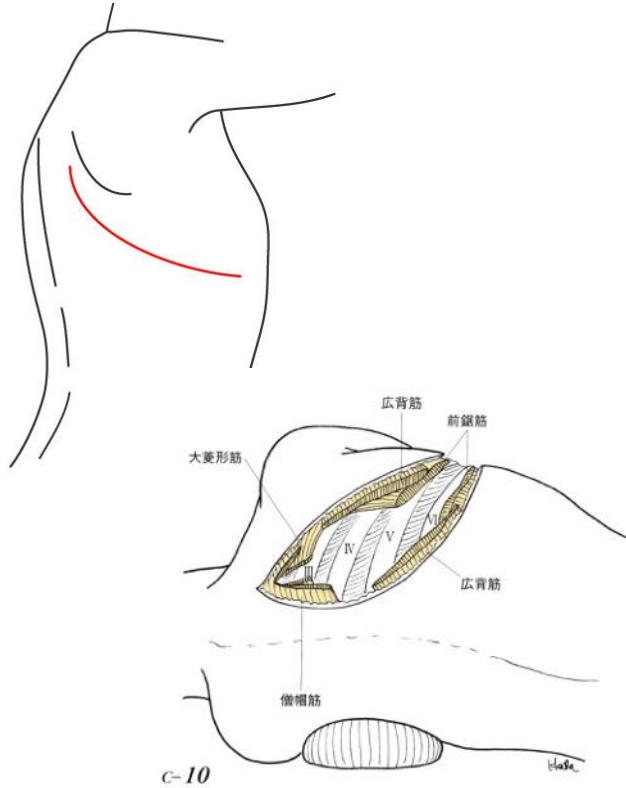
2021年度 呼吸器外科手術

肺癌手術 : 111例  
（うち胸腔鏡 : 101例 (91.0%)）

■ 葉切除 ■ 区域切除 ■ 部分切除 ■ 葉切除 + 区域切除

# 【低侵襲性を求めた胸腔鏡手術】

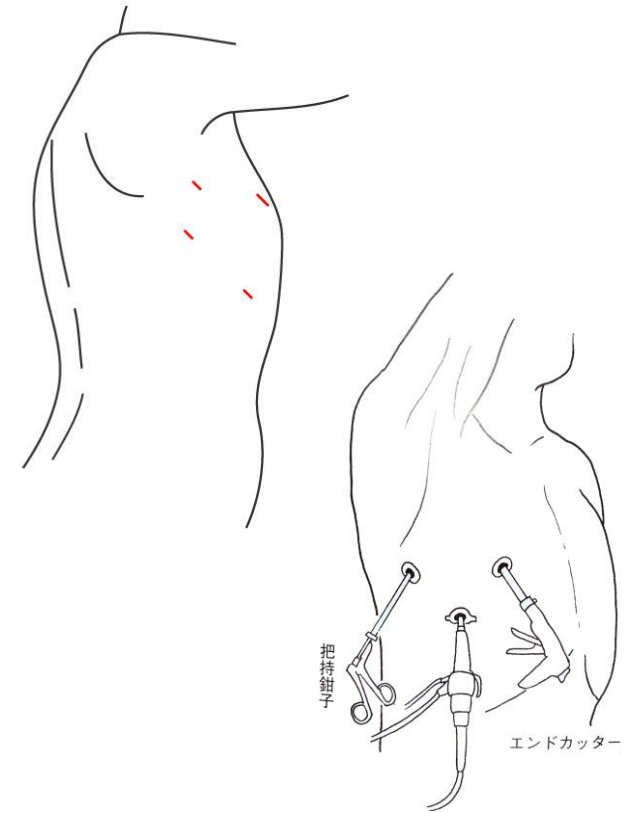
## 《開胸の手術創》



### ➤後側方開胸

- 胸腔内の広い視野を得られる、標準的開胸法
- 筋肉（広背筋、僧帽筋等）・肋骨切断が必要

## 《胸腔鏡の手術創》



### ➤胸腔鏡

- 創が小さく、胸壁の損傷も少ない
- 胸腔内の視野・操作性は制限される

## 【術後QOLを考慮した手術アプローチ】

- 胸腔鏡手術のメリットは、創が小さいことにより痛みが少ないこと、整容性（美容上）にも優れていることなどがあります。
- デメリットとしては、小さな器具しか胸の中に入らないため手術操作が制限されてしまうこと、モニター越しに胸の中を見ながら手術を行うため出血したとき等に対応が遅れてしまう可能性があることなどです。
- それぞれの患者さんの病気の状態を十分に評価し、メリットとデメリットを頭に入れたうえで、最適な手術アプローチを提案していきます。

ご清聴、ありがとうございました。

