

Review of Thoracic Surgical Oncology

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Esophageal cancer

Salvage esophagectomy effective in select patients

Ann Thorac Surg. 2012 Sep 6. Salvage Esophagectomy for Locoregional Failure After Chemoradiotherapy in Patients With Advanced Esophageal Cancer. Yoo C, Park JH, Yoon DH, Park SI, Kim HR, Kim JH, Jung HY, Lee GH, Choi KD, Song HJ, Song HY, Shin JH, Cho KJ, Kim YH, Kim SB. Department of Oncology, University of Ulsan College of Medicine, Asan Medical Center, Seoul, Korea; Esophageal Cancer Study Group (ECSG), Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea. **BACKGROUND:** Definitive chemoradiotherapy is associated with high local treatment failure rates, and surgical resection may be an appropriate salvage therapy. However, the efficacy and safety of salvage esophagectomy have not been elucidated fully. The clinical outcomes of salvage esophagectomy for locoregional failure after chemoradiotherapy were assessed. **METHODS:** Twelve patients who underwent salvage esophagectomy after chemoradiotherapy between January 2003 and November 2010 were included in this retrospective analysis. Baseline demographics and survivals of these patients were compared with 21 patients who did not receive salvage esophagectomy for locoregional failure only after chemoradiotherapy, identified from our own previous prospective trials. **RESULTS:** The median age was 62.5 years (range 50 to 69) and all patients had squamous cell carcinoma. The median radiation dose was 54.0 Gy (range 41.4 to 66.0) and the median interval between completion of chemoradiation and surgery was 8.0 months (range 2.0 to 32.9). There were no in-hospital deaths. Pulmonary complication was the most common postoperative morbidity (42%), and anastomotic leakage occurred in 1 patient (8%). With a median follow-up period of 29.3 months (range 5.8 to 73.0), the overall 3-year survival rate was 58%. Patients with early pathologic stage disease (T1/2 and N0) showed significantly prolonged survival ($p = 0.03$) compared with those with advanced pathologic stage (T3/T4 or N1). Patients with salvage esophagectomy had prolonged event-free survival and overall survival compared with those patients with locoregional failure who received primary chemotherapy or boost radiotherapy ($p < 0.001$). **CONCLUSIONS:** While salvage esophagectomy for locoregional failure after chemoradiotherapy should be employed with great caution, it appears to be a feasible and effective therapeutic option for highly selected patients, especially with early pathologic stage disease. Salvage esophagectomy can be recommended as the only current curative treatment option for patients with locoregional failure after chemoradiotherapy

Ann Thorac Surg. 2012 Oct;94(4):1126-33. Salvage esophagectomy after failed definitive chemoradiation for esophageal adenocarcinoma. Marks JL, Hofstetter W, Correa AM, Mehran RJ, Rice D, Roth J, Walsh G, Vaporciyan A, Erasmus J, Chang J, Maru D, Lee JH, Lee J, Ajani JA, Swisher SG. Department of Thoracic and Cardiovascular Surgery, The University of Texas, MD Anderson Cancer Center, Houston, Texas. **BACKGROUND:** Outcomes of salvage esophagectomy after definitive chemoradiation (CRT) for squamous cell carcinoma are well defined. Previous reports of salvage esophagectomy in patients with recurrent adenocarcinoma after definitive CRT are limited by small numbers and high morbidity and mortality rates. **METHODS:** We reviewed our experience of 65 patients with esophageal adenocarcinoma treated from 1997 to 2010 who underwent salvage esophagectomy after failed definitive CRT. We then compared this group to 65 matched patients of 521 total patients with esophageal adenocarcinoma who received preoperative CRT followed by planned esophagectomy. Propensity matching and multivariable analysis were performed. **RESULTS:** Median time to surgery from completion of therapy for the salvage group was 216 days. Major postoperative events (major pulmonary event, conduit loss, leak, readmission to intensive care unit) occurred in 35% (23 of 65) of salvage patients and 31% (20 of 65) of the planned resection matched group. Anastomotic leak occurred in 18.5% (12 of 65) and 11.3 (59 of 521) of salvage and planned groups, respectively. Thirty-day mortality was 3.1% (2 of 65) after salvage resection and 4.6% (3 of 65) after planned resection. There was no difference in 3-year overall or median survival between the two groups of patients (32 months, 48% salvage, versus 40 months, 57% planned resection). Multivariable analysis did not identify salvage strategy or time from completion of therapy to resection as a predictor of major event or death. **CONCLUSIONS:** Postoperative morbidity, mortality, and overall survival of patients after salvage esophagectomy are comparable to matched patients after planned resection. These results suggest that patients with esophageal adenocarcinoma who fail definitive CRT and recur locoregionally should be considered for salvage esophagectomy at experienced esophageal centers.

