

Video Assisted Thoracoscopic Surgery (VATS) Lung biopsy for non-responsive patients of Interstitial Lung Disease (ILD)

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Abstract

Objective: To study the results of VATS (Video Assisted Thoracoscopic Surgery) Lung Biopsy in Interstitial Lung Disease (ILD)

Study Design: Case series

Place and Duration of Study: Department of Thoracic Surgery, CMH Rawalpindi from Jan 2009 to Mar 2010

Patient and Methods: All those patients of ILD (Interstitial Lung Disease) were included who failed to improve after a period of observation including those on empiric therapy, all patients in which BAL (Bronchoalveolar Lavage) and TBLB (Transbronchial Lung biopsy) was inconclusive and all those patients fit to undergo thoracoscopic surgery. Patients excluded were elderly patients, those with systemic disorders frequently associated with ILD and those with known neoplasm likely to have lymphangitic dissemination. We used three thoracoscopic ports, all biopsies were sent for histopathology examination, single chest tube was placed in all cases and it was removed once the airleak ceased. All complications encountered were noted.

Results: Fourteen patients were registered during study period. Biopsy showed that 9 had ILD, and 5 did not have ILD. Only complication was a prolonged airleak for 2 days in 2 patients. No mortality was encountered.

Conclusion: Thoracoscopic surgical biopsy can be accomplished safely in most cases where there is a diagnostic dilemma for interstitial lung disease.

Keywords : Interstitial lung disease, non responders, VATS.

Article

INTRODUCTION

The modern technologies on one hand hold promise of revolutionizing our society on the contrary advancements like the nanotechnology have increased the risks for interstitial lung diseases¹. Interstitial Lung Diseases (ILDs) / Diffuse parenchymal lung diseases (DPLDs) are characterized by generalized or extensive multifocal involvement of the pulmonary parenchyma. More than 100 disorders have been classified as diffuse diseases and are grouped together because of common clinical, histologic, and radiographic features². The importance of exact diagnosis is becoming important as technologies like mesenchymal stem cell are in the offing³.

The role of the thoracic surgeon in DPLD is mainly diagnostic. Invasive approaches are adopted when the clinical synthesis does not produce a confident diagnosis, when the course of disease is atypical, when it is necessary to assess disease activity, and occasionally for legal and compensation purposes. Histopathological correlation is especially required in the Paediatric age group patients of interstitial lung disease⁴. Tissue diagnosis can be achieved through BAL and TBLB done through flexible bronchoscopy. It can also be obtained by Surgical Lung Biopsy done by open or video assisted thoracoscopic surgery (VATS) techniques. When surgical biopsy is considered, the surgeon plays an important role by deciding the timing, method and choice of procedure for biopsy. Open lung biopsies are accompanied with a morbidity of a mini thoracotomy but the minimally invasive procedures have a definitive edge. The world is now turning over to minimally invasive procedures and even the most tedious of procedures like excision of ectopic parathyroid glands are

now being attempted by VATS⁵. Comparatively VATS Lung biopsy is a minor procedure and probably underutilized. In present article we present data for the evaluation of requirement of tissue diagnosis in patients of ILD especially those not responding to treatment and the results of VATS lung biopsy.

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Patient and Methods

This is a case series compiled at Department of Thoracic Surgery Combined Military Hospital Rawalpindi which is a tertiary care centre. The study was carried out from Jan 2009 to Mar 2010. Those patients were considered for biopsy who were being treated as interstitial lung disease and were not responding to empiric therapy. BAL and TBLB were inconclusive in all these patients. Fitness to undergo one lung ventilation for thoracoscopic surgery was taken from the anaesthetist. The patients of interstitial lung disease in which the subsequent clinical or radiographic course was atypical after treatment for the presumed diagnosis were also subjected to biopsy. While the patients who were too old or frail to tolerate the procedure and had clinical and radiographic features typical of IPF were excluded from the study. Also excluded were those having systemic disorders frequently associated with DPLD (e.g., connective tissue disease), and those with known neoplasm likely to have lymphangitic dissemination.

