Thoracic Surgery In The Modern Era

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No Disclosures
What Has Changed

- Minimally Invasive Surgery
- Focus on Air Leak Reduction
- Pain Management
- Outpatient Chest Tubes
- Smoking Cessation
STAR
A Standardized Approach to Air-Leak Reduction Following Pulmonary Resection

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Air Leak Reduction

2-Layer porcine intestinal submucosa
Memorial 2 Layer SLRA
Standardized Approach to Prolonged Air Leak Reduction After Pulmonary Resection

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Background. Prolonged air leaks after pulmonary resection lead to patient discomfort, increased hospital length of stay, greater healthcare costs, and increased morbidity. A standardized approach to air leak reduction (STAR) after lung resection was developed and studied.

Methods. A prospective review was conducted of a prospective database from 1 surgery center. The adoption of STAR as standard of care was compared with independent factors shown to reduce air leaks as incorporated in STAR: fissure closure, bronchial calcium, staple line buttressing, and prophylactic chest tube management. Patient characteristics and outcomes were compared against aggregate data from The Society of Thoracic Surgeons National Database (2012–2014).

Results. From June 2010 through May 2015, 475 patients met the study criteria. Of these, 264 (55.6%) had lobectomies, 198 (41.7%) had wedge resections, and 13 (2.7%) had segmentectomies. Prolonged air leaks were reduced in the STAR lobectomy group by 52% (5.7% versus 10.9%; p = 0.08) and in the STAR wedge group by 40% (2.5% versus 4.2%; p = 0.38). Hospital length of stay was lower in lobectomies (3.2 versus 6.3 days; p = 0.001) and in segmentectomies (3.2 versus 5.2 days; p = 0.0152), but not in resections (3.3 versus 4.3 days; p = 0.0152).

Conclusions. Use of STAR for pulmonary resection, particularly for lobectomies, shows decreased postoperative prolonged air leaks when compared with The Society of Thoracic Surgeons National Database. This aggressive approach did not lead to air leak–related hospital readmissions or compromise postoperative mortality. The STAR protocol is an innovative strategy that has the potential to improve postoperative pulmonary resection outcomes.

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Protocol driven management

- 10 cm suction in recovery
- Water seal @ 0700
- Permissive pneumothorax
- Remove for output <450 cc/24 hrs
- no air/chyle leak


Chest Tube Management

- Outpatient chest tube management
  - Medically ready for discharge
  - Persistent air leak unlikely to resolve <24 hrs
  - Follow up in 72 hrs

Safety of Outpatient Chest Tube Management of Air Leaks After Pulmonary Resection

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Prolonged air leaks are the most common postoperative complication following pulmonary resection, leading to increased hospital length of stay (LOS) and cost. This study assesses the safety of discharging patients home with a chest tube (CT) after pulmonary resection. A retrospective review was performed of a single surgeon's experience with pulmonary resections from January 2010 to January 2015. All patients discharged home with a CT were included. Discharge criteria included a persistent air leak controlled by water seal, resolution of medical conditions requiring hospitalization, and pain managed by oral analgesics. Patient demographics, type of resection, LOS, and 30-day morbidity and mortality data were analyzed. Comparisons were made with the Society of Thoracic Surgery database January 2011 to December 2013. Four hundred ninety-six patients underwent pulmonary resection. Sixty-five patients (13%) were discharged home postoperatively with a CT. Fifty-eight patients underwent a lobectomy, two patients a bilobectomy, and five patients had a wedge excision. Two patients were readmitted: One with a lower extremity deep venous thrombosis and the other with a nonlife threatening pulmonary embolus. Four patients developed superficial CT site infections that resolved after oral antibiotics. Patients discharged home with a CT following lobectomy had a shorter mean LOS compared to lobectomy patients (3.65 vs 6.2 days). Mean time to CT removal after discharge was 4.7 days (range 1–22 days) potentially saving 305 inpatient hospital days. Select patients can be discharged home with a CT with reduced postoperative LOS and without increase in major morbidity or mortality.
Who Should we Operate On?

Stage 1

Stage 2

Stage 3
Preoperative Changes

- Determine clinical stage prior to surgery
- CT scan, PET/CT, EBUS, Navigational bronchoscopy and selective MRI
- Only operate on Stage 1 or 2......occasionally Stage 3a
- Determine Performance status (cardiac risk, PFT’s)
- DLCO is the new FEV1
- CT Biopsy only for non-surgical or high risk pts
- All patients must stop smoking prior to surgery
Smoking Cessation

- Limited stage small cell cancer
  - 5 year survival 63% vs. 29%
- Early stage non small cell lung cancer
  - 5 year survival 70% vs. 33%
- Risk of new primary increased 4 fold
Safety of Next Day Discharge After Lobectomy: Have We Broken the Speed Limit?

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Results: 2010 - 2017

390 patients
Lobectomy

- POD 1
  150 (38%)

- After POD 1
  240 (62%)
  LOS 3.9 days
Results

Categorical variables are displayed as % total.

Discharged POD #1 by Year

- 2010: 23%
- 2011: 76%
- 2012: 63%

Note: Categorical variables are displayed as % total.
Conclusion

- Safe

- 76% Discharged Home on POD 1

- LOS 1.5 days (5.3 days)

- Mortality 0.8%

- Readmission Rate 3.6%
Impact-Modern Thoracic Surgery

- Only helped Individuals
- Need Stage Shift----- Lung Screening
- I-ELCAP and NLST
Survival of Patients with Stage I Lung Cancer Detected on CT Screening

The International Early Lung Cancer Action Program Investigators

ABSTRACT

BACKGROUND

The outcome among patients with clinical stage I lung cancer detected on annual screening using spiral computed tomography is unknown.

METHODS

In a lung cancer screening study, 58,254 asymptomatic individuals aged 50 to 79 years were randomly assigned to spiral CT screening (n = 29,127) or usual care (n = 29,127). SPIRIT, a trial to determine the effectiveness of CT screening for lung cancer, was performed from 1993 through 2005. Of the 29,127 participants recruited in SPIRIT, 15,127 underwent 112,624 annual screening examinations performed by 228 CT centers. The mean number of screening examinations per participant was 7.4. The number of lung cancers detected by CT screening or the number of participants who underwent surgical resection of a stage I lung cancer was reported.

RESULTS

Survival resulted in a diagnosis of lung cancer in 484 participants. Of these participants, 412 (85%) had clinical stage I lung cancer, and the estimated 10-year survival rate was 88% in this subgroup (95% confidence interval [CI], 84 to 91). Among the 302 participants with clinical stage I cancer who underwent surgical resection within 1 month after diagnosis, the survival rate was 92% (95% CI, 88 to 95). The 8 participants with clinical stage I cancer who did not receive treatment died within 5 years after diagnosis.

CONCLUSIONS

Annual spiral CT screening can detect lung cancer that is curable.
Memorial Hospital

12 Programs (7%)