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Case Report

Uniportal Thoracoscopic Right Lower Lung Lobectomy for Ground Glass Lesion, First Time in Our Hospital

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Abstract

A 66-year-old lady was referred to the thoracic surgery service from respiratory clinic at king Hamad hospital with an incidental finding of right lower lung lobe ground glass densities. She underwent a uniportal thoracoscopic right lower lung lobectomy. The minimally invasive operation was successfully performed King Hamad university hospital which was the first of its kind in the center. Histopathology showed single focus of invasive adenocarcinoma.

Keywords: *Video-Assisted Thoracoscopic Surgery; Uniportal Lobectomy; Lung Cancer; Lung Nodule; Lung Adenocarcinoma; Minimal Invasive Surgery*

Abbreviations

VATS: Video-Assisted Thoracoscopic Surgery; CT: Computed Tomography; PET-CT: Positron Emission Tomography; SUVmax: Maximum Standardized Uptake Value; FDG: Fluorodeoxyglucose; ICU: Intensive Care Unit; UVIG: Uniportal VATS Interest Group; ESTS: European Society of Thoracic Surgeon

Introduction

Video-assisted thoracoscopic surgery (VATS) is usually carried out with three or four incisions. A relatively new approach is the single port or uniportal video-assisted thoracoscopic lobectomy [1]. Although VATS lobectomy is an emerging technique for the surgical resection of non-small cell lung cancer, there are few reports on uniportal VATS in Middle Eastern countries. These worldwide experiences and promising results in uniportal VATS encouraged us to introduce this technique in our country. In this case report we describe the first patient to be operated in our center using the single port approach.

Case Presentation

A 66 -year- old lady known to have hypertension, asthma and hypothyroidism was referred to the thoracic surgery service from respiratory clinic at King Hamad University hospital due to an incidental finding on the patient's CT chest which reported a 21 x 13 mm pulmonary nodule in the right lower lobe. The reported CT Chest with contrast was done as part of a follow up plan for right lower lobe ground glass infiltrates that were detected first on 07/01/2020 and warranted further imaging as malignancy could not have been ruled out. She is an ex-smoker (Smoked for a duration of 6 months, 8 cigarettes per day, and stopped smoking 20 years ago). She has had no significant family history of cancer. She had chronic dyspnea on exertion for many years.

Upon performing further investigations, PET-CT showed a questionable low grade FDG activity of the right lower lobe; posterior basal segment with an SUVmax of around 1.7.

A follow up CT guided biopsy of the right lower pulmonary nodule was attempted by the interventional radiology team but histopathology showed scant material and a definite diagnosis could not be reached. The differential diagnoses initially included - Reactive alveolar changes adjacent to inflammation versus neoplasm (Atypical adenomatous hyperplasia).

A multidisciplinary team meeting was conducted and the decision was made to proceed with a right lower lobectomy after explaining to the patient the possibility of a benign versus malignant diagnosis. All risks and complications were thoroughly explained to the patient.

Investigations

- The patient's pulmonary function test showed a mild obstructive pattern with a forced expiratory volume of 86% predicted.
- A high resolution CT chest was performed on 3rd March 2020 which showed a right pulmonary nodule in the Lower lobe; posterior basal centrilobular, non-calcific, mixed solid and ground glass densities, surrounding fine reticulation and a size of 21 x 13 mm.
- PET-CT done on 16th March 2020 showed questionable low grade FDG activity of the right lower lobe with a SUV max of around 1.7.
- A follow up high resolution CT chest after 6 months on 18/10/2020 showed stable findings (Figure 1).
- CT-guided biopsy of right lung nodule was inconclusive.

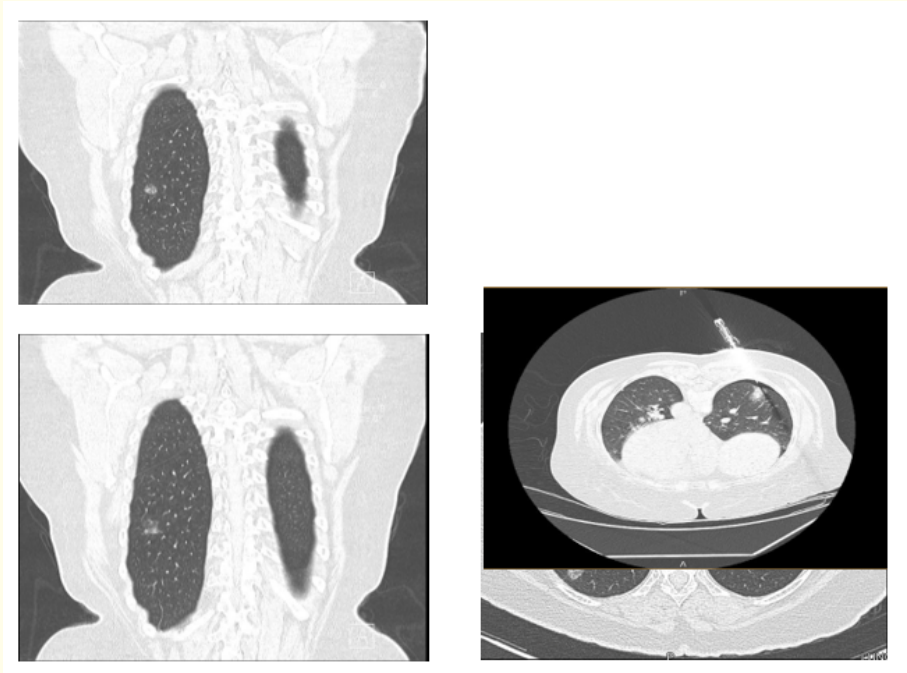

Figure 1: *Shows CT images and biopsy attempt.*

Differential diagnosis

The differential diagnose for this case was either benign inflammatory changes or malignancy or atypical adenomatous hyperplasia.

