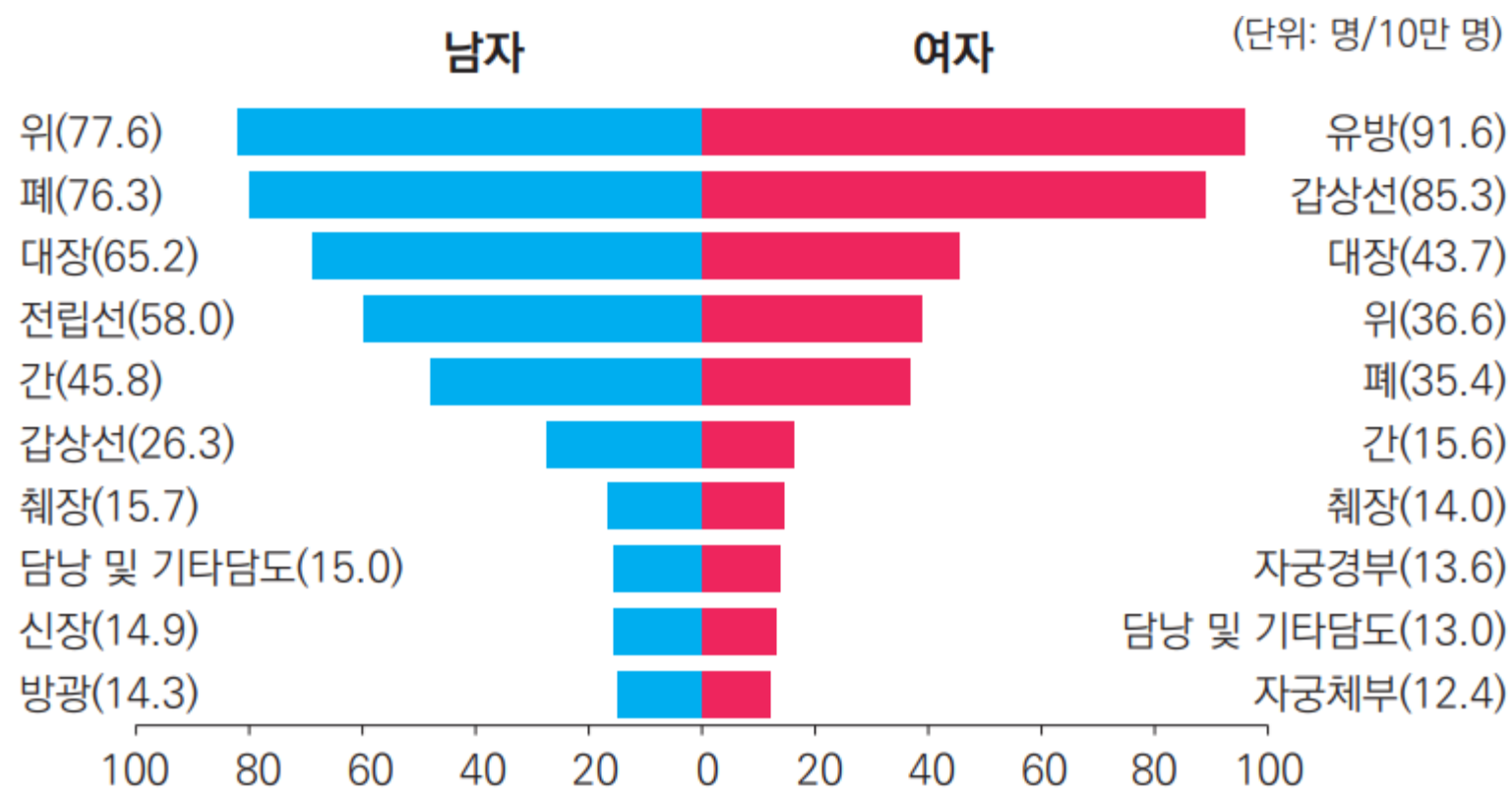
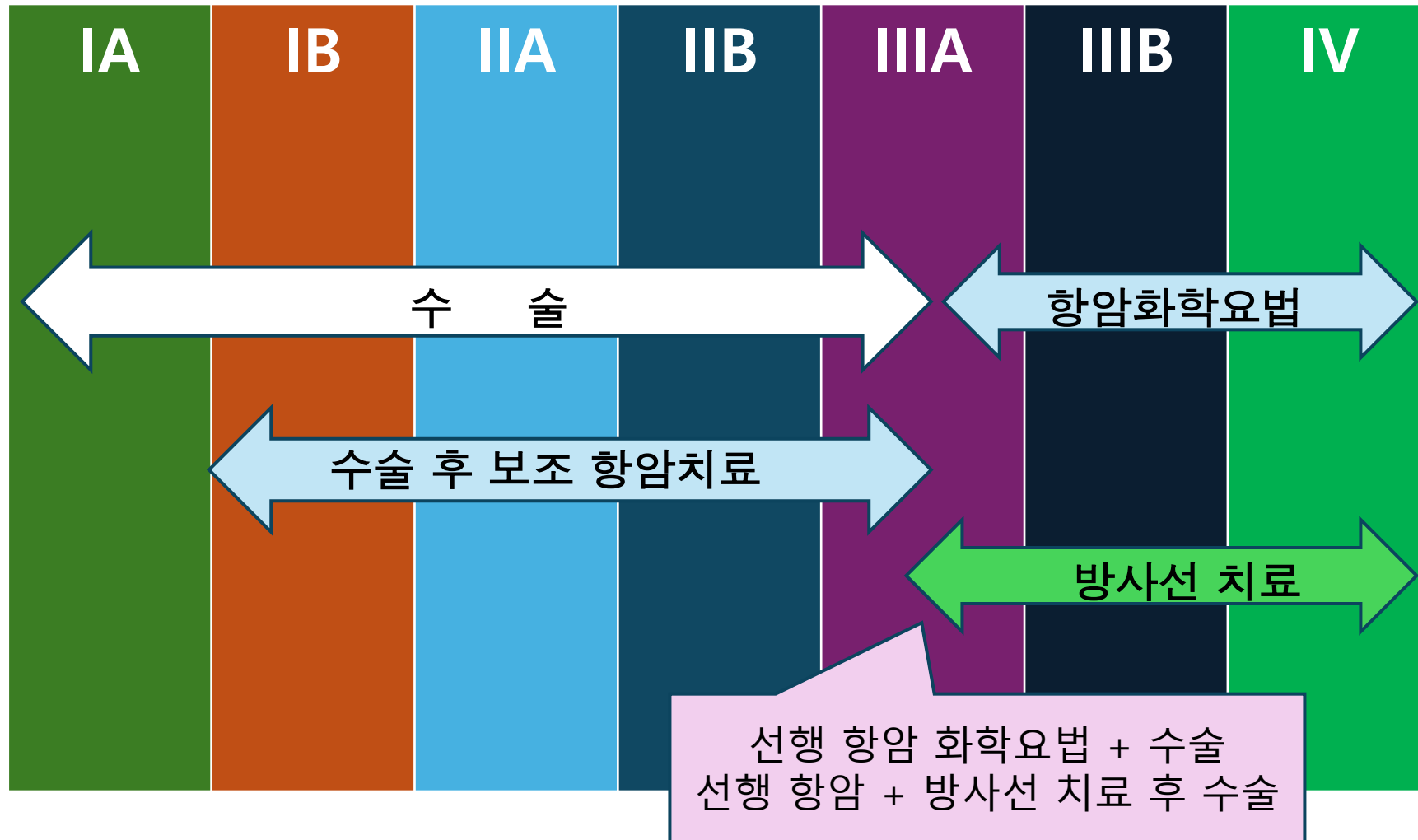




성별 10대암 조발생률
(국가암정보센터, 2018년)

