

Limited Axillary Thoracotomy or Posterolateral Thoracotomy vs. Video-Assisted Thoracoscopic Surgery for Recidivant Spontaneous Pneumothorax
Our Experience



Healthcare

Keywords: thoracoscopic surgery, PNX, VATS surgery, PSP, LAT/PLT cases, etc.

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Abstract

Video-assisted thoracoscopic surgery (VATS) has been reported to have a higher pneumothorax recurrence rate than limited axillary thoracotomy (LAT) or postero-lateral thoracotomy (PLT). We investigated the cause of pneumothorax recurrence after VATS by comparing surgical results for VATS and LAT or PLT.

Introduction

The term pneumothorax was used for the first time in 1803 by Itard (1). Pneumothorax (PNX) is defined as the entry of air into the pleural space (2). Over half of pneumothoraces are traumatic (accidental or iatrogenic); the remaining occur without any preceding trauma and are labelled spontaneous (2,3).

Although intrapleural pressures are negative throughout most of the respiratory cycle (4), air does not enter into the pleural space because the sum of all the partial pressures of gases in the capillary blood averages only 93.9 kPa (706 mmHg).

Hence, net movement of gases from the capillary blood into the pleural space would require pleural pressures lower than -54 mm Hg (i.e. lower than -36 cmH₂O), which hardly ever occur in normal circumstances (5).

Spontaneous pneumothoraces can be divided into two types – primary and secondary. Primary spontaneous pneumothorax is the idiopathic variety which occurs in otherwise healthy persons. In secondary spontaneous pneumothorax an underlying disease state responsible for the pneumothorax can be identified.

Primary spontaneous pneumothorax (PSP) has an incidence of 7.4 to 18 cases (age-adjusted incidence) per 100,000 population each year in males, and 1.2 to 6 cases per 100,000 population each year in females (6,7). PSP typically occurs in tall, thin subjects. Other risk factors are male sex and cigarette smoking.

The exact pathogenesis of the spontaneous occurrence of a communication between the alveolar spaces and the pleura remains unknown. Most authors believe that spontaneous rupture of a subpleural bleb, or of a bulla, is always the cause of PSP (8), but alternative explanations are available (9,10,11,12).

Objective of the study

1.To have an overview of features of PNX according age, and site. 2.To analyse our patients treated by VATS and Limited axillary thoracotomy LAT or posterolateral thoracotomy PLT in terms of operating

duration, bleeding during surgery, number of resected bullae, duration of postoperative chest tube drainage, postoperative hospital stay, postoperative complications, and pneumothorax recurrence.

Materials and Methods

This was a retrospective study. We reviewed the medical records of all patients with a spontaneous pneumothorax, treated by either VATS or LAT or PLT, in the Service of Thoracic Surgery I in the University Hospital “Shefqet Ndroqi” between January 2010 to December 2014.

Results

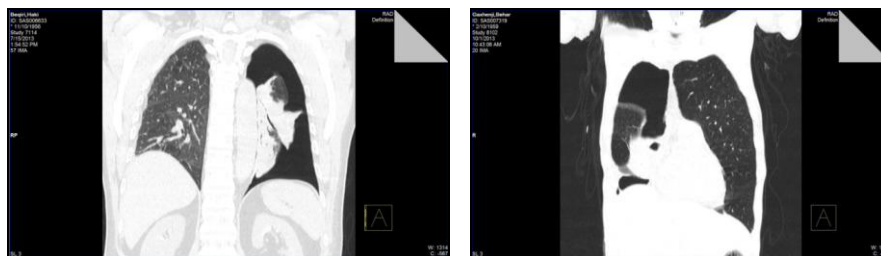
There were 278 patients treated for spontaneous pneumothorax. Male to female ratio was 67,2% : 32,8% (187:91). The procedure was on the right lung in 141 cases (51%), the left lung in 116 (42%), and bilateral in 7 cases (7%). 111 patients with recidivant spontaneous pneumothorax underwent resection of pulmonary bullae by VATS (n= 2), bullae termocauterisation and frutazh pleural (n= 32), apical pleurectomy (n=33), partial pleurectomy (n=27), subtotal pleurectomy (n=6),only frutazh in (n=13) patients.

