Talc Pleurodesis During Videothoracoscopy for Pneumocystis carinii Pneumonia-Related Pneumothorax*

A New Technique

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Pneumocystis carinii pneumonia in AIDS patients represents a growing problem for chest physicians. For thoracic surgeons, spontaneous pneumothorax and recurrent or persistent pneumothoraces can complicate this disease, requiring surgical intervention. Minimally invasive videothoracoscopy has now become a standard form of surgery for these patients, and we present a technique of talc insufflation that we believe is safe, simple, cost-effective, and reliable.

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| NG | nasogastric; PCP | Pneumocystis carinii pneumonia |

The literature is steadily growing with reports of spontaneous pneumothoraces associated with Pneumocystis carinii pneumonia (PCP). Although these patients may be successfully treated with conventional tube thoracostomy, frequently recurrent or persistent pneumothoraces complicate this treatment. We believe that these patients are ideal candidates for minimally invasive videothoracoscopic procedures. We now describe such a patient who was successfully treated with talc pleurodesis administered under videothoracoscopic guidance demonstrating this to be a safe, simple, cost-effective, and reliable technique.

CASE REPORT

A 27-year-old white homosexual man with positive human immunodeficiency virus titers presented with respiratory distress. On hospital day 5, he required mechanical ventilatory support with endotracheal intubation. Due to low oxygen saturation, positive end-expiratory pressure was added. Soon after intubation, he developed a right-sided pneumothorax that required chest tube insertion. He was weaned from the ventilator after 6 days, but subsequently he developed a left pneumothorax that also required treatment with a chest tube. Despite weaning from positive pressure ventilatory support, he had persistent large air leaks bilaterally, which were refractory to all conservative modalities, including multiple large bore chest tubes with increasing amounts of closed chamber suction. Therefore, on hospital day 37, he was taken to the operating room and right videothoracoscopy was performed. An apical bleb causing the large air leak was resected utilizing an “Endo GIA Stapler” (autosuture multifire Endo-GIA, US Surgical Corp, Norwalk, Conn). Talc pleurodesis was then performed and a single chest tube was inserted. Four days later, a similar procedure was performed on the left side. Four days after this, both chest tubes were removed resulting in complete lung inflation with no postoperative complication. Although we had suspected P carinii preoperatively, it was only after tissue cultures were obtained from surgery that we were able to confirm its presence in this patient.

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Talc Insufflation Technique

We developed a safe and effective technique to perform talc pleurodesis under direct videothoracoscopic guidance. A standard 18-Fr Salem sump nasogastric (NG) tube was trimmed to approximately two thirds of its length. Side holes were then cut at 1-cm intervals, for a distance of 3 cm from the distal end. Sterile talc was then poured into a standard 60-ml bulb syringe that was inserted into the main port of the NG tube. This was then passed through the 5-mm port (Thoracosport, US Surgical Corp, Norwalk, Conn) and visualized thoracoscopically. Through a third port, a grasping instrument was used to direct the tip of the NG tube throughout the hemithorax while the talc was injected. To minimize impairment of visualization due to lens occlusion from the talc, we began at the apex and proceeded anteriorly to the base of the chest cavity, then returned to the apex along the posterior hemithorax. A transient “snowstorm” of talc can clearly be seen on the thoracoscopic video monitor while the entire chest cavity is visualized for even distribution of talc. After pleurodesis was performed, a small chest tube was positioned, all ports were removed, and the wounds were closed in standard fashion. Postoperatively, the chest radiographs revealed complete inflation of the lungs without obscurcation from the talc.

DISCUSSION

Recently, videothoracoscopy has evolved as the preferred surgical approach for a variety of intrathoracic disorders. Compared with a standard open thoracotomy, a thoracoscopic procedure can markedly improve the patient’s quality of life while providing equal or better surgical results. Utilizing this technology, the practicing thoracic surgeon is now able to perform diagnostic and therapeutic procedures that result in fewer hospital days, minimal postoperative pain, and lower surgical morbidity. In addition, in certain conditions (such as AIDS, PCP, tuberculosis, or other contagious processes), we believe that the risk of exposing the operating room staff to the patient’s disease is significantly reduced by this essentially “closed” technique.

