How-to-do-it

Pleural flap to prevent lobar torsion: a novel technique

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Received 28 June 2006; received in revised form 4 September 2006; accepted 18 September 2006; Available online 18 October 2006

Abstract

Lobar torsion is reported as very rare but sometimes catastrophic complication if overlooked during the early postoperative period following a lobectomy, though it is totally preventable. In this novel technique, a piece of parietal pleural flap is harvested from the posterior wall of the chest using a hook diathermy while keeping its upper border as close to the apex as possible. Finally, distal end of the flap is secured to the upper edge of the lobe using a fine monofilament absorbable suture. This procedure not only protects the lobe from rotation but also maintains continuous expansion of the lung in the early postoperative period and may, therefore, be a good option to prevent such a serious complication in selected patients following a lobectomy.

Keywords: Lobectomy; Lobar torsion; Patient safety; Perioperative care; Postoperative complications

1. Introduction

Lobar torsion is a rare but serious complication following lobectomy. Rotation of the remaining lobe results in vascular occlusion requiring re-thoracotomy and re-positioning of the lobe unless infarction and/or gangrene have evolved; otherwise completion pneumonectomy is unavoidable [1]. Number of techniques is recommended for fixation of a floppy lobe that is prone to rotate in the literature. Here we present a novel technique that can be used for the same purpose.

2. Technique

In order to prevent lobar torsion, a parietal pleural flap is prepared if it appears that the remaining lobe has a propensity for rotation at the end of a lobectomy. First, the anaesthetist is asked to inflate the lung to identify estimated postoperative localisation of the remaining lung to reach and possible direction of the torsion of the floppy lobe that tends to rotate. Then, a 5–6 cm wide and 8–10 cm long parietal pleural flap is harvested from the posterior wall of the chest using a hook diathermy while keeping its upper border as close to the apex as possible. The pleural flap is retracted gently using a ring clamp as it is mobilised from the chest wall and the inferior margin is determined. Finally, the pleural flap is inverted down and sutured to the edge of the lobe with a running suture using 4/0 monofilament absorbable material or alternatively, tied with a heavy silk suture if the underlying parenchyma appears to be emphysematous (Fig. 1). Care should be taken to avoid twisting and over traction of the flap. The lung is inflated once more to check final position of the fixation before inserting the chest tube(s).

3. Discussion

Lobar torsion is known as very uncommon but sometimes catastrophic complication with a reported incidence of 0.089% in the current practice [2], though it is totally preventable. A high index of suspicion is therefore required at the end of every lobectomy if this potentially fatal condition is to be avoided. It is believed that the middle lobe is the most prone to rotation [1] but reported cases demonstrate that other lobes also have a potential for torsion [2]. Relatively long pulmonary artery and main bronchus may be an explanation for occurrence of the lobar torsion on the left side. Pulmonary ligament is almost always divided following upper lobectomies to improve expansion capability of the remaining lobe(s) to obliterate the chest cavity. However, this manoeuvre increases the risk of lobar torsion, especially in patients with single trunk pulmonary veins. Therefore, it may be a good option leaving the pulmonary ligament intact in order to prevent lobar torsion for those cases that require stitching the lobe to the adjacent thoracic structures (e.g., pericardium, pericardial fat pad or pleura). Even in cases of non-small cell lung cancer (NSCLC),...
lymph nodes at station 9 can be removed without total division of the ligament. On the right side, surgeons usually prefer to fix the remaining lobes (upper-middle or lower-middle lobes), which might in turn limit the expansion capacity of the lung to some extent.

In this regard, using above described pleural flap technique seems superior over other preventive methods. Pleural tent may alternatively be used, but most thoracic surgeons rather use it in order to better manage major air leaks and unacceptable sized postoperative space problems. On the contrary, it has a potential disadvantage of restricting lung expansion, which is indeed, unpredictable in most cases. However, pleural flap not only protects the lobe from rotation but also maintains the ability of remaining lung for continuous expansion in the early postoperative period. From the technical viewpoint, it does not necessitate additional much effort and takes only a few minutes to perform. Furthermore, our initial experience also shows that this additional procedure neither causes further morbidity nor makes future pneumolysis more difficult in patients undergoing re-thoracotomy. This technique is therefore simple and may be a good option to prevent such a serious complication in selected patients following lobectomy.

References