

Uniportal video assisted thoracoscopic surgery right upper sleeve lobectomy- The first experience in Hospital Kuala Lumpur

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SUMMARY

Sleeve lobectomy is a lung sparing surgery and is the preferred alternative to pneumonectomy for centrally located tumours, which has less postoperative morbidity and mortality. Surgical approach for the technically demanding sleeve lobectomy evolved over the decades from conventional thoracotomy to video assisted thoracoscopic surgery (VATS) to uniportal VATS (uVATS) which allows for quicker recovery and less pain postoperatively. We report our very first successful uVATS sleeve right upper lobectomy performed in the Hospital Kuala Lumpur, Malaysia.

KEY WORDS:

Uniportal VATS, sleeve lobectomy, lung sparing surgery

INTRODUCTION

Sleeve lobectomy is a procedure to remove a portion of main bronchus and the diseased lung, followed by bronchial reconstruction preventing a pneumonectomy in patients with centrally located tumours. This leads to less postoperative morbidity and mortality with equal oncological outcome and superior long-term quality of life.¹ Sleeve resections of the lung was first performed via thoracotomy in 1947 and evolved over the decades to be executed by video assisted thoracoscopic surgery (VATS) using multiports in early 2002 and recently uniportal VATS (uVATS).^{2,3} In 2013 Gonzalez-Rivas demonstrated that this complex and skill demanding surgery can be done by uVATS and the technique has since been adopted by many thoracic surgeons. The advantages of uVATS include quicker recovery and less postoperative pain.¹ We report our very first experience in uVATS right sleeve upper lobectomy for mucoepidermoid carcinoma of right upper lobe and main bronchus.

CASE REPORT

A 35-year-old lady presented with cough and haemoptysis in her 32nd week of pregnancy. Chest X-Ray (CXR) revealed a collapsed right upper lobe and contrast enhanced computed tomography (CECT) thorax showed a centrally located tumour at right upper lobe bronchus infiltrating into the right main bronchus (RMB) (Fig 1 a & c). Bronchoscopy showed the tumour occluding the whole of right upper lobe bronchus and extending into the RMB which was about 1cm from the carina (Fig 1 b). The biopsy revealed mucoepidermoid carcinoma.

She was planned for delivery at 36th week gestation by caesarean section. After completing her confinement period, she underwent uVATS right upper sleeve lobectomy. Under general anaesthesia, she was positioned in left lateral with right lung isolation by double lumen intubation. Both the surgeon and the assistant stood in front of the patient. A 4cm incision was made at the right sided 4th intercostal space, over the anterior axillary line without the ribs spreading. Wound protector was applied to ease introduction of the VATS instruments. A 30-degree angled 10mm telescope was used with a high definition video system.

Truncus anterior artery and superior pulmonary vein were divided using vascular stapler respectively, followed by division of fissure, leaving the bronchus last. Lymph node dissection was then carried out at paratracheal, subcarinal, paraesophageal, hilar and inferior pulmonary ligament. Azygos vein was divided to facilitate bronchial dissection and anastomosis. Intermedius bronchus was circumferentially cut just after the upper lobe bronchus take off until a good margin was seen. RMB was resected near the carina enabling the upper lobe specimen to be removed using an endobag (Fig 2a). Frozen section confirmation of negative malignancy in the resected bronchial margin was obtained before anastomosis. Intermedius bronchus was anastomosed to the remnant RMB using prolene 3/0 suture in continuous method. Lung was inflated with no air leak detected. The bronchial anastomosis was not buttressed with any tissue. A drain was inserted through the same incision (Fig 2d).

The patient was extubated immediately after surgery and post-operative CXR showed an expanded right lung (Fig 2c). Postoperative bronchoscopy showed a healthy and patent anastomosis (Fig 2b). She was discharged on day 6 of surgery. Histopathology report confirmed a low grade mucoepidermoid carcinoma, with good surgical margin. None of the 15 lymph nodes removed were malignant.

DISCUSSION

Sleeve lobectomy is advocated whenever feasible for centrally located tumour to preserve maximum normal lung parenchyma, lung function and to avoid pneumonectomy. Sleeve lobectomy was once an absolute contraindication by VATS due to concerns of oncological clearance and technical complexity.⁴ With the rapid development of video technology, thoracoscopic instruments, evidence and knowledge sharing via multiple published reports, uVATS approach is more frequently used for this complex surgery.⁵

