Introduction of Video- Assisted Thoracic Surgery (VATS) at Shree Birendra Hospital

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Introduction:

Minimally invasive surgical techniques have been developed for most aspects of general surgery & the surgical specialities including thoracic surgery & more recently cardiac surgery have been no exception to this trend. Although thoracoscopy has been a recognized approached to the thoracic cavity since early in the 20 th century it is only with the introduction of Video imaging techniques in the last 1980s that the field of thoracoscopy has expanded into Video-Assisted thoracic surgery (VATS).

The keystone of minimally invasive surgery is the introduction of a Video Camera (Thoracoscope) through a small incision for intra cavity (Intra thoracic cavity) visualization. Similar incision may be placed at strategic location on chest to insert instrument designed to function through small access ports. The use of lasers and development of endoscopic staplers permitted direct therapy for bullous, disease of Lung, wedge resection of the lung for Biopsy and resection of pulmonary masses.

Hans Jacobaeus proposed thoracocscopy in 1910 AD and performed the first procedure in 1913 AD. He introduced a cystoscope into the pleural cavity to Lyse adhesions to inhance pneumothorax for the therapy of Tuberculosis.

Anaesthesia: Most Video procedures are performed with patients under general endotracheal anaesthesia with double lumen endotracheal tube to effect one Lung collapse. Some centers perform thoracoscopy under Local Anaesthesia.

Video Equipment : The difference between Video-Assisted procedure and open procedure is the methods of viewing. The difference of visualization from direct vision to Video assisted images on a monitor introduces a fundamental change in perception and motor orientation. Camera and thoracoscope system is a rigid lens thoracoscope with light fibers and an operating channel. The Camera is attached to the eyepiece of the thoracoscope and a Video image for Camera connected to Video monitor.
The Video system consists of the television Camera mounted on the thoracoscope.

Operating Equipment: Currently available operating instruments attempt to duplicate the function of standard instruments with extended blades and a shaft that can be inserted through a intercostal ports e.g., forceps, scissors, cautery, hemoclips applicators, retractors. Two devices have done much to advance the scope of VATS intervention, Endoscopic stapling devices and the Nd:YAG laser.

A standard thoracotomy instruments set should be in the operation room for conversion to an open thoracotomyif a significant complications occurs.

Indication of VATS:

1) **Procedure**
   - i) Diagnosis of indeterminate pleural effusions
   - ii) Treatment of malignant pleural effusions
   - iii) Diagnosis of indeterminate pleural malignant masses
   - iv) Wedge resection for diagnosis of diffuse Lung disease
   - v) Management of recurrent or persistents spontaneous pneumothorax
   - vi) Sympathectomy Thoracic

2) **Accepted Procedure**
   - i) Management of early Emphyema
   - ii) Management of Clotted hemothorax
   - iii) Diagnosis of Indeterminate Lung Nodule
   - iv) Wedge resection for cancer in patients with limited pulmonary function
   - v) Spontaneous pnemothorax due to bullous Lungdisease
   - vi) Management of effusive pericardial disease
   - vii) Lung volume reduction Surgery
   - viii) Diagnosis of Anterior Madiastinal Masses
   - ix) Management of Posterior Madiastinal Masses
   - x) Treatment of benign Oesophageal diseases

3) **Advantage of VATS yet to be proved**
   - i) Lobectomy
   - ii) Thymectomy
   - iii) Spine Procedure
   - iv) Cardiac Procedure

Patient Selection : As experience with VATS has developed, the selection of patients has became a patient related & with small intercostals interspace incisions, it is possible to perform nearly all intrathoracic procedure Videoscopically. The decision to proceed with a Video-assisted procedure is no longer dependent on the procedure to be performed but rather on the presence or obsence of intrapleural adhesions, the completeness of intra pulmonary fissure development and ability to control ventilation.

Patient with previous thoracotomies or with history of extensive pleural diseases are not good condition for Video-Assisted procedure, since a complete pneumothorax with good visibility is diffcult to obtain.

If visibility becomes in adequate or if the dissections becomes difficult the accessory incisions can easily be extended to an open thoracotomy.

Case Report VATS-I

1) Mr. P.B.G. 45 yr. Old retired army soldier was a admitted in Chest Dept. on 16/02/2059 with difficulty in breathing on exertion for last one year provisingly Diagnosed as Miliary TB/Silicosis.
2) *Investigation:*
   Routine Blood Count and ESR was within normal limit
   Sputum AFB Negative

X-Ray Chest showed – Bilateral Miliary opacity both Lungs.
Spiromerty : VC – 76%
FVE – 72%
FEV – 73%
Bronchoscopy done on 17/02/2059 showed no intrabronchial lesions.

3) *Referred to Cardio-* Thoracic Surgery for open Lung Biopsy on 06/04/2069 with Provisional Diagnosis of :
Silicosis
Miliary TB
Idiopathic Pulmonary Fibrosis
Lymphoma
Hypersensitive Pneumonitis

4) *Operation:*
Rt. Thoracoscopic Lung Biopsy was done under GA using Karl Storz optical Camera Video System and Auto suture stepler and using 3 intercostal porsts.
Finding :
Multiple Nodular lesions on Lung surface.
Procedure :
Wedge resection of Rt. Upper lobe Lung done with help of Endo Auto Suture Stapler. Patient had smooth postoperative recovery and Discharged on 20/04/2059.

5) *Histopathology Report :*
Showed Focal Anthracotic pigmentation in hyalinized collagen tissue consistent with silicosis.

Case Report – II

1) Mr. H.K.D. 76yr. tather of a soldier admitted in Chest Dept. on 31/06/2059 with fever cough and breathlessness one month with diagnosis of ? CA Lung or With ? PTB

2) *His Investigations:*
- Blood Count Normal with raised ESR
- X-Ray Chest showed Lt. Pleural Effusion with mass lesion on Lt. Lung
- Spirometry VC – 49%
  FVC – 48%
  FEV1 – 55%
- Bronchoscopy 02/07/2059 no intrabroncheal mass lesion
- Pleural Tape Aspirated
- 500 ml Blood mixed fluid, Microscopic Picture shows no malignant cell and no AFB seen.

3) *Refered to Cardio-* Thoracic Surgery on 09/08/2059

4) Operation with Thoracoscopy under LA and Sedation on 13/08/2059.

Finding
- Pleural Effusion with Pleural Adhesions
- Lung Mass could not be localized due adhesions and pleural thickening
- Biopsy of pleura taken and sent for Histopathological Examination.
- Pathology showed
  1. Mild Pleuritis
  2. No Malignancy

Discussion: Video-Assisted thoracic surgery (VATS) has been started in Shree Birendra Hospital in this year 2059 BS 2002 AD Video-Assisted Thoracoscopic Surgery is a useful surgical procedure for diagnosis & therapeutic use for Thoracic diseases. This surgical procedure should be utilized more frequently for suitable cases for quicker post operative recovery and short hospital stay and this is comparatively less painful than formal thoracotomy & surgical scar is smaller.

At times in selected cases this procedure can be done under local anaesthesia. With the use of VATS surgery. Lots of staplers are to be used which is quite expensive in our local market. The benefit of less pain, quicker recovery and shorter hospital stay has to be compared against high cost of disposable materials being used in VATS surgery.

Conclusion: Video- Assisted Thoracoscopic Surgery (VATS) is an advance surgical procedure which should be utilized more frequently for diagnosis and treatment of Thoracic Diseases. With the gain in experience this VATS procedure this can be utilized for treatment of most of the Thoracic Diseases.

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