

One Case of Acute Fluid Pericarditis and Hyperthyroidism at Teaching Hospital of Bouake (Ivory Coast): Cause-Effect Relationship or Accidental Association?

Gnaba Loa Ambroise^{1,2*}, Kouakou Florent Diby^{1,2}, Aka Leon Yves-Roland Akatchi¹, Pinnin Evelyne Adjara^{1,2}, Abdoulaye Coulibaly¹, Samuel Abro^{1,2}, Joel Oné¹, Marie Nicole Konan¹, Kassi Anicet Adoubi^{1,2}

¹Departement of Cardiology, Teaching Hospital, Bouake, Ivory Coast

²Medical Sciences Training and Research Unit, Alassane Ouattara University, Bouake, Ivory Coast

Email: *loaambroise@gmail.com

How to cite this paper: Ambroise, G.L., Diby, K.F., Akatchi, A.L.Y.-R., Adjara, P.E., Coulibaly, A., Abro, S., Oné, J., Konan, M.N. and Adoubi, K.A. (2023) One Case of Acute Fluid Pericarditis and Hyperthyroidism at Teaching Hospital of Bouake (Ivory Coast): Cause-Effect Relationship or Accidental Association? *World Journal of Cardiovascular Surgery*, 13, 137-143.

<https://doi.org/10.4236/wjcs.2023.139014>

Received: March 11, 2022

Accepted: September 19, 2023

Published: September 22, 2023

Copyright © 2023 by author(s) and Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Cardiovascular complications during hyperthyroidism are dominated by arrhythmias, heart failure and coronary heart disease. Pericardial effusion which is a common complication of hypothyroidism is extremely rare in hyperthyroidism. We report the case of a 45-year-old woman admitted for management of pleuro-pericarditis associated with atrial fibrillation in the context of cardiomyopathy. The treatment consisted of a pericardial puncture associated with synthetic anti-thyroid drugs and anti-tuberculosis drugs with positive clinical and echocardiographic outcomes.

Keywords

Hyperthyroidism, Pericarditis, Tuberculosis, Bouake, Ivory Coast

1. Introduction

Pericardial effusions, which are essentially viral origin in industrialized regions, are almost commonly tuberculous in developing countries [1] [2]. In addition, during cardiovascular disorders of thyroid origin, pericarditis has often been described in hypothyroidism, while the rhythm and excitability disorders, heart and coronary insufficiency were the prerogative of hyperthyroidism [3]. Although rare cases of hyperthyroidism and pericardial effusion have been reported establishing their causal link [4] [5] [6]. We report the case of a young

woman admitted for the management of a pleuro-pericardial effusion in a photo of heart failure, in whom the etiological investigation had revealed hyperthyroidism. Is it a fortitious association or and/or a cause and effect relationship?

2. Presentation of the Case

A 45-year-old patient who was referred by a Community Health Center to the Cardiology Department of the Teaching Hospital of Bouake for dyspnea that is associated with electrocardiographic abnormalities. The signs have been evolving for a month by the installation of gradually increasing effort dyspnea up to stage 3 of the New York Heart Association associated with medial thoracic pain with posterior irradiation, with a tingling type aggravated by the supine position. These symptoms were associated with palpitations, a productive cough and seromucous sputum. The evolution would have been marked by the progressive appearance of abdominal distension and edema of the lower limbs in a context of deterioration of the general state without a notion of fever or evening sweats. The personal and family cardiovascular history was unremarkable and no mention of tuberculosis contagion was found during interrogation. The physical examination at admission revealed an average general impression with a temperature of 37°C and a skin-mucosal pallor with frank jaundice. The cardiovascular examination was performed in a dyspneic patient with a respiratory rate of 28 cycles/minute, blood pressure of 120/70 mmHg with a heart rate of 125/minute.

The patient show signs of right congestive heart failure and bilateral pleural fluid effusion syndrome. Cardiac auscultation revealed a tachyarrhythmia without additional noise. The rest of the physical examination found clear signs of hyperthyroidism including neuropsychological disorders (excessive nervousness, psychomotor restlessness, mood disorders), fine and regular tremor of the extremities, weight loss and predominant root atrophy, anterior cervical swelling with thrill-free swallowing associated with discrete exophthalmos and pharyngeal disorders.

