

Thoracoscopic esophagectomy

- Patient's position:
- ✓ Left lateral decubitus vs. prone
- Obtaining the surgical field:
- ✓ CO₂ pneumothorax or through mini-thoracotomy
 - ✓ Double or single-lumen endotracheal tube w/wo bronchial blocker
- Surgical endoscopic system:
- ✓ Rigid or flexible videoscope
 - ✓ 2D or 3D
 - ✓ Increasing resolution (display)

Prone position (PP) vs. left decubitus position (LDP)

- Potential advantages of PP
 1. Shortened learning curve
 2. Excellent surgical space
 3. Experienced assistant not necessary needed
 4. Ergonomic position of surgical hands
 5. Theoretical improved oxygenation

Advantages of 3D-flexible videoscope

- ✓ Enhance the feeling of depth and distance on the monitor
- ✓ Emphasize the three-dimensional recognition of target organ
- ✓ Reducing the interference with surgeon's forceps
- ✓ Providing better surgical view

Aim

To evaluate the clinical usefulness of 3D-flexible thoracoscopy for prone-position thoracoscopic esophagectomy.

Patients

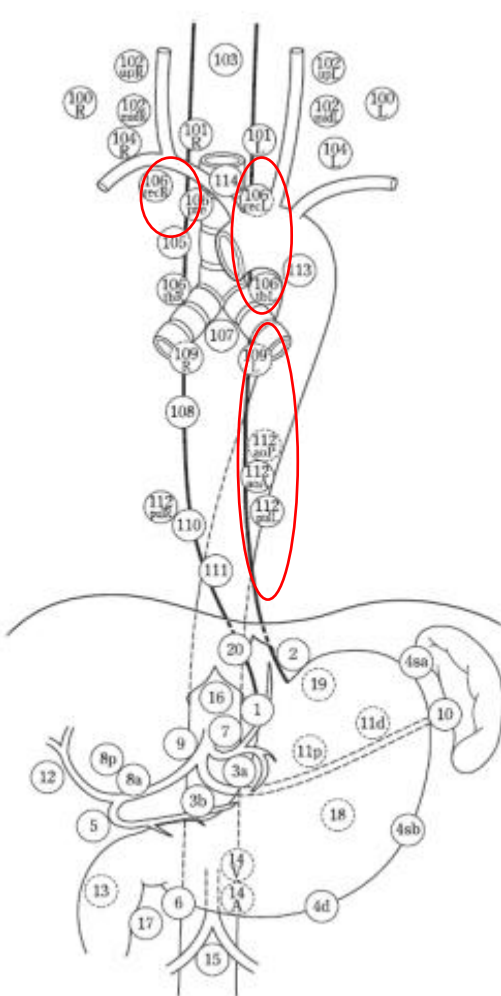
- Between 2009 and 2017
- 338 patients
- Esophageal and EGJ cancer
- Treated by prone-position thoracoscopic esophagectomy with 3F LN dissection

2D group (2009-2014): n = 184
3D group (2015-2017): n = 154

Methods

2D group vs. 3D group

- Compare the clinicopathological findings
 - Compare the surgical outcome
- ✓ Mediastinal LN zones
→ Upper, middle, and lower mediastinal LN zones
 - ✓ LN station: Japanese Classification 11th edition
 - ✓ Tumor staging: TNM 7th edition



