Post Operative Evaluation of the Oncology Patient
Michelle S. Ginsberg, MD

Objectives
- To recognize complications in the postoperative thoracic patient
- To recognize and avoid pitfalls in distinguishing recurrent tumor, new primary tumor or treatment changes

Complications of Thoracic Surgical Patients
- Higher incidence for more extensive resections wedge rxn vs lobectomy vs. sleeve resection vs. pneumonectomy
  - Index of suspicion rises with complexity of surgery
- Interval since surgery
- Immediate postoperative period
- Late postoperative period

Surgeons’ Paradigm for the Postoperative Inpatient Thoracic Patient
- CXR until chest tube is out
- CT scan only if fever that is unexplained or not responding to Abx
- CTPA protocol for clinical indications of PE

Types of Complications
Immediate postoperative period
- Collapse
- Hemorrhage
- Pulmonary Edema
- Pneumonia
- BP fistula
- Chylothorax
- Lung Torsion
- Pulmonary Embolism
s/p RULobectomy

Hemorrhage requiring exploration

next day

later that day

Bronchopleural Fistula

- Immediately post operative period due to:
  - Mechanical ventilation
  - Preop infection
  - Inadequate closure of bronchus
  - Pre surgical RTx

Findings of Bronchopleural Fistula

- CXR:
  - Incr. PTX
  - Loss of fluid in pneumonectomy space or failure to fill
  - Incr. SQ emphysema or mediastinal emphysema

- CT findings:
  - Post lobectomy incr. intrapleural air
  - Post pneumonectomy decre. in AF level

VATS LUL incomplete anterior fissure and prolonged dissection

Post op day 1 large PTX

Post op day 3 BP fistula bronchial stump hole on FB

BP fistula repair w intercostal muscle flap repair

Wound infection with gram + cocci, no communication to pleural cavity
Evaluating the AF levels in the complex resection cases

- 9 days post pneumonectomy for stage IIIA NSCLC
- 1 month post pneumonectomy
- Eloesser flap for BF fistula, large amount of fibrinous tissue
- Pancoast squamous cell cancer T4

↓ fluid level in post pneumonectomy space

- EPP with RT
- BP fistula due to Aspergillus infection
- Eloesser flap

- Preop
- 1 month later
- 6 months later
- 7 months later
Pneumonia in the Immediate Postoperative Period

- Assoc. with ventilation
- Difficulty clearing TB secretion
- Aspiration of gastric contents

Chylothorax

- Accumulation of chyle in pleural space
- Due to thoracic duct injury – early within 3 days of surgery
- CT attenuation of effusion is variable due to fat and protein content
- Injury seen:
  - Usually with esophagectomy but also surgery in inferior hemithorax in paravertebral area during extrapleural pneumonectomy
  - Pericarinal and subaortic areas during mediastinal nodal dissection
  - Inferior pulmonary ligaments during standard resection

s/p RUL lobectomy, rxn ribs 1-5, T2-4 laminectomy

1 day post op
12 days post op
3 days post op

s/p RUL wedge resection
with new bibasilar pneumonia from aspiration

s/p mediastinal dissection
with chylothorax
embolization of thoracic duct
**Lung Torsion**
- Rarely in early postoperative period
- RML is flopping if not in anatomical position when re-inflating the lung or in a large space can stay twisted, blocking both air and blood supply
- Need to re-operate and possibly RMLobectomy if necrotic
- Can occur in a lingula-sparing LULobectomy and the lingula twists

**CT findings in Lung Torsion**
- Tapered obliteration of prox.PA and assoc. bronchus
- Amorphous soft tissue attenuation at the hilum
- Torsed lobe: poorly enhancing consolidation with increased volume, GG attenuation, interlobar and intralobular septal thickening

**Late Complications**
- **Delayed BP fistula**
  - Rare
  - Occurs in patients who get adjuvant chemo or XRT
  - Especially in pneumonectomies
  - Delayed due to infection or recurrent tumor

