UNIPORTAL VATS COMPLEX ANATOMIC SEGMENTECTOMY

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Anatomy

1. Bronchial anatomy is consistent

2. Arterial anatomy sometimes follows the bronchus but not always!

3. Venous anatomy can drain multiple segments. Travels in intersegmental planes, not essential to define and isolate.
Uniportal VATS Segmentectomy

Indications

- Small tumors. <2cm
- GGO (ground glass opacity)
- COPD-Impaired lung function test
- Previous resections
- Central metastasis, Benign lesions
- Ager > 75
Reduced Lung-Cancer Mortality with Low-Dose Computed Tomographic Screening

The National Lung Screening Trial Research Team*

20% Decrease in Lung Cancer mortality with CT Screening
Preoperative marking

- Vital Dyes (methylene blue)
- Hook-wire
- Radiolabeled aggregates
- Electromagnetic navigation
  - Blue dye
  - Barium sulfate
- Coils
- Lipiodol injection
- Hybrid OR
New Techniques

Intraoperative Near-Infrared Imaging  Activatable cell-penetrating peptides

Anatomic variations by 3D-CT reconstruction image
Uniportal Technique

Previous double-port experience
Utility incision: 2-4 cm
4th or 5th intercostal space
No rib spreading, no trocar
Lung exposure

- Direct visualization target tissue
- One screen, 30 degree
- 5-10mm HD thoracoscope
- Camera: posterior part of incision
- Bimanual instrumentation, coordination
- Vascular clips, ligasure, curved tip staplers
Instruments

- Adapted VATS instruments (Scanlan, Shanghai pulmonary)
- Long Curved suction
- Long cautery, hook
- Harmonic, Ligasure, thunderbeat
- Vascular clips: Click a´V (Grena), hemolocks
- Staplers: Tri-staple, PVS, Cardica
- HD 30°camera (Olympus)
Challenging segmentectomies

- Variations of anatomy
- Non intubated
- Unisurgeon, no assistant
- Bilateral segmentectomies
- Situs inversus
- Combined segments
- Inflammatory disease
- Single segments lower lobes
Complex anatomic segmentectomy
S1+S2 (Tuberculosis)
Abnormal anatomy
Complex anatomic segmentectomy
S1+S2 (Tuberculosis) - Abnormal anatomy
Left Apical segmentectomy S1
Uniportal S1+S2 (abnormal A1+A3 trunk)
RUL apical segmentectomy S1 (Non intubated)
Open gate to the future
Uniportal Unisurgeon VATS
Uniportal UNISURGEON VATS instrumentation

Uniportal VATS left hand double finger technique
Posterior RUL segmentectomy (S2) Uniportal Unisurgeon
Uniportal Unisurgeon VATS Right apical segmentectomy S1 Magnetic grasper
Unisurgeon Anterior Right upper segmentectomy (S3)
Uniportal Bilateral anatomic S3

Subxiphoid uniportal VATS segmentectomy S3

Situs inversus right S6 and S1-S2
En bloc antero-posterior S3+S2

ML Lateral segmentectomy (S4)
En bloc segmentectomy S10a+S6+S2

Uniportal VATS left S3+S4+S5
Uniportal VATS anatomic S7+S4-5
Complex CCAM lower lobe S6 Segmentectomy
Anatomic S3 after Thoracotomy and middle lobectomy (8 year old)
Ultra advanced instrumentation
Anatomic segmentectomy (S10)
Unisurgeon Uniportal S9-S10
Right Anatomic segmentectomy (S9-10)
Left Anatomic segmentectomy (S9-10)
Conclusions

- Uniportal VATS complex Segmentectomy is feasible and safe
- When in doubt follow the bronchus to the lesion
- Anatomic variations by 3D-CT reconstruction image
- Frozen section for LN10, remove LN 11, 12 in order to skeletonize the bronchovascular structure
- Identify inter-segmental vein and intra-segmental vein
- Inflation/ deflation test for inter-segmental plane if in doubt
KEEP CALM AND ENJOY UNIPORTAL SEGMENTS!!