Editor's commentary: Two reports detailing successful results for patients failing definitive chemoradiation for esophageal cancer. These are highly selected patients and the surgical team has to be experienced as noted.

Pleurectomy/decortication preserves quality of life in small study of mesothelioma patients

Ann Thorac Surg. 2012 Oct;94(4):1086-92. Quality of life after radical pleurectomy decortication for malignant pleural mesothelioma. Mollberg NM, Vigneswaran Y, Kindler HL, Warnes C, Salgia R, Husain AN, Vigneswaran WT. Department of Surgery, University of Illinois at Mount Sinai Hospital, Chicago, IL. **BACKGROUND:** Malignant pleural mesothelioma is an aggressive malignancy in which radical surgical treatment appears to improve survival. It is unknown, however, if radical surgical treatment affects quality of life (QoL) adversely. Our objective was to assess patient-reported symptoms of health-related QoL after radical pleurectomy decortication (PD). **METHODS:** Patients with malignant pleural mesothelioma were prospectively enrolled between 2010 and 2011 to determine the effects of PD on baseline QoL. Health-related QoL was assessed using the European Organization for Research and Treatment of Cancer core Quality of Life Questionnaire-C30 tool (EORTC QLQ-C30) before operation and at 1, 5 to 6, and 8 to 9 months postoperatively. Patients were grouped based on World Health Organization baseline performance status (PS) and compared. **RESULTS:** Of the 28 patients enrolled, 16 (57.1%) and 12 (42.9%) were World Health Organization PS 0 and PS 1, respectively. At baseline, PS 1 patients had significantly worse global QoL functional and symptom scores at baseline. At 5 to 6 months' follow-up, PS 0 patients had no significant change in global QoL or functional domain scores. PS 1 patients had significant improvement in global QoL ($p = 0.038$), symptoms of fatigue ($p = 0.05$), and dyspnea ($p = 0.048$). At 8 to 9 months' follow-up, PS 0 patients showed significant improvement in symptoms of fatigue ($p = 0.026$) from baseline and PS 1 maintained the improvements in symptoms of fatigue ($p = 0.049$) and dyspnea ($p = 0.048$). **CONCLUSIONS:** Radical PD does not negatively impact minimally symptomatic patients at intermediate follow-up. Patients who have symptoms at baseline can have significant improvement in their QoL after surgical treatment.

Editor's commentary: More evidence that decortication/pleurectomy may allow for better outcomes for mesothelioma patients. This is a small study but the results are impressive for this difficult subset of thoracic oncology patients.

