Large Mediastinal Hematomas Not Associated with Aortic Rupture
Case Presentations and Surgical Approach

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Mediastinal hematomas not associated with aortic disruption are thought to be common entities, and it is generally believed that most will spontaneously resolve. However, large mediastinal hematomas can cause fluctuations in cardiorespiratory physiology and can even cause death.

Traumatic mediastinal hematomas were first described in 1915.1 In 1953, Vincent et al3 were first to describe a fatal case of hemomediastinum not associated with major vascular injury. In that report, the autopsy revealed only a large mediastinal hematoma, without concomitant injuries. Subsequent reports indicated mediastinal hematomas could be associated with great vessel injuries.3–5

The surgical literature is replete with the documented association of mediastinal hematomas with aortic rupture.6–10 Yet, there is implication that a mediastinal hematoma not associated with great vessel injury is a benign entity.

The purpose of this report is to bring to light the fact that large mediastinal hematomas not due to aortic rupture can be life-threatening and should be treated surgically.

CASE REPORTS

CASE 1

A 35-year-old obese man was first evaluated two hours after receiving a blow to the sternum from an assailant’s fist. Upon initial evaluation in the emergency room, his vital signs showed: blood pressure, 120/80 mm Hg; pulse rate, 84 beats/min; and respirations, 22/min. He was in moderate distress. His chief complaints were substernal chest pain, without radiation, and marked shortness of breath. Physical examination of the neck failed to reveal any neck venous distension. The chest examination showed slight ecchymosis over the mid-sternum, the lungs were clear to auscultation and percussion, and results of the cardiovascular examination were normal. The blood pressure was equal in both arms. The remainder of the examination was noncontributory.

A standard upright chest x-ray film at 100 cm was obtained (Fig 1). Detailed radiologic examination of the ribs and sternum showed no fractures or dislocations. The initial hematocrit reading was 34 percent, and his coagulation studies were normal. An ECG was interpreted as sinus rhythm, and there were small Q waves in leads 2, 3, and aVF.

Three cases of mediastinal hematomas are presented, as well as their surgical approach. Mediastinal hematomas should be evacuated because of their potential morbidity and mortality.

The patient underwent angiography. An aortogram, with good visualization of the great vessels and internal mammary arteries, showed no extravasation of the contrast material. A venogram also failed to demonstrate extravasation. Computerized tomography of the thorax (Fig 2) showed a large anterior mediastinal mass interpreted to be a hematoma.

The patient was observed in the ICU for approximately 24 hours. It was noted that the patient’s central venous pressure rose from 6 cm H2O to 14 cm H2O, suggesting cardiac tamponade. It was also noted that his urine output decreased to less than 20 ml/m²/hour. A repeated chest x-ray film revealed a right hydrothorax and the persistent hematoma. A chest tube was placed, with an immediate return of 800 ml of dark, nonclotting bloody fluid.

Evacuation of the anterior mediastinal hematoma was accomplished via a right anterolateral thoracotomy. Exploration of the mediastinum showed no apparent source of bleeding. The patient’s postoperative course was unremarkable, and he was discharged ten days postoperatively.

CASE 2

A 70-year-old man drove his automobile into a power pole at an unknown rate of speed. Paramedics found the patient unconscious. The patient’s initial vital signs were: pulse rate, 70 beats/min; respiration, 18/min; and blood pressure, 0/0 mm Hg. The patient became apneic and pulseless, and CPR was begun. An ECG during a period of spontaneous cardiac activity in the emergency room

Note

FIGURE

A 37-year-old woman was in a motor vehicle accident, hitting another car broadside. She was found awake and alert at the time of the accident, having driven the steering wheel through the windshield with her chest. Initial vital signs were: blood pressure, 114/78 mm Hg; pulse rate, 78 beats/min; and respirations, 16/min. There was no evidence of venous distension of the neck, and the chest examination revealed multiple abrasions of the right anterior chest. The breath sounds were clear to auscultation and percussion. The pulses were equal in both arms and were without delay. The chest x-ray film (Fig 4) demonstrated a widened superior mediastinum without evidence of hemopneumothorax. There were no rib or sternal fractures noted. The ECG was normal. An aortogram failed to reveal any disruption in the continuity of the great vessels. The patient was observed in the ICU for three days, and she was discharged on the fourth hospital day. Subsequent chest x-ray films taken as an outpatient showed nearly complete resolution of the mediastinal hematoma in two weeks.

DISCUSSION

Laforet was the first to indicate that mediastinal hematomas could cause significant morbidity, and surgical intervention is justified. Sandor elucidated the incidence and significance of traumatic mediastinal hematomas.

Sandor stated that of 14 patients without aortic rupture, the mediastinal hematoma was the direct cause of death in two patients, and indirectly caused fatal complications for another two. Also, significant morbidity was found in 50 percent of the remaining cases reported in the same article.

Other reports implicate morbidity and mortality due to hematomas of the mediastinum by direct compression of the heart and pulmonary outflow tract. Also, hematomas can interfere with ventilation and
lymphatic drainage of the lung.\textsuperscript{14} Al-Naaman\textsuperscript{13} suggested that a hematoma could cause death by extrapericardial tamponade of the cardiac inflow. In addition, hemorrhage of a major degree could cause death by simple exsanguination. The two factors of reduced venous return due to central venous compression and blood loss could work hand in hand, causing the cardiac output to be severely reduced, and in turn could result in potentially lethal arrhythmias.

In this report, case 1 had signs and symptoms of progressive cardiac tamponade, with increasing shortness of breath, rising central venous pressure, tachycardia, and distant heart sounds. The progressive deterioration was relieved by operative exploration and decompression. In case 2, the only significant injury which could be found at autopsy was a large anterior mediastinal hematoma. It is difficult to say if this was the cause of death, but no other cause was found. In case 3, the small hematoma resolved spontaneously without surgical intervention.

The treatment of mediastinal hematomas reported in the literature has been inconsistent and varied. The majority of small hematomas have been treated expectantly and sometimes resolved spontaneously within a matter of weeks.\textsuperscript{12,15,16} The first recorded drainage of a hematoma of the mediastinum was reported by Hanner and Clauzer.\textsuperscript{17} In 1956, Thomas and Keeling\textsuperscript{18} reported drainage of an anterior mediastinal hematoma via a tracheostomy incision. Cote et al\textsuperscript{19} and Berry et al\textsuperscript{20} drained an anterior mediastinal hematoma via a median sternotomy.

Mediastinal hematomas are not benign entities. They can cause rapid deterioration and possible death. If a moderate-sized hematoma is associated with any signs of cardiorespiratory instability, aggressive surgical intervention is warranted. When a large mediastinal hematoma is encountered, such as that in our case 1, without initial signs or symptoms, surgical intervention is indicated because of the potential for increased morbidity. Rapid deterioration of the clinical state may be unexpectedly fatal.

REFERENCES

5. Townsend SR. Case of aneurysm of the aorta, with rupture and hemorrhage into the mediastinum and partial dissection of the left parietal pleura. Can Med Assoc 1936; 34:542-543
15. Endress ZF. Traumatic mediastinal hematoma. AJR 1953, 70: 576-580