Journal of Geriatric Oncology xxx (2016) xxx–xxx

Contents lists available at ScienceDirect

Journal of Geriatric Oncology

Effect of advanced age on peri-operative outcomes after robotic-assisted pulmonary lobectomy: Retrospective analysis of 287 consecutive cases

Kathryn S. Kass [d], Frank O. Velez-Cubian [b], Wei Wei Zhang [b], Kavian Toosi [d], Tawee Tanvetyanon [a,c], Kathryn L. Rodriguez [d], Matthew R. Thau [d], Joseph R. Garrett [a], Carla C. Moodie [a], Jacques P. Fontaine [a,b,c], Eric M. Toloza [a,b,c,*]

[a] Department of Thoracic Oncology, Moffitt Cancer Center, Tampa, FL USA
[b] Department of Surgery, University of South Florida, Health Morsani College of Medicine, Tampa, FL USA
[c] Department of Oncologic Sciences, University of South Florida, Health Morsani College of Medicine, Tampa, FL USA
[d] Morsani College of Medicine, University of South Florida Health, Tampa, FL USA

ARTICLE INFO

Article history:
Received 5 April 2016
Received in revised form 9 August 2016
Accepted 27 November 2016
Available online xxxx

Keywords:
Lung cancer
Robotic
Lobectomy
Advanced age
Surgical outcomes

ABSTRACT

Objectives: We investigated whether advanced age affects peri-operative outcomes after robotic-assisted pulmonary lobectomies.

Materials and methods: We retrospectively analyzed patients who underwent robotic-assisted lobectomy by one surgeon over a 5-year period. Rates of postoperative complications were compared according to age group. Other outcomes, such as intraoperative complications, hospital length of stay (LOS), and in-hospital mortality, were also compared.

Results: A total of 287 patients were included (mean age 67.1 yr). Group A had 65 patients of advanced age ≥ 75 yr (range 75–87 yr; 37 men, 28 women); Group B had 222 patients aged <75 yr (range 29–74 yr; 95 men, 127 women). Group A had 10/65 (15.4%) patients with robotic-related intraoperative complications, compared to 10/222 (4.5%) for Group B ($p = 0.002$), with the most frequent intraoperative complications being bleeding from a pulmonary vessel (10.8% vs. 4.5%, $p = 0.06$), bronchial injury (3.1% vs. 0.9%, $p = 0.18$), and injury to the phrenic or recurrent laryngeal nerve (1.5% vs. 0.4%, $p = 0.33$). There were 28/65 (43.1%) patients in Group A with postoperative complications compared to 76/222 (34.2%) in Group B ($p = 0.19$). While operative times were similar ($p = 0.42$), Group A had longer median hospital LOS of 6 ± 0.9 days compared to 4 ± 0.3 days for Group B ($p = 0.02$).

Conclusion: While younger patients have lower risk of robotic-related intraoperative complications and shorter hospital LOS, elderly patients do not have increased overall or emergent conversion rates to open lobectomy, overall postoperative complications rates, or in-house mortality compared to younger patients. Thus, robotic-assisted pulmonary lobectomy is feasible and relatively safe for patients of advanced age.

© 2016 Elsevier Ltd. All rights reserved.

1. Introduction

Technological advances and increased life expectancies have resulted in increasingly complex procedures, including minimally invasive surgery (MIS), being performed on patients of advanced age [1]. Minimally invasive surgery results in decreased pain, lower rates of perioperative complications, and a shorter median hospital length of stay (LOS). Two separate studies, conducted a decade apart, evaluated and compared the perioperative outcomes after open lobectomy via thoracotomy versus lobectomy via conventional video-assisted thoracoscopic (VATS) surgery in elderly patients (>70 years) with early stage non-small cell lung cancer (NSCLC) and concluded that the minimally invasive VATS approach was associated with fewer and less severe complications as well as a shorter hospital LOS compared with thoracotomy [2,3]. Another very similar study conducted by Whitson et al., noted shorter chest tube duration, shorter hospital LOS, and improved survival 4 years after VATS lobectomy when compared with open lobectomy [4].