NCSCL

Unusual prevalence of MAI found in lung cancer patients

J Thorac Oncol. 2012 Sep;7(9):1345-51. Association between pulmonary mycobacterium avium complex infection and lung cancer. Lande L, Peterson DD, Gogoi R, Daum G, Stamper K, Kwait R, Yankowski C, Hauler K, Danley J, Sawicki K, Sawicki J. *Division of Pulmonary and Critical Care Medicine, Lankenau Medical Center, Wynnewood, PA; †Lankenau Institute for Medical Research, Wynnewood, PA; ‡Division of Pulmonary and Critical Care Medicine, Thomas Jefferson University, Philadelphia, PA; §Department of Gynecologic Oncology, Lankenau Medical Center; || Department of Pathology, Lankenau Medical Center; and ¶Kimmel Cancer Center, Thomas Jefferson University, Philadelphia, PA. **INTRODUCTION:** Patients with lung cancer are sometimes found to have respiratory cultures growing *Mycobacterium avium* complex (MAC). This study describes the clinical, pathologic, and radiographic characteristics of individuals who harbor concomitant lung cancer and MAC. **METHODS:** Retrospective analysis of patients with positive respiratory cultures for MAC (370 men, 475 women) and with newly diagnosed lung cancer (792 men, 840 women) from 1995 to 2010. **RESULTS:** Of the patients with respiratory cultures growing MAC, 8.6% of men and 6.3% of women had lung cancer. Twenty-five percent of patients with lung cancer and 3% with nonbronchiectatic benign lung disease grew MAC from their respiratory cultures. Significantly fewer women with both MAC and lung cancer were smokers than the control group of women with lung cancer and negative MAC cultures (68% versus 89%, $p < 0.01$). Squamous cell carcinoma occurred in 40% of women in the MAC/lung cancer group versus 28% of women in the lung cancer control group. Peripherally located squamous cell carcinomas were found in 71% of the MAC/lung cancer group versus 40% of the lung cancer control group ($p = 0.01$). **CONCLUSIONS:** The percentage of smokers among women with both MAC and lung cancer was lower than among the lung cancer control group who did not grow MAC. The presence of MAC in respiratory cultures of lung cancer patients was particularly associated with squamous cell carcinomas located in the periphery of the lung. Because MAC typically affects distal airways, this possible association between MAC infection and lung cancer warrants further study.

Editor's commentary: This is a provocative report drawing a line between MAI and lung cancer, particularly in white woman. This was a retrospective chart review of patients with positive cultures for MAI at one institution cross referenced with patients diagnosed with lung cancer at the same institution. Obviously, this is preliminary information but interesting to consider, especially when one considers the well described connection between chronic inflammation and carcinogenesis.

Outcomes better when lung cancer resection done by thoracic surgeons vs. general surgeons

J Thorac Cardiovasc Surg. 2012 Oct 8. A comparison of quality and cost indicators by surgical specialty for lobectomy of the lung. Freeman RK, Dilts JR, Ascoti AJ, Giannini T, Mahidhara RJ. Department of Thoracic and Cardiovascular Surgery, St Vincent Hospital, Indianapolis, Ind. Electronic address: RFreeman@corvascmds.com. OBJECTIVES: This investigation compared patients undergoing lobectomy for non-small cell lung cancer by either a general surgeon or a cardiothoracic surgeon across a geographically diverse system of hospitals to see whether a significant difference in quality or cost was present. METHODS: The Premiere administrative database and tumor registry data of a single health system's hospitals was used to compare adherence to national treatment guidelines, patient outcomes, and charges for patients undergoing lobectomy for non-small cell lung cancer in a 5-year period. Surgeons performing lobectomy were designated as a general surgeon or cardiothoracic surgeon according to their national provider number and board certification status. Excluded from analysis were centers that performed fewer than 50 lobectomies during the study period. RESULTS: During the study period, 2823 lobectomies were performed by 46 general surgeons and 3653 lobectomies were performed by 29 cardiothoracic surgeons in 54 hospitals in a single health care system. Significant differences were found between general and cardiothoracic surgeons with respect to adherence to national guidelines in staging and treatment, mean length of stay, significant morbidity, and operative mortality. Mean charges for lobectomy of the lung were also found to differ significantly between general and cardiothoracic surgeons. CONCLUSIONS: This review found that currently measurable indicators for quality of care were significantly superior and overall charges were significantly reduced when a lobectomy for non-small cell lung cancer was performed by a cardiothoracic surgeon rather than by a general surgeon.

Editor's commentary: Duh, right? It turns out that the vast majority of resections for lung cancer in this country are done by general surgeons (or cardiac surgeons faking it as thoracic surgeons). Put aside the documented difference in outcomes, and just consider patient discomfort and pain: it is a very rare general surgeon who does **any** form of minimally invasive resection, whether VATS or robotic assisted. So why are patients still sent to these surgeons?....