병기에 따른 폐암의 치료



병기에 따른 폐암의 치료

표 5 NSCL-2. 1A 병기의 치료



병기에 따른 폐암의 치료

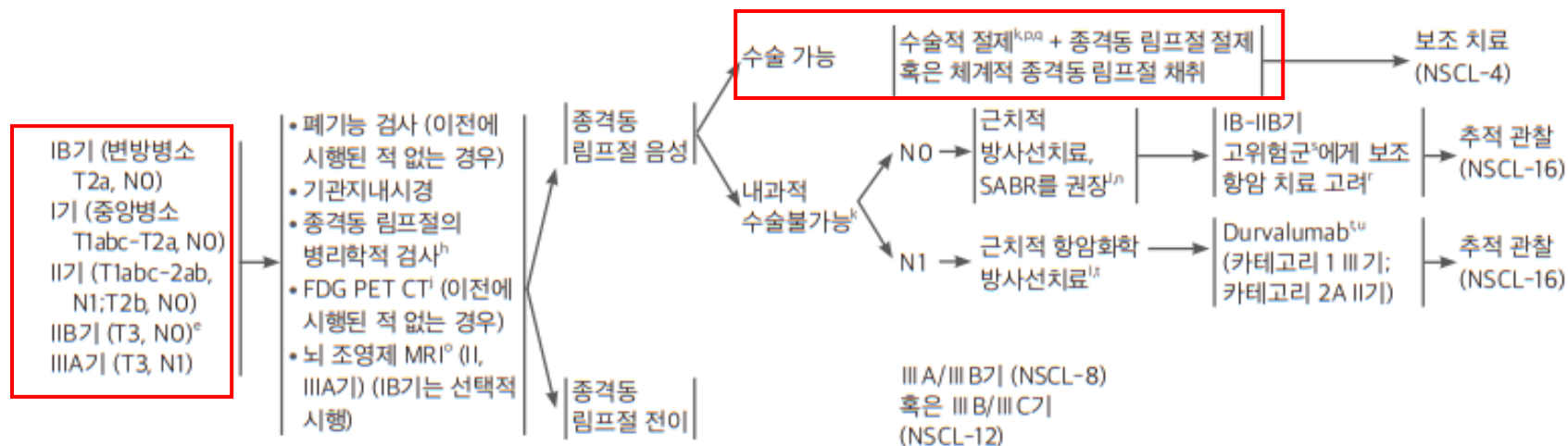
표 6

NSCL-3. 1B-2B 병기의 치료

임상적 평가

치료전 검사^a

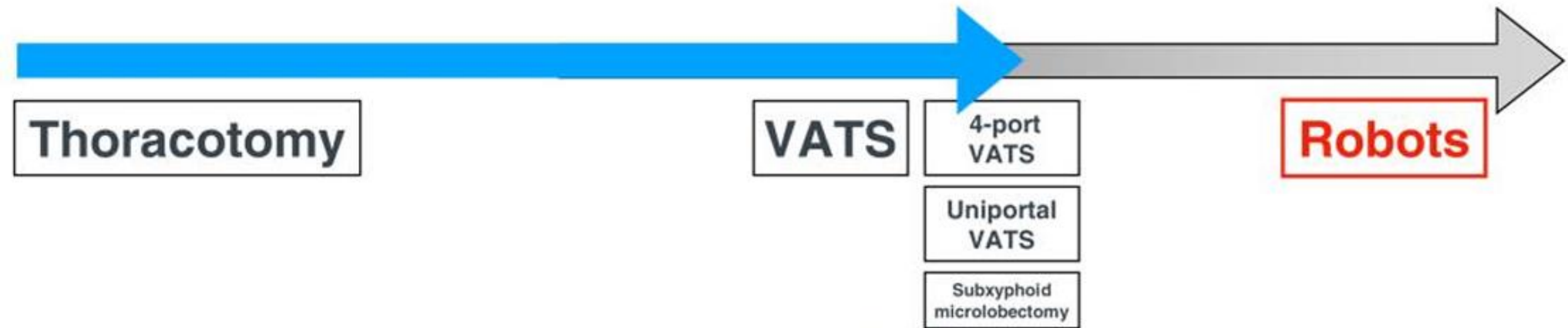
초 치료



General thoracic surgery: Lung

- Preoperative evaluation of Lung cancer
- Lobectomy and lymph node dissection
- Localization techniques and sublobar resection
- Complication of lung surgery
- Congenital, benign, inflammatory lung disease

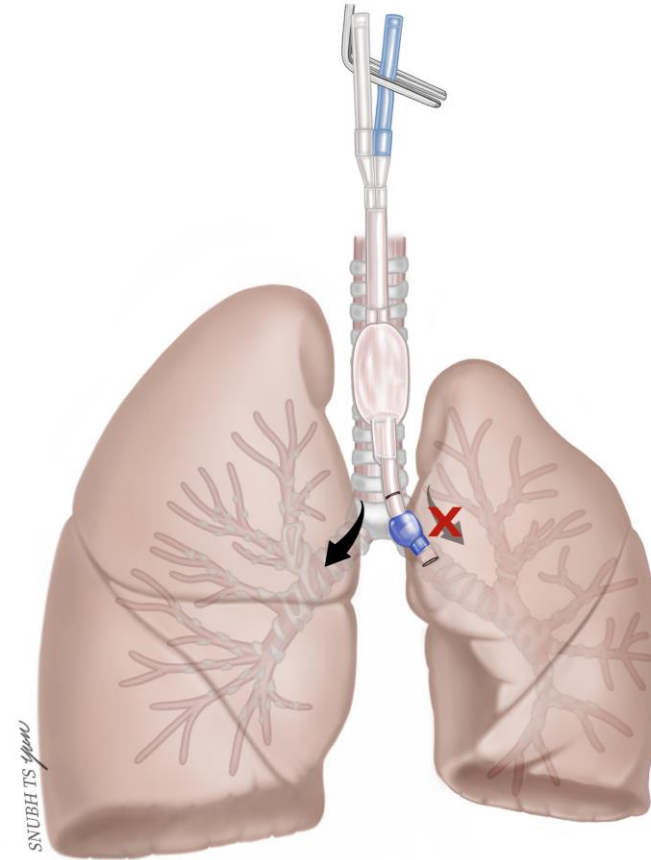
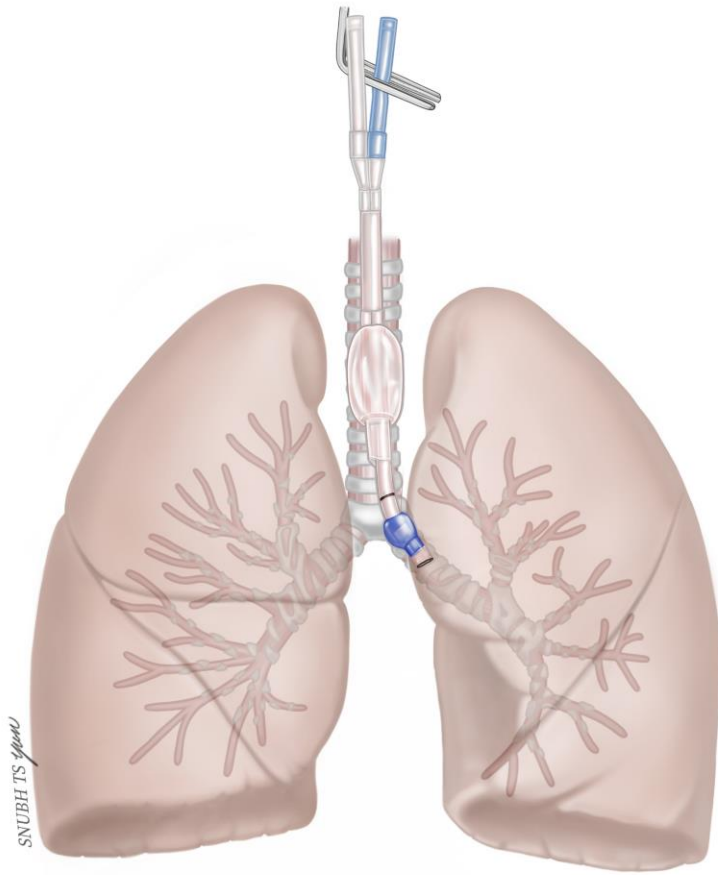
Surgical approach for Lobectomy