Among patients with NSCLC, younger individuals have been reported to have a significantly worse prognosis than older patients, possibly related to younger patients having a greater delay in seeking thoracic surgical care or else having NSCLC that is more biologically aggressive [5]. However, as life expectancy increases, so will the incidence of malignancies, such as lung cancer, and the demand for appropriate modes of treatment. Life expectancy of an 80-year-old person in the United States is 9.1 years (8.1 years in males and 9.7 years in females), while the

* Corresponding author at: 12902 USF Magnolia Drive, Suite FOB-1, Tampa, FL 33612 USA.
E-mail address: eric.toloza@moffitt.org (E.M. Toloza).

http://dx.doi.org/10.1016/j.jgo.2016.11.003
1879-4068/© 2016 Elsevier Ltd. All rights reserved.

median survival for elderly patients with untreated early stage lung cancer is only 14 months [6]. The conventional assumption is that older individuals have a slower recovery and have worse overall outcomes due to factors such as weaker immune systems, other co-morbidities, overall frailty, and less social support, and many studies have found this assumption to be true [6]. The traditional bias against surgical therapy in the elderly is being challenged [7,8]. A thorough preoperative evaluation of overall performance status, cardiopulmonary function, and other geriatric co-morbidities can help determine whether, and which type of, surgical resection is appropriate for a patient in this age group [9]. Over a decade ago, one study concluded that advanced age alone is not a contraindication to surgical resection of lung cancer, especially when utilizing a VATS lobectomy procedure [10]. As surgeons gain competency in robotic-assisted surgery, the benefits of this minimally invasive approach are being extended to special populations, such as geriatric patients. Thus, we investigated perioperative outcomes in patients of advanced age ≥ 75 years after robotic-assisted VATS pulmonary lobectomy.

2. Materials and Methods

We retrospectively analyzed prospectively collected data from all patients who underwent any robotic-assisted pulmonary lobectomy at our institution by one surgeon from September 2010 through August 2015. We included patients who underwent robotic-assisted lobectomy or else wedge resection followed by robotic-assisted completion lobectomy. Patients converted from robotic-assisted to open lobectomy via thoracotomy or with planned en-bloc chest wall resection during robotic-assisted pulmonary lobectomy were included in our study. Patients were grouped to age ≥ 75 at the time of operation (Group A) versus age < 75 (Group B).

We included all pathologies reported for our lobectomies, including NSCLC, early-stage small cell lung cancer, pulmonary metastases, and benign tumors that required lobectomy due to size and central location. For NSCLC, we included early-stage (I and II) NSCLC, resectable stage-IIIA NSCLC with or without induction chemotherapy +/− radiation therapy, and resectable stage-IV NSCLC with isolated brain metastases.

Patients who only underwent sublobar resection, such as wedge resection or segmentectomy, without lobectomy or who required pneumonectomy were excluded from this study. Patients who underwent lobectomy by other surgical approaches, such as conventional VATS or thoracotomy (other than from conversion from robotic-assisted approach), were also excluded from our cohort.

This study was conducted in accordance with the amended Declaration of Helsinki as outcomes research for quality assurance as part of our departmental thoracic oncology clinical research database protocol. This database protocol was approved by our institution's Scientific Review Committee (MCC# 16512, MCC# 16728, and MCC# 18761) and our Institutional Review Boards (USF IRB# Pro00002678, USF IRB# Pro00022263, and Chesapeake IRB# Pro00017745), which considered this study as review of existing data and which waived informed consent for this retrospective study. However, through our institutional surgical informed consent, patients gave permission to use surgery-related and tissue-related data for education and research purposes.

All our patients underwent fiberoptic bronchoscopy by the operating surgeon after the induction of general anesthesia. After placement of the dual-lumen endotracheal tube, the patient is then placed in either right or left lateral decubitus position, depending on which hemithorax the lesion is located. Prior to preparation of the patient's skin with Chloraprep and draping of the surgical field, the proposed robotic port incision sites as well as the potential thoracotomy incision site, in case of conversion to open lobectomy, are marked on the patient's skin with indelible ink. Our robotic-assisted lobectomy technique utilizes a three-port system, which includes a 4-cm camera port along the 6th intercostal space (ICS) at the anterior axillary line, which doubles as the assistant's access port, and two 1-cm instrument ports along the 3rd ICS at the anterior axillary line and along the 9th ICS at the posterior axillary line.