167 patients recidivant spontaneous pneumothorax underwent resection of the pulmonary bullae, wedge lung resection and frutazh pleural by PLT (posterolateral thoracotomy or limited axillary thoracotomy LAT (n = 140) patients; combined with apical, parcial pleurectomy (n=27) patients.

In all patients were used one pleural drainage, but in 37patients we used double pleural drainage. Bilateral approach by VATS was performed in two patients where as bilateral anterior or posteriorlateral thoracotomy was performed in 7 patients. In two patients we had pneumothorax combined with severe pectus excavatum and hypogenesis of the left lung in one case.

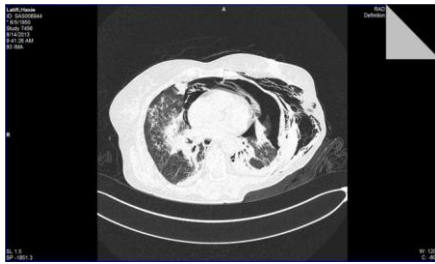
The duration of surgery was a little bit longer in VATS than in LAT or PLT mean time of procedure was 120 ± 30 minutes, vs 90 ± 30 minutes, postoperative chest tube drainage 3-5 days and 3-14 days, and postoperative hospital stay 3-5 and 4-14 respectively was significantly shorter in VATS than in LAT/PLT cases ($p < 0.0005$ and $p < 0.005$).

Bleeding during surgery was significantly less in VATS than in LAT/PLT cases ($p < 0.005$). Numbers of resected bullae were significantly lower single bullae under 2 cm in VATS than in LAT/PLT cases multiple more than one bulae over 2 cm ($p < 0.05$). Postoperative pneumothorax recurrence was more frequent in VATS in 7 patients (6.2%) than in LAT/PLT in 5 cases (3.8%), but there was no significant difference. Post operative hemothorax was in 10 (6%)patients after open surgery and 3 (2.7%) patients after VATS surgery.

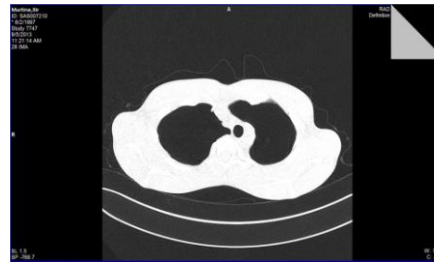


Left total Pneumothorax

Right pneumothorax



Subcutaneous emphysema and PNX after surgical treatment



Bilateral pnx



Axillary vertical approach



Thoracoscopic image of apical blebs in patient with spontaneous pneumothorax



Giant bullectomy by posterior thoracotomy

Discussion

Pneumothorax recurrence represents an actual challenge to physicians and none of the drainage methods (simple aspiration, intercostals tube drainage or even chemical pleurodesis) do guarantee definitive pleural symphyse. The rate of recurrence of ipsilateral pneumothorax in patients treated with non-surgical methods varies widely between 16% and 52% (13-19). Controlateral recurrence occurs in 5–15% cases. Numerous studies have previously examined the predictive value of CTscan for findings for the recurrence of pneumothoraces. In our study all patients was performed CT-scan before the treatment.

Conclusions

VATS has many advantages over LAT/PLT in treating spontaneous pneumothorax, although the pneumothorax recurrence rate in VATS cases was double that in LAT/PLT cases. The lower number or may we say only single bullae less 2 cm of resected in VATS than in PLT or LAT cases suggests that overlooking bullae in operation could be responsible for the high recurrence rate in VATS cases.

We recommend additional chemical, mechanical, surgical pleurodesis in VATS for recidivant spontaneous pneumothorax to prevent postoperative pneumothorax recurrence.

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