We had a high index of suspicion for malignancy therefore after discussing the case in the National Tumor Board, we decided to offer the patient a right lower lobectomy after explaining to her the above-mentioned differentials.

Treatment

The patient agreed to proceed with the surgery after understanding all the risks and complications. The unique operation was carried out for the first time in King Hamad University Hospital in the Kingdom of Bahrain. The patient was kept under general anaesthesia and intubated with a double lumen endotracheal tube. In the left lateral position, a horizontal incision of around 5 cm was made over the right axillary safety triangle, the incision was deepened till the pleura was punctured and the right thoracic cavity was entered. All the instruments were inserted through this incision including a 10 mm scope at 30 degrees. The right lower lobe was identified and dissection was carried out to release it from all its attachments. The right lower pulmonary vein, pulmonary artery, and right lower bronchus were stapled in sequence. The specimen was extracted using an Endo-bag. On gross examination, a hard palpable mass was felt which was suspicious for malignancy.

An intercostal drainage tube (size 28Fr) was kept through the wound and the area was closed with nylon sutures. The operative time was approximately 240 minutes.

The patient remained clinically stable throughout the operation and was then transferred to the ICU where she stayed for one night only for close observation. She was then transferred to the ward where she was kept on antibiotics, prophylactic anticoagulation, proton pump inhibitors and incentive spirometry. Her pain management requirements were minimal. She was given paracetamol, diclofenac and oxycodone as inpatient during her hospital stay. All of them were oral agents. The right intercostal drainage tube was removed on day five and the patient was discharged in stable condition. Patient was discharged on Paracetamol 1g every 6 hours as needed for 1 week, Oxycodone 5 mg every eight hours as needed for 5 days and oral antibiotics cefuroxime 500 mg twice daily for five days along with proton pump inhibitor.

Outcome and follow-up

The patient's wound healed very well and she had no complications post operatively (Figure 2).

Figure 2: *Shows the healed port site wound.*

The final histopathology report of the specimen was Right Lung Adenocarcinoma, Grade I, pT1bN0M0, with R0 resection. The case was discussed again in the National Tumour Board and the final decision was to refer her to a medical oncologist for assessment. She was reviewed by the medical oncology team and advised that there was no indication for any chemotherapy. She will be followed up in 3 months with a CT scan of the chest and mammogram. Chest CT on the 6th April 2021 showed right lung upper lobe posterior segmental and middle lobar posterior multiple pleuro-parenchymal fibrotic linear bands with mild pleural effusion and extra-pleural fat plane thickening. Otherwise, no significant changes.

Discussion

Uniportal thoracoscopic lobectomy was first described by Diego Gonzales in 2011 [2]. It is used for a wide range of diseases from benign to malignant diseases of the lung, pleura and mediastinum including diagnostic and therapeutic procedures [3-5]. He listed the advantages of this approach which include less postoperative pain [2]. The possible drawback of this method is field vision limitation if the operator is inexperienced, but Gonzales mentioned with the use of a 30 degrees thoracoscope and correct coordination of the camera and surgical instruments the entire operation can be carried out smoothly with no instrument competition [2]. Uniportal thoracoscopic surgery has many benefits and advantages including less postoperative morbidity, less duration of postoperative drainage, with less post-operative analgesia requirement and fast recovery time [6]. In addition, if there are any difficulties or complications encountered such as bleeding, lymph node invasion or adhesion, the surgeon may convert from uniportal VATS to formal thoracotomy [7]. Another well-known benefit is less incisions and trocars use [8].

Gonzales later published a paper in 2013 about his experience with uniportal Lobectomies. A total of 102 major lung resections were included in which 97 of them underwent a successful uniportal lung resection. His operative time ranged between 60 - 310 minutes and the median hospital stay was 3 days [9]. His surgical technique involved making a 4 - 5 cm incision at the fifth intercostal space and introducing a 30 degrees camera alongside two or three long and curved instruments. A trocar is not used as it will take valuable space from the utility incision. Camera placement in the incision depends on the anatomical resection intended [9]. In our case, the patient was placed in left lateral position and the surgeon was standing to her left-hand side with the assistant holding the camera on the opposite side. This allowed for greater mobility and exposure of the right lower lobe.

Recently, in 2019 a Delphi consensus report from the Uniportal VATS Interest Group (UVIG) of the European Society of Thoracic Surgeon (ESTS) was published and they concluded that UVATS is a valid alternative to Multiportal Video-assisted Thoracoscopy [10].

Conclusion

- Uniportal lobectomy combines the benefits of the classical Multiportal VATS and Thoracotomies. If done by proper experienced thoracic surgeons it yields the same results as the above-mentioned procedures.
- Uniportal Lobectomies are gaining more acknowledgement due to the fact that patients have less post-operative pain and there is a possibility for the procedure to be extended to a thoracotomy in case of any complications intraoperatively.

Conflict of Interest

The authors declare no financial interest or conflict of interest.

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