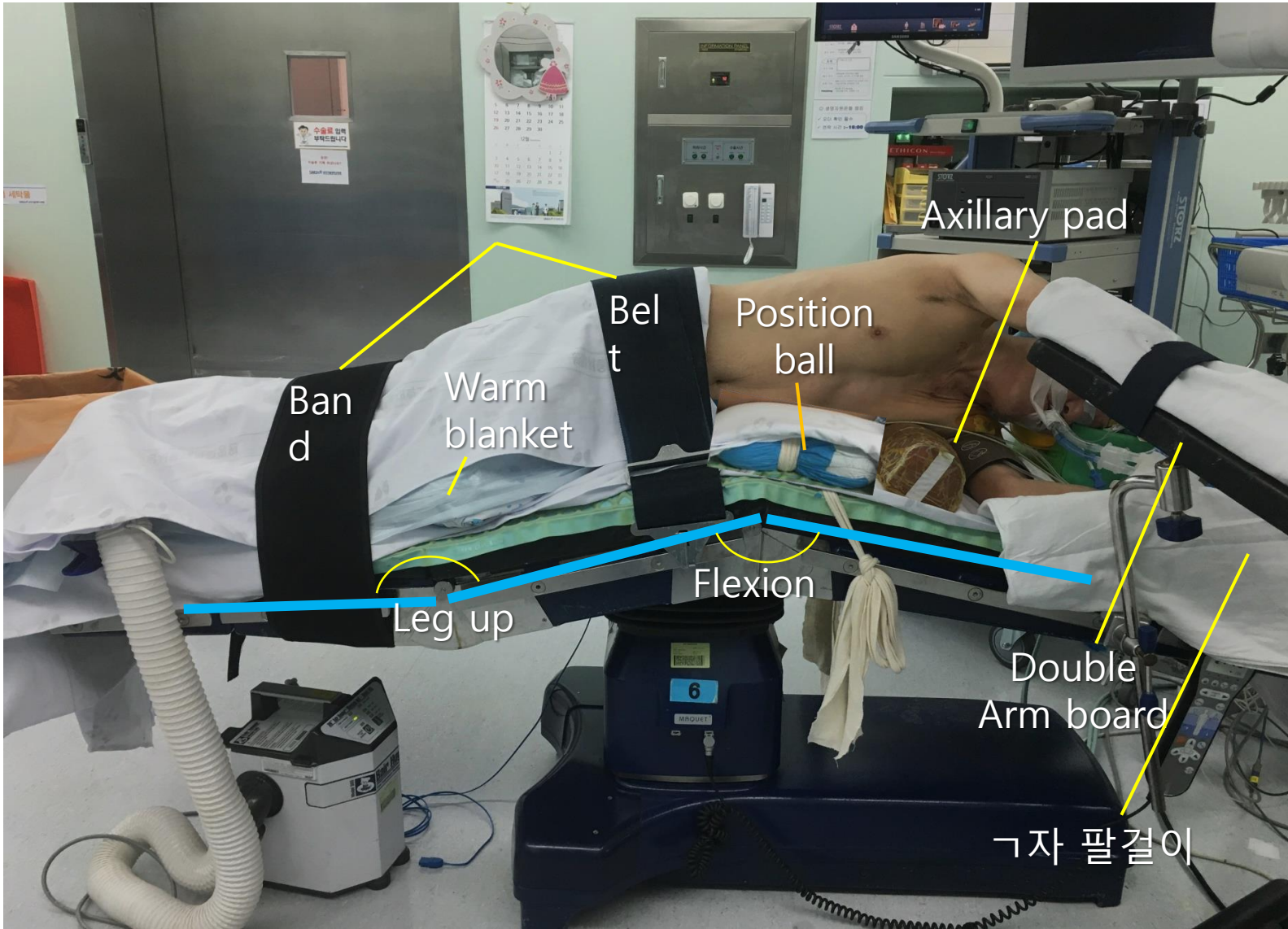
Induction



Induction: One lung ventilation



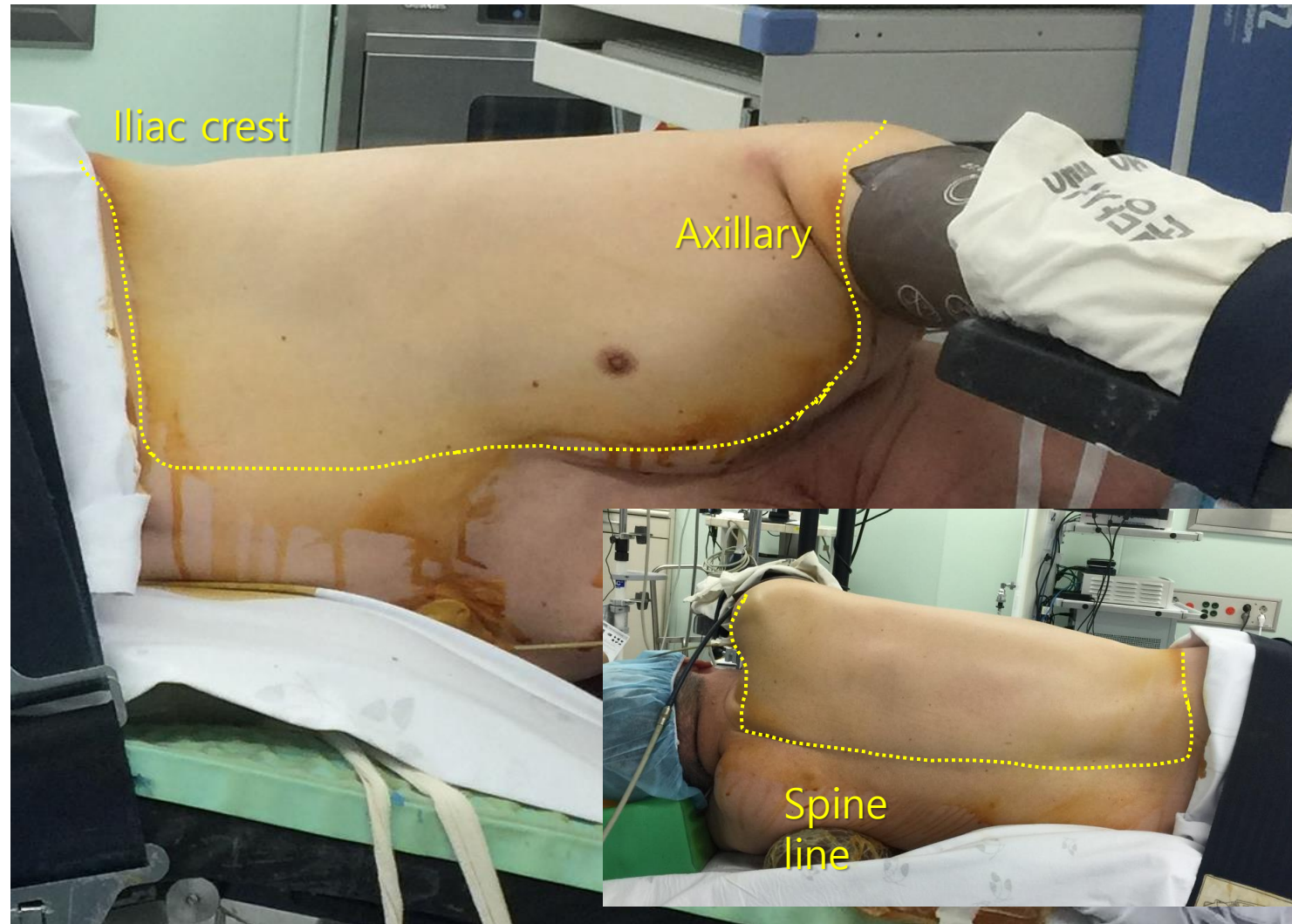
Surgical Positioning



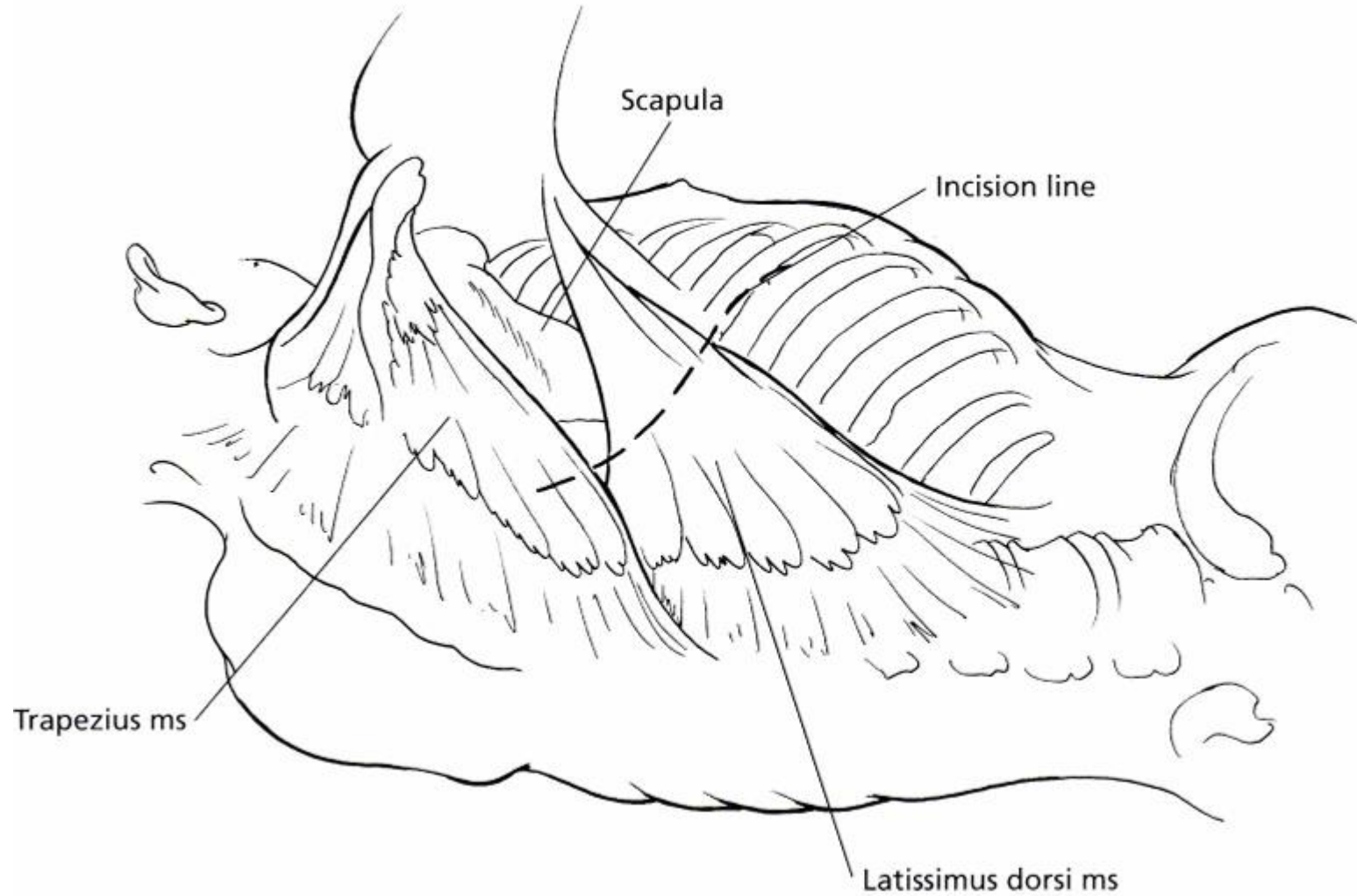