From September 2010 through December 2011, our group used the da Vinci® (Intuitive Surgical Corporation, Sunnyvale, CA) "S"™ robotic surgical system, with the "Si"™ system being used from January 2012 to the present. Lobectomy is performed by first dividing the pulmonary vein, then division of the pulmonary artery branch(es) and bronchus, followed by completion of the pulmonary fissures. After delivery of the lobectomy within an endopouch through the 6th ICS port incision, robotic-assisted complete mediastinal lymph node dissection is performed. At the end of the procedure, a 32-French chest tube is introduced through the 9th ICS incision and connected to drainage at −20 cm H_2O continuous suction.

Thoracotomy instruments are kept available during each of our robotic-assisted cases. During dissection of the major pulmonary vessels and due to the risk of potential bleeding, the surgical assistant keeps a long, curved ring clamp with a sponge ball ready. In the event of pulmonary vascular injury, the assistant can promptly place this "sponge stick" through the assistant port incision and into the pleural cavity and apply gentle pressure directly onto the pulmonary vascular injury.

If bleeding persists and conversion to thoracotomy is required, the sponge ball is transferred to the robotic grasper on the robotic instrument arm at the 3rd ICS port incision, which maintains gentle pressure with the sponge ball on the pulmonary vascular bleeding site, as the robotic camera arm and the other robotic instrument arm at the 6th and 9th ICS port incisions, respectively, are undocked from the patient. The assistant holds the robotic thoracoscope as the surgeon scrubs into the surgical field and creates a posterolateral thoracotomy incision along the 5th ICS in a deliberate but unrushed fashion, possibly with latissimus and serratus muscle sparing. Once the thoracotomy has been created, the sponge ball held by the robotic instrument arm is replaced with a new "sponge stick" placed through the thoracotomy incision, and the remaining robotic instrument arm is undocked from the patient. The robotic patient cart can now be pulled back from the surgical field by the circulating nurse. The pulmonary vascular injury is then suture repaired and the lobectomy is completed by the open approach.

Variables and outcomes analyzed include demographics, intraoperative estimated blood loss (EBL), operative time (skin incision to skin closure), conversion to open lobectomy via thoracotomy, chest tube duration, hospital LOS, and in-hospital mortality. At the time of hospital discharge, most of our patients were discharged to their home, while a few required transfer to an acute rehabilitation facility and/or skilled nursing facility prior to ultimately being discharged to their home. Patients about to be discharged to their home are also evaluated for their need of a home-health nurse and/or a home-health physical therapist.

All perioperative complications that were clinically significant (i.e., Clavien-Dindo Classification grades II or greater) were noted [11]. Respiratory complications included acute respiratory failure requiring prolonged oxygen supplementation, pneumonia, aspiration pneumonitis, prolonged air leak lasting ≥7 days, mucous plugs requiring bronchoscopy, pneumothorax requiring chest tube reinsertion after chest tube removal, pleural effusion requiring thoracentesis, pulmonary embolism, and chyle leak or hemothorax requiring surgical intervention. While the Society of Thoracic Surgeons (STS) has defined prolonged air leaks as those persisting more than 5 days after pulmonary resection, we have routinely reported prolonged air leaks as those lasting 7 days or greater after lobectomy, which differs from the STS definition by only 1 day. Cardiac complications included atrial fibrillation, other arrhythmias requiring medications, myocardial infarction, and cardiovascular arrest.

Mean or median, standard error of the mean (SEM), and range were reported for continuous and ordinal variables. Categorical data were expressed as count and percentages. Where applicable, we used Chi-square (X^2), Fisher's exact test, Student's *t*-test, or Mood's median test to compare variables, with statistical significance established at $p \leq 0.05$. Multivariable logistic regression analyses were performed

Download English Version:

https://daneshyari.com/en/article/5502381

Download Persian Version:

https://daneshyari.com/article/5502381

Daneshyari.com