Diverticulum of the Pericardium

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A case of true diverticulum of the pericardium is reported, with a review of the literature. A cure was effected by excision of the cystic pericardial diverticulum. Consideration of the etiology of true pericardial diverticulum is given, and possible explanation for accumulation of the fluid is suggested.

We are reporting a case of pericardial diverticulum, as much for a consideration of its cause as for additional documentation of this rare condition.

In the American literature, Mazer1 was the first to report an instance of true pericardial diverticulum proved by operation or autopsy. Cushing2 collected the published reports of 39 cases, adding one of his own, and Reitan3 (quoted by Haas4), enumerated 55. Specifically, Cushing2 failed to differentiate true from false diverticula, or to mention embryologic background; his own case was apparently of an inflammatory nature. Reitan,4 on the other hand, grouped his cases into acquired and congenital types, the former being encapsulated pericardial exudates, while the latter (the minority) were noninflammatory or true diverticula. Mazer1 recognized the same distribution in the literature up to that time. Our case, in its essential features, fits into the category of true pericardial diverticula.

Case Report

A 26-year-old tugboat hand was admitted to the Veterans Administration Hospital, Bronx, N. Y., on March 26, 1948, because of easy fatigability of five months' duration, and a recent history of pain in both flanks. The pain was dull in character. Originating in the costovertexal regions, it radiated anteriorly, in girdle fashion, about the lower chest on both sides to the midepigastrium. Pain first occurred in the early morning, approximately two weeks before hospitalization, and lasted half an hour, disappearing spontaneously. It had occurred on three successive mornings after its onset, with no further recurrence. The patient had been doing heavy labor up to the time of admission without undue distress.

At the time of the onset of the pain, the patient went to a clinic where x-ray examination of the chest was made. He was told that he had "a swelling on his heart," and hospitalization was advised.

The past history indicated that he had suffered an attack of acute polyarthritis at the age of 13 years, which had necessitated absolute bed rest for a period of three months. A year following this episode, he was told that he had a "heart murmur." He passed the Army physical examination in 1943, and subsequently had had several careful physical examinations for the Paratroopers and Rangers, with no abnormality noted.

On admission to the Veterans Administration Hospital, physical examination failed to reveal any physical abnormality. Laboratory studies included a Kahn test, complete blood count, determination of blood sedimentation rate, and urinalysis. Results of none of these studies indicated any abnormality. An electrocardiogram made on admission also showed no abnormality. The x-ray and fluoroscopic study of the chest revealed the heart to be enlarged in the transverse diameter. There was a localized bulge in the region of the left ventricle, which appeared to move independently of the left ventricle (fig. 1). The localized bulge seemed to be cystic in nature, changing its configuration on inspiration. The apparently localized cystic lesion seemed to be adherent to the left ventricular wall. Angiocardiogram failed to reveal opacification of the mass (fig. 2).

Clinical Course. The patient was admitted to the Cardiac Service, and a tentative diagnosis of pericardial cyst was made. He was asymptomatic, except for occasional vague pain on the left side of the chest.

He was transferred to the Chest Surgical Service. On April 30, 1948, a left intercostal thoracotomy was accomplished, and a cystic mass measuring approximately 2 inches in its greatest diameter was found. The mass was covered by a layer of parietal pleura. When dissected free down to its base, it was found to communicate with the pericardium by means of a narrow neck measuring approximately 2 to 3 mm. in diameter. The cyst contained clear, watery fluid. It was easily separated from the pericardium down to its neck, where it was divided, at

From the Veterans Administration Hospital, Bronx, N. Y.

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which point its attachment to the pericardium was demonstrated. The cystic diverticulum was then excised.

The postoperative course was uneventful. Immediately following operation, the electrocardiogram showed an inverted T wave in Lead C\(\text{F}_4\); tracing made on May 11, 1948, showed reversion of the T wave in Lead C\(\text{F}_4\) to normal. Postoperative x-ray examination on May 3, 1948, revealed a normal cardiac contour, and the oval density was no longer discernible (fig. 3).

Pathologic Report. The specimen consisted of a collapsed cystic structure which measured 8 by 4.5 by 1 centimeters. The external surface was light pinkish-gray, smooth, and glistening. There was a small defect in the wall of the cavity which measured 0.3 centimeter. On section, a collapsed cavity was found lined by smooth, glistening membrane. The microscopic diagnosis was “pericardial cyst.”

Discussion

In the light of our case, it is interesting to consider the nature of the origin of true pericardial diverticulum. Lambert clearly portrayed the nature of “thin-walled thoracic cysts,” which he showed to be related to failure

Fig. 1.—Esophagram (anteroposterior view) made on March 26, 1948, shows a localized bulge in the region of the left ventricle.

Fig. 2.—Angiocardiogram (anteroposterior view) made on March 31, 1948, reveals nonopacification of a mass adjacent to the left ventricular wall.

Fig. 3.—Postoperative roentgenogram of chest (anteroposterior view) made on May 3, 1948, shows normal cardiovascular silhouette. The cyst, previously apparent, is no longer visible.
of coalescence of the primitive lacunae of the pericardial anlage. Unequal development and partial coalescence result in diverticulum formation. As none of the cases cited (Mazer, Cushing, Haas, Reitan, and Abbott) have been observed in early life, we must assume that pericardial diverticula exist either in a collapsed state or in similar nondetectable form, or as a congenital weakness of the pericardium (Haas), and that in either instance there is added an incident factor of pericardial distention by fluid. Roesler mentions increased intrapericardial pressure caused by hydropericardium, or by an enlarged heart, as a universal accompaniment. Other bodily abnormalities (such as inguinal hernia and colonic diverticulum) have comparable modes of origin.

The occurrence of an embryologic rest, which later in life secretes fluid and undergoes cyst formation, is well known; if this structure communicates with a normal absorptive surface, such as the pericardium, the fluid should never accumulate. Mechanical kinking of the isthmus with valve mechanism can result in distention of the diverticulum, the fluid being formed from its own membrane; or normal pericardial fluid may be squeezed into it by the massaging action of the heart beat.

**SUMMARY**

A case of true diverticulum of the pericardium is reported, with a review of the literature. A cure was effected by excision of the cystic pericardial diverticulum.

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4. **REITAN**: Quoted by Haas.
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