Thoracoscopic Mediastinal Lymph Node Dissection Using an Endoscopic Spacer

Tadashi Akiba, MD, PhD, FACS,1 Hideki Marushima, MD,1 Kyoji Hirano, MD, PhD,2 and Toshiaki Morikawa, MD, PhD3

Although fewer lymph nodes are dissected with video-assisted thoracic surgery than with open lobectomy, thoracoscopic lobectomy is increasingly becoming the preferred surgical approach for early-stage lung cancers. The endoscopic surgical spacer SECUREA™ is a medical device that has been effectively employed in laparoscopic surgery, but no study has evaluated its efficacy in thoracoscopic surgery. In this report, we demonstrate the utility of SECUREA for complete thoracoscopic mediastinal lymph node dissection in patients with non-small cell lung cancer.

Keywords: lymph node dissection, endoscopic spacer, lung cancer, thoracoscopic surgery

Introduction

Although fewer lymph nodes are dissected with video-assisted thoracic surgery (VATS) than with open lobectomy, VATS lobectomy is increasingly becoming the preferred surgical approach for early-stage lung cancers.1) The endoscopic surgical spacer SECUREA™ (Hogy Medical Co., Ltd., Tokyo, Japan) is a medical device that is employed and evaluated in laparoscopic pancreatic enucleation and laparoscopic cholecystectomy.2,3) In this report, we demonstrate the utility of SECUREA in complete thoracoscopic mediastinal lymph node dissection in patients with non-small cell lung cancer.

Case Report

A 71-year-old woman with pulmonary adenocarcinoma (cT1aN0M0) underwent a right lower lobectomy with complete VATS. For VATS, a stab wound of approximately 2 cm was made in the fourth intercostal space on the anterior axillary line for insertion of the camera port.4) Four stab wounds, each approximately 2 cm in length, were made as access ports.

SECUREA is a general medical device, which had already been approved to use for endoscopic surgery by The Pharmaceutical Affairs Law in Japan. SECUREA, a polyurethane sponge with a radiopaque marker was inserted to widen the narrow space between the left atrium and esophagus. Furthermore, the vagal nerve ran along the spacer apart from neighboring organs. By retracting the right main bronchus anteriorly with a sponge stick, we exposed the subcarinal space, thus, enabling us to see the subcarinal and paraesophageal lump to be dissected.

After moving the spacer into the space between the superior vena cava and trachea, we exposed mediastinal structures such as the lateral aspects of the aortic arch and pulmonary artery, superior vena cava, and trachea and dissected the mediastinal lump easily (Fig. 1).

A 67-year-old woman with pulmonary adenocarcinoma (cT1aN0M0) underwent left lower lobectomy with complete VATS. The spacer compressed the descending
aorta and esophagus posteriorly and the left atrium anteriorly. The right main bronchus was retracted anteriorly with a sponge stick. The subcarinal lump was exposed and dissected under an excellent surgical field (Fig. 2). Furthermore, we were able to use forceps, otherwise, we would have compressed organs by forceps.

Discussion

SECUREA, a polyurethane sponge with a radiopaque marker, is an elliptic cylinder measuring 40 mm × 25 mm × 15 mm, 50 mm × 30 mm × 15 mm, and 65 mm × 35 mm × 20 mm. It possesses excellent characteristics for endoscopic surgery such as (1) it can be moved in and out of the surgical field through the endoscopic port; (2) it can absorb exudate (e.g., blood, lymph), helping to maintain a clean surgical field, and the suction tube pressed over SECUREA can aspirate the absorbed exudate without being clogged by debris; (3) it can maintain sufficient space for surgical maneuvers after being inserted between organs; (4) it is less adhesive than gauze and can be used for compression hemostasis; and (5) it can prevent secondary injuries caused by the transmission of heat and vibration from surgical instruments. We confirmed these characteristics excluding its utility for compression hemostasis.

Only two reports, evaluating the utility of SECUREA in laparoscopic enucleation of pancreatic cystadenoma. Nakamura et al. also evaluated the efficacy of single-incision laparoscopic surgery in cholecystectomy with SECUREA. They concluded that SECUREA increased the safety and reduced the technical difficulties of laparoscopic surgery.

Various methods have been adapted for lymph node dissection with VATS, in addition to improvements in the VATS technique and instruments. In general, fewer lymph nodes are dissected with VATS than with thoracotomy, and fewer N2 nodes are dissected with VATS than with thoracotomy. For left-sided resections, there were significantly fewer level 7 nodes dissected in the VATS group than in the open group. Although not significant, this trend was similar for right-sided resections.

Witte et al. added video-assisted mediastinoscopic lymphadenectomy to VATS and demonstrated that this strategy was significantly superior to VATS in both the number of dissected mediastinal lymph node stations and the weight of the mediastinal specimen.

Conclusion

SECUREA possesses the necessary characteristics to facilitate lymph node dissection with complete VATS, but further investigation is needed to evaluate the superiority of maneuvers with SECUREA.
Disclosure Statement

We do not have any relevant financial interests, relationships, or financial conflicts in the past and for the foreseeable future.

References