Lung cancer detection

Gas chromatography/ mass spectroscopy of exhaled breath predicts lung cancer in solitary lung nodules

J Thorac Oncol. 2012 Oct;7(10):15 Non-invasive Breath Analysis of Pulmonary Nodules. Peled N, Hakim M, Bunn PA Jr, Miller YE, Kennedy TC, Mattei J, Mitchell JD, Hirsch FR, Haick H. Thoracic Cancer Research and Detection Center, Sheba Medical Center, Tel Aviv University, Tel Aviv, Israel; †Division of Medical Oncology, Department of Medicine and Pathology, University of Colorado Cancer Center, UC Denver, Aurora, Colorado; ‡Department of Chemical Engineering and Russell Berrie Nanotechnology Institute, Technion-Israel Institute of Technology, Haifa, Israel; §Division of Medical Oncology, Department of Medicine, University of Colorado Cancer Center, UC Denver, Aurora, Colorado; || Department of Pulmonary Sciences and Critical Care Medicine, Department of Medicine, University of Colorado Cancer Center, UC Denver, Aurora, Colorado; ¶Department of Cardiothoracic Surgery, University of Colorado School of Medicine, Aurora, Colorado; and #Division of Medical Oncology, Department of Medicine and Pathology, University of Colorado School of Medicine, Aurora, Colorado. INTRODUCTION:: The search for non-invasive diagnostic methods of lung cancer (LC) has led to new avenues of research, including the exploration of the exhaled breath. Previous studies have shown that LC can, in principle, be detected through exhaled-breath analysis. This study evaluated the potential of exhaled-breath analysis for the distinction of benign and malignant pulmonary nodules (PNs). METHODS:: Breath samples were taken from 72 patients with PNs in a prospective trial. Profiles of volatile organic compounds were determined by (1) gas chromatography/mass spectrometry (GC-MS) combined with solid-phase microextraction and (2) a chemical nanoarray. RESULTS:: Fifty-three PNs were malignant and 19 were benign with similar smoking histories and comorbidities. Nodule size (mean \pm SD) was 2.7 ± 1.7 versus 1.6 ± 1.3 cm ($p = 0.004$), respectively. Within the malignant group, 47 were non-small-cell lung cancer and six were small-cell lung cancer. Thirty patients had early-stage disease and 23 had advanced disease. Gas chromatography/mass spectrometry analysis identified a significantly higher concentration of 1-octene in the breath of LC, and the nanoarray distinguished significantly between benign versus malignant PNs ($p < 0.0001$; accuracy $88 \pm 3\%$), between adeno- and squamous-cell carcinomas [LINE SEPARATOR]($p < 0.0001$; $88 \pm 3\%$) and between early stage and advanced disease ($p < 0.0001$; $88 \pm 2\%$). CONCLUSIONS:: In this pilot study, breath analysis discriminated benign from malignant PNs in a high-risk cohort based on LC-related volatile organic compound profiles. Furthermore, it discriminated adeno- and squamous-cell carcinoma and between early versus advanced disease. Further studies are required to validate this noninvasive approach, using a larger cohort of patients with PNs detected by computed tomography.

Editor's commentary: My first reaction to this paper was "How much would **that** cost?" assuming such a high tech application would be prohibitively expensive. But when one considers that mass spectroscopy is used routinely in the OR now to monitor anesthetic gas concentration, it may be possible to get the cost down to a realistic level. Nevertheless, I find it hard to believe that subcentimeter cancers can produce a volatile signature specific enough to allow prediction. However, if replicated, this may become an extremely useful adjunct to low dose CT screening for lung cancer.

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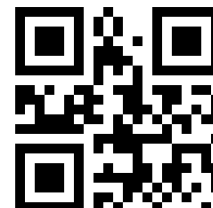
Florida Heart and Lung Surgery

4007 N. Taliaferro Ave; Suite C

Tampa, FL 33603

email: esommers@fhls.com tel: 813 238-0810

website: fhls.com



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Florida Heart and Lung Surgery
4007 N. Taliaferro Ave.; Suite C
Tampa, FL 33603