Surgical Positioning



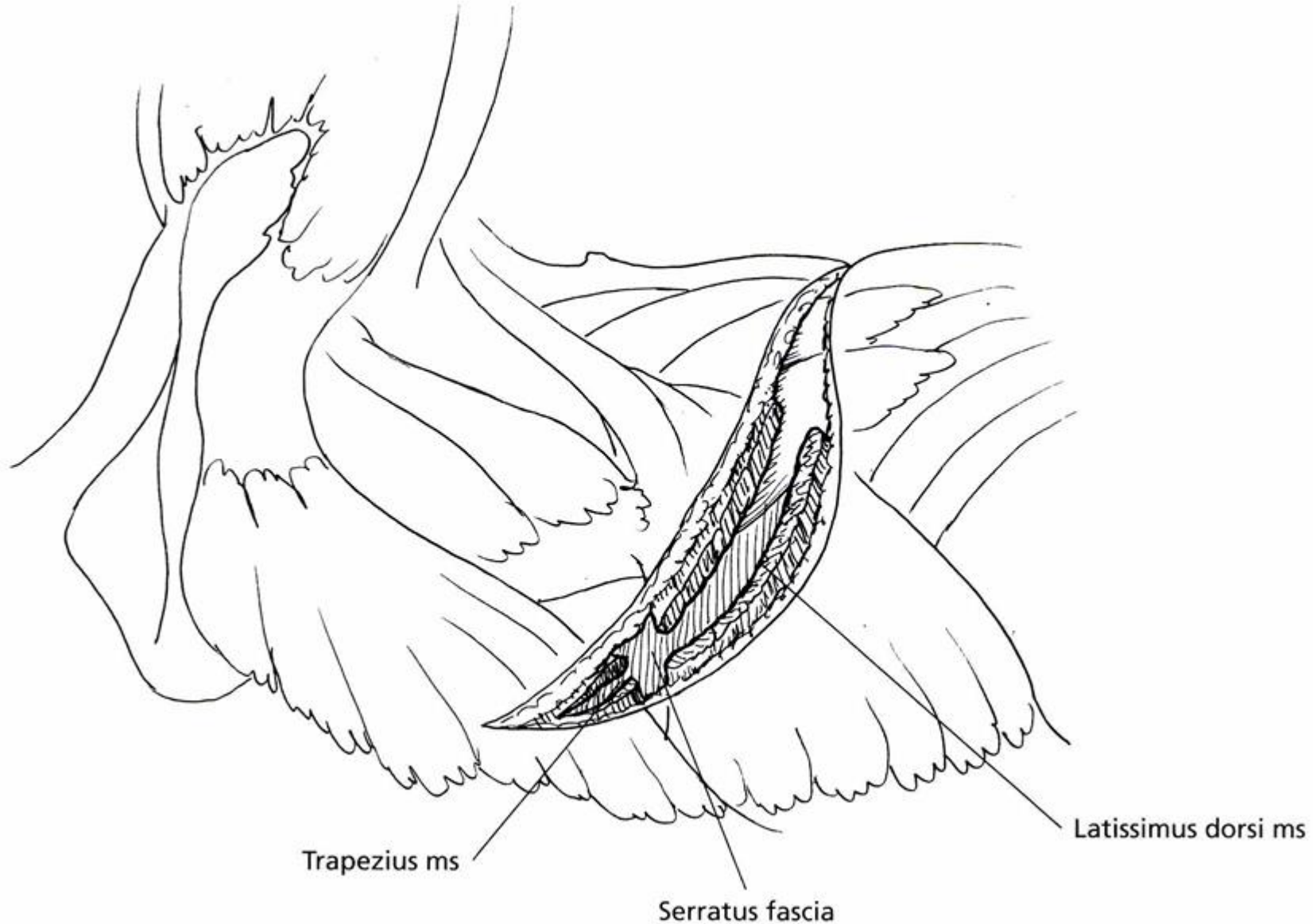
Surgical Positioning



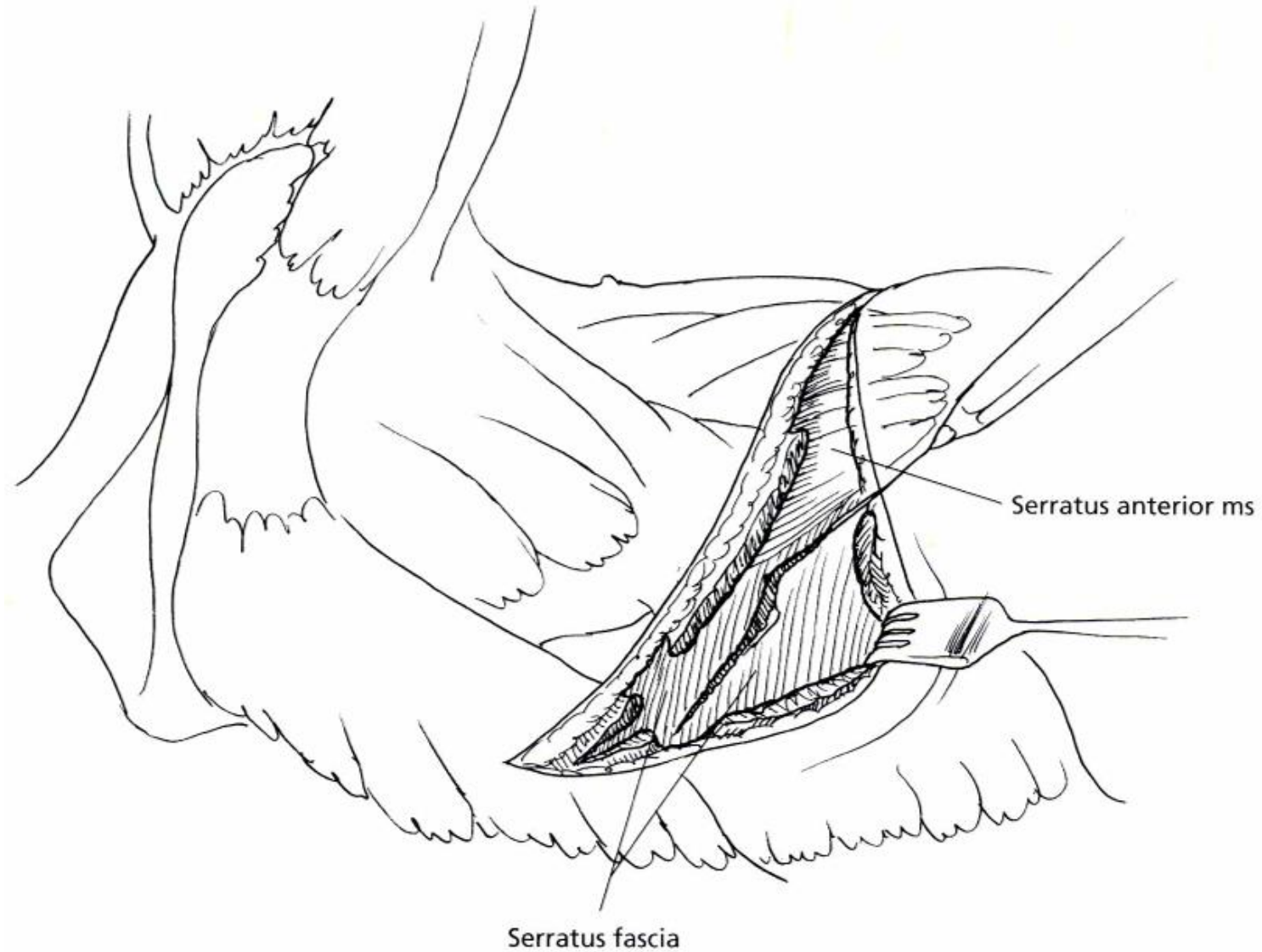
Approach: Thoracotomy



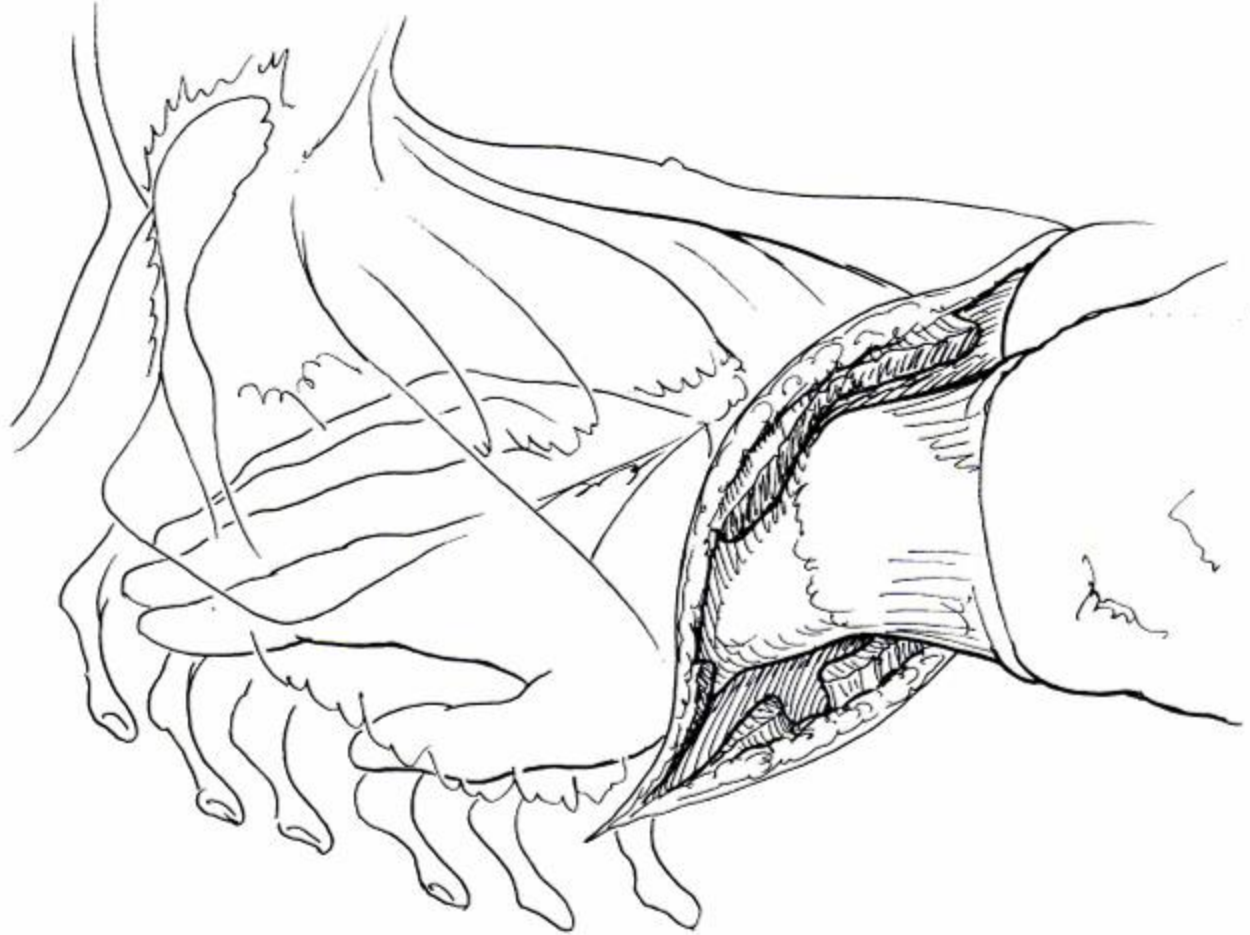
