Case Report

Subxiphoid Video-Assisted Thoracoscopic Surgery for Lung Resection Under Spontaneous Ventilation: Case Report

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This case report describes two patients that underwent successful video-assisted thoracoscopic surgery (VATS) lung resections under spontaneous ventilation using the uniportal subxiphoid approach. The authors performed lung wedge resection in both patients under local anesthesia without using of a Foley catheter, arterial line, or intercostal chest drain. Only intravenous drugs and an oxygen mask with reservoir bag were used. The postsurgical course for both patients was uneventful. Both were discharged on postoperative day 2 and were doing well at 1- and 3-month follow-ups.

Keywords: Subxiphoid approach; Pulmonary resection; Lung cancer

Received 5 July 2021 | Revised 27 September 2021 | Accepted 30 September 2021

J Med Assoc Thai 2021;104(11):1847-9

Website: http://www.jmatonline.com

In recent year, spontaneous ventilation has become an alternative approach for thoracic surgery with a benefit of reducing side effects related to general anesthesia[1,2]. However, most cases were performed through transthoracic incision. Therefore, the authors reported a successful case series of uniportal subxiphoid thoracoscopic surgery for pulmonary resection under spontaneous ventilation.

Case Report

To date, the authors have performed this procedure in two patients at Vajira Hospital, Bangkok, Thailand. Two patients underwent pulmonary resection. The first patient, a 61-years old Thai female diagnosed as corpus carcinoma underwent total abdominal hysterectomy and bilateral salpingo-oophorectomy in 2012. During her follow-up, multiple small pulmonary nodules in both lower lungs were detected. She was referred for lung biopsy to the cardiovascularthoracic department (Figure 1). The second case, a 55-years old Thai female with no underlying disease had multiple small pulmonary nodules detected during her check-up chest X-ray. She was also referred for lung biopsy (Figure 2). There were no intraoperative complication and no conversion to multi-ports video-assisted thoracoscopic surgery (VATS) or general anesthesia. The patients were discharged on the second post-

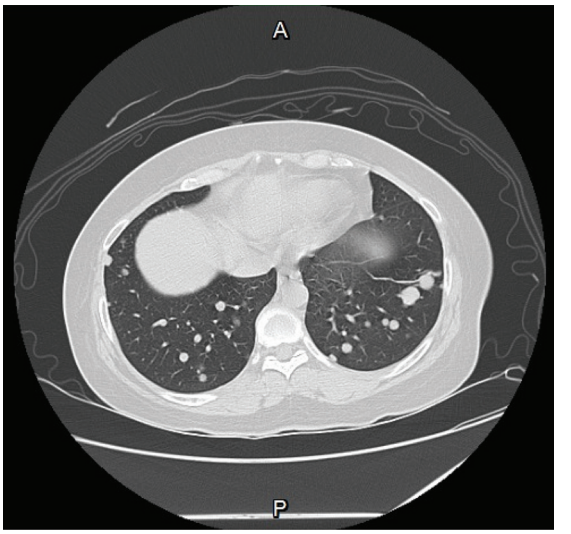

Figure 1. Chest computed tomography showed multiple lung nodule both lungs.

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How to cite this article:

Laohathai S, Weerayutwattnan R, Wannadilok P, Poopipatpab S, Pathonsamit C. Subxiphoid Video-Assisted Thoracoscopic Surgery for Lung Resection Under Spontaneous Ventilation: Case Report. J Med Assoc Thai 2021;104:1847-9.

doi.org/10.35755/jmedassocthai.2021.11.13117

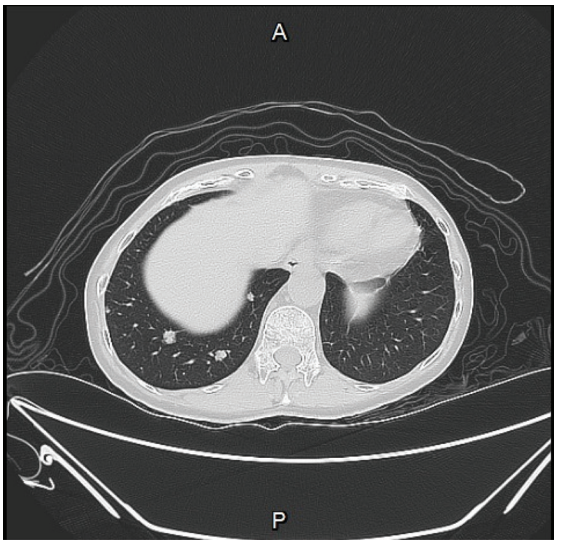

Figure 2. Chest computed tomography showed multiple lung nodule both lungs.

