Lung hernia after en bloc cervicothoracic resection

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Lung hernia after chest wall resection and reconstruction has been infrequently described in the literature. It most commonly occurs after trauma and occasionally as a spontaneous event.¹ Here we discuss a case of lung hernia that developed after cervicothoracic resection and free flap reconstruction performed for recurrence of thyroid carcinoma. Inadequate chest wall support and increased intrathoracic pressure were important factors leading to lung herniation.

Clinical Summary

A 74-year-old man with a history of papillary carcinoma of the thyroid was seen with recurrence as a pretracheal mass. En bloc resection was performed, with removal of the upper half of the sternum, both clavicles, anterior third of first and second ribs bilaterally, anterior mediastinal contents, upper half of the trachea, and proximal esophagus. Reconstruction was done with a free-pedicle rectus myocutaneous flap, a jejunal interposition graft, and a mediastinal tracheostomy. On postoperative day 4, the patient reported pain across the right upper aspect of the chest after an episode of coughing. A right apical chest wall swelling was noted;

this was soft, spongy, resonant to percussion, nonreducible, and increased on coughing (**Figure 1, A**). Crepitus was felt, and breath sounds were heard over it. The patient had neither discomfort nor shortness of breath. Oxygen saturation remained stable. Chest radiography revealed a new, small right apical pneumothorax and a small pleural effusion. A clinical diagnosis of lung hernia was made and confirmed on chest computed tomographic scan. Computed tomography showed protrusion of the right upper lobe through an anterior superior chest wall defect, possibly as a result of dehiscence of the myocutaneous muscle flap from the surrounding tissues (**Figure 2**). Because of the lack of symptoms, surgery was not performed, to avoid disturbing the free flap and the maturing mediastinal tracheostomy. The swelling decreased during the next 4 days and then disappeared completely (**Figure 1, B**). The patient was subsequently discharged home.

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Comment

Herniation of the lung is an unusual occurrence, with about 300 cases reported in the literature.² It occurs as a result of absent or compromised chest wall support or increased intrathoracic pressure. Trauma constitutes the major cause of lung hernias, mostly after vehicular crashes and seat belt trauma.² A few case reports have described spontaneous or atraumatic appearance of a lung hernia.³

Lung hernias have traditionally been classified on an anatomic basis as cervical, intercostal, and diaphragmatic or according to etiology as congenital and acquired. Lung hernia has been reported after thoracotomy without appropriate reconstruction.⁴ Thoracoscopic procedures, despite their smaller incisions, do not seem to reduce the occurrence of lung hernia.⁵ The lung hernia in this case was difficult to classify solely on an anatomic basis because of the

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Figure 1. Right lung hernia. A, Right apical chest wall swelling (arrow) was soft, spongy, nonreducible, and increased on coughing. B, Swelling reduced with conservative management.

Figure 2. Computed tomographic scan of patient's chest showing large right lung hernia (A).

absence of the clavicles and the first rib. Because the hernia developed after surgery (trauma) and was associated with coughing (spontaneous event), multiple etiologic factors were involved. To our knowledge, there has been no report of lung herniation after elective myocutaneous flap reconstructive surgery on the chest wall. Clearly, weakening of the chest wall from surgery and increased intrathoracic pressure from coughing were important factors. Whether an associated pleural effusion was a contributing factor is uncertain.

Lung hernia has been managed both surgically and conservatively,^{1,6} and no absolute guidelines have been established. Expe-

rience from reported cases suggests that the treatment in each case needs to be individually determined on the basis of the clinical situation and symptoms. Most authors recommend that supraclavicular or cervical hernias be managed conservatively unless there is deterioration in lung function or evidence of strangulation. In our case, a conservative approach was used because the patient was free of symptoms and because surgical exploration of the area after a recent free flap for a non-graft-related complication could compromise the flap and disturb the maturing mediastinal tracheostomy. Resolution with conservative treatment over time suggests that decrease in edema in the surrounding tissues or the lung itself allowed spontaneous reduction and subsequent healing of the defect in the chest wall.

In summary, a lung hernia after flap reconstruction of the chest wall is a rare occurrence. The current system of classifying lung hernias is not helpful in determining therapy in situations such as this. The etiology of the hernia was multifactorial, with an increase in intrathoracic pressure and inadequate support from the chest wall being causative factors. This case emphasizes that a conservative approach should be considered before surgical therapy for a patient who is free of symptoms and that surgical therapy should be reserved for those in whom strangulation of the lung or a deterioration in pulmonary function occurs.

References

1. Weissberg D, Refaely Y. Hernia of the lung. *Ann Thorac Surg.* 2002;74:1963-6.
2. Minai OA, Hammond G, Curtis A. Hernia of the lung: a case report and review of literature. *Conn Med.* 1997;61:77-81.
3. Brock MV, Heitmiller RF. Spontaneous anterior thoracic lung hernias. *J Thorac Cardiovasc Surg.* 2000;119:1046-7.
4. Sonett JR, O'Shea MA, Caushaj PF, Kulkarni MG, Sandstrom SH. Hernia of the lung: case report and literature review. *Ir J Med Sci.* 1994;163:410-2.
5. Temes RT, Talbot WA, Green DP, Wernly JA. Herniation of the lung after video-assisted thoracic surgery. *Ann Thorac Surg.* 2001;72:606-7.
6. Lang-Lazdunski L, Bonnet PM, Pons F, Brinquin L, Jancovici R. Traumatic extrathoracic lung herniation. *Ann Thorac Surg.* 2002;74:927-9.