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Chronic pericarditis and cardiac tamponade in a patient with HIV/AIDS

Pericarditis crónica y taponamiento cardiaco en paciente con VIH/SIDA

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ABSTRACT

Pericarditis is the most frequent cardiac complication of AIDS, due to multiple causes. Pericardial involvement may be manifested as acute pericarditis, constrictive pericarditis, symptomatic pericardial effusion and cardiac tamponade. The aim of this report is to present a patient with AIDS and chronic pericarditis who developed cardiac tamponade a few days after the onset of cardiovascular manifestations. **Case report:** A 40-year-old male diagnosed with AIDS developed an effusion and cardiac tamponade; he was treated with a left anterolateral thoracotomy that revealed hemorrhagic effusion of 1 liter of blood. Anterior pericadiectomy was performed. The histologic diagnosis was chronic fibrinous pericarditis with areas of hemorrhage. The patient recovered uneventfully. As an outpatient, no other cardiovascular complications developed. **Conclusions:** Patients with HIV who develop effusions and pericarditis should be treated as all other patients, but considering that it may be multifactorial. Treatment choice depends on the clinical presentation, its cause and need for diagnosis, surgical risk, the physician's and the institution's experience, the anatomical characteristics of the effusion, and failure of previously attempted therapeutic procedures.

RESUMEN

La pericarditis es la complicación cardiaca más frecuente del SIDA debido a múltiples causas; esta afectación pericárdica puede manifestarse como pericarditis aguda, pericarditis constrictiva, derrame pericárdico sintomático y taponamiento cardiaco. El objetivo del trabajo es presentar a un enfermo con SIDA y pericarditis crónica con un taponamiento cardiaco días próximos al inicio de sus manifestaciones cardiovasculares. ***Presentación de caso:*** *Enfermo masculino de 40 años de edad con diagnóstico de SIDA que presentó un derrame con taponamiento cardiaco; fue tratado mediante una toracotomía anterolateral izquierda; se encontró un derrame hemorrágico, con un litro de sangre; se realizó una pericardiectomía anterior. El diagnóstico histológico fue pericarditis fibrinosa crónica con áreas de hemorragia. La evolución fue satisfactoria. En la consulta externa no se presentaron otras complicaciones cardiovasculares.* ***Conclusiones:*** *Los enfermos con VIH con derrames y pericarditis deben ser tratados igual que los otros pacientes, teniendo en cuenta que la causa puede ser multifactorial. La elección del método depende de la forma clínica, la causa y necesidad de diagnóstico, el riesgo quirúrgico, la experiencia del médico y la institución, las características anatómicas del derrame y el fracaso de procedimientos terapéuticos anteriores.*

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INTRODUCTION

Viral pericarditis is the most frequent pericardial infection; the inflammatory alterations are the result either of direct viral aggression, the immune response or both. Early viral replication in the pericardium and epimyocardial tissue generates a humoral and cellular immune response against the virus and/or the heart tissue.[1-5] Currently, 35 million people live with HIV worldwide. Due to their longer survival because of the availability of advanced antiretroviral therapy, an increase in chronic diseases has been observed,[4-12] particularly cardiovascular disease. According to the results of autopsy studies, the pericardium is the most affected structure in acute pericarditis, which may

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be asymptomatic or symptomatic, and associated with a small, moderate or large pericardial effusion, cardiac tamponade or constrictive pericarditis. The pericardial manifestations of HIV infection may result from infectious or non-infectious mechanisms or malignancies.[3,4,8] The aim of this report is to describe a patient with AIDS who, in spite of having chronic pericarditis, developed cardiac tamponade a few days after the first cardiovascular manifestations.

CLINICAL CASE

A 40-year-old male living in Havana had been under treatment at *Hospital "Freyre De Andrade"* for 7-day fever, myalgia, retrosternal pain and dyspnea. The patient had a history of HIV-positivity for the past 14 years with no follow-up. He was admitted to our institution, *Hospital Universitario "Manuel Fajardo"*, in the municipality of Plaza in Havana.

The following lab results were obtained:
Viral load: 65,000.
CD4 count: 76/mm^3.
Blood culture: *Acinetobacter baumannii*.
Echocardiogram: systolic collapse of the right ventricle. Pericardial fluid in the anterior (53 mm^3) and posterior sacs (48 mm^3).
Chest X-ray: global cardiomegaly with straightening of the pulmonary artery, congestive-appearing hila with redistribution of flow to the apices, and pleural effusion.

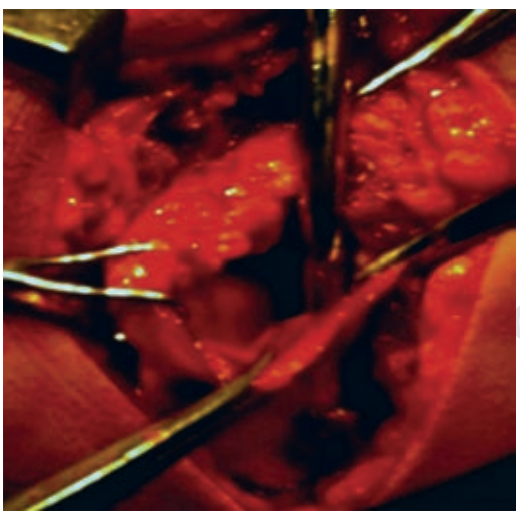

Figure 1: *Anterior pericardiectomy.*

Figure 2: *Anterolateral thoracotomy.*

Supportive treatment was initiated. Eight days later, the patient was referred to the hospital with the diagnosis of moderate to severe pleural effusion in a patient with AIDS. Upon arrival, he was hemodynamically stable and was admitted to the intensive care unit. On the following day, he developed signs of arterial hypotension, paradoxical pulse, jugular ingurgitation, muffled heart sounds, and obnubilation. His case was discussed and it was decided to perform a pericardiocentesis. Twelve hours later, cardiac tamponade manifestations persisted and he was transferred to the operating room to drain the pericardial collection through an emergency pericardial window. A left anterolateral thoracotomy was performed. A thickened pericardium was observed; it was punctured to prevent abrupt decompression, and the pericardium was opened. One liter of hematic content was aspirated. A portion of the pericardium's anterior wall was resected and submitted for histopathological analysis *(Figures 1 and 2)*.

Normal clinical parameters were restored in the operating room, but he developed hospital-acquired pneumonia in the postoperative period. The patient was discharged from the hospital 19 days later and followed in the

outpatient clinic. He developed no further cardiovascular complications. The Department of Pathology reported chronic fibrinous pericarditis with areas of hemorrhage.

DISCUSSION

Viral pericarditis is the most frequent pericardial infection. Inflammatory abnormalities result either from direct viral aggression, from the immune response or both. Early viral replication in the pericardium and epimyocardial tissue triggers humoral and cellular immunity against the virus and/or the heart tissues. Viral genome fragments do not replicate, but may be the source of antigens promoting an inflammatory response. Several viruses may cause pericarditis, including enterovirus, echovirus, adenovirus, cytomegalovirus, Epstein-Barr virus, herpes simplex virus, influenza virus, parvovirus B19, hepatitis C virus and human immune deficiency virus (HIV). Frequently, pericarditis in AIDS patients is caused by cytomegalovirus.

Pericardial conditions are the most frequent cause of heart disease in patients with HIV infection, with an incidence of 21%, slightly above that of myocardial involvement (18%). Most are cases of mild, asymptomatic pericardial effusion. These effusions are mostly serous; they are associated to pleural effusion or ascites, their cause cannot be identified and they spontaneously resolve in almost 40% of cases. Symptomatic pericardial involvement is infrequent (approximately 3% of patients infected by HIV). It is more common in the advanced stages of HIV infection and presents as acute pericarditis or cardiac tamponade — the latter, in 30% of cases. Two thirds are due to infection or malignancy, while the cause is unknown in the remaining third.

HIV could be considered a viral infection capable of increasing the risk of cardiac abnormalities with pericardial involvement, such as acute pericarditis, pericardial effusion, cardiac tamponade and constrictive pericarditis. The most frequent causes of cardiac tamponade in patients with HIV infection are tuberculosis (26%), purulent pericarditis (17%), and infection by *Mycobacterium avium-intracellulare* complex (8%). Lymphoma and Kaposi's sarcoma cause 5% of cases of cardiac tamponade each. Cytomegalovirus infection is responsible for 3% of cases. AIDS was described in 1981, and two years later, in 1983, Autran described myocardial involvement by Kaposi's sarcoma. As HIV patients age, the risk of cardiovascular involvement and events increases; this is associated to the interaction among traditional risk factors, the virus, inflammation and antiretroviral treatment.[1-3]

Our experience on the subject dates back to 1995. To this date we have managed 33 patients with pericardial effusion, eight of which developed cardiac tamponade; of these, two had HIV pericarditis. In another patient, pericardiocentesis and a subxyphoid window were performed under local anesthesia. His overall physical status was very deteriorated, with advanced disease, and he died a few weeks later.

When the pericardium is damaged, it reacts with an inflammatory response, almost always accompanied by the accumulation of fluid in variable amounts. If the fluid accumulates rapidly, the patient suffers from hemodynamic compromise and cardiac tamponade, with the need for urgent draining due to the risk of death. However, if fluid accumulates gradually, large quantities may build up in the cavity with no symptoms for months or years. The need to evacuate the pericardial fluid is indicated in cardiac tamponade and if purulent pericarditis is suspected. In other cases, there is no consensus on the need for pericardial drainage, even in the presence of a severe effusion with no signs of tamponade. Faced with a severe pericardial effusion, a large number of authors recommend drainage, even without clinical manifestations (Weitzman criteria). The path to follow will depend on the clinical presentation of pericarditis, its etiology, and its clinical and hemodynamic repercussions. Pericardiocentesis is not a risk-free technique: complications have been reported in up to 10 to 25% of cases if performed blindly, with a 4% mortality rate. Currently, its preferred use is for establishing an etiologic diagnosis of the effusion and as an emergency decompression technique that makes it possible to create subsequently a pericardial window.[3,4]

Pericarditis with or without tamponade, may be the initial presentation in patients with AIDS.

Our patient appeared like a puzzle: he first presented with acute pericarditis with clinical tamponade, but the histology report chronic pericarditis that had been silent for a long time, with no cardiovascular manifestations. When he developed cardiac tamponade, an emergency pericardiocentesis was performed, making it possible to take the patient to surgery and perform an anterior pericardiectomy via an anterolateral thoracotomy, which turned out to be an effective approach.

The treatment of choice in patients with clinical tamponade is emergency pericardial fluid drainage, either by pericardiocentesis or surgical drainage. The choice between one or the other depends on the patient's characteristics and the experience of the medical team. Pericardiocentesis may be performed under electrocardiographic or echocardiographic guidance. After pericardiocentesis, an intrapericardial drainage is usually left in place for two or three days, to prevent immediate recurrence. If the tamponade is not solved with pericardiocentesis or the pericardial effusion recurs, surgical drainage is required, including a biopsy. Usually, a pericardial window is created through a subxyphoid approach or a thoracotomy; subxyphoid drainage with a balloon catheter is another option. In cases of cardiac tamponade, the possibility of establishing a specific cause is high, over 50%, so besides biochemical, cytologic and microbiological analyses of the fluid, a comprehensive laboratory and general diagnostic workup should be undertaken. Specific treatment will depend on the established cause. In idiopathic tamponade, which may represent up to 50% of cases, once the acute problem is solved, the patient's subsequent course is good.[13]

Treatment of pericarditis in HIV patients is no different from that in the general population. In asymptomatic patients, treatment of pericardial effusion should be conservative and include anti-inflammatory therapy. If tamponade occurs or the effusion's course is poor, pericardiocentesis or surgical drainage through a subxyphoid window should be carried out. Cardiac tamponade is infrequent and it is usually due to infectious or malignant causes. Traditionally, surgical treatment of pericardial effusions is performed through one of three approaches, i.e., subxyphoid drainage, left anterolateral thoracotomy or sternotomy. Subxyphoid drainage has the advantage of requiring only local anesthesia; it is doubtlessly useful in weakened patients and in those in deteriorated general conditions. However, exposure is limited, and only the resection of a small pericardial patch is possible, with a recurrence rate that some authors place at 20%, since broader pericardial resections cannot be performed.[14]

A thoracotomy allows wide visualization of the pericardium, as well as a broad resection, but it associated with greater morbidity. The choice of optimal pericardial drainage in non-constrictive pericarditis should rely on the needs and circumstances of each case. In the presence of cardiac tamponade, pericardial fluid must be removed to decrease intrapericardial pressure; in extreme cases, an immediate pericardiocentesis must be performed. A pericardial window is indicated in patients who need "something more" than a simple puncture, i.e., if there is a septated, purulent, uremic or malignant effusion, or any other situation in which recurrence is expected. It is the technique of choice, and is performed through a subxyphoid approach or a left thoracotomy. Surgical drainage has the advantage of being more thorough; it allows the surgeon to take a biopsy and has fewer recurrences, because adhesions and localized effusions can be removed. Once the need to evacuate the pericardial effusion is established, the selection of a treatment option is controversial: to begin with, one must choose between a pericardial puncture in its various modalities or surgical drainage through one of two approaches. Studies on the subject are not randomized, and they report different procedures and methods covering a broad range of clinical situations and causes, thus providing a low level of evidence.

Pericardiocentesis is clearly indicated in the following situations:

- Cardiac tamponade.
- Severe acute and chronic effusions.

- Smaller effusions that require an etiologic diagnosis.
- Patients at high surgical risk or with terminal diseases.

The transpleural approach through a left anterolateral thoracotomy carries greater morbidity and mortality. In their large series, Hidetaka[15] et al. used this approach in 110 patients, with a complication rate of 25.4% and a mortality rate of 2.7%. We therefore believe that the main indications for this procedure are the following:

- Traumatic pericarditis.
- Failure of other procedures.
- Pericardial flocculations and adhesions.
- The need for pericardial biopsy.

Except for trauma cases, patients should be in good physical condition, to tolerate the adverse effects of thoracotomy. We consider that our patient fulfilled the requirements for this approach, particularly in view of the need to establish a precise diagnosis of the cause and minimize the possibility of recurrence.

A pericardial window performed with VATS (video-assisted thoracic surgery) is appropriate in elective patients that are hemodynamically stable, with chronic effusions that have a poor course or have recurred after other procedures. It is also indicated in postpericardiotomy pericarditis and in recurrent idiopathic cases, where a more extensive pericardial resection is required. This approach offers the advantage of less complications, postoperative pain and time to recovery. It also allows the performance of other procedures, including pleural and pulmonary biopsies and talc pleurodesis.[16] We are currently developing this technique at our institution, a fact that we consider a great development to improve our results.

The subxyphoid window is an intermediate method between puncture and thoracotomy; it has a low morbidity and can be performed under local anesthesia. A pericardial drain should not be placed, since it does not promote continuous drainage to the peritoneum and recurrence of the effusion is frequently observed. Its main indications would be:

- Severe. non-flocculated effusions with or without tamponade.
- The need for diagnosis.
- Patients with high surgical risk.

CONCLUSIONS

Patients with HIV and pericardial effusion should be treated the same as other patients, but always considering that its cause may be multifactorial.

Election of the appropriate method depends on several factors, including:

- Clinical presentation and cause of the pericardial effusion.
- The need for diagnosis of the pericardial condition and other pleuropulmonary disorders.
- The patient's surgical risk.
- Experience of the physician and institution.
- Anatomical features of the effusion.
- Failure of previous therapeutic procedures.

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