The Limitations of Artificial Pneumothorax

Perhaps no single procedure in medicine has had a more profound and far-reaching effect than has the introduction and more general utilization of artificial pneumothorax in the therapy of pulmonary tuberculosis. Though quite different in its mode of attack, less specific in its adaptability and less certain in its application, it might take rank with the arsenicals in syphilis, insulin in diabetes and liver extract in pernicious anaemia; not solely because of consequences inherent in its own efficacy, but because of the wide therapeutic horizons which it has opened up. Like these modalities, it has revived and even revolutionized the whole therapeutic concept of the disease and stimulated research and investigation of even greater potentials.

In recent years knowledge of the success of this measure has spread widely both in lay as well as medical circles. It is not, therefore, surprising that inquiry is frequently made of the sanatorium physician by the patient, his relatives, and often his personal doctor, as to why artificial pneumothorax has not been used. It is to these that this paper is addressed.

It is important to keep in mind that in the employment of collapse therapy a clear concept of the underlying pulmonary pathological changes should be had. This can only be ascertained by a careful clinical and roentgenological study. The form of treatment which affords the best possibilities of arresting the process with the least possibility of harm should be instituted. There is no one standard to go by, there is no one method applicable to all; each case presents its own problems, and to each the proper procedure must be directed if success is to be attained.

The accepted indications of artificial pneumothorax are:

First, predominantly unilateral disease. The process may be infiltrative, pneumonic or cavernous. If the latter, it is of the utmost importance that artificial pneumothorax be used as early as possible. A lesion in the contralateral lung does not contraindicate treatment of the most involved lung. Frequently, this will clear up when the other lung has been collapsed.

Second, in progressive minimal tuberculosis artificial pneumothorax should not be attempted until a brief period of observation on bed-rest fails to show improvement. Where tubercle bacilli are present, even though the process involves only a small area, the treatment should not be delayed very long.

Third, Artificial pneumothorax may be used in certain selected cases of bilateral disease with a fair degree of success.

Fourth, Cases of recurrent hemoptysis frequently demand immediate collapse. The wide-spread use of this method of treatment has been the means of cutting down the number of hemorrhage cases in the sanatorium to a minimum.

Fifth, In certain cases of pleurisy with effusion, where there is a known lesion on the affected side, the removal of fluid and the replacement with air is most helpful.

The induction of artificial pneumothorax is, of course, dependent upon a free pleural space. Extensive adhesions between the visceral and parietal surface of the pleura too frequently make this treatment impossible. Hence, no matter how well selected the case may be, no matter how pressing the need for collapsing the diseased area, when adhesions are present this form of therapy must be abandoned. Adhesions constitute the chief limitation to the application of artificial pneumothorax.

Not long ago two young female patients entered the sanatorium at about the same time. Both had cavernous tuberculosis...
Diseases in the lower lobe of the left lung; both were extremely toxic. Artificial pneumothorax was attempted almost immediately after admission. In one, successful collapse was obtained; in the other there was no pleural space. The first has recovered; the latter is dead. This is a common experience.

Cases with large, superficial, thin walled apical cavities should rarely receive artificial pneumothorax. There is danger of rupture and there is little likelihood of successful collapse. Rest therapy should be first instituted, then later partial thorcoplasty or apicotomy.

The minimal fibroid cases involving the extreme apex should rarely require pneumothorax. These cases do best with phrenic interruption.

Bilateral cavitation frequently found in advanced disease presents a serious problem in collapse therapy. It is possible at times to use pneumothorax on one side and, later, to induce it on the opposite side, maintaining both simultaneously. In other cases pneumothorax may be applied on one side, the lung permitted to re-expand, and later the contralateral lung collapsed.

The usefulness of this procedure, however, in bilateral cases is extremely limited and only rarely successful. Every tuberculous therapeutist has a few successes of this kind to report, but it is probable that all will agree that it is hazardous and only warranted because of the hopelessness of the situation without it.

Pneumothorax is unnecessary in the first infection types as the majority of these cases will heal without it. As a matter of fact, it is contraindicated, as it might be the means of adding fuel to the flame and might result disastrously.

In acute pulmonary types of tuberculosis pneumothorax is not often successful. Especially is this true in lobar involvement. However, where cavitation develops it should be given a chance. In the acute broncho-pneumonic varieties it has a definite place and not really dramatic results are obtained.

Even with this, the mortality still remains high. It should not be withheld on that account where a free pleural space makes it possible.

Asthma and severe emphysema are distinct contraindications for pneumothorax. Despite the desirable character of the lesions, the additional burden of the collapse in these cases with low vital capacity makes its employment quite hazardous.

In rare instances, where a cardiac disease complicates tuberculosis, artificial pneumothorax cannot be employed. Age, too, probably constitutes one of the limitations of the employment of pneumothorax. In childhood and in adolescence it is quite successful, but in persons beyond middle life, where the lung has lost much of its elasticity, only rarely should it be employed. However, I have a patient 72 years of age in whom the treatment has been very successful.

In conclusion I would emphasize that each case of tuberculosis demands individualization in choice of therapeutic procedure. Artificial pneumothorax is the best method of collapse therapy that is available at the present time, but it should be used with discretion.

It has certain distinct limitations, the first of which is brought about by extensive pleural adhesions, over which the physician has no control. Even where there is a free pleural space it should not be employed in first infection types, in tuberculous lobar pneumonia, in extensive bi-lateral disease, and in cases of pulmonary tuberculosis complicated by heart disease, asthma and emphysema.