Approach: Thoracotomy



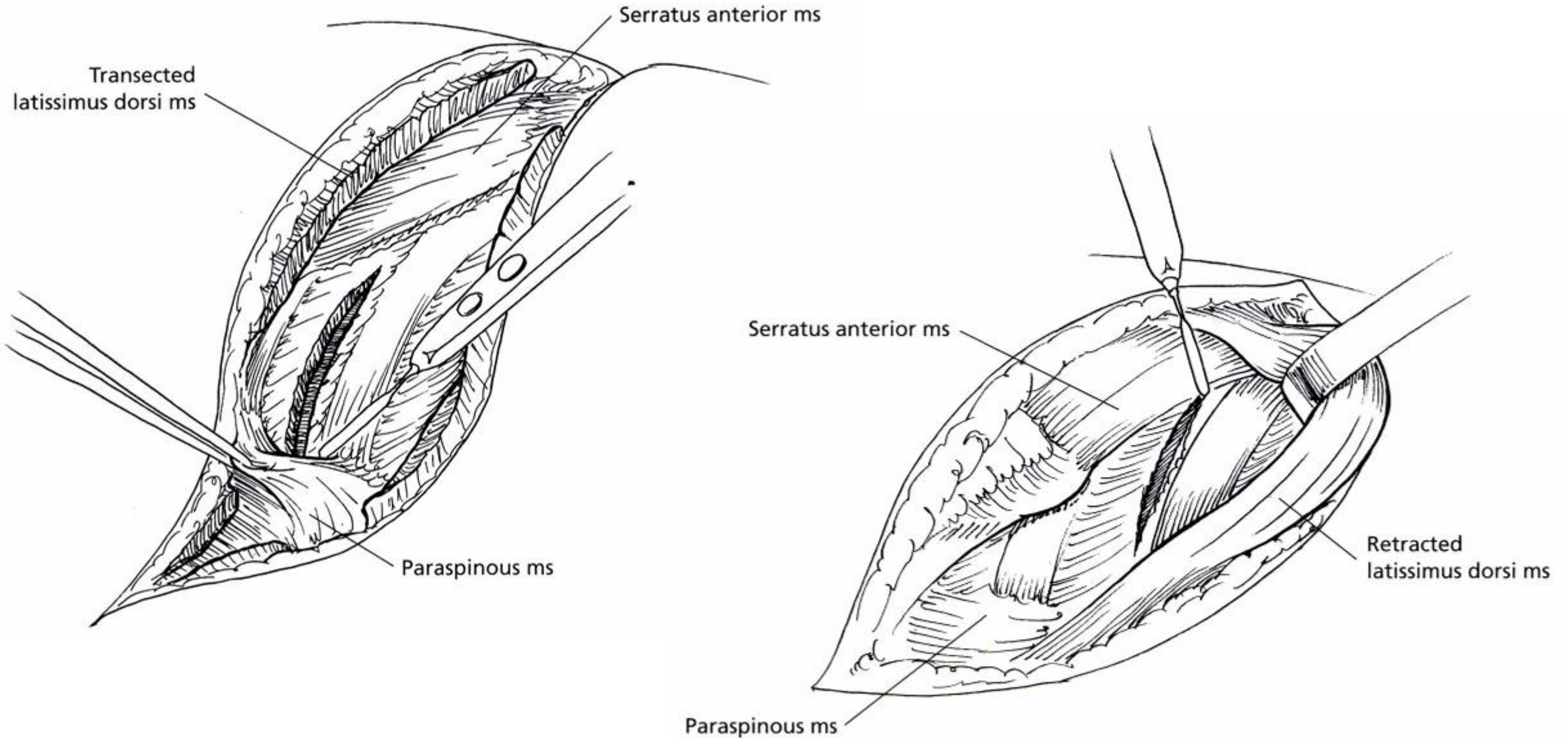
Approach: Thoracotomy



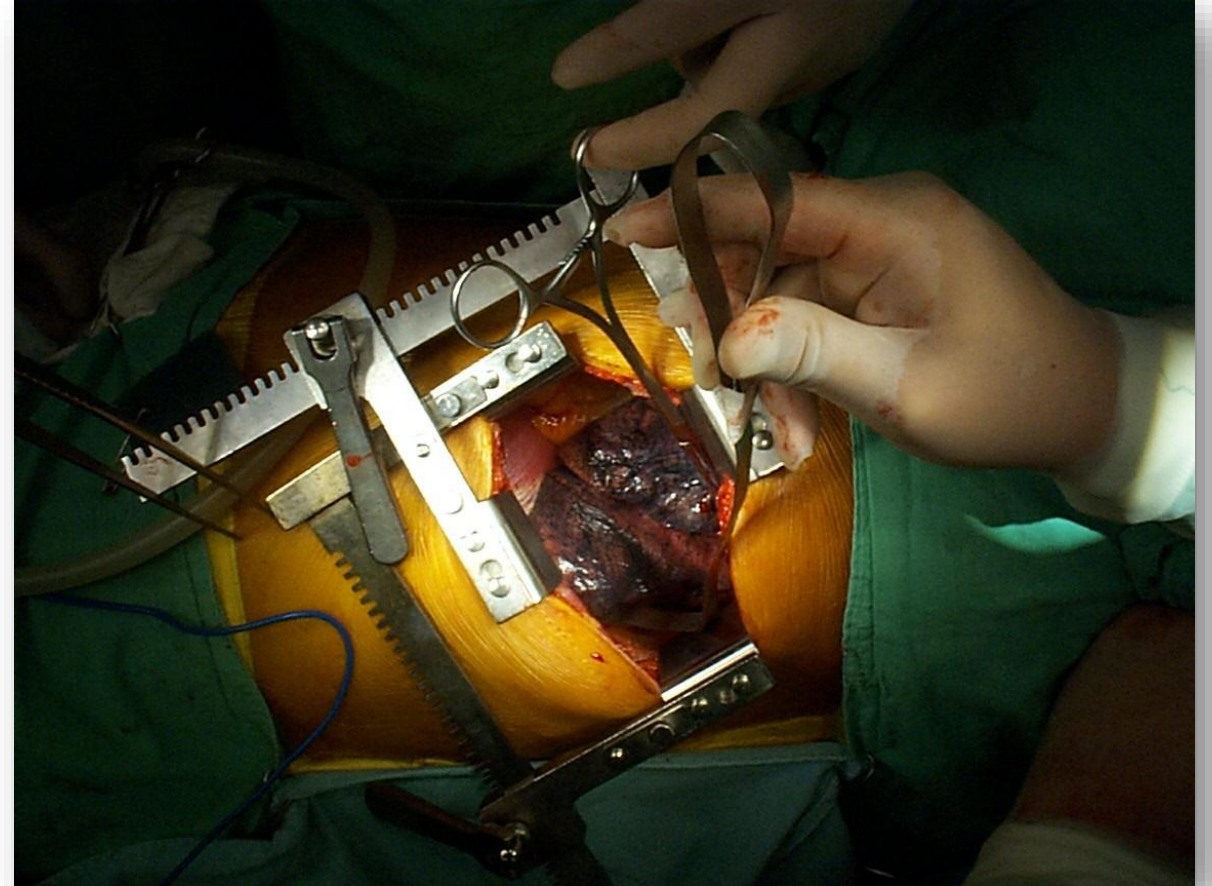
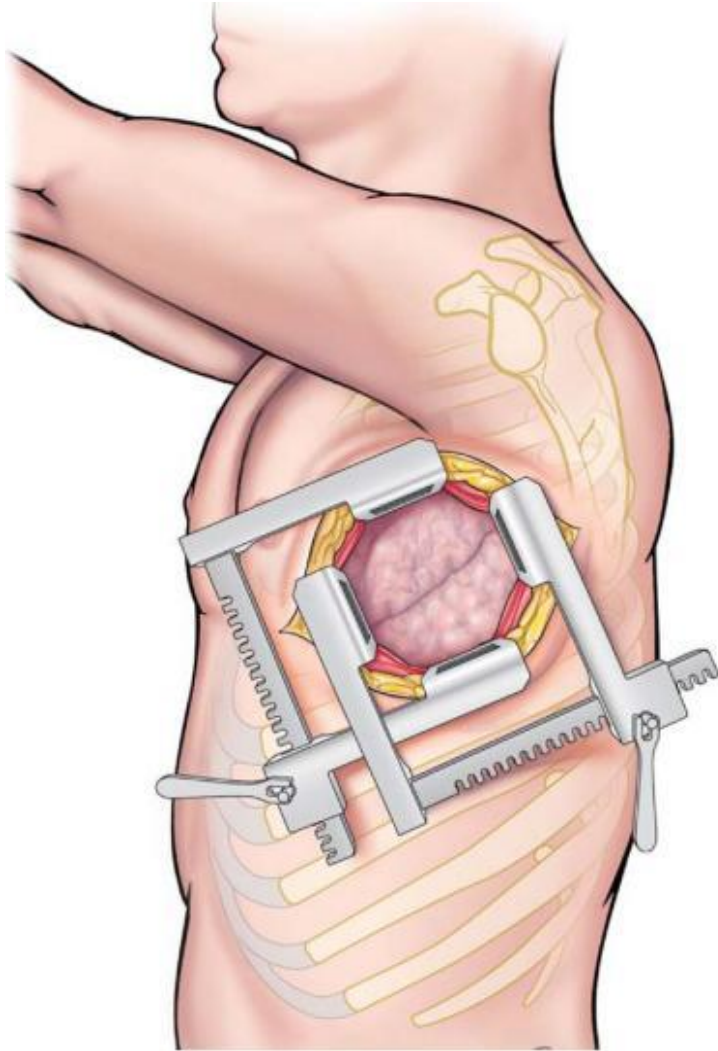
Approach: Thoracotomy



