

## HERNIATION OF THE HEART\*

THROUGH A PERICARDIAL INCISION

RALPH BOERNE BETTMAN, M.D. AND WILLIAM J. TANNENBAUM, M.D.

CHICAGO, ILL.

FROM THE SURGICAL SERVICE MICHAEL REESE HOSPITAL

THE FOLLOWING CASE is of interest because of the infrequency of the complication, the seriousness of the symptoms subsequent to the cardiac herniation and the dramatic recovery following its reduction.

The sequence of events is as follows: Mr. P., a rather frail, 53-year-old male, in fair general condition, was operated upon by us for a carcinoma of the left lung. The operation was uncomplicated except that there was a dense, broad adhesion which firmly bound the lower part of the upper lobe of the left lung to the parietal pericardium at the level of the conus arteriosus of the heart. Because of the density of the adhesion and its proximity to the tumor in the lung, we thought that the carcinoma might have infiltrated into it and for this reason decided to remove the pericardium with the affixed lung rather than cut through the adhesion. This resulted in a defect of the anterior pericardium about  $2\frac{1}{2}$  inches in diameter through which the conus and the base of the pulmonary artery could easily be seen.

Before closing the chest wall at the end of the operation, the advisability of suturing the pericardium was discussed, but we decided against it because closing this large defect would have constricted the outflow tract of the heart. I must admit that the possibility of a herniation at this site never occurred to us.

The pneumonectomy had been performed through a posteriolateral incision with the patient lying on his right side. At the end of the operation, the patient's condition was good, he was pink, his pulse was 90, his blood pressure was 110/90. Careful aspiration of the trachea and bronchus had been carried out during operation both by the anesthetist and once by us just before closing the bronchial stump, so that his respirations were free and easy.

After the dressings had been applied he was rolled over on his back, lifted on to the cart and placed gently on his operated (left) side. A moment after this was done, the entire picture changed! The patient went into collapse. His radial pulse became imperceptible, his blood pressure could not be obtained, he was pale and started to perspire. Thinking the condition was due to a cardiac shift, he was immediately put flat on his back and oxygen was administered through the tracheal tube, which, fortunately, had not yet been removed. The picture did not change. The pulse still remained imperceptible and the condition was still one of profound shock. A bottle of blood, which was available, was hooked to the

---

\* Submitted for publication June, 1948.

indwelling intravenous needle in the ankle and its contents forced into the vein. Even after the entire bottle had been injected, the patient's condition did not improve. It was noted that there was no difficulty in getting air into and out of his right lung, nor did hurried examination show any evidence of unusual mediastinal shift. Thinking that the condition was most probably due to a massive internal hemorrhage, and realizing that the patient would die if nothing were done, he was put back on the operating table, pushed back into the operating room, dressings removed and draped ready for reopening the chest wall. The diagnosis of hemorrhage was strengthened by the aspiration of a few centimeters of sanguiniferous fluid from the catheter drainage tube. (Note—We usually do not drain the chest cavity following pneumonectomy, but did in this case because there had been innumerable adhesions between the visceral and parietal pleura over the entire posterior lung field and we felt that there might be a great deal of pleural reaction with a large effusion.)

It must have been at least 25 minutes from the sudden onset of shock to the start of the second operation.

When the chest cavity was re-opened through the former incision, the picture that presented was startling. The apex of the heart almost protruded through the incision. The heart appeared to be standing on end and pointing directly upward, that is, perpendicular to its usual position. It was entirely devoid of pericardial covering; it was dilated; its veins were greatly engorged and it was beating very feebly but at an extremely rapid rate. The diagnosis was obvious, namely, the heart had herniated through the pericardial defect. The rim of the pericardial opening was easily located and slit and the heart slid back into its normal position. After a few more twitches, it started to regain its normal form of contraction, and within less than half a minute was beating strongly. The cardiac dilatation and the venous engorgement receded quickly. The anesthetist was able to pick up the pulse at the temple within a few seconds and the first blood pressure reading after the cardiac replacement was 90/50 and soon 110/70. Inspection now of the left pleural cavity revealed nothing abnormal, a small amount of serosanguineous fluid, no signs of severe hemorrhage and the great vessels well tied off and the stump of the bronchus well buried in the mediastinum. It seemed to us that the entire episode was due to the angulation and the strangulation of the outflow zone of the heart incidental to the herniation. In order to guard against a recurrence, the opening in the pericardium was enlarged by removing practically the entire anterior pericardium.

By this time, the general condition of the patient was excellent. The wound was resutured; the dressings reapplied. The patient was gently turned on his back and no change in condition noted. He was returned to his room and kept on his back, with the backrest slightly elevated for the rest of the day. Needless to say, he was carefully watched!

His convalescence from here on was uneventful. He seemed to show no signs of damage due to the period of profound shock. His mentality was

normal. There were no renal manifestations. The day after the operation, he was allowed to turn at will. He preferred lying on his back, but could turn on his right side. However, whenever he started to turn on his left side, for the first week or ten days, he felt "as if he were going to faint." This also happened whenever he raised himself suddenly. These symptoms were accompanied by the objective signs—pallor, increased pulse rate up to 120 and thready pulse, and a drop in his blood pressure to 90/60. Electrocardiographic study immediately after operation and during the convalescence was not particularly significant.

By the end of the third week after operation, he was well enough to leave the hospital; he could turn in any position he wanted to but still did not like to lie on his left side because it made him "feel funny."

Now six months after operation, he is doing well, he looks in as good health as before operation, he is out-of-doors, but does not yet feel able to go back to his job, which was one of physical labor.

#### SUMMARY

A patient was operated upon for a carcinoma of the left lung. The pneumonectomy included the removal of an adherent piece of parietal pericardium about  $2\frac{1}{2}$  inches in diameter overlying the region of the conus arteriosus. When the patient's position was shifted after the operation, the patient suddenly went into profound shock which he was able to tolerate for about 20 minutes, during which time means to combat the shock were tried. When the chest was re-opened, it was found that the heart had herniated through the pericardial defect and had become angulated and partially strangulated. As soon as the herniation was reduced, the symptoms disappeared. Recurrence was prevented by removing practically the entire anterior parietal pericardium. Recovery was complete and the removal of the pericardium seemed to produce no untoward effects.

---

#### UROLOGY AWARD

*"Urology Award*—The American Urological Association offers an annual award of \$1000.00 (first prize of \$500.00, second prize \$300.00 and third prize \$200.00) for essays on the result of some clinical or laboratory research in Urology. Competition shall be limited to urologists who have been in such specific practice for not more than five years and to residents in urology in recognized hospitals.

"The first prize essay will appear on the program of the forthcoming meeting of the American Urological Association, to be held at the Biltmore Hotel in Los Angeles, May 16-19, 1949."

For full particulars write the Secretary, Dr. Thomas D. Moore, 899 Madison Avenue, Memphis 3, Tennessee. Essays must be in his hands before February 15, 1949.