
Mediastinal shift towards postpneumonectomy space in the early postoperative period and its management by simple technique of air insufflation

Sir,

We report a case of early-onset mediastinal shift toward the postpneumonectomy space (PPS) and its management by simple but lifesaving technique of air insufflation into the PPS to restore the mediastinum to its normal position. Our search on the internet (PubMed) revealed that there was

limited literature on the use of air insufflation technique to stabilize the mediastinum in the early postoperative period, although late-onset mediastinal shift to operative side is well known and its management by filling the PPS with a variety of autologous and prosthetic materials is documented in the literature,^[1-3] also documented is the mediastinal shift toward the remaining lung in the early

postoperative period.^[4] Pneumonectomy is associated with many pathophysiologic changes which can adversely affect the patient outcome and is associated with large number of known complications which can occur during or after the procedure and many of these are due to a large PPS.

A 50-year-old male patient presented with a history of single episode of hemoptysis. The patient was investigated and was found to have a left lung mass near the hilum on chest roentgenogram [Figure 1a] and computed tomogram [Figure 1b]. Bronchoscopic biopsy revealed the mass to be malignant (squamous cell carcinoma). Surgical intervention (pneumonectomy) was planned as there was no evidence of distant metastasis. The thoracic epidural catheter, arterial line, and central venous lines were inserted, and a single-lumen endotracheal tube was used. Pneumonectomy was done through posterolateral thoracotomy [Figure 2a] in the fifth intercostal space after resecting part of the fifth rib and harvesting the intercostal muscle flap. Pulmonary artery and veins were individually ligated and divided without opening the pericardium, and left main bronchus was closed with continuous 3-0 polypropylene sutures [Figure 2b] and was further reinforced with the intercostal pedicle flap. Standard thoracotomy closure was done after inserting a single intercostal chest tube which was clamped after closure of the wound. The patient remained hemodynamically stable throughout the procedure. In the postoperative period, the chest tube clamp inadvertently opened, and patient had vigorous cough along with severe chest pain and perspiration. The patient developed tachycardia and hypotension. The chest tube was immediately clamped, but there was no improvement in the symptoms and hemodynamics despite supportive measures and inotropic support. Mediastinal shift toward the PPS was suspected, and a 20-ml syringe was used to inject air into the PPS through the chest tube proximal to the clamp. The symptoms and hemodynamics of the patient improved rapidly as we kept on injecting air. The total volume of air injected was approximately 150 ml. Chest roentgenogram after the incident showed mediastinum in its normal position [Figure 3]. The chest tube was removed on the 2nd postoperative day after repeat chest roentgenogram was also normal. The patient remained stable thereafter and was discharged on the 10th postoperative day. The first follow-up was 3 weeks after discharge, and the patient was doing well and was attached to the oncology department for adjuvant chemotherapy.

Stabilization of the mediastinum postpneumonectomy is an important aspect of the patient management and is also a unique feature of the procedure. Many surgeons do not insert a chest tube and instead do suction of the PPS after closure of the chest to stabilize the mediastinum, and others do insert a chest tube and keep it clamped to be removed within 48 h.

Suction of air from the PPS is a common practice to stabilize the mediastinum, but not insufflation of air as was done

in this case. Air insufflation is likely to be helpful only in the early postoperative as later on fibrosis and fixation of the mediastinum will occur. Mediastinal shifting leads to sudden deterioration in the patient's hemodynamics along with severe chest pain as we experienced in this case and inotropic support along with other resuscitative measures are of little benefit till mediastinum is stabilized.

There are many reports in the literature on the late-onset mediastinal shifting and its treatment by a variety of implants.^[5-7] The implants include saline-filled prosthesis, silicone implants, and muscle transposition into the PPS. Nowadays, more and more lung resections are being done using thoracoscopic techniques^[8] where the facilities are available. Thoracoscopic procedures have the advantages

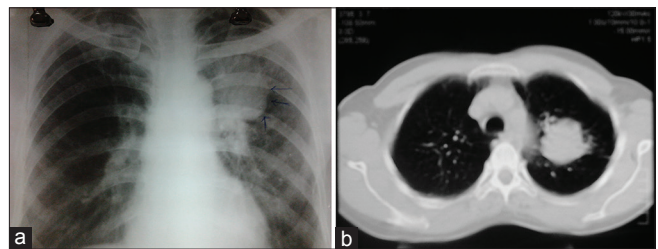


Figure 1: (a) Chest roentgenogram showing a large mass in the left hilum. (b) Computed tomogram chest showing a large lobulated homogenous mass in the left hilum