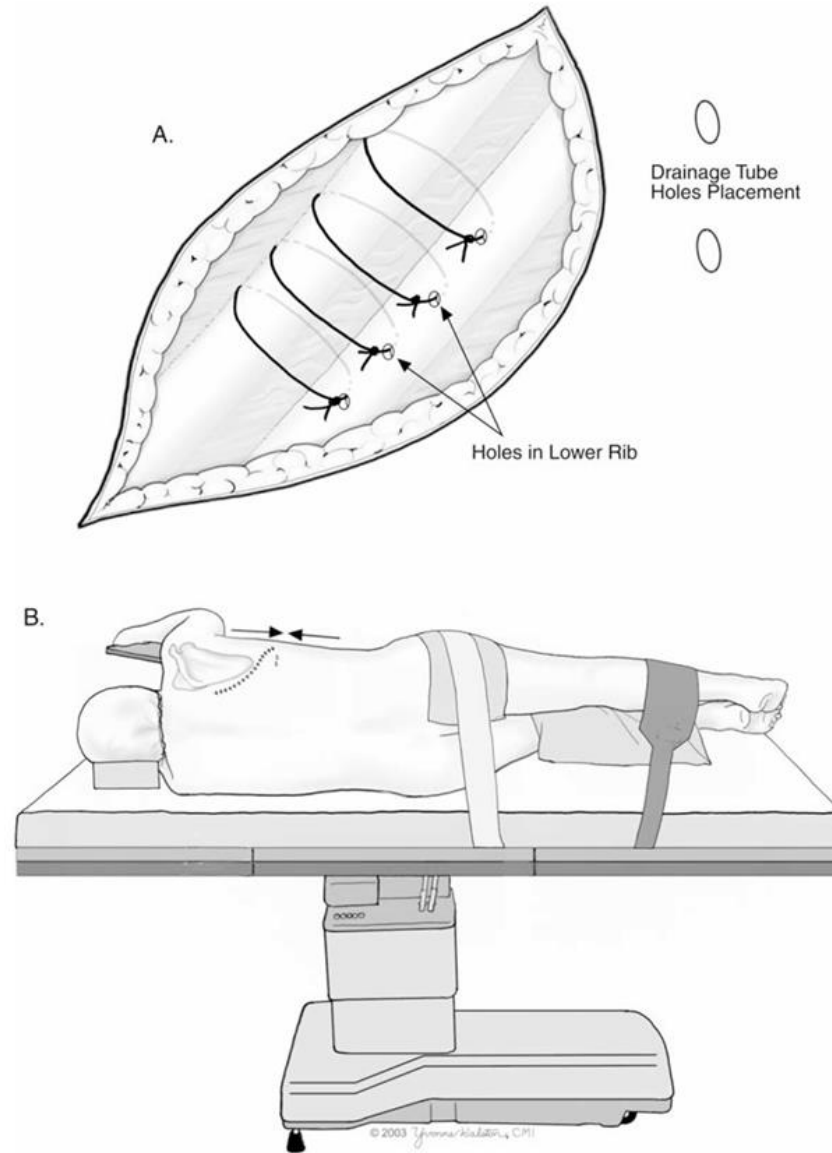
Approach: Thoracotomy



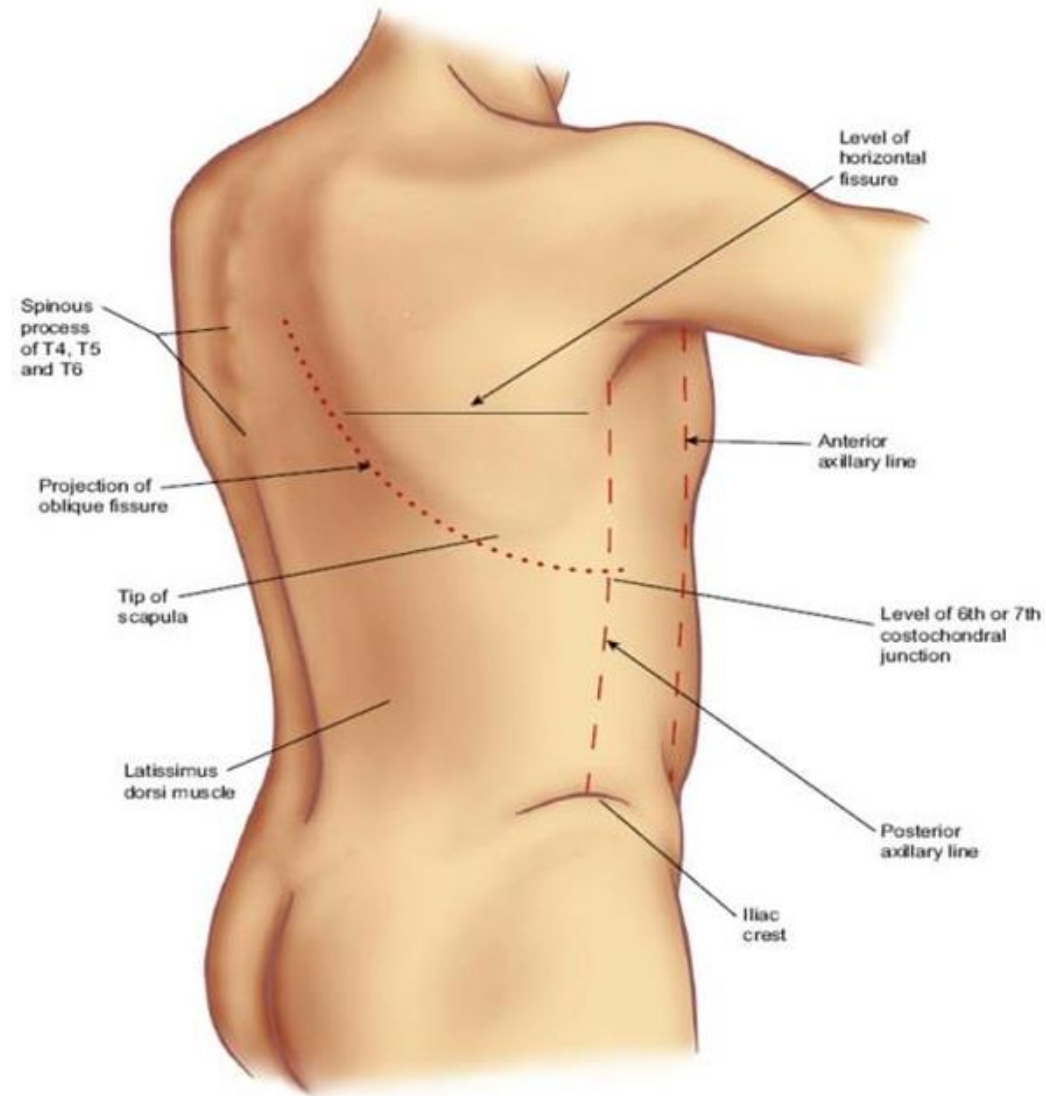
Approach: Thoracotomy



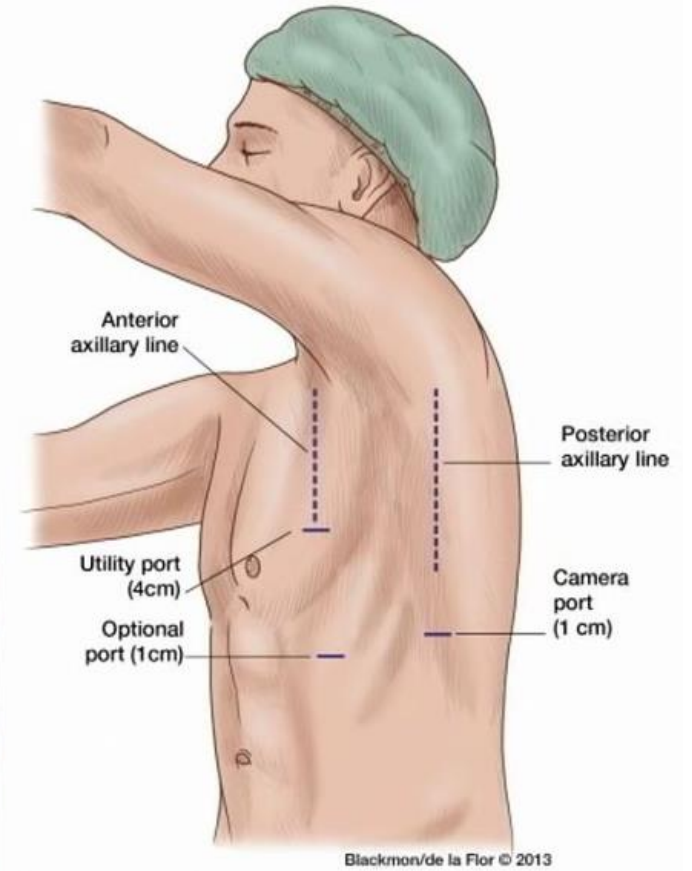
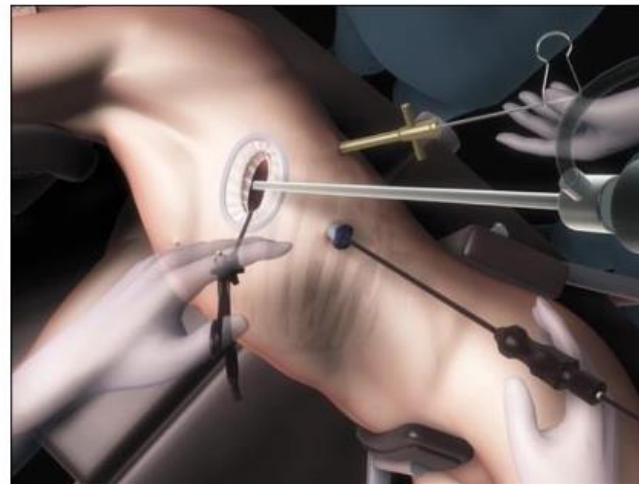
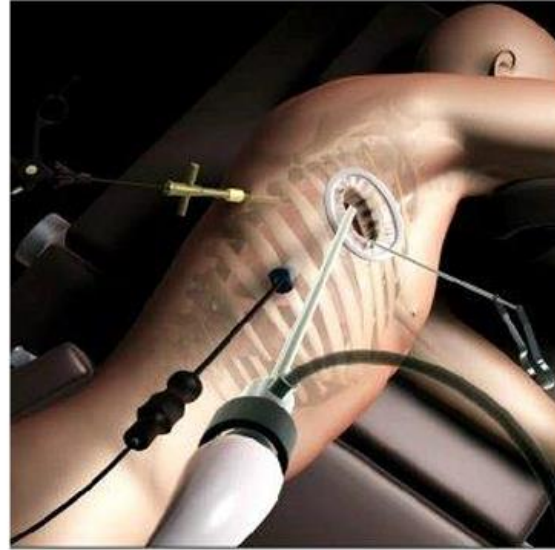
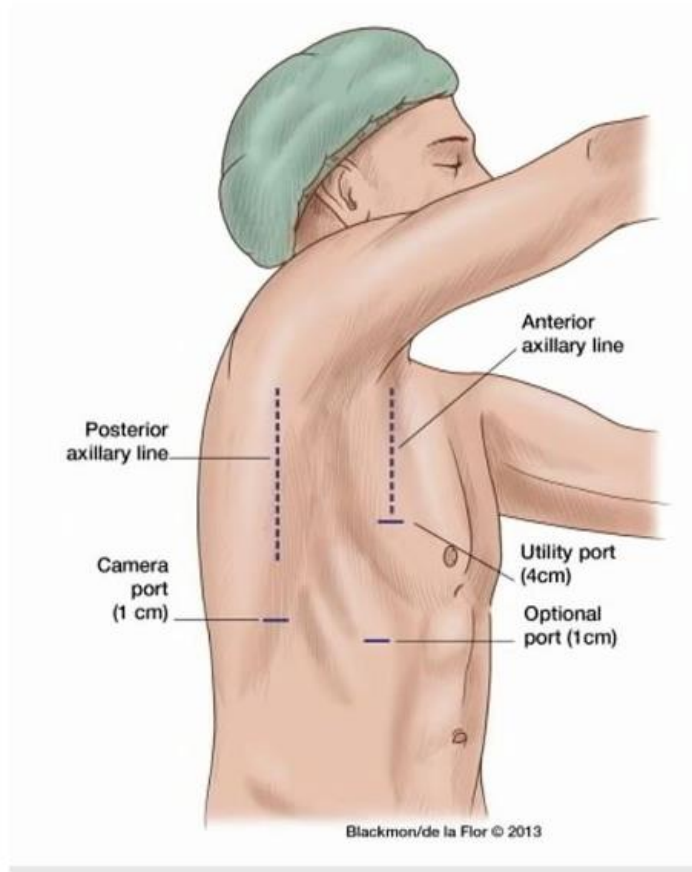
Approach: Thoracotomy