The electrocardiogram showed atrial fibrillation with a rapid ventricular response of between 130 - 160 beats per minute, a diffuse undershirt of the PQ segment and a diffuse concave ST elevation. The frontal X-ray (**Figure 1**) revealed that there was global cardiomegaly with a cardiothoracic index of 0.60 and bilateral fluid effusion in the pleura. The patient presented a problem of lesional diagnosis, etiological and therapeutic management of right heart failure associated with rapid atrial fibrillation with signs of thyrotoxicosis in a context of deterioration of general condition. The diagnostic hypotheses evoked were fluid pericarditis in adiasstolia, and pulmonary hypertension. The transthoracic ultrasound (**Figure 2**) performed for this purpose objectified a very abundant pericardial effusion with signs of adiasstolia and many fibrin filaments.

The patient received a pericardial puncture bringing back a serohaematic fluid of about 1700 milliliters whose chemical and cytobacteriological study was in favor of a sterile exudative fluid. The geneXpert test was negative. The etiological

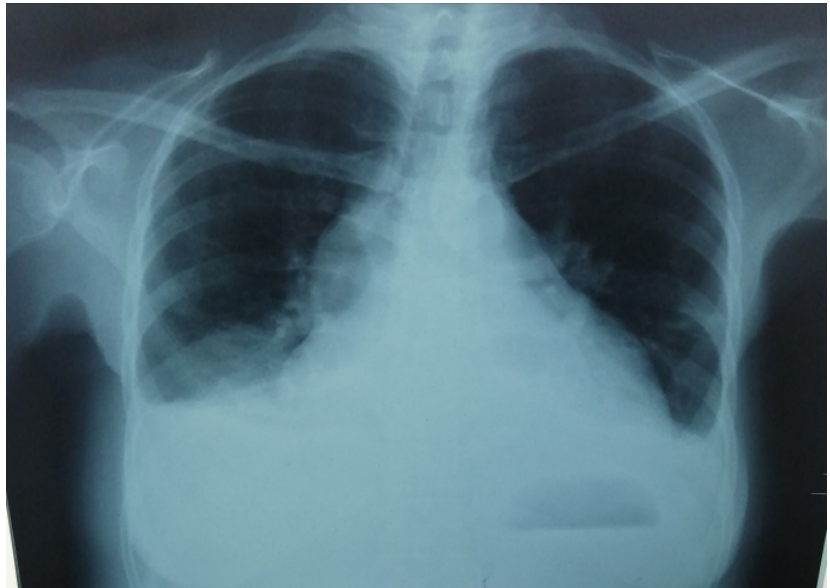


Figure 1. Thoracic X-ray showing cardiomegaly and bilateral fluid pleural effusion.

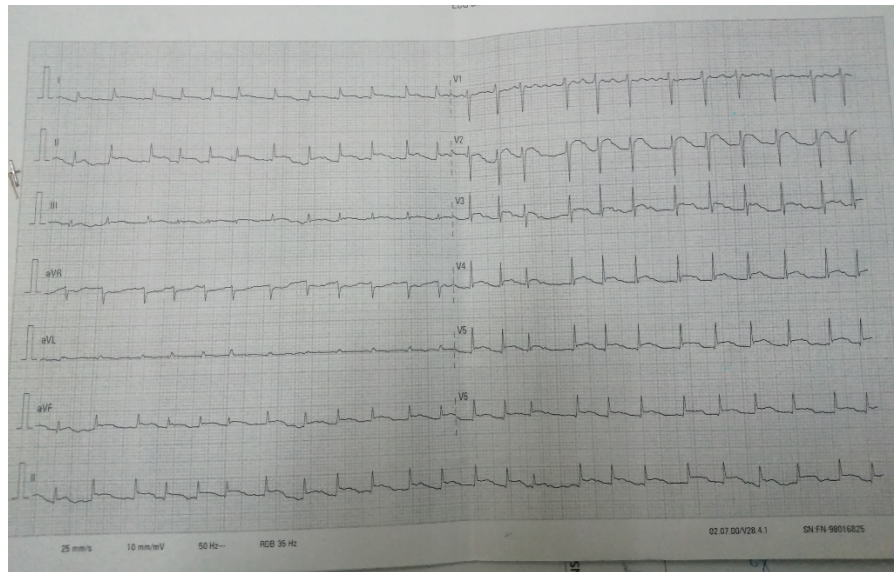


Figure 2. Electrocardiogram showing atrial fibrillation with a rapid ventricular response of between 130 - 160 beats per minute, a diffuse undershift of the PQ segment, a diffuse concave ST elevation.