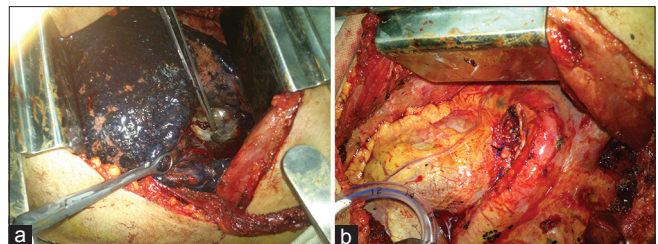


Figure 2: (a) Intraoperative photograph showing gross appearance of the tumor and left lung. (b) Intraoperative photograph showing postpneumonectomy space

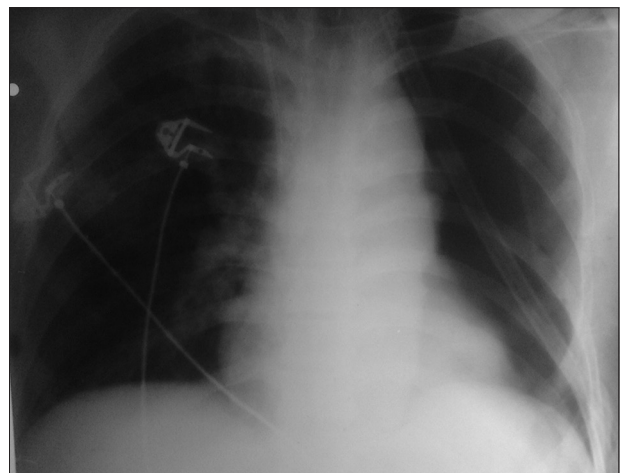


Figure 3: Postoperative chest roentgenogram showing mediastinum in normal position after air insufflation

of shorter hospital stay, small incisions, and better cosmetic results, but reinforcement of bronchus with intercostal muscle flap cannot be easily performed.

Mediastinal shifting should be suspected if sudden-onset severe hemodynamic instability occurs in the early postoperative period after pneumonectomy unless proved otherwise and either insufflation of air or the removal of air will be the appropriate treatment depending on whether the shift is toward the PPS or the remaining lung, respectively.

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Conflicts of interest

There are no conflicts of interest.

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REFERENCES

1. Kotoulas C, Patris K, Tsintiris K, Zoumboulides A, Lazarides K, Laoutides G, *et al.* Platypnea-orthodeoxia syndrome after pneumonectomy relieved by mediastinal repositioning. *Ann Thorac Surg* 2007;83:1524-6.
2. Deutsch MA, Martetschlaeger F, Muenzel D, D'Haese JG, Krane M, Bauernschmitt R, *et al.* Combined spontaneous contralateral pneumothorax and post-pneumonectomy mediastinal shift-associated dextrocardia. *Thorac Cardiovasc Surg* 2011;59:60-2.
3. Shamji FM, Deslauriers J, Daniel TM, Matzinger FR, Mehran RJ, Todd TR, *et al.* Postpneumonectomy syndrome with an ipsilateral aortic arch after left pneumonectomy. *Ann Thorac Surg* 1996;62:1627-31.
4. Ilan B, Papiashvili M, Zuckermann B. Mediastinal shift toward the remaining lung: A report of six cases. *Isr Med Assoc J* 2007;9:885-6.
5. Kelly RF, Hunter DW, Maddaus MA. Postpneumonectomy syndrome after left pneumonectomy. *Ann Thorac Surg* 2001;71:701-3.
6. Wolfe WG, Lewis CW Jr. Control of the pleural space after pneumonectomy. *Chest Surg Clin N Am* 2002;12:565-70.
7. Valji AM, Maziak DE, Shamji FM, Matzinger FR. Postpneumonectomy syndrome: Recognition and management. *Chest* 1998;114:1766-9.
8. Reed MF, Lewis JD. Thoracoscopic mediastinal repositioning for postpneumonectomy syndrome. *J Thorac Cardiovasc Surg* 2007;133:264-5.

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