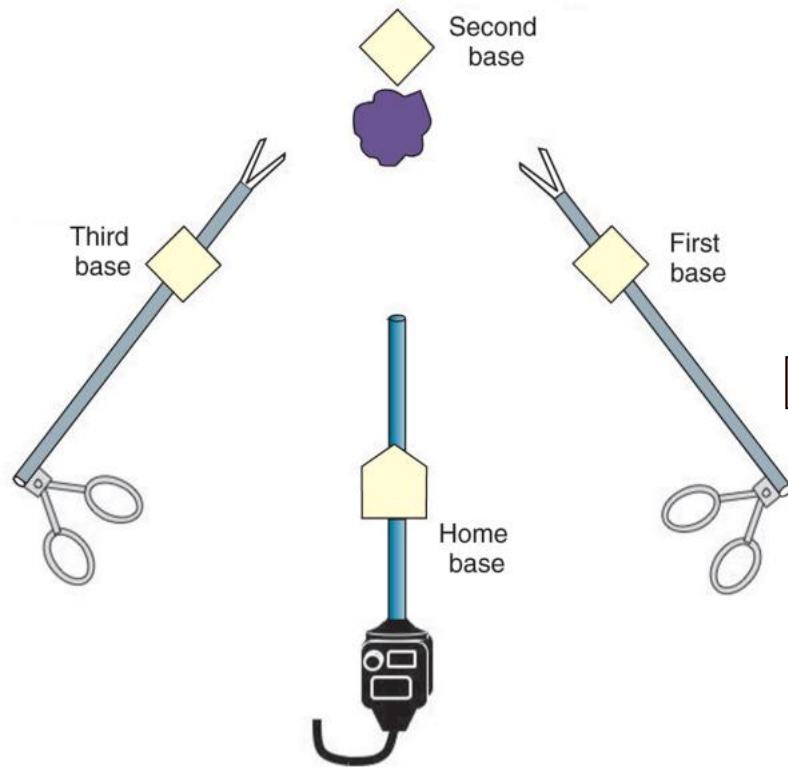
Approach: VATS



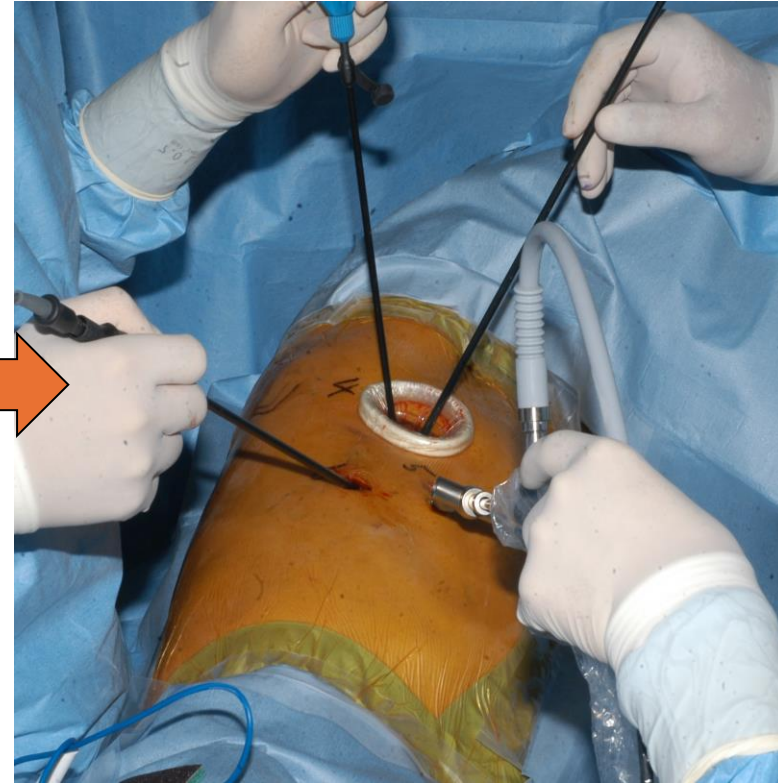
Approach: VATS



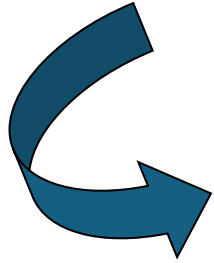
Approach: VATS



baseball-diamond strategy



**No hand cross-over,
No competing!**



VATS: Instruments

endo hook



VATS: Instruments



VATS: Instruments



VATS: Instruments



VATS: Instruments



VATS: Instruments



Operation

- One lung ventilation
- Adhesion
- Identification of mass
- Effusion
- Pleural seeding
- Fissure development

Main procedure

Oncological principles

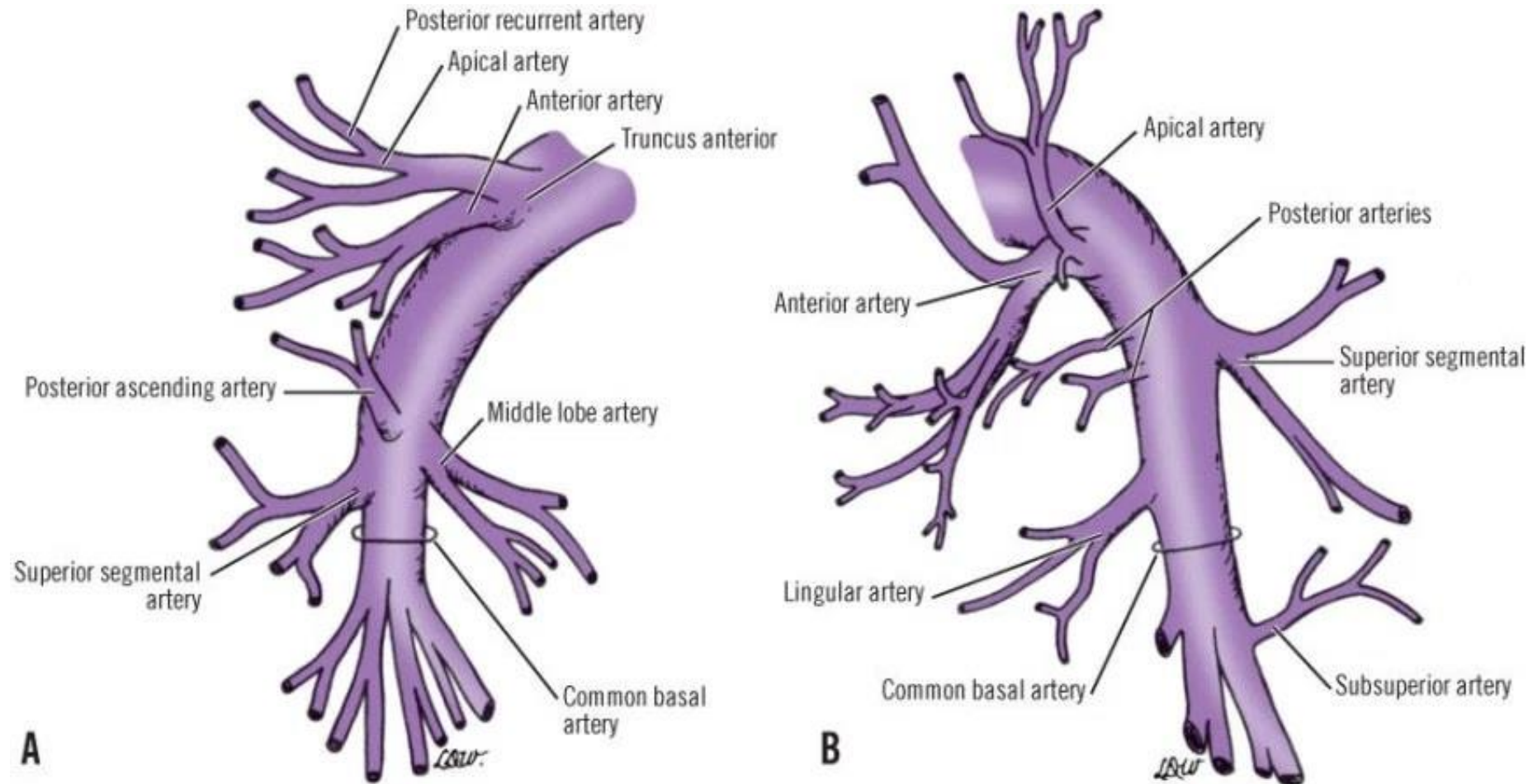
- (1) The vessels and bronchus of the target lobe should be individually divided
- (2) Systematic lymph node dissection is mandatory
- (3) Touching the lymph node itself and rupturing the capsule of the lymph node should be minimized

Main procedure

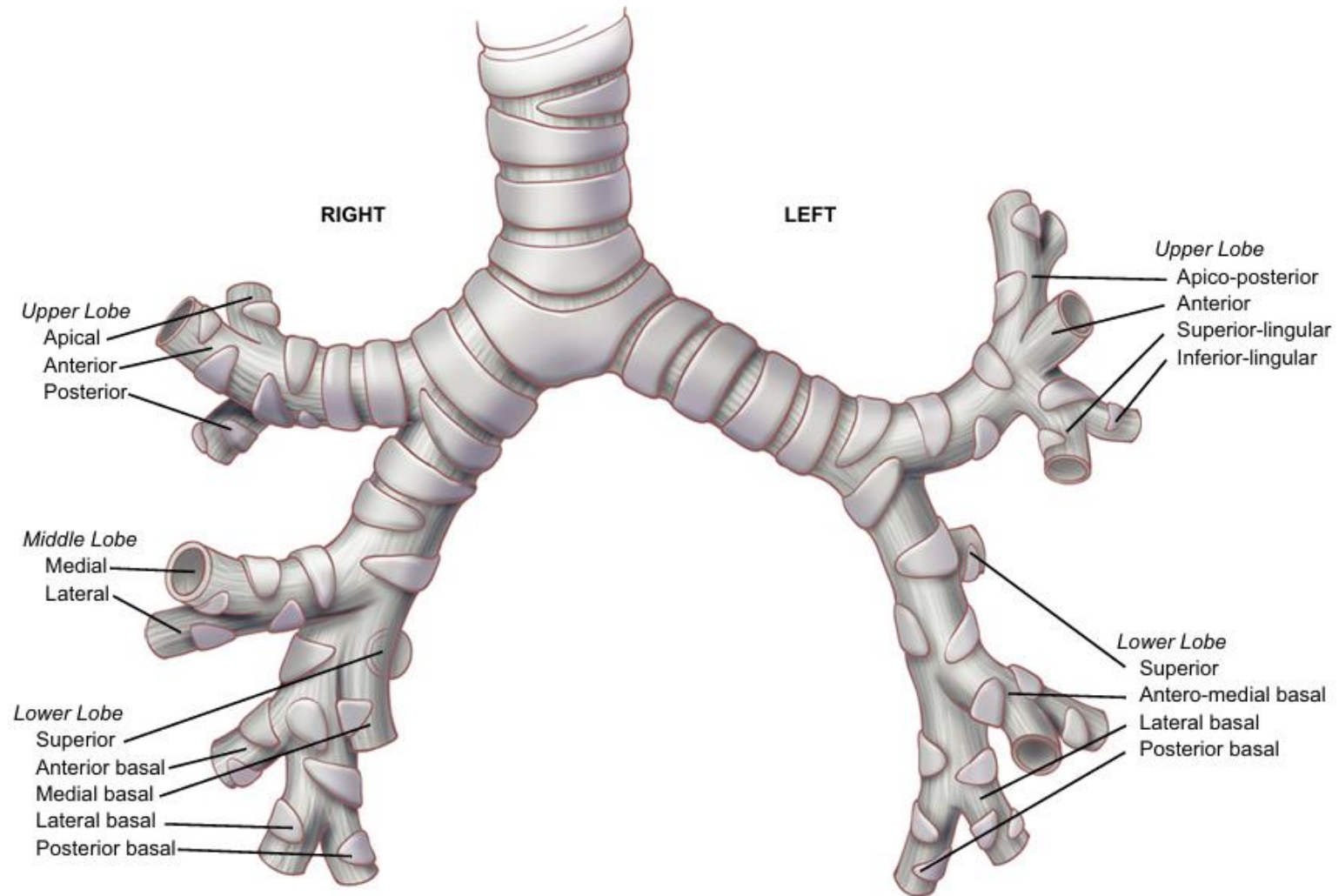
Sequence

- (1) Dissection along the hilar structure
- (2) Fissure division
- (3) Perivascular and peribronchial dissection
- (4) Individual division of the vessels and bronchus
- (5) Specimen retrieval
- (6) Mediastinal lymph node dissection