Results

Surgical outcome

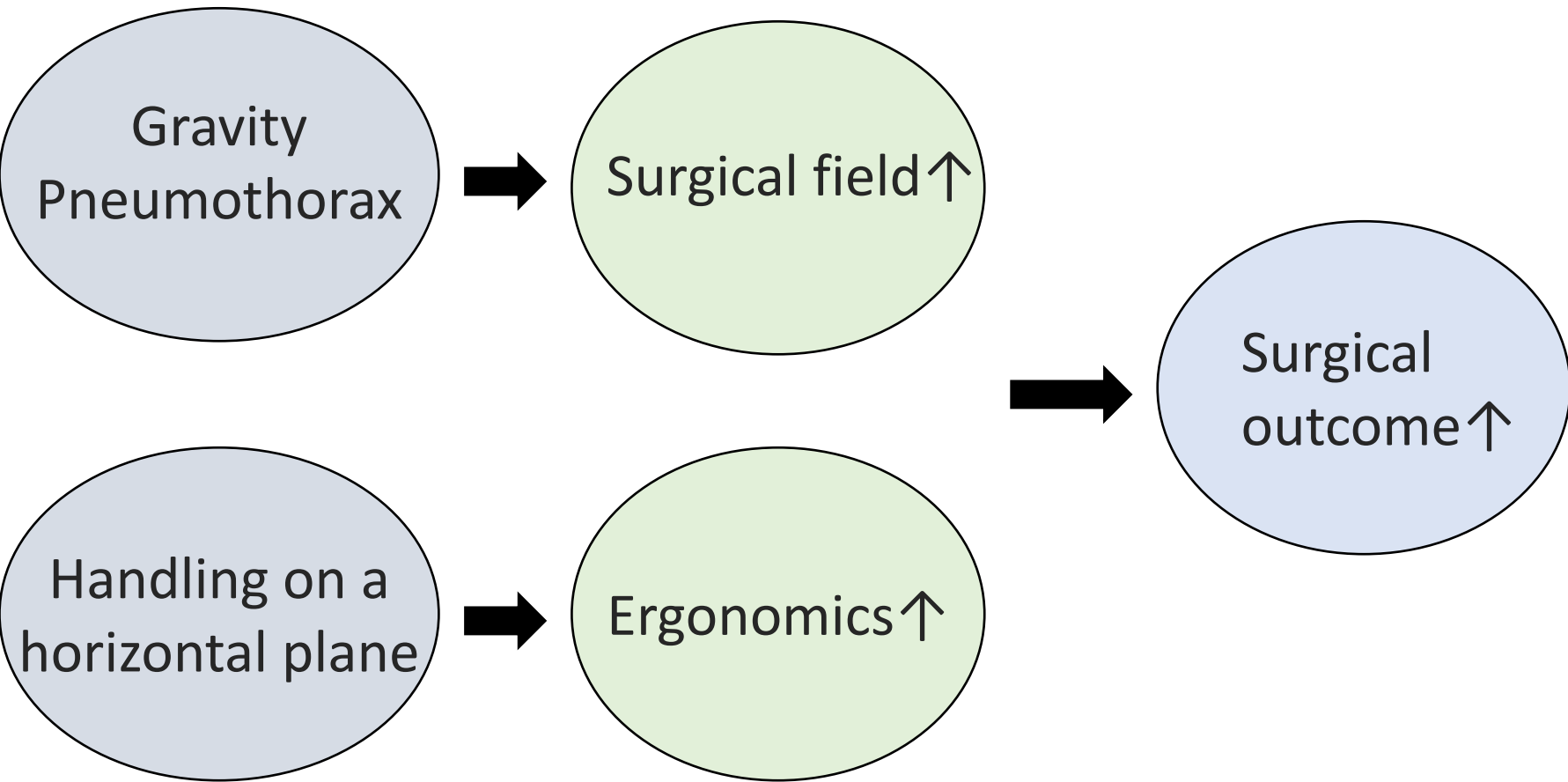
Surgical factors	2D (n = 184) (%)	3D (n = 154) (%)	P
Ope time (chest, min, median)	220 (120-390)	206 (106-370)	0.028
Blood loss (chest, mL, median)	20 (1-97)	14 (2-98)	<0.001
Postope. complications			
RLNP	53 (28.8)	36 (23.4)	0.27
Chylothorax	5 (2.7)	1 (0.6)	0.23
RM1/2	18 (9.8)	11 (7.1)	0.44
No. of LN dissected (chest)	21 (6-66)	28 (7-64)	<0.001
Hospital stay (day, median)	26 (14-177)	30 (2-284)	0.13