All the patients were booked and a demographic workup performed. A preanaesthesia assessment was done. We used the three port approach. One was for camera and the other two working ports. We used long rotating instruments and endostapling devices with a combined staple and cut feature. After anaesthetizing the patient with a double lumen tube alternately the tube was clamped and the fall in saturation observed with a view that the more affected lung will exhibit a fall in saturation. The chosen lung was then deflated and biopsy specimen was taken. After the biopsy the staple line was observed for hemostasis and airleak. Additional Liga clips were applied if required to address the problem. Thereafter instruments were withdrawn and positive pressure ventilation was done to assess the inflation of lung under vision. One chest tube was placed through the camera port. This tube was removed and retaining stitch tightened when postoperatively the airleak stopped. Other port sites were closed primarily. The biopsy specimen was sent in diluted formalin solution and biopsy report then followed up. We used Microsoft excel to assess the data.

RESULTS

A total of 14 patients were registered during the study period. Male : Female ratio was 9:5 and average age was 48 + 9.6. Out of these the biopsy reported to have a variety of ILD in 9 of patients, diagnosed it to be a disease other than ILD in 4 patients and it was non specific inflammation in one of the patients. (Figure). In patients of ILD, 2 had desquamative interstitial pneumonia, 3 had BOOP, 1 had Alveolar protienosis and in 3 patients further subcategorization of interstitial lung disease was not possible. The other five patients which were not ILD had Lymphocytic Infiltration, Ch Non Specific Inflammation, Emphysematous Change each and Ch Bronchiectasis in two patients. Post operatively Staple line leak was observed in 2 patients and resolved within conservative time of one week. While we had no empyema, lung injury or procedure related mortality.

DISCUSSION

ILD is much more than just an interstitial pneumonia⁶. Moreover this disease entity is a classical example for diseases having interobserver diagnostic variability at all levels⁷. To go for their surgical biopsy is yet another challenging task requiring utmost care and perfection. These dyspnoeic patients can hardly tolerate any intervention under LA and barely maintain their saturations under general anaesthesia, thereby requiring advanced anaesthesia managements. In these circumstances the surgical dexterity has to be expeditious yet precise. Open lung biopsy has been the usual practice but has its own limitations as described by Herber K and Ronald P². VATS lung biopsy allows assessment of most of the lung, as opposed to the limited exposure afforded by standard open biopsy by anterior thoracotomy. VATS biopsy is also cost-effective and can safely be performed on an outpatient basis.

Open lung biopsy is helpful not only in the diagnosis of various diseases but also in the evaluation of their clinical outcome⁸⁻¹¹. Our experience with VATS biopsy has remained a satisfactory one. We

had prolonged air leak as the only complication. This problem of prolonged air leak was with the patients having a very friable lung with an extensive disease. There was no incidence of infection or bronchopleural fistula formation. The endostappling and cutting devices are very user friendly and allow the satisfactory completion of the procedure. The retrieval of the cut tissue is a tricky business especially if it slips out of, however with adequate training at surgical skill this does not remain a real issue.

Out of all the patients referred to our department for confirmation of the diagnosis 65% of patients were proven to be suffering from ILD. Their treatment was started in the light of the histopathology report. In this study we have found that 35% patients were actually not suffering from ILD. The treatment regimens had to be revised for these patients. In all patients the gold standard is the lung biopsy. This is just the tip of the ice berg because the exact number of patients taking treatment for ILD in this subset of population can only be delineated by the pulmonologists. So we recommend that these results should only be interpreted for a thoracic surgical center only.

CONCLUSION

A sizeable proportion of the patients who are referred to thoracic surgical center for lung biopsy for ILD are not actually suffering from the disease. Thoracoscopic surgical biopsy can be accomplished safely in most of these cases. Surgical biopsy remains the gold standard.

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