Constrictive Pericarditis due to Infection with Nocardia asteroides*

Carlos M. Chavez, M.D., F.C.C.P., William A. Causey, M.D., and J. Harold Conn, M.D.

A case of constrictive pericarditis caused by Nocardia asteroides is reported. Pericardiectomy, combined with proper chemotherapy, gave excellent results in the treatment of the patient herein reported. Even though this case represents a primary infection by Nocardia asteroides, this fungus is known for its opportunistic characteristic, which frequently complicates debilitating diseases of variable etiology.

Nocardiosis, a fungal infection caused by the organism, Nocardia asteroides, is a disease affecting primarily the respiratory tract.1 The infecting organisms enter the body primarily through the airway, but in rare instances, gain access through the alimentary tract. Nocardia asteroides is a pathogen and as such, is the primary infecting organism in many cases; however, several authors have considered Nocardia as an opportunistic infective agent.2 Whatever the case may be, the clinical picture is similar even though when found as an opportunistic invader, its virulence is greater and the clinical picture is far more serious. The characteristic infection with Nocardia is that of pulmonary disease with gradual onset of generalized infectious symptoms, consisting of flu-like manifestations, weakness, malaise, pleuritic chest pain, fever and cough. Sometimes hemoptysis may be present. The radiologic picture consists of diffuse or nodular infiltrates, and sometimes a conglomerate of these nodular infiltrates form nodular masses.4 The similarities of the clino-radiologic picture of nocardiosis and tuberculosis presents, in many occasions, difficulties in the diagnosis.4 Murray2 states that the infection has a great tendency to infiltrate the pleura and chest wall. However, no cases have been reported of infiltration of the pericardium by the disease. Unfortunately the infected process with Nocardia may become generalized by hematogenous dissemination with formation of abscesses in other parts of the body. The most frequent manifestation of this dissemination is in the central nervous system, producing brain abscesses.1,2

As far as we have been able to determine, only one previous case has been reported of infectious pericarditis with the clinical picture of constrictive pericarditis caused by Nocardia asteroides.3 Unfortunately, the patient died as a consequence of this complication. The present report describes a similar case successfully treated by pericardiectomy and subsequent chemotherapy.

Case Report

This was the first admission to the Veterans Administration Hospital in Jackson, Mississippi for this 47-year-old man. He was admitted on August 27, 1970, with a four-week history of progressive shortness of breath and pain in his chest. This was accompanied by productive cough with whitish sputum, which at times changed character to become yellowish. The patient also noted daily fever and pleuritic type pain in his right chest, which exacerbated with breathing; the pain was bilateral at the time of admission. His local physician had given him penicillin and other medication with no benefit. There was no history of significant previous illness, but he had been smoking approximately one pack of cigarettes a day since 1933.

Upon admission, the physical examination revealed neck vein distention with reflux from below, which was noted in the supine position. The chest examination revealed rales over both left and right lung fields posteriorly with some apical rales on the left. Cardiac examination revealed rapid regular rhythm without murmurs with a heart rate of 100 beats per minute. Blood pressure was 90/70 and respiration was 18 per minute. The PMI was not displaced but was diffuse. His admission temperature was 90° F with various degrees of fever in subsequent days. The abdomen showed a large mid-abdominal scar and there was hepatomegaly. The initial chest x-ray film on August 26, 1970 showed an infiltrate in both lower lung fields, most marked on the right. The abdomen showed a large mid-abdominal abscess and the shadow was grossly enlarged, both to the right and to the left. His admission temperature was 90° F with various degrees of fever in subsequent days. The abdomen showed a large mid-abdominal abscess and there was hepatomegaly. The initial chest x-ray film on August 26, 1970 showed an infiltrate in both lower lung fields, most marked on the right. The heart shadow was grossly enlarged, both to the right and to the left. Shortly after his admission, he developed tachycardia with a rate of 150 beats per minute, and also flutter with a 2:1 block, for which he underwent cardioversion. The pleural effusion increased in the following days and thoracentesis rendered Figure 1. Initial chest x-ray film showing a marked enlargement of the cardiac silhouette and infiltrative images in both lungs.

*From the Departments of Surgery and Medicine, University of Mississippi Medical Center and Veterans Administration Center, Jackson, Mississippi. Supported in Part by NIH Grant No. HE-06163.
570 ml of a straw-colored, clear fluid from the right chest. At this time, a presumptive diagnosis of a pericardial effusion was made and pericardiocentesis was performed on August 31, at the same time as the thoracentesis. Sixty ml of straw-colored fluid was aspirated from the pericardium. Several pericardiocenteses were done on successive days and the specimens sent for culture were negative. A cardiac scan on May 28, 1970, revealed "abnormal cardiac scan with all the usual criteria present for a significant and rather large pericardial effusion." The area of decreased uptake, as compared with the x-ray film, measured 3 to 4 cm in thickness.