No. of dissected LN according to LN zones or stations

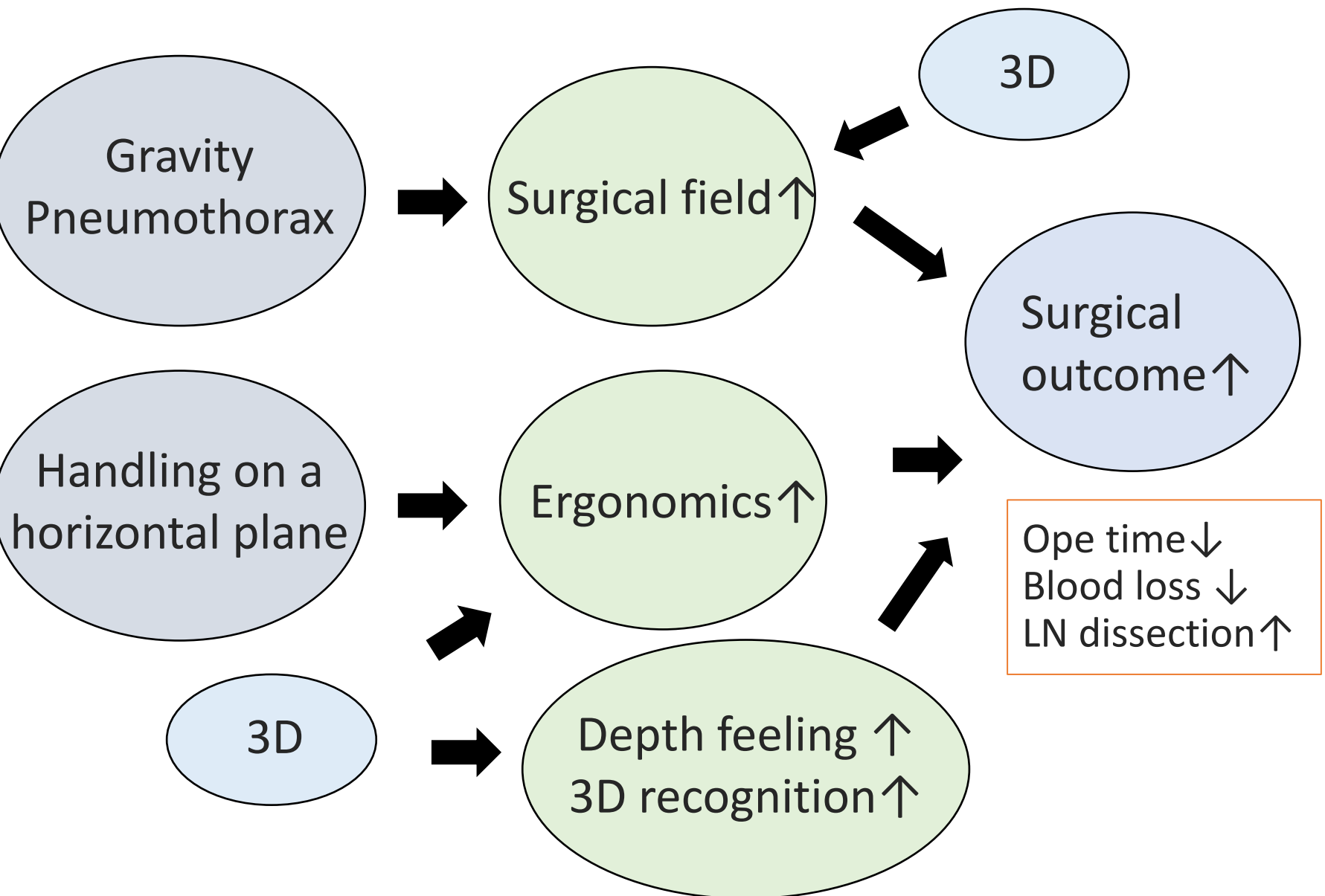
LN zone or station	2D (n = 184) (mean)	3D (n = 154) (mean)	P
Mediastinal LN zone			
Upper	9.3	13.2	<0.001
Middle	10.1	10.3	0.19
Lower	2.7	3.1	0.08
LN station			
No. 101	3.2	2.2	0.004
No. 109L	2.0	2.6	0.001
No. 112	1.1	1.7	<0.001

Discussion

Prone position



Prone position with 3D flexible videoscope



Conclusions

3D thoracoscopy further reduced the invasiveness of the prone-position thoracoscopic esophagectomy and makes thorough dissection of the mediastinal lymph nodes possible in esophageal cancer patients.