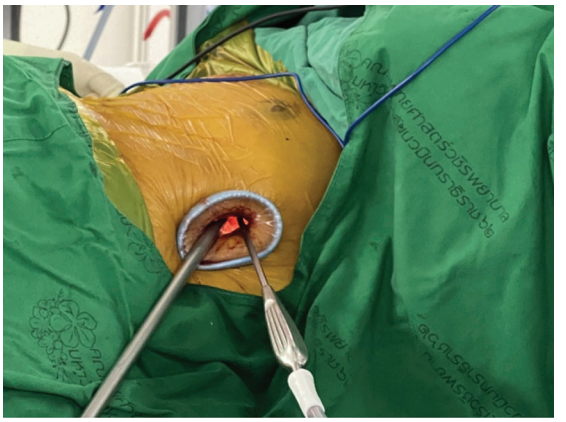

Figure 3. Surgical instrument through subxiphoid incision.

operative days. The patients were doing well after 30 and 90 days post-surgery.

Operative technique

The patient was placed in a left semi-lateral decubitus position slightly rotated posteriorly at 60 degrees, for exposure of the subxiphoid region. A 3.5 cm midline vertical incision was made below xiphoid process. A linea alba was identified, dissected, and then pleural cavity was entered by using dissector clamps above the level of the diaphragm. A wound protector was introduced to create a space for the instrument and a 30-degree 10 mm camera (Figure 3). Pulmonary lesions were identified and wedged by using an Endo-GIA articulating endoscopic stapler. For anesthesia technique, glycopyrrolate was administered during induction to reduce oral secretion. During the operation, propofol was used for slight sedation and maintained with a bispectral index of 40. For oxygenation, an oxygen mask with reservoir bag was used with flow rate of 10 L/minute (FiO_2 1.0) to kept oxygen saturation above 90. Intra-operative, the authors did not use any CO_2 insufflation or inserted any Foley catheter, arterial line, or intercostal chest drain.

The patients had uneventful post-operative care. Oral analgesics were administered resulting in postoperative pain score of only 1. All patients were discharged two days after the surgery.

Discussion

At present, transthoracic thoracoscopic surgery is the most common approach for all thoracic surgery. In 2014, Liu et al reported that they had performed a successful case of subxiphoid thoracoscopic lobectomy[3].

Since then, numerous studies have been reported about the benefit of less post-operative pain in subxiphoid approach[4,5]. Most studies showed benefits of less chronic post-thoracotomy pain. The incidence of chronic post-thoracotomy pain occurred in approximately 50% of the cases after thoracotomy, with 5% of severe and disabling pain for the patient[6]. These symptoms were most likely caused from intercostal nerve injuries, which usually could be avoided. However, the subxiphoid approach is more difficult and technically demanding than the transthoracic approach.

When the authors used a combination of uniportal subxiphoid VATS approach and non-intubated anesthesia, the method benefited in term of peri- and post-operative recovery and reduced intubation-related and general anesthesia complications.

To the best of the authors knowledge, the uniportal subxiphoid thoracoscopic surgery or Tubeless technique, under spontaneous ventilation is still infrequently performed. Therefore, the present study showed that this method could be a benefit in the near future.

Conclusion

The authors reported a successful case series of subxiphoid VATS under spontaneous ventilation as tubeless surgery, for pulmonary resection. This novel surgical approach could be an alternative way in management of pulmonary resection with less post-operative pain and shorter hospital stay.

What is already known on this topic?

Pulmonary resection under spontaneous ventilation was an alternative approach for thoracic surgery with comparable outcome as the mechanical ventilation. Subxiphoid approach could be a benefit with less post-operative pain after thoracic surgery.

What this study adds?

This is the first report of successful cases of tubeless non-intubated video-assisted thoracoscopic surgery (NIVATS) through subxiphoid approach in Thailand.

Conflicts of interest

The authors declare no conflict of interest.

References

1. Hwang J, Shin JS, Son JH, Min TJ. Non-intubated thoracoscopic bullectomy under sedation is safe and comfortable in the perioperative period. J Thorac Dis 2018;10:1703-10.
2. Laohathai S, Wannadilok P, Poopipatpab S, Pathonsamit C. Nonintubated video-assisted thoracoscopic surgery using local anesthesia for catamenial pneumothorax. Ann Thorac Surg 2021;111:e245-6.
3. Liu CC, Wang BY, Shih CS, Liu YH. Subxiphoid single-incision thoracoscopic left upper lobectomy. J Thorac Cardiovasc Surg 2014;148:3250-1.
4. Song N, Zhao DP, Jiang L, Bao Y, Jiang GN, Zhu YM, et al. Subxiphoid uniportal video-assisted thoracoscopic surgery (VATS) for lobectomy: a report of 105 cases. J Thorac Dis 2016;8(Suppl 3):S251-7.
5. Wang BY, Chang YC, Chang YC, Wang KM, Lin CH, Lin SH, et al. Thoracoscopic surgery via a single-incision subxiphoid approach is associated with less postoperative pain than single-incision transthoracic or three-incision transthoracic approaches for spontaneous pneumothorax. J Thorac Dis 2016;8(Suppl 3):S272-8.
6. Rogers ML, Duffy JP. Surgical aspects of chronic post-thoracotomy pain. Eur J Cardiothorac Surg 2000;18:711-6.