Main procedure: Lobectomy



Main procedure: Lobectomy



Main procedure: Lobectomy

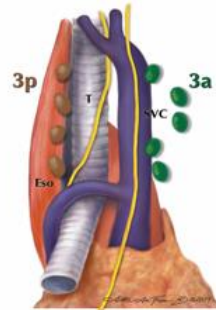
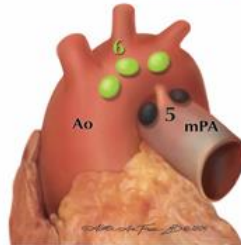
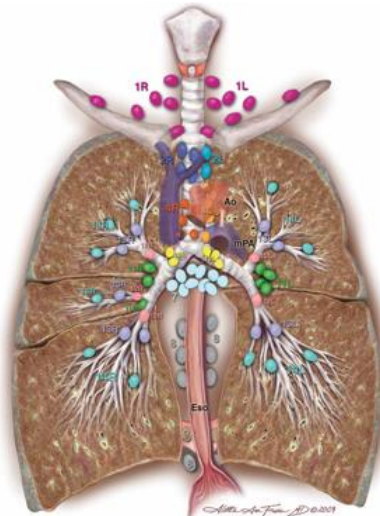
Video clip

Main procedure: Lymph node dissection

Significance of lymph node dissection: **Accurate staging**

- CT in assessing mediastinal nodal involvement
: sensitivity 52-79%, specificity 69-78%
- PET-CT in assessing mediastinal nodal involvement
: sensitivity 79-85%, specificity 90-91%
- "Unexpected N2" - 60% of cN1 adenocarcinoma
- Small sized lung cancer (<2cm): Hilar and mediastinal nodal involvement
: more than 20%
- Skip metastasis: 20-38% in N2 patients

Main procedure: Lymph node dissection



Supraclavicular zone

- 1 Low cervical, supraclavicular, and sternal notch nodes

SUPERIOR MEDIASTINAL NODES

Upper zone

- 2R Upper Paratracheal (right)
- 2L Upper Paratracheal (left)
- 3a Prevascular
- 3p Retrotracheal
- 4R Lower Paratracheal (right)
- 4L Lower Paratracheal (left)

AORTIC NODES

AP zone

- 5 Subaortic
- 6 Para-aortic (ascending aorta or phrenic)

INFERIOR MEDIASTINAL NODES

Subcarinal zone

- 7 Subcarinal

Lower zone

- 8 Paraesophageal (below carina)
- 9 Pulmonary ligament

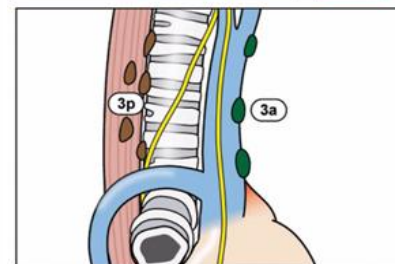
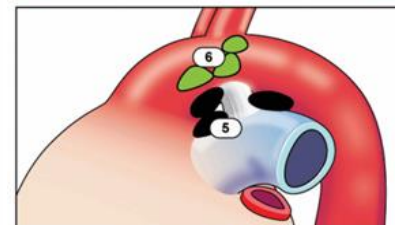
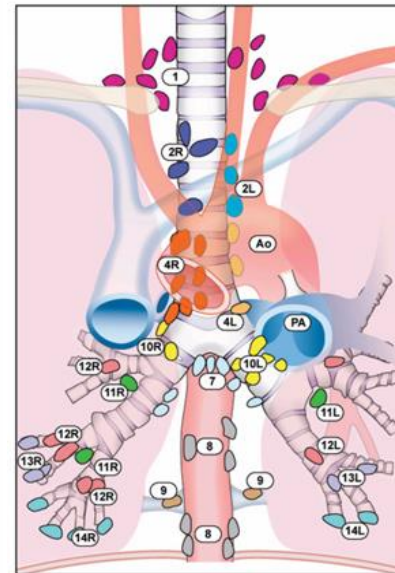
N1 NODES

Hilar/Interlobar zone

- 10 Hilar
- 11 Interlobar

Peripheral zone

- 12 Lobar
- 13 Segmental
- 14 Subsegmental



Supraclavicular zone

- 1 Low cervical, supraclavicular, and sternal notch nodes

SUPERIOR MEDIASTINAL NODES

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- 2L Upper Paratracheal (left)
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N1 NODES

Hilar/Interlobar zone

- 10 Hilar
- 11 Interlobar

Peripheral zone

- 12 Lobar
- 13 Segmental
- 14 Subsegmental

Nodal station	Description	Definition
#1 (Left/Right)	Low cervical, supraclavicular and sternal notch nodes	<u>Upper border</u> : Lower margin of cricoid cartilage <u>Lower border</u> : Clavicles bilaterally and, in the midline, the upper border of the manubrium #L1 and #R1 limited by the midline of the trachea.
#2 (Left/Right)	Upper paratracheal nodes	2R: <u>Upper border</u> : Apex of lung and pleural space and, in the midline, the upper border of the manubrium <u>Lower border</u> : Intersection of caudal margin of innominate vein with the trachea 2L: <u>Upper border</u> : Apex of the lung and pleural space and, in the midline, the upper border of the manubrium <u>Lower border</u> : Superior border of the aortic arch As for #4, in #2 the oncologic midline is along the left lateral border of the trachea.
#3	Pre-vascular and retrotracheal nodes	3a: Prevascular On the right <u>Upper border</u> : Apex of chest <u>Lower border</u> : Level of carina <u>Anterior border</u> : Posterior aspect of sternum <u>Posterior border</u> : Anterior border of superior vena cava On the left <u>Upper border</u> : Apex of chest <u>Lower border</u> : Level of carina <u>Anterior border</u> : Posterior aspect of sternum <u>Posterior border</u> : Left carotid artery 3p: Retrotracheal <u>Upper border</u> : Apex of chest <u>Lower border</u> : Carina

Nodal station	Description	Definition
#4 (Left/Right)	Lower paratracheal nodes	4R: Includes right paratracheal nodes, and pretracheal nodes extending to the left lateral border of trachea <u>Upper border</u> : Intersection of caudal margin of innominate vein with the trachea <u>Lower border</u> : Lower border of azygos vein 4L: Includes nodes to the left of the left lateral border of the trachea, medial to the ligamentum arteriosum <u>Upper border</u> : Upper margin of the aortic arch <u>Lower border</u> : Upper rim of the left main pulmonary artery
#5	Subaortic (aorto-pulmonary window)	Subaortic lymph nodes lateral to the ligamentum arteriosum <u>Upper border</u> : The lower border of the aortic arch <u>Lower border</u> : Upper rim of the left main pulmonary artery
#6	Para-aortic nodes (ascending aorta or phrenic)	Lymph nodes anterior and lateral to the ascending aorta and aortic arch <u>Upper border</u> : A line tangential to the upper border of the aortic arch <u>Lower border</u> : The lower border of the aortic arch
#7	Subcarinal nodes	<u>Upper border</u> : The carina of the trachea <u>Lower border</u> : The upper border of the lower lobe bronchus on the left; the lower border of the bronchus intermedius on the right
#8 (Left/Right)	Para-esophageal nodes (below carina)	Nodes lying adjacent to the wall of the esophagus and to the right or left of the midline, excluding subcarinal nodes <u>Upper border</u> : The upper border of the lower lobe bronchus on the left; the lower border of the bronchus intermedius on the right <u>Lower border</u> : The diaphragm
#9 (Left/Right)	Pulmonary ligament nodes	Nodes lying within the pulmonary ligament <u>Upper border</u> : The inferior pulmonary vein <u>Lower border</u> : The diaphragm
#10 (Left/Right)	Hilar nodes	Includes nodes immediately adjacent to the main-stem bronchus and hilar vessels including the proximal portions of the pulmonary veins and main pulmonary artery <u>Upper border</u> : The lower rim of the azygos vein on the right; upper rim of the pulmonary artery on the left <u>Lower border</u> : Interlobar region bilaterally

Nodal station	Description	Definition
#11	Interlobar nodes	Between the origin of the lobar bronchi *#11s: Between the upper lobe bronchus and bronchus intermedius on the right *#11i: Between the middle and lower lobe bronchi on the right *optional sub-categories
#12	Lobar nodes	Adjacent to the lobar bronchi
#13	Segmental nodes	Adjacent to the segmental bronchi
#14	Sub-segmental nodes	Adjacent to the subsegmental bronchi

Main procedure: Lymph node dissection

Video clip

Main procedure: Lymph node dissection

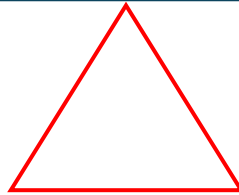
LN dissection related complications

- Nerve damage: Recurrent laryngeal nerve paralysis after dissection of nodal station 2R, 4L, 5
- Atrial fibrillation: Postoperative local inflammation around the vagal nerve
- Chylothorax: After dissection of nodal station 7
- Bleeding
- Pleural effusion
- Prolonged hospital stay

Oncologic Surgery

Extended resection
Chest wall resection
Vascular reconstruction
Mediastinal LN dissection

Conservative resection
Lung saving resection
No mediastinal LN dissection



More

Complications
Functional loss
Mortality

Less

Thank you for your attention