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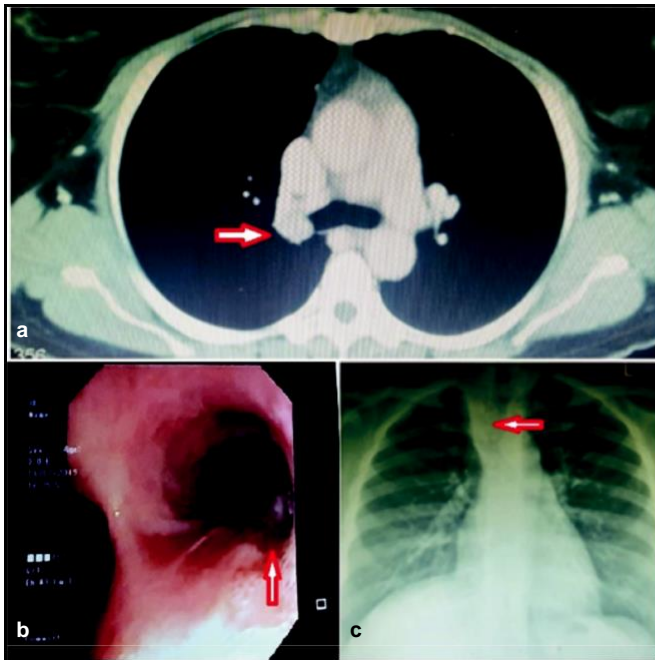


Fig. 1: a) CT thorax showing tumour at the right main bronchus (RMB). b) Bronchoscopy view of carina with tumour seen at RMB. c) Preoperative CXR showing collapsed right upper lobe.

In uVATS sleeve lobectomy, sharp dissections are performed on the bronchus instead of using energy device to reduce risk of bronchial necrosis and anastomosis dehiscence. To achieve a tension free anastomosis, prior radical lymphadenectomy and release of inferior pulmonary ligament are performed.^{2,5}

The main challenge of this surgery is bronchial reconstruction where advance and delicate uVATS skills are required for end-to-end anastomosis within the confined space having vital structures like pulmonary artery and oesophagus in the vicinity. The complications to be avoided are anastomotic dehiscence, stenosis, bronchopleural or bronchovascular fistula which often results in pneumonectomy. Despite these potential complications, recent study reported that the bronchial anastomosis is safe without any tissue flap buttressed for protection.³

Performing uVATS sleeve lobectomy did not compromise oncological safety in this patient. Good pathological margin was achieved with high lymph node ratio without any nodal involvement. This was similarly reported by Koryllos et al. and Zhou et al. in their experience.^{1,4}

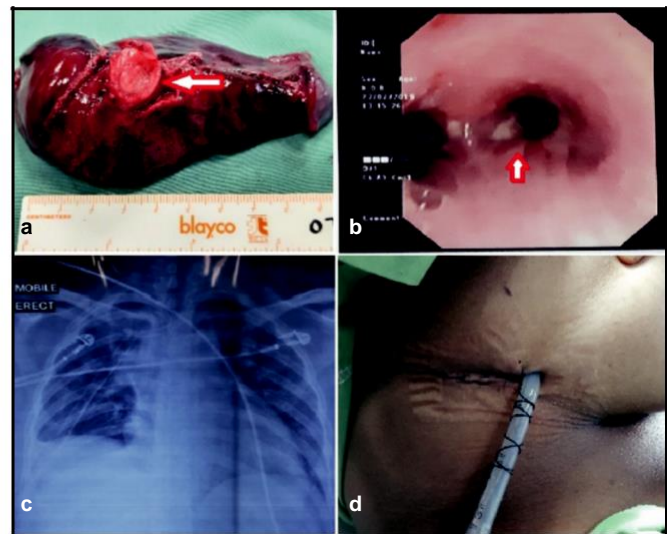


Fig. 2: a) Resected right upper lobe with tumour in the RMB b) Postoperative bronchoscopy showing patent anastomosis of right intermedium bronchus to RMB. c) Postoperative CXR with expanded lungs d) The small uVATS incision

uVATS sleeve lobectomy is an advance thoracic procedure to be performed safely in the hands of well-trained thoracic surgeons. By performing this procedure, prevention of pneumonectomy as well as reduction in postoperative pain greatly improves patient outcome.

REFERENCES

1. Koryllos A, Stoelben E. Uniportal video-assisted thoracoscopic surgery (VATS) sleeve resections for non-small cell lung cancer patients: an observational prospective study and technique analysis. *J Vis Surg* 2018; 4-16.
2. Gonzalez-rivas D, Fernandez R, Fieira E. Uniportal video-assisted thoracoscopic bronchial sleeve lobectomy: First report. *J Thorac Cardiovasc Surg* 2013; 145(6): 1676-7.
3. Storelli E, Tutic M, Kestenholz P, Schneider D, Opitz I, Hillinger S, et al. Sleeve resections with unprotected bronchial anastomoses are safe even after neoadjuvant therapy. *Eur J Cardiothorac Surg* 2012; 42(1): 77-81.
4. Zhou S, Pei G, Han Y, Yu D, Song X, Li Y, et al. Sleeve lobectomy by video-assisted thoracic surgery versus thoracotomy for non-small cell lung cancer. *J Cardiothorac Surg* 2015; 10: 116.
5. Gonzalez-rivas D, Fieira E, Delgado M, Torre M De, Mendez L. Uniportal video-assisted thoracoscopic sleeve lobectomy and other complex resections. *J Thorac* 2014; 6: 674-81.