- **Bronchial stricture**
  - Post sleeve resection
  - Interrupted bronchial blood supply to the distal bronchial segment and partial anastomotic dehiscence and granulation tissue formation

- **Recurrence**
  - **Locoregional recurrence** - same lung, staple margin, bronchial stump, hilar and mediastinal nodes
  - **Distant recurrence** - pleura, pericardium, contralateral lung, extrathoracic

- **Second primary lung cancer**
Surgeons’ Paradigm for Follow up of the Outpatient Postoperative Patient

- CXR at the first post-op visit usually 2-3 weeks after discharge
- CT scan with contrast q 6 months for 2 years, then yearly scans w/o contrast forever
- PET if something shows up on the CT scan or if they are symptomatic outside the chest

CT Detection of Recurrences
1278 early stage I/II NSCLC patients (T1-2, N0-1)
Complete resection for NSCLC 1/04 - 12/09

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Recurrence</td>
<td>252</td>
<td>19.7*</td>
</tr>
<tr>
<td>Locoregional</td>
<td>64</td>
<td>25.4</td>
</tr>
<tr>
<td>Distant</td>
<td>112</td>
<td>44.4</td>
</tr>
<tr>
<td>LR/Distant</td>
<td>76</td>
<td>30.2</td>
</tr>
</tbody>
</table>

Detection Method
- CT 154 (61.1)
- Symptoms 79 (31.3)
- Lab 3 (1.2)
- MRI 3 (1.2)
- PET 5 (2.0)
- Other 5 (2.0)
- Unknown 2 (0.8)

Detection Method
- CT 154 (61.1)
- Symptoms 79 (31.3)
- Lab 3 (1.2)
- MRI 3 (1.2)
- PET 5 (2.0)
- Other 5 (2.0)
- Unknown 2 (0.8)

Survival Difference Between Recurrence and Second Primary Cancer

Log-Rank test comparing survival from time of diagnosis between patients with recurrence and second primary lung cancers. (p<0.001)

Feiran Lou, MD; Peter B. Bach, MD MAPP; Valerie Rusch, MD; James Huang, MD, MS.
Unpublished data provided by Department of Thoracic Surgery MSKCC
**Locoregional Recurrence**
same lung, staple margin, bronchial stump
hilar and mediastinal nodes

**Synchronous tumors, s/p LLL and wedge resection LUL**

**Postoperative RT is controversial**
- Most widely accepted is postop RT in patients with:
  - Pathologic N2 or N3 disease
  - Positive margins
  - Gross residual disease
- Currently no role for postoperative RT for pathologic N0 or N1 disease

**s/p LUL**
- 8 months later
- 14 months later
- 20 months later

**s/p RUL and RT**
- 5 months later

**Long term changes 3-12 month after completion of RT**
- RT changes usually stabilize by 2 years (usually 1 yr)
- Features distinguishing recurrence from post Tx changes in RT field
  - Bulging margin
  - Disappearance of air bronchograms
  - Appearance of pleural effusion after 12 months
EPP+ Hemithor RT
4 years later
2 years later
3 years later
3 years later
5 years later

Distant Recurrence
pleura, pericardium, contralateral lung extrathoracic

s/p RUL lobectomy for NSCLC
3 months later presented with back pain

New Primary Tumor
Metachronous Lesions
- Defined by Martini-Melamed criteria:
  - histology is different from the index tumor, or
  - diagnosed ≥2 years after the primary tumor, or
  - located in different lobes or segments with no positive intervening lymph nodes and no evidence of metastasis
- 10-32% of patients surviving resection for lung cancer may develop a second primary lung cancer
  - previously, squamous cell most common
  - now, adenocarcinoma

Spindle cell sarcomatoid CA LLL
RUL adeno with focal BAC 4 years later
LUL adeno with mixed subtype 6 years later
RLL adeno 12 years later
SUMMARY

- To be aware of complications in the immediate postoperative period
- To continue to follow patients long term and recognize recurrent and new disease

New primary tumor
Treated with SBRT