Because of recurrent tamponade due to reaccumulation of pericardial fluid, a subxyphoid pericardial window was made on September 9, 1970. At the time of induction, the blood pressure dropped to 0 and no pulse was felt. Cardiac massage was started immediately and other measures were taken to resuscitate the patient, such as intravenous infusion of metaraminol (Aramine) and sodium bicarbonate. The pulse reappeared and the blood pressure went up to 90 mm Hg. Immediate pericardiocentesis was carried out, removing 800 ml of cloudy, yellowish fluid with fibrinous clots. Following this, the chest was prepared for surgery and the pericardial window performed. The pericardium showed a granulation reaction with evidence of active inflammation. The patient made an uneventful recovery, his general condition improved considerably and the tube drainage was removed in one week. His venous pressure was maintained between 18-20 cm H2O, with a good urinary output. He received digitalis and furosemide. During a three-day leave from the hospital, he gained eight pounds in weight resulting in return of his extreme shortness of breath, orthopnea, and signs of cardiac tamponade. His CVP was 25 cm of saline, and a paradoxical pulse was present. The heart shadow was again increased in size and was relatively quiet at fluoroscopy. A cardiac scan at this time revealed a small cardiac silhouette with an area of decreased uptake, separating the cardiac blood pool from that of the liver and lung, compatible with pericardial effusion (Fig 2). With the diagnosis of constrictive pericarditis, the patient was taken to surgery on September 24, 1970, and...
under general anesthesia, pericardectomy was done, using the transverse incision through the fifth intercostal space with section of the sternum. A very thick pericardial and epicardial sac was removed from the left and right ventricles.

The cultures taken from the pericardial effusion and the specimen removed at the time of surgery showed the growth of *Nocardi a asteroides* organisms (Fig 3a, b), and as a result, he was placed on sulfoxazole (Gantrisin) 1.0 gm gid.

His postoperative course was remarkably smooth and the patient has gradually recovered. His central venous pressure came down to normal values. During his hospital course, he was treated for tuberculosis with INH and PAS and streptomycin, along with intermittent doses of corticosteroids. The report of the last chest x-ray examination on November 2, 1970, revealed complete regression of the pleural changes in the right base. Some parenchymal changes persisted, but no significant change appeared on the left side. The patient was discharged on October 15, 1970. In February, 1971 he was fully recovered and had resumed normal working activities. The chest x-ray film showed a cardiac silhouette of normal appearance and considerable regression of lung parenchymal lesions (Fig 4).

**DISCUSSION**

The effective treatment of most pathogenic organisms affecting lung and pericardium has altered the outcome of these infections in the past ten years. Unfortunately, the progress made in this direction has created a circumstance where the mildly pathogenic or saprophytic microorganisms have developed a degree of virulence to make them pathogenic and invasive. The circumstances of debilitation created by the originally infecting organisms then become favorable to the occurrence of this phenomenon. This new infective process, caused by "opportunistic" organisms, has been described in various regions of the body, and more and more frequently, we are faced with conditions of this nature which evidently create difficult therapeutic problems. *Nocardia* infections are considered rare, and outside of the lung, other manifestations have been unusual. Most of these have been due to dissemination of the infection to the brain with the production of abscesses. Despite the great tendency of the infiltration shown by infections due to *Nocardia*, only one known reported case of pericardial involvement has been reported in the literature. Most of the infiltrating processes have been described involving the pleura and chest wall with production of empyema or fistulization.

It is, therefore, important in this state of effective bacterial and fungus control to start thinking of opportunistic infections which can be as serious as most pathogenic infections. Even more, they can be extremely difficult to control with routine therapeutic agents.

**REFERENCES**


**CHEST, VOL. 61, NO. 1, JANUARY 1972**


---

**Traumatic Rupture of the Bronchus**

R. B. Lynn, M.D., F.C.C.P., and K. Iyengar, M.D.

**Traumatic rupture of the bronchus after blunt injury to the chest is an uncommon injury. Early repair of the bronchus will ensure a good anatomic result and almost complete return of pulmonary function. Delayed repair impedes recovery of lung function and exposes the patient to irreversible pulmonary suppuration and ultimately resection.**

Although rupture of a mainstem bronchus is an uncommon complication of blunt chest trauma, the increasing incidence and severity of chest injury after automobile accidents makes re-emphasis of this eminently correctable lesion timely.

**CASE REPORT**

A 14-year-old girl was admitted to the Kingston General Hospital 15 days after an auto accident in which she sustained a chest injury and a fractured humerus. On admission to the referring hospital the patient demonstrated hemoptysis, there was subcutaneous emphysema palpable in the suprasternal notch and tension pneumothorax was treated by two intercostal tubes, but the right lung remained collapsed and a pleural effusion developed. She was transferred to the Kingston General Hospital and on admission the x-ray film showed complete opacity of the right hemithorax (Fig 1). Apart from this, the general physical examination was normal except for an elevated respiratory rate at 36 per minute. Hemoglobin was 12.7 gm with 11,600 white blood cells and 89 percent neutrophils. On the day of admission, bronchoscopy showed termination of the right mainstem bronchus just proximal to the right upper lobe orifice. Neither a probe nor a catheter could be passed through this area into the distal bronchus. The patient was prepared for surgery and four days later, right thoracotomy showed complete disruption of the right mainstem bronchus just proximal to the right upper lobe orifice. The raw edges were identified, trimmed and an end-to-end suture carried out using interrupted 3-0 Tevdek stitches.

The postoperative course was entirely uneventful and one week after the bronchial repair, the patient was rebronchoscoped and the suture line inspected. All was well; the distal...