As the number of patients with AIDS continues to expand, we are encountering an increasing number of complications directly related to this disease. The majority of these patients will eventually manifest some type of pulmonary infection, with P carinii being the most common organism implicated. Pneumothorax related to PCP may have several causes, including isolated focal areas of PCP, the use of aerosolized pentamidine, and barotrauma. Regardless of the cause, however, treatment must be aimed at sealing the air leak, reinflating the damaged lung, and preventing further collapse.

Over the past two decades, talc pleurodesis has fallen out of favor with thoracic surgeons because of the difficulty of dispersion throughout the pleural space, potential risk of malignancy, and the availability of other less toxic and less painful sclerosing agents. However, talc is known to be highly effective in causing pleural adhesions and the risk of malignancy should not deter its use in this group of patients with terminal disease. Recently, Hartman presented data comparing talc pleurodesis with bleomycin and tetracycline and demonstrated that talc was superior. As tetracycline is no longer available and bleomycin is very expensive, talc is being considered as a first-line agent for pleurodesis.

It was previously thought that the malignant potential
from talc was due to its preparation with asbestos. Currently, we use heat-sterilized pure USP talc for pleurodesis. We are not aware of any related carcinogenic potential, but further long-term evaluation would be helpful.

Some surgeons believe that pleurectomy should be performed as an alternative to pleurodesis. Although we agree that this is an option during videothoracoscopy, patient selection is crucial to avoid markedly prolonged operating time in these patients with compromised pulmonary function and limited long-term survival. In our patient presented herein, we believe that surgical efficiency helped yield the successful result without significant morbidity. When this type of intraoperative decision is required, talc pleurodesis should be in every thoracic surgeon’s armamentarium during videothoracoscopy in AIDS patients.

We report this case as representative of our experience with a safe, simple, cost-effective, and reliable method of delivering talc into the hemithorax for pleurodesis during videothoracoscopy for patients with spontaneous persistent pneumothoraces related to PCP.

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REFERENCES


Doppler Analysis of Pulmonary Venous Flow in Left Atrial Myxoma

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In a patient with obstructive left atrial myxoma, we analyzed by pulsed Doppler echocardiography the flow pattern through the mitral valve and in the pulmonary veins. Two mitral flow patterns were observed: the first was present near the medial commissure and along the anterior leaflet and was characterized by the absence of mid-to-late diastolic filling flow; the second was found near the lateral commissure and was characterized by the obstruction of mid-to-late diastolic filling flow, mimicking mitral stenosis. The pulmonary vein flow showed brief and rapidly decelerating anterograde diastolic flow wave and an early systolic retrograde flow wave. These waves were respectively related to the diastolic forward and the systolic backward movement of the tumor. This case report shows that pulmonary vein flow analysis may give new insights into left atrial filling and emptying dynamics in left atrial myxoma.

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The obstructive left atrial myxoma mimics mitral valve stenosis and is expected to modify the flow pattern through the mitral valve and within the pulmonary veins. It is possible by Doppler analysis of the pulmonary veins flow to noninvasively examine either the filling or the emptying of the left atrium. To our knowledge, no previous study has described the pulmonary veins flow pattern in left atrial myxoma. We report a patient with obstructive left atrial myxoma who showed an inverted systolic flow in pulmonary veins and two different flow-velocity profiles at the mitral valve level.

CASE REPORT

The patient was a 67-year-old woman admitted to our institution because of recent-onset exercise-induced and paroxysmal nocturnal dyspnea. Physical examination revealed bilateral pulmonary rales and a diastolic murmur at the cardiac apex. The ECG was normal, and chest radiograph revealed redistribution of pulmonary perfusion.

Transthoracic echocardiography showed a large (4 x 5 cm) left atrial mobile tumor, attached to the septum and prolapsing into the pulmonary veins through the mitral valve. A narrow "mosaic" flow stream was visible by color Doppler along the lateral mitral commissure. Two mitral flow patterns were observed by pulsed- and continuous-wave Doppler: the first pattern, found near the medial commissure and along the anterior leaflet, was characterized by a broad (74 ms at a heart rate of 75 bpm), high-velocity (96 cm/s), early-diastolic filling wave, with no flow evidence after the tumor prolapse (Fig 1, top); the second pattern, found near the lateral commissure, showed a rapidly decelerating high-velocity early-diastolic filling wave and a mitral stenosis-like flow-velocity profile (mean gradient, 5 mm Hg) in mid-to-late diastole (Fig 1, bottom). Mitral regurgitation was absent.

At the level of the right pulmonary vein, the systolic flow-wave was biphasic (wave J; Fig 2), being retrograde in early systole and

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