survey showed a negativity of the bacilloscopy of sputum and retroviral serology to HIV. Moreover, the hormonal evaluation showed hyperthyroidism with an Ultrasensitive Thyroid Stimulating Hormone (U-TSH) to $0.18 \mu\text{UI/ml}$, others hormones and nuclear antibodies could not be performed.

All these elements made it possible to retain the diagnosis of probable Base-dow disease complicated pleura-pericarditis (**Figure 3**) and atrial fibrillation without formally ruling out the Tuberculosis etiology given the epidemiological context. Evolution under anti-tuberculosis treatment, synthetic antithyroid, beta-blocker associated with corticosteroid and adjuvant corticosteroid therapy

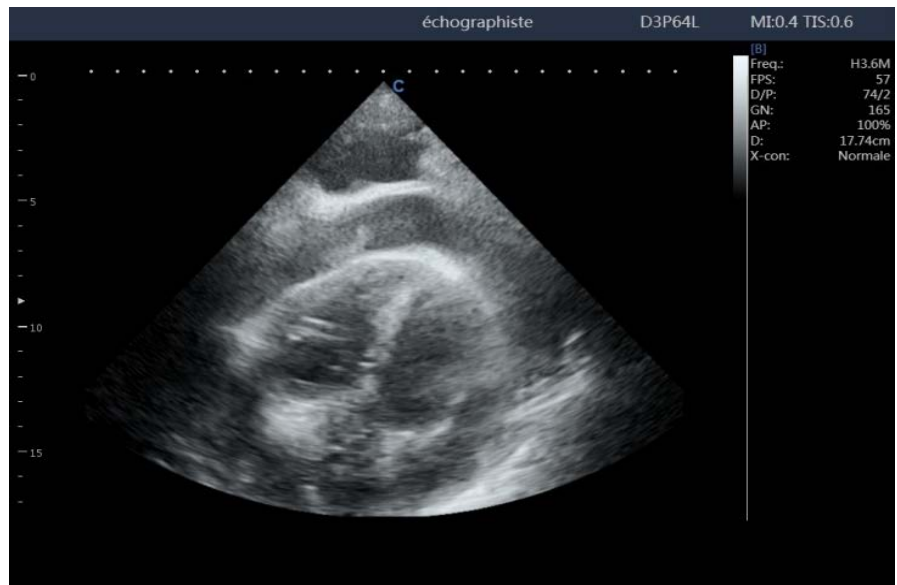


Figure 3. Echocardiographic showing fluid pericarditis in subcostal incidence.

was marked by the regression of the signs of adiestolia and a spontaneous return to sinus rhythm at electrocardiogram monitoring after three days of treatment.

3. Discussion

Cardiothyreosis is a form of cardiovascular disease during hyperthyroidism and it is linked to several etiopathogenic entities: multihetero-nodular goiters, Graves' disease, toxic adenoma and thyroid cancer. His best known manifestations are arrhythmias, heart failure and coronary insufficiency, while pericardial effusion has rarely been described [7]. Atrial fibrillation is the most common arrhythmia. Sometimes indicative of hyperthyroidism, it is present in 9% to 22% of cases, compared to 0.4% in the general population [8]. Spontaneous return to sinus rhythm during hyperthyroidism correction is common prior to age of 60 in patients without underlying heart disease and whose hyperthyroidism was short-lived. About 3% - 6% of patients with hypothyroidism have pericardial effusions [9]. In contrast, the association of a pleuropericardial effusion with hyperthyroidism is rarely described in the literature, only 18 have been reported since 1958. Treusch and Jaffe were the first to report three cases of hyperthyroidism associated with acute pericarditis in three women, but they did not provide any definitive conclusion about the association [10]. Tourniaire *et al.* reported two cases of pleuropericarditis that were complicated by tamponade evolving in a febrile context associated with Graves' disease [11]. Four cases of pericardial effusion were reported Clarke *et al.* in middle-aged patients with Basedow's disease [12]. The mechanism of development of a pleuro-pericardial effusion in Basedow's disease remains subject to several hypotheses. Authors stated that the mechanism is similar to that of ophthalmopathy and myxedema found in hypothyroidism [12] [13]. A study of hypothyroidism revealed changes in capillary permeability and extravascular and intravascular protein movement as well as decreased

lymphatic drainage. The pathophysiology of hyperthyroidism may be a similar [14]. Others authors incriminate an autoimmune mechanism involving direct or indirect interaction with anti-receptor antibodies in the pericardium and pleura [4] [15] [16]. The metabolism of pericardial brown fat can be directly affected by thyrotoxicosis [17]. The authors suggest performing a thyroid examination in the presence of a pericardial effusion, to detect both hypothyroidism and hyperthyroidism [18]. The vital prognosis is at stake, given the risk of tamponade which is added to other serious forms of cardiothyreosis such as arrhythmias. Teague and O'Brien emphasize that it is crucial to rule out Graves' disease when there is any unexplained pericardial effusion, even if there no signs of thyrotoxicosis. The authors mentioned that a patient on carbimazole and Propranolol for Graves' disease undergoing biological improvement had a pericardial effusion complicated by tamponade [19]. In the majority of reported cases, the pleuro-pericardial effusion resolves after treatment of the hyperthyroidism alone [4] [20], but in the cases of tamponade, surgical drainage or pericardiocentesis are necessary. In all cases, it is important to ensure the absence of HIV infection, and to evoke in principle the origin of tuberculosis before a progressive and poorly tolerated pericardial effusion because ECG, radiological and echocardiographic abnormalities are common to abundant pericardial effusions, regardless the etiology [21] [22].

4. Conclusion

The association of fluid pericarditis and hyperthyroidism is still very uncommon in cardiothyreosis. It must be reviewed and documented to support a causal link between the two. The evolution is generally favorable under synthetic antithyroid treatment while the absence of treatment may engage the prognosis vital by the occurrence of tamponade.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Mayosi, B.M., Burgess, L.J. and Doubell, A.F. (2005) Tuberculous Pericarditis. *Circulation*, **112**, 3608-3616. <https://doi.org/10.1161/CIRCULATIONAHA.105.543066>
- [2] Longo-Mbenza, B., Tondangu, K., Seghers, K.V. and Mubagwa, D. (1997) HIV Infection and Pericardial Disease Invasion in Africa. *Les Archives des Maladies du Coeur et des Vaisseaux*, **90**, 1377-1384.
- [3] Lorcy, Y. and Klein, M. (2005) Troubles cardiovasculaires d'origine thyroïdienne. *EMC-Cardiologie Angéiologie*, **2**, 127-135. <https://doi.org/10.1016/j.emcaa.2005.01.001>
- [4] Koo, E.H., Kim, S.M., Park, S.M., *et al.* (2012) Acute Recurrent Pericarditis Accompanied by Graves' Disease. *Korean Circulation Journal*, **42**, 419-422. <https://doi.org/10.4070/kcj.2012.42.6.419>

- [5] Fabowale, M.O., Ogah, O.S., Kehinde, A.M., Olusola, F.I., Okafor, I.J., Bakare, T.A., *et al.* (2021) Pericardial Effusion in a Patient with Hyperthyroidism: A Case Report. *Annals of Ibadan Postgraduate Medicine*, **19**, 78-81.
- [6] Zargar, P.A., Tahir, S.M. and Bhat, H. (2020) Acute Recurrent Pericarditis in Thyrotoxicosis. *IHJ Cardiovascular Case Reports*, **4**, 38-40. <https://doi.org/10.1016/j.ihjccr.2019.12.002>
- [7] Moumen, A., *et al.* (2014) L'épanchement péricardique: Une manifestation peu connue de la maladie de Basedow. *La Presse Médicale*, **43**, 1129-1133. <https://doi.org/10.1016/j.lpm.2013.12.019>
- [8] Woeber, K.A. (1992) Thyrotoxicosis in the Heart. *The New England Journal of Medicine*, **327**, 94-96. <https://doi.org/10.1056/NEJM199207093270206>
- [9] Bui, P.V., Zaveri, S.N. and Pierce, J.R. (2016) Sanguineous Pericardial Effusion and Cardiac Tamponade in the Setting of Graves' Disease: Report of a Case and Review of Previously Reported Cases. *Case Reports in Medicine*, **2016**, Article ID: 9653412. <https://doi.org/10.1155/2016/9653412>
- [10] Treusch, J.V. and Jaffe, H.L. (1958) Hyperthyroidism Associated with Presumptive Acute Pericarditis, a Report of Three Cases. *California Medicine*, **89**, 217-221.
- [11] Tourniaire, J., Sassolas, G., Toubou, L.P., *et al.* (1983) Tamponnade par péricardite subaiguë au cours de la maladie de Basedow. *La Presse Médicale*, **12**, 1989-1990.
- [12] Clarke, N.R.A., Banning, A.P., Gwilt, D.J. and Scott, A.R. (2002) Pericardial Disease Associated with Grave's Thyrotoxicosis. *Quarterly Journal of Medicine*, **95**, 188-189. <https://doi.org/10.1093/qjmed/95.3.188>
- [13] Nakata, A., Komiya, R., Ieki, Y., Yoshizawa, H., Hirota, S. and Takazakura, E. (2005) A Patient with Graves' Disease Accompanied by Bloody Pericardial Effusion. *Internal Medicine*, **44**, 1064-1068. <https://doi.org/10.2169/internalmedicine.44.1064>
- [14] Parving, H.H., Hansen, J.M., Nielsen, S.L., Rossing, N., Munck, O. and Lassen, N.A. (1979) Mechanisms of Edema Formation in Myxedema—Increased Protein Extravasation and Relatively Slow Lymphatic Drainage. *The New England Journal of Medicine*, **301**, 460-465. <https://doi.org/10.1056/NEJM197908303010902>
- [15] Chhabra, L. and Spodick, D.H. (2013) Pericardial Disease in the Elderly. In: Aronow, W.S., Fleg, J.L. and Rich, M.W., Eds., *Cardiovascular Disease in the Elderly*, 5th Edition, CRC Press, London, 644-668.
- [16] Paz-ibarra, J., Sueldo-Espinoza, D., Concha-Tamo, R., Zamame-Ramirez, V., Velasquez-Rimachi, V. and Concepcion-Zavaleta, M. (2022) Pleuropericardial Compromise Associated with Graves' Disease: A Systematic Review. *Journal of Endocrinology and Metabolism*, **12**, 1-9. <https://doi.org/10.14740/jem790>
- [17] Chhabra, L. and Spodick, D.H. (2014) A Comment on Thyrotoxic Pericarditis. *International Journal of Cardiology*, **173**, 587. <https://doi.org/10.1016/j.ijcard.2014.03.104>
- [18] Ovardia, S., Lyssy, L. and Zubkov, T. (2007) Pericardial Effusion as an Expression of Thyrotoxicosis. *Texas Heart Institute Journal*, **34**, 88-90.
- [19] Teague, E., O'Brien, C.J. and Campbell, N.P.S. (2009) Pericardial Effusion and Tamponade Complicating Treated Graves' Thyrotoxicosis. *Ulster Medical Journal*, **78**, 56-57.
- [20] Khalid, Y., Sulaiman, R., Zahir, R., Baskar, V. and Buch, H.N. (2011) An Unusual Complication in a Patient with Graves' Disease. *The New Zealand Medical Journal*, **124**, 69-71.
- [21] Vacheron, A., Le Feuvre, C. and Di Matteo, J. (1999) Manifestations cardiovasculaires

des maladies endocriniennes et des troubles métaboliques. In: Vacheron, A., Le Feuvre, C. and Di Matteo, J., Eds., *Cardiologie*, 3rd Edition, Expansion Scientifique Publications, Paris, 506-513.

- [22] Loire, R. and Pinede, L. (1999) Péricardites aiguës et épanchements non inflammatoires du péricarde. *EMC Cardiologie-Angéiologie*